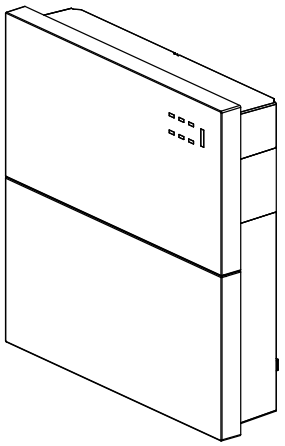
ideal
COMMERCIAL

*i*CCS COMMERCIAL CONTROL SYSTEM

Extension Module



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January 2020
UIN 221253 A01

CONTENTS

NOTE : LEAVE THESE INSTRUCTIONS ADJACENT TO THE *i*CCS

CONTENTS - Figures

SCOPE

This document describes the iCCS Extension Module.
The operation and configuration, through the iCCS compliant System Manager on the boiler, and the Installation of the module.

COMPLIANCE

The control is an independent wall/DIN rail mounted enclosure for automatic temperature control of heating and/or DHW systems.

The control is designed for continuous operation.

INTRODUCTION

The Extension Module interfaces into the iCCS via the VariCAN bus that can be installed into any ICCS compatible boiler control system. The boiler requires a VariCAN Bus adapter to be fitted.

The Bus can then be extended outside of the boiler and connected to up to four Extension Modules. Each Extension Module supports two Heating Circuits, DHW storage tanks with circulating pumps, or one DHW system. A combination of Heating Circuits and DHW storage tanks can be configured in any given Extension Module.

Each heating circuit can be a Constant temperature circuit or a Variable temperature (Mixing) circuit, or an Air handling/blower unit.

The single DHW system can be configured as a Primary buffer tank with mixing circuit via a plate heat exchanger, or a mixing circuit with a plate heat exchanger and a Secondary buffer tank. The system also supports a direct Hot Water System via a plate heat exchanger. All of these can also have DHW circulation pumps.

DISPOSAL

Do not throw away this device as unsorted waste in the household trash. Return it to dedicated collection points for proper disposal. In this way you ensure an environmentally sound disposal and contribute to waste reduction.

according to the WEEE Directive

1 OPERATING GUIDE

1.1 Introduction

The control of the extension module is done via the Master Boiler System Manager. The configured extension module will be visible under the Heating Circuits and DHW Circuits menus.

The same sub-menu items will be available as shown in the iCCS system manual and are shown here for clarity.

1.2 Status LEDs

The unit has 7 status LEDs visible on the front panel. The LEDs numbered 1-6 show the operation of the outputs relating to the configured circuits, primarily for an EM configured with 2 circuits the LEDs are split into two groups of 3, 1-3 and 4-6, each of these shows the status of the configured outputs for each individual circuit. The LEDs will illuminate GREEN when the outputs are operating.

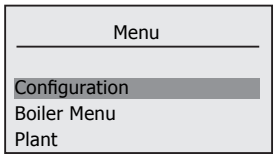
Where a complex HWS is configured, the full set of LEDs is used for this application.

The Power/System status LED on the RHS shows the operational status of the EM, normally when powered up and with no errors this LED will be steady GREEN. If a fault exists it will turn to RED, the fault code will be displayed on the Master Boiler System Manager.

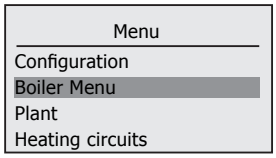
1.3 Menu

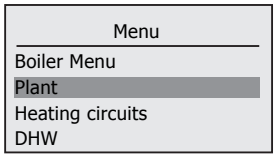
When any of the buttons are pressed or the knob rotated the display backlight will brighten up from its standby reduced level.

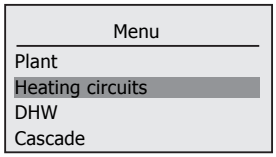
To select the menu, press the 'Select' button, the menu will appear:

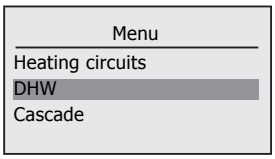


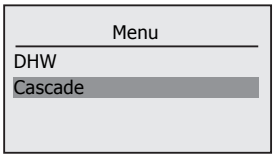
The menu can be scrolled down and contains the following items:







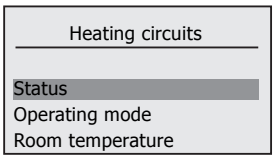


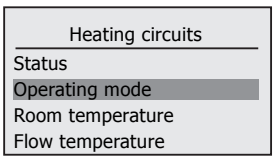


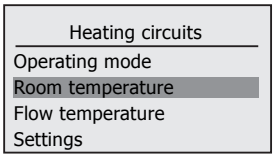
Note: Slave boilers do not have the Cascade menu option.

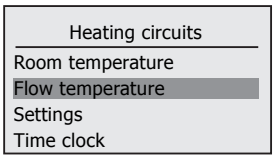
1.4 Menu – Heating Circuits

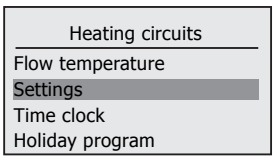
The heating circuits menu has the following options, there are other options but these are hidden from the User/ Installer:

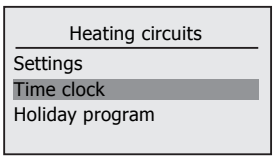


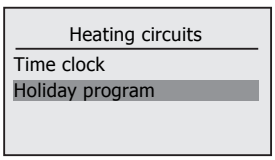








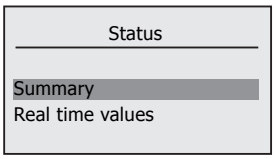




1.4.1 Menu – Heating Circuits - Status

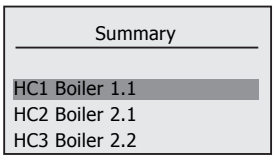
The status sub menu give you access to see the current real time values of the heating circuits.

The status menu has the following options:

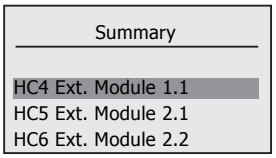


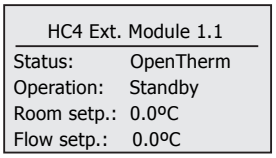
1.4.2 Menu – Heating Circuits – Status - Summary

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.



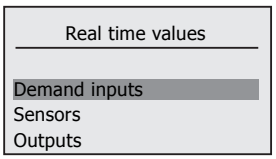
Depending on how many heating circuits are configured the Ext. Module heating circuits will appear in this scrolling list and can be selected:

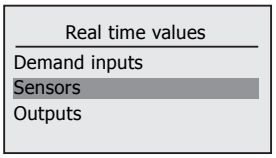


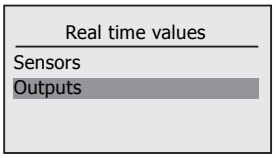


1.4.3 Menu – Heating Circuits – Status – Real Time Values

The Real time values menu has the following options:

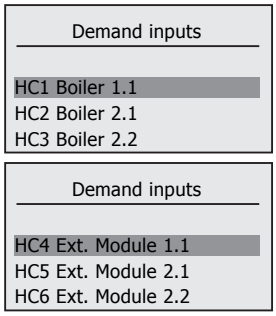




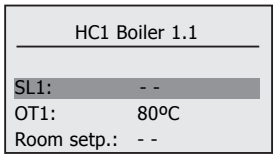


1.4.4 Menu – Heating Circuits – Status – Real Time Values – Demand Inputs

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

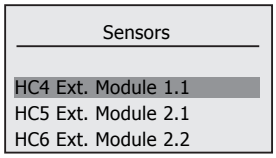


Once a heating circuit is selected, then the following screen will display the current Real time values for the configured Inputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

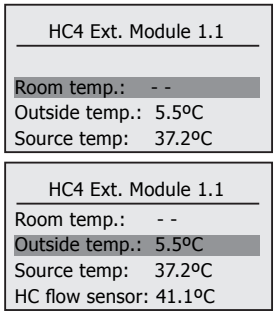


1.4.5 Menu – Heating Circuits – Status – Real Time Values – Sensors

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

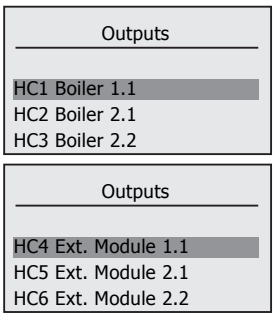


Once a heating circuit is selected, then the following screen will display the current Real time values for the configured sensors, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

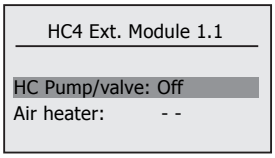


1.4.6 Menu – Heating Circuits – Status – Real Time Values – Outputs

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

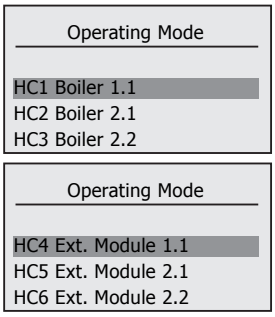


Once a heating circuit is selected, then the following screen will display the current Real time values for the configured outputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

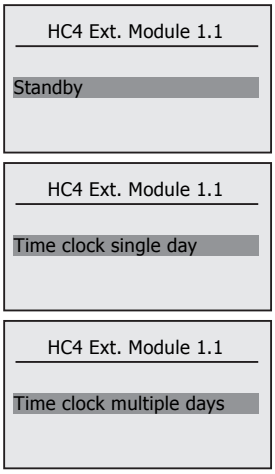


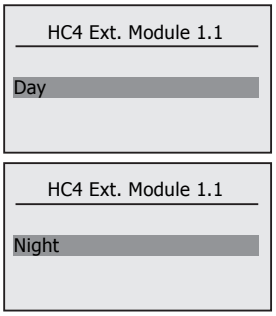
1.4.7 Menu – Heating Circuit – Operating Mode

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

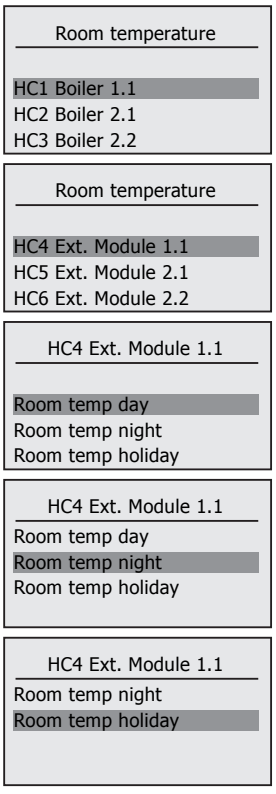
Time clock multiple day – Normal operation, timed

Day – Normal operation, continuous day mode

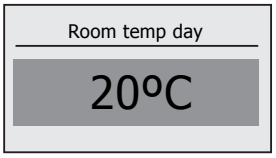
Night – Normal operation, continuous night mode.

1.4.8 Menu – Heating Circuit – Room Temperature

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

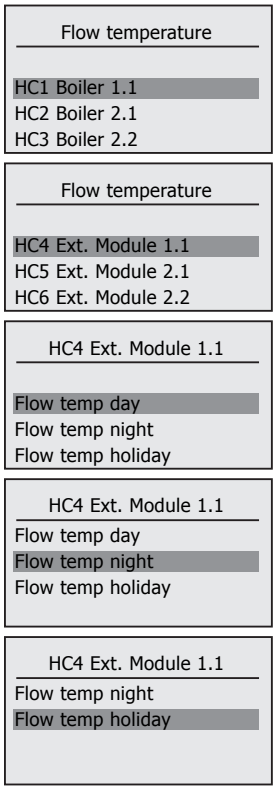


Each selected room temperature set point can be adjusted and then set, the adjustment screen is left by pressing the back button:

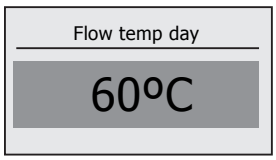


1.4.9 Menu – Heating Circuit – Flow Temperature

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



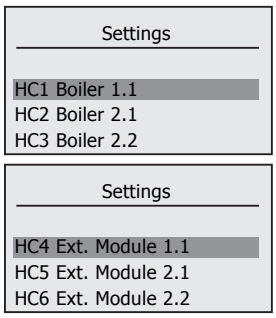
Each selected flow temperature set point can be adjusted and then set, the adjustment screen is left by pressing the back button:

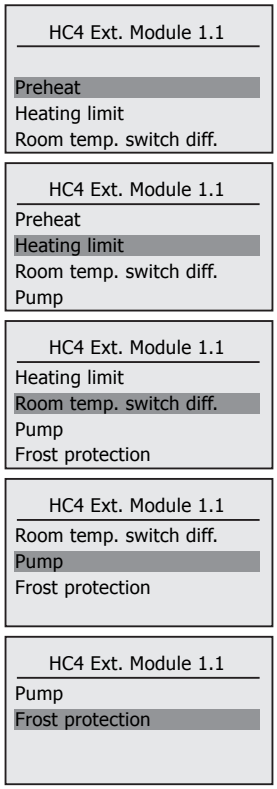


This limits the flow temperature into a HC.

1.4.10 Menu – Heating Circuit – Settings

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

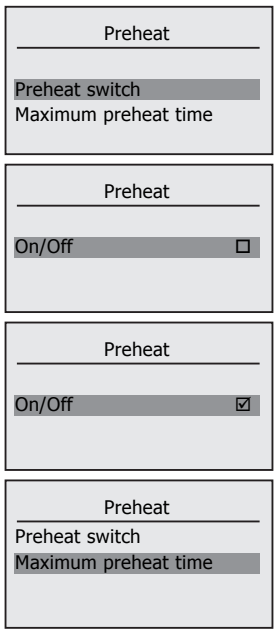


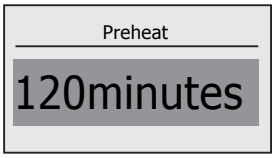


1.4.11 Menu – Heating Circuit – Settings - Preheat

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.

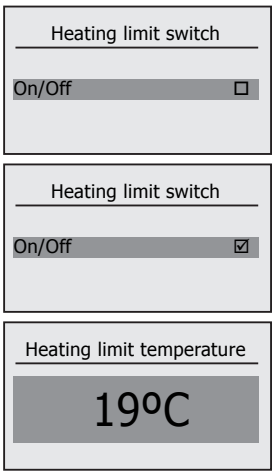




1.4.12 Menu – Heating Circuit – Settings – Heating Limit

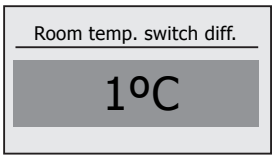
This ensures that the heating is not switched on unnecessarily if the average outside temperature, e.g. during the summer months, is higher than the room temperature setpoint in day mode.

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



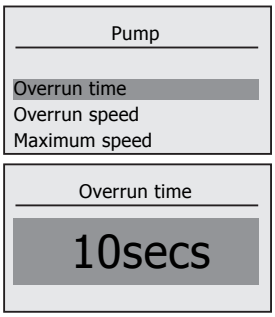
1.4.13 Menu – Heating Circuit – Settings – Room Temp. Switch Diff.

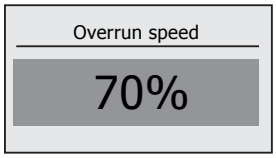
This sets the switching differential for the HC room sensor. The value ensures that the HC does not continuously cycle demand into the system.

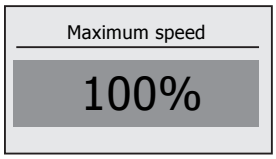


1.4.14 Menu – Heating Circuit – Settings – Pump

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.

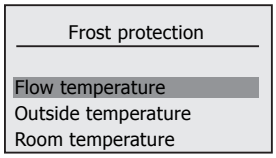






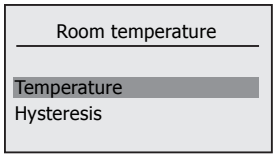
1.4.15 Menu – Heating Circuit – Settings – Frost Protection

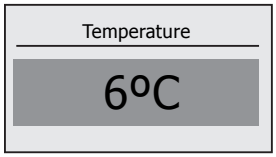
Heating circuit frost protection operation can be triggered by a number of measured real time values:

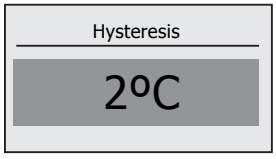


Each of these has a trigger set point and a hysteresis value above which the function is once again deactivated.

E.g. Room temperature, if the actual room temperature drops below the temperature setpoint value then HC 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.

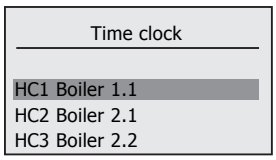


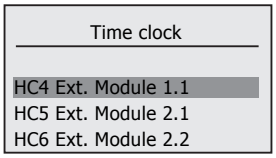




1.4.16 Menu – Heating Circuit –Time Clock

The Heating circuit internal time clock can be adjusted as below.

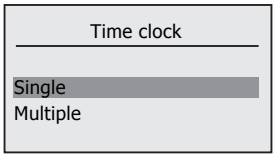




The next prompt asks if you wish to configure individual days or multiple days for the timeclock programmes.

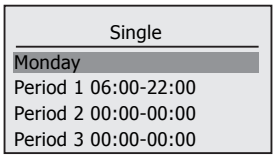
A single day is for individual programmes for every day of the week, Monday through to Sunday.

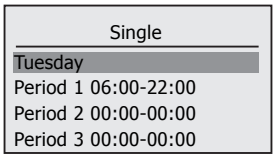
Multiple days are defined as Mon-Fri, or Sat-Sun. Where the same programme times are set for each group.

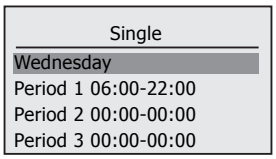


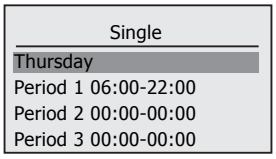
Single Days

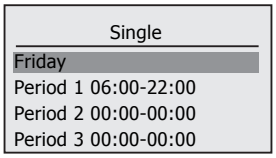
The individual days can be selected as highlighted, then each of the program periods and Start/Finish times. As shown below:

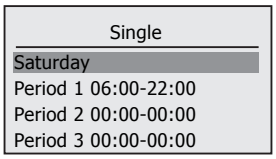


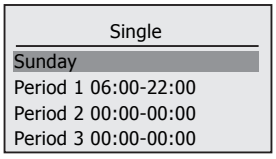




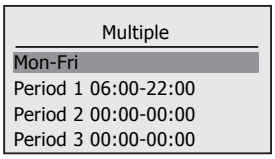


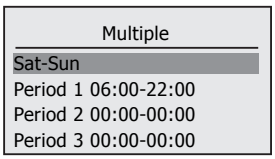






Multiple Days

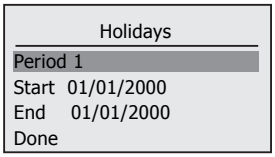




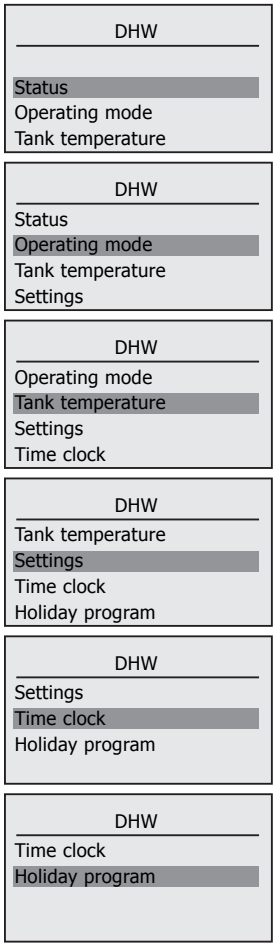
1.4.17 Menu – Heating Circuit – Holiday Programme

The Heating circuit holiday programmes may also be adjusted as shown.

To set holiday periods select the period, 1-8 and set the Start and End date.



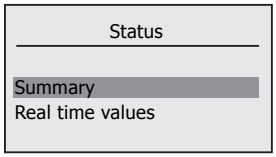
1.5 Menu – DHW



1.5.1 Menu – DHW - Status

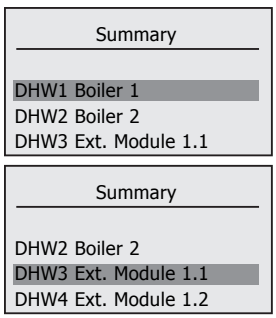
The status sub menu give you access to see the current real time values of the DHW circuits.

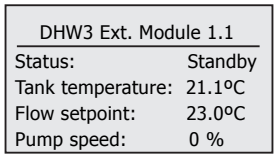
The status menu has the following options:



1.5.2 Menu – DHW – Status - Summary

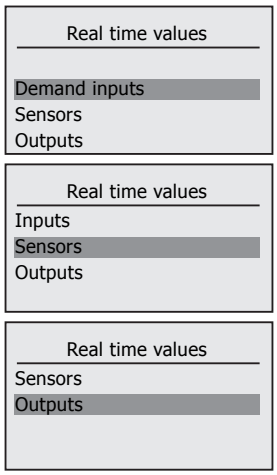
The summary sub menu lists the configured DHW circuits that are configured and can be selected, which then shows the main values for the DHW circuit.





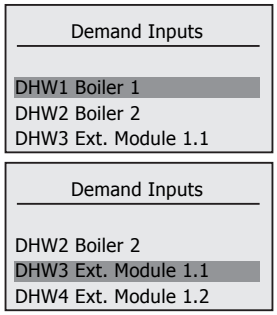
1.5.3 Menu – DHW – Status – Real Time Values

The Real time values menu has the following options:

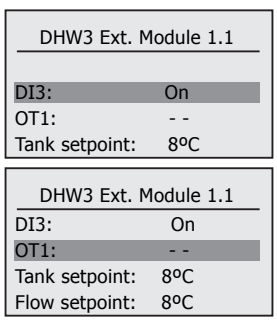


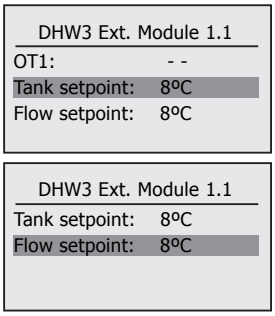
1.5.4 Menu – DHW – Status – Real Time Values – Demand Inputs

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



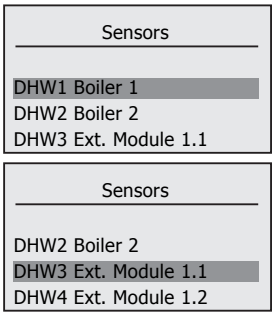
Once a DHW circuit is selected, then the following screen will display the current Real time values for the configured Inputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:



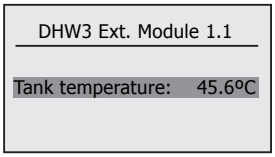


1.5.5 Menu – DHW – Status – Real Time Values – Sensors

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

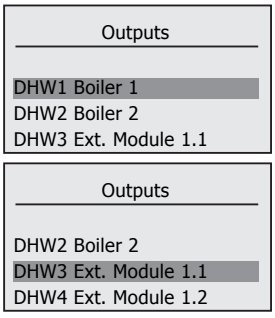


Once a DHW circuit is selected, then the following screen will display the current Real time values for the configured sensors, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

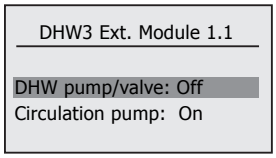


1.5.6 Menu – DHW – Status – Real Time Values – Outputs

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

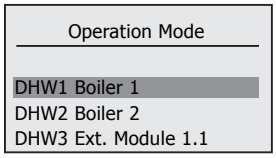


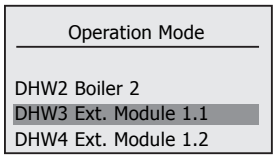
Once a DHW circuit is selected, then the following screen will display the current Real time values for the configured outputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:



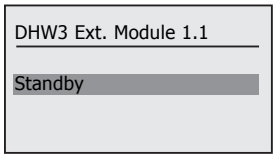
1.5.7 Menu – DHW – Operating Mode

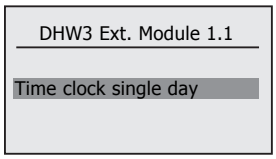
Each DHW circuit operating mode can be set. This controls the operation of the selected DHW circuit.

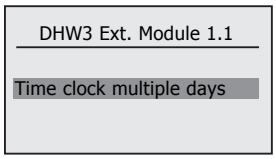




The options are:



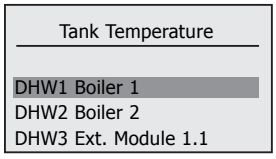


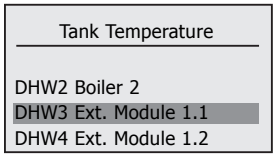


Standby – Frost protection only
Time clock single day – Normal operation, timed
Time clock multiple day – Normal operation, timed

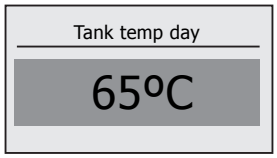
1.5.8 Menu – DHW – Tank Temperature

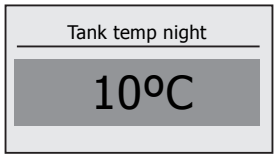
Each DHW circuit target tank temperature can be set for different operating modes for the selected DHW circuit.

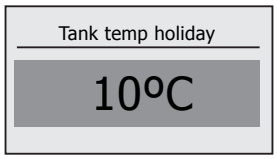




Each selected tank temperature set point can be adjusted and then set, the adjustment screen is left by pressing the back button:

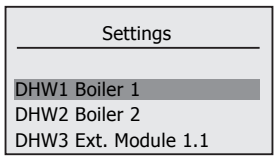


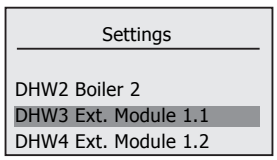


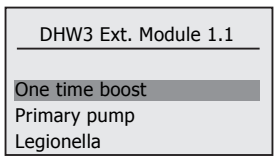


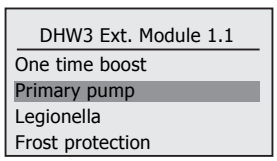
1.5.9 Menu – DHW – Settings

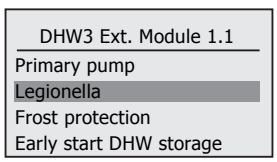
Each DHW circuit has a number of settings that can be adjusted for the selected DHW circuit.

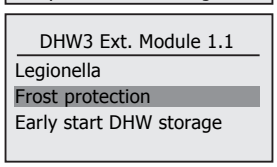


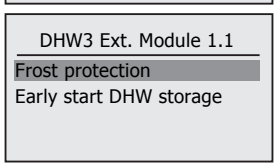


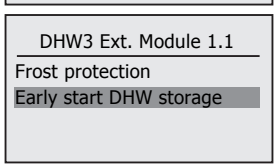






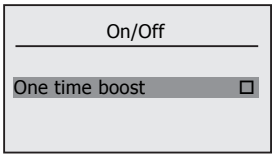


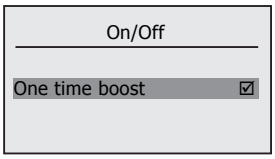


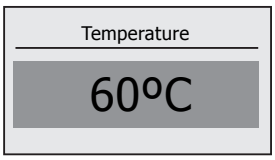


1.5.10 Menu – DHW – Settings – One Time Boost

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.

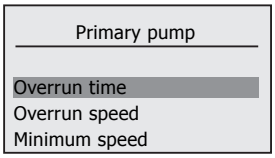


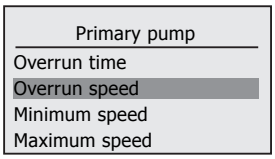


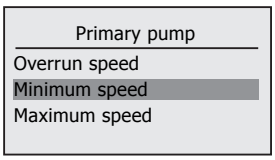


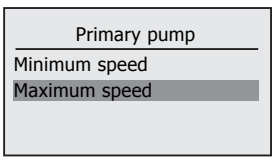
1.5.11 Menu – DHW – Settings – Pump

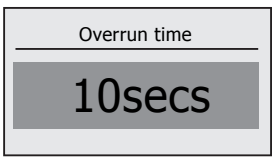
The primary pump for each individual DHW circuit has a number of settings. Some relate to speed if configured for control by a 0-10V output.

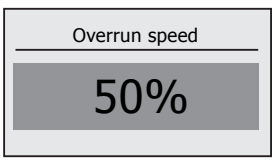


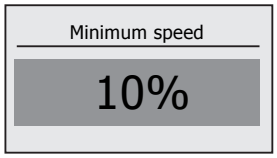


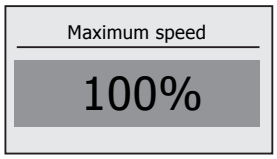






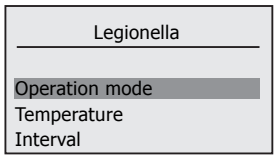




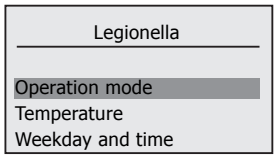


1.5.12 Menu – DHW – Settings – Legionella

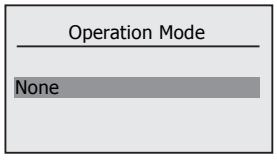
Two modes of operation of the function for Anti-legionella exist in the system. They can be selected and the parameters adjusted.

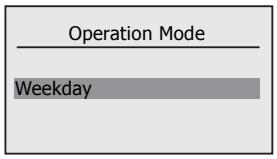


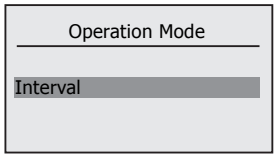
or



The operating mode options are:



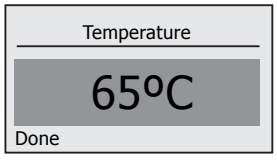


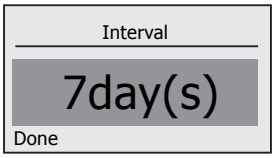


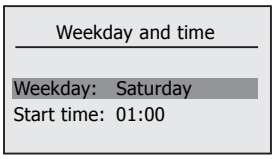
Weekday – set the weekday and time of operation

Interval - sets the interval between operation

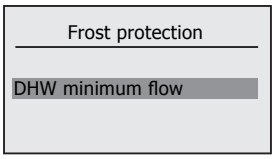
The mode of operation when set changes the last menu option to set the parameter controlling the anti-legionella event. Both modes require a temperature setpoint.

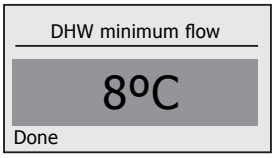






1.5.13 Menu – DHW – Settings – Frost Protection





1.5.14 Menu – DHW – Settings – Early Start DHW Storage

Each DHW circuit can have an early start prior to Day mode. This allows the tank to be charged prior to normal day time by starting storage at a defined number of minutes earlier.

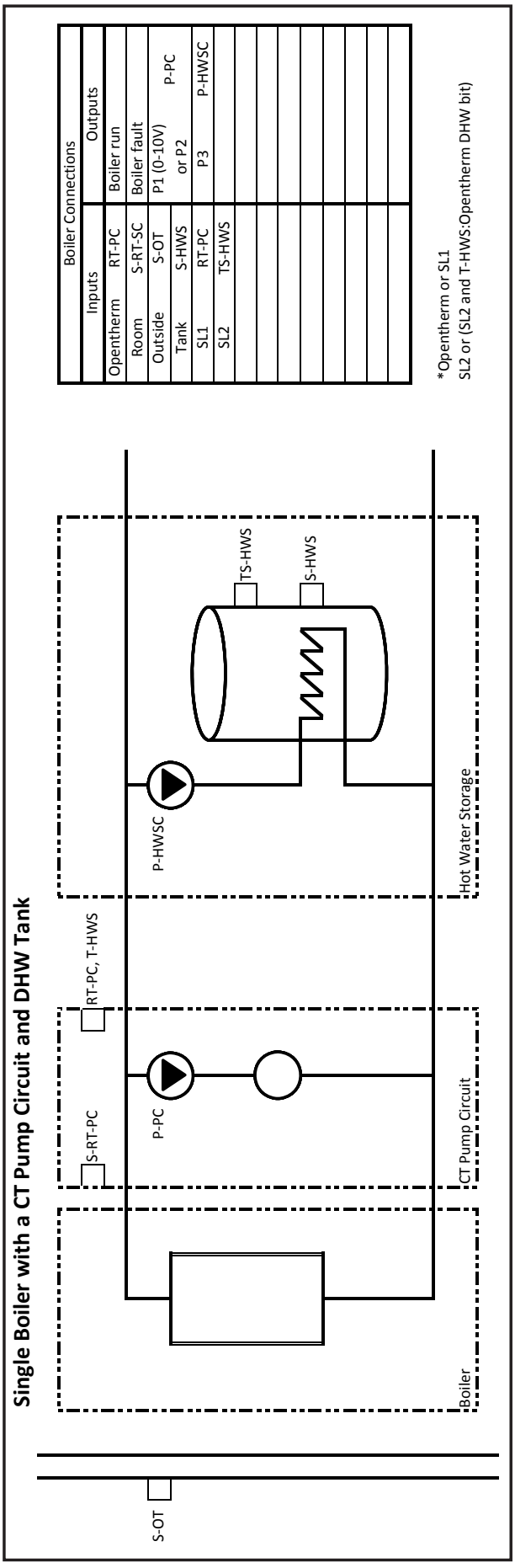
1.5.15 Menu – DHW – Time Clock

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

1.5.16 Menu – DHW – Holiday Programme

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

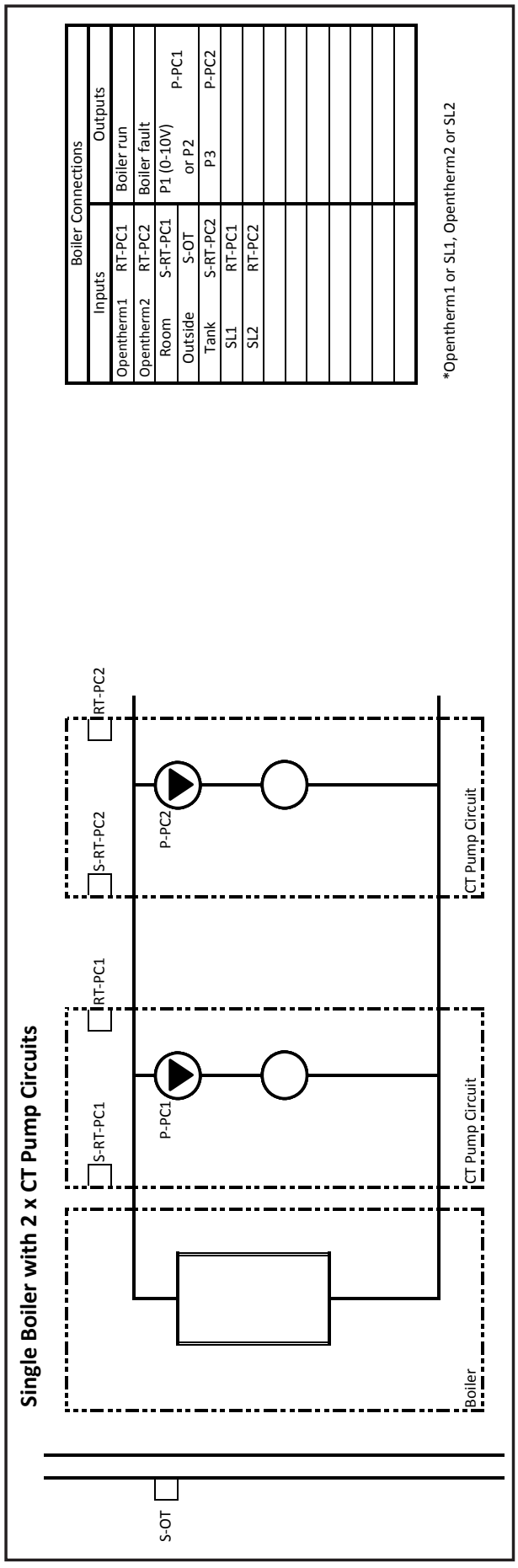
2 PARTIAL HYDRAULICS



Boiler Connections			
Inputs		Outputs	
Opentherm	RT-PC	Boiler run	
Room	S-RT-SC	Boiler fault	
Outside	S-OT	P1 (0-10V) or P2	P-PC
Tank	S-HWS	P3	P-HWSC
SL1	RT-PC		
SL2	TS-HWS		

*Opentherm or SL1
SL2 or (SL2 and T-HWS:Opentherm DHW bit)

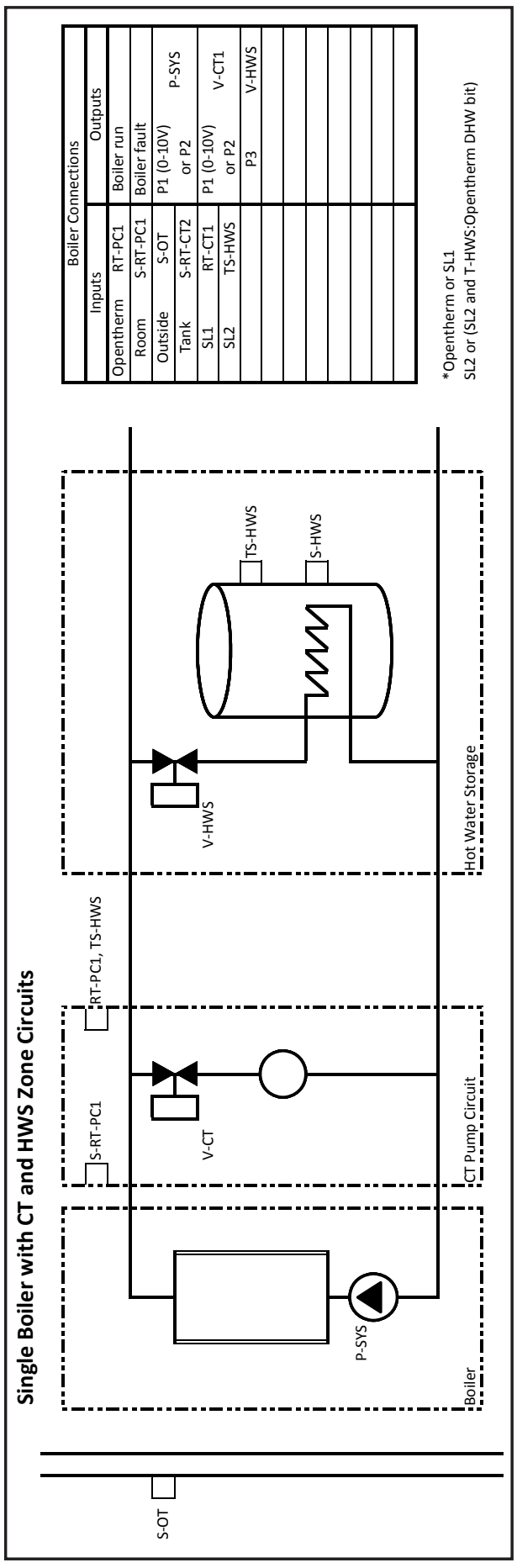
FIGURE 1 SINGLE BOILER WITH A CT PUMP CIRCUIT AND DHW TANK



Boiler Connections			
Inputs		Outputs	
Opentherm1	RT-PC1	Boiler run	
Opentherm2	RT-PC2	Boiler fault	
Room	S-RT-PC1	P1 (0-10V) or P2	P-PC1
Outside	S-OT	P3	P-PC2
Tank	S-RT-PC2		
SL1	RT-PC1		
SL2	RT-PC2		

*Opentherm1 or SL1, Opentherm2 or SL2

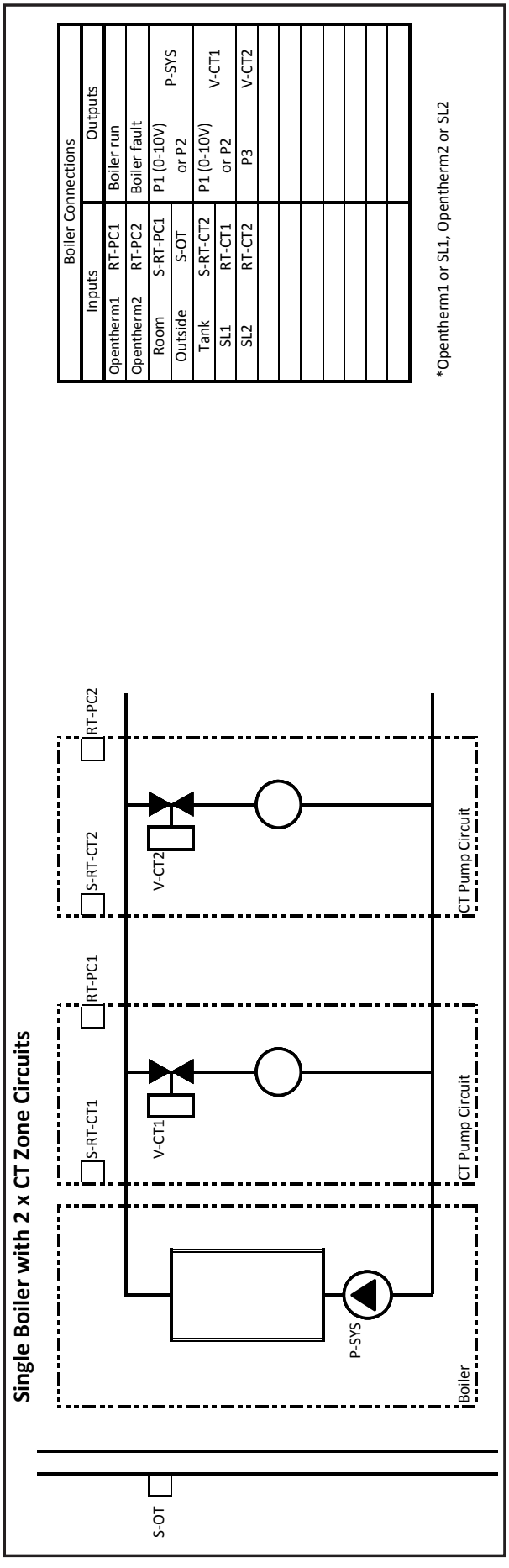
FIGURE 2 SINGLE BOILER WITH 2 X CT PUMP CIRCUITS



Boiler Connections		Outputs	
Inputs			
Opentherm	RT-PC1	Boiler run	
Room	S-RT-PC1	Boiler fault	
Outside	S-OT	P1 (0-10V) or P2	P-SYS
Tank	S-RT-CT2		
SL1	RT-CT1	P1 (0-10V) or P2	V-CT1
SL2	TS-HWS		
		P3	V-HWS

*Opentherm or SL1
SL2 or (SL2 and T-HWS:Opentherm DHW bit)

FIGURE 3 SINGLE BOILER WITH CT AND HWS ZONE CIRCUITS

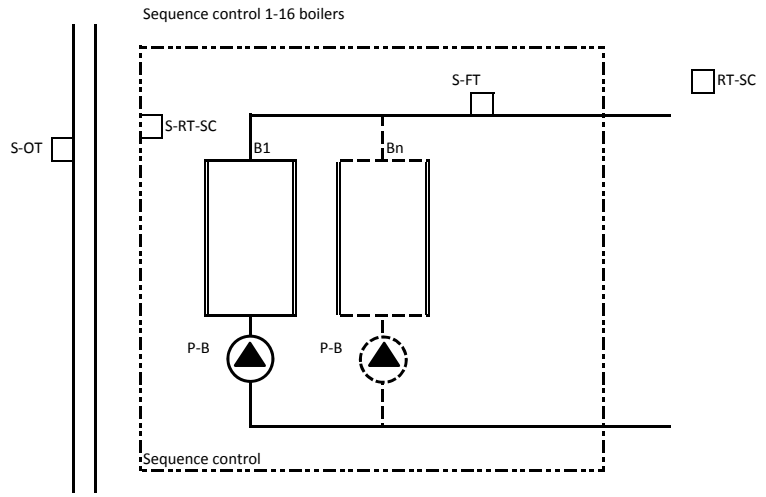


Boiler Connections		Outputs	
Inputs			
Opentherm1	RT-PC1	Boiler run	
Opentherm2	RT-PC2	Boiler fault	
Room	S-RT-PC1	P1 (0-10V) or P2	P-SYS
Outside	S-OT		
Tank	S-RT-CT2	P1 (0-10V) or P2	V-CT1
SL1	RT-CT1		
SL2	RT-CT2	P3	V-CT2

*Opentherm1 or SL1, Opentherm2 or SL2

FIGURE 4 SINGLE BOILER WITH 2 X CT ZONE CIRCUITS

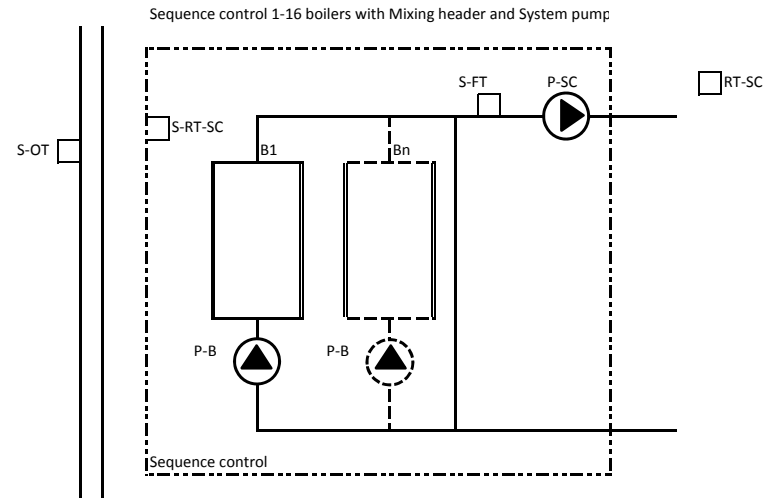
PARTIAL HYDRAULICS - Boiler 1 Master Configuration Options



B1 Connections			
Inputs		Outputs	
Opentherm	RT-SC	Boiler run	
Room	S-RT-SC	Boiler fault	
Header	S-FT	P1 (0-10V) or P2	P-B
Outside	S-OT		
SL1	Ext.Timer or Enable or Override		
VariCAN Adapter	B1..Bn		

*SL1 is Plant control

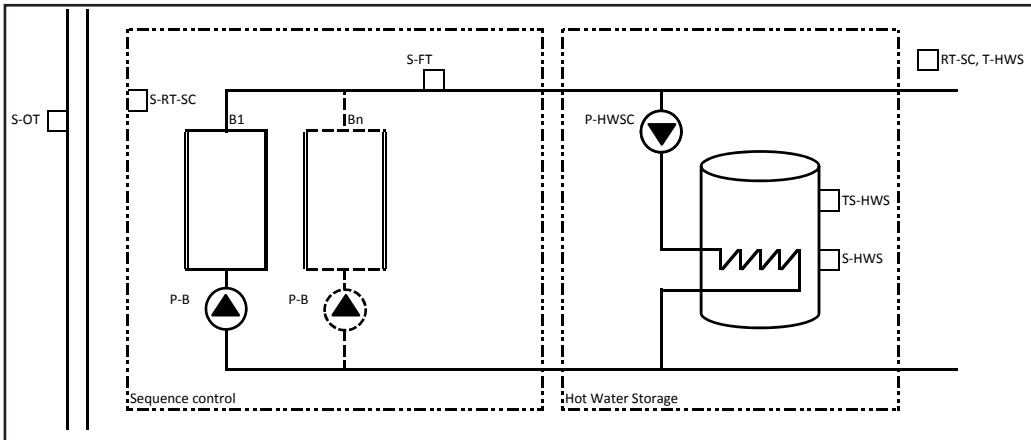
FIGURE 5 SEQUENCE CONTROL 1-16 BOILERS



B1 Connections			
Inputs		Outputs	
Opentherm	RT-SC	Boiler run	
Room	S-RT-SC	Boiler fault	
Header	S-FT	P1 (0-10V) or P2	P-SC
Outside	S-OT		
SL1	Ext.Timer or Enable or Override	P1 (0-10V) or P2	P-B
VariCAN Adapter	B1..Bn		

*SL1 is Plant control

FIGURE 6 SEQUENCE CONTROL 1-16 BOILERS WITH MIXING HEADER AND SYSTEM PUMP

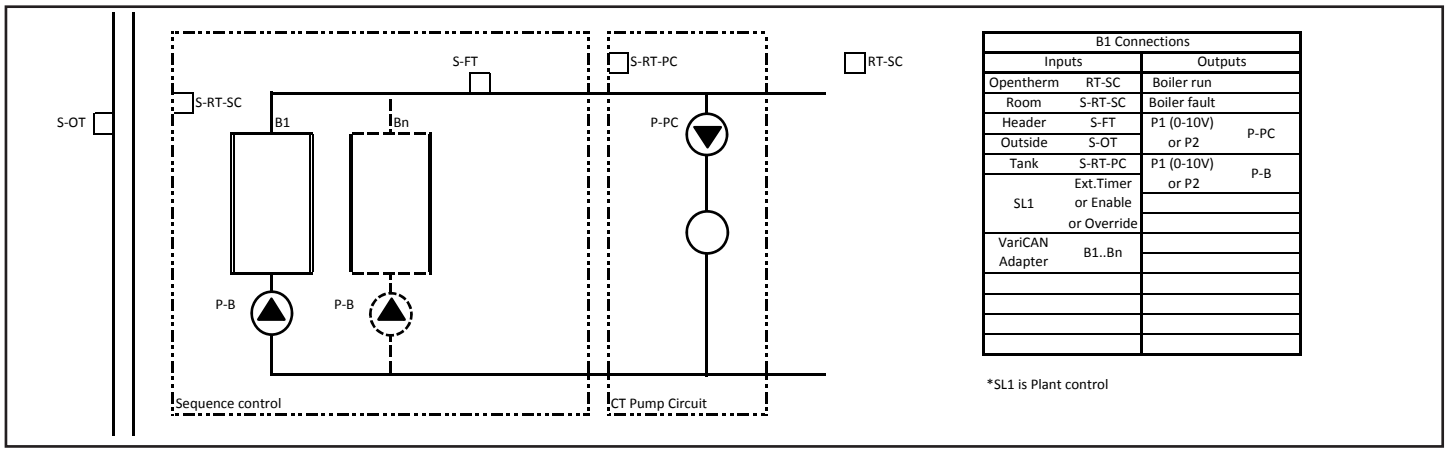


B1 Connections			
Inputs		Outputs	
Opentherm	RT-SC	Boiler run	
Room	S-RT-SC	Boiler fault	
Header	S-FT	P1 (0-10V) or P2	P-B
Outside	S-OT		
Tank	S-HWS	P3	P-HWSC
SL1	Ext.Timer or Enable or Override		
SL2	TS-HWS		
VariCAN Adapter	B1..Bn		

*SL1 is Plant control
SL2 or (SL2 and T-HWS:Opentherm DHW bit)

FIGURE 7 SEQUENCE CONTROL 1-16 BOILERS WITH INDIRECT HOT WATER STORAGE TANK

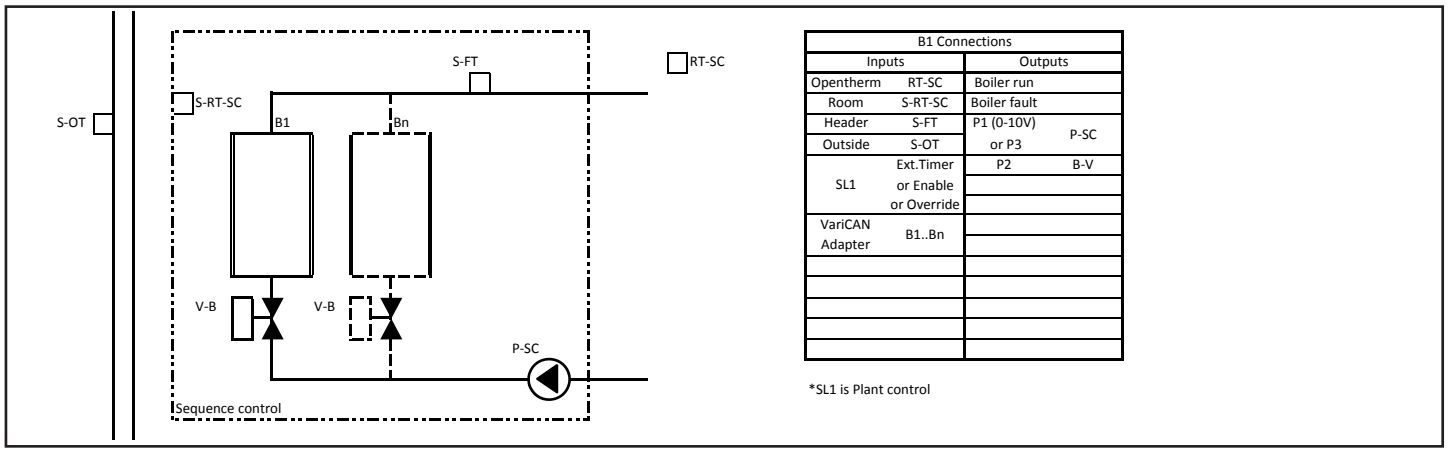
PARTIAL HYDRAULICS - Boiler 1 Master Configuration Options Continued



B1 Connections			
Inputs		Outputs	
Opentherm	RT-SC	Boiler run	
Room	S-RT-SC	Boiler fault	
Header	S-FT	P1 (0-10V) or P2	P-PC
Outside	S-OT		
Tank	S-RT-PC	P1 (0-10V) or P2	P-B
SL1	Ext.Timer or Enable or Override		
VariCAN Adapter	B1..Bn		

*SL1 is Plant control

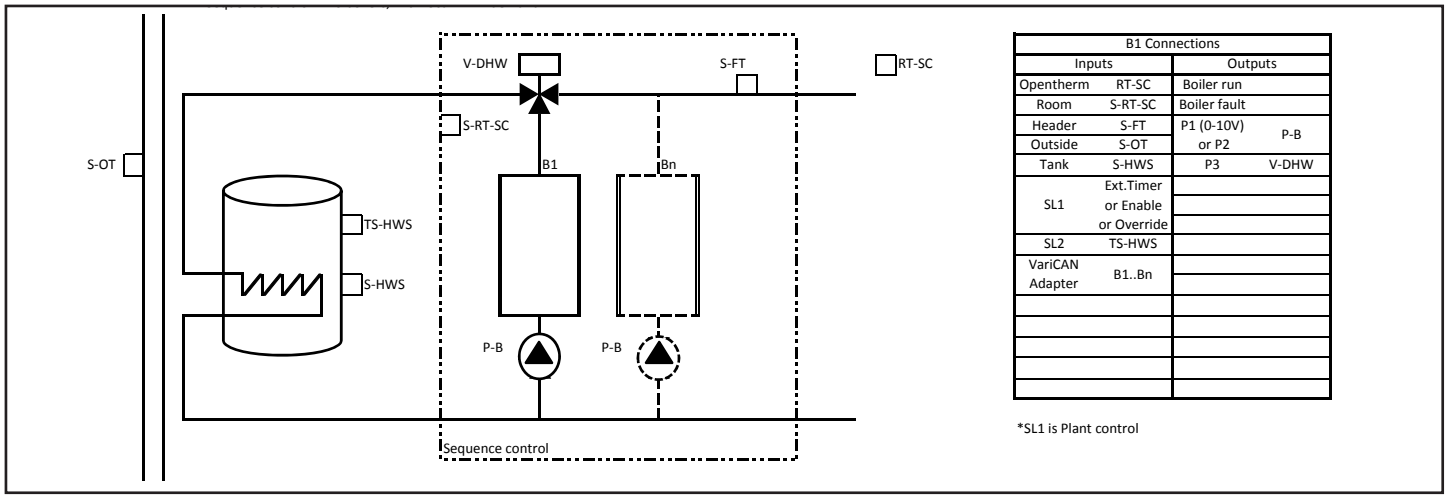
FIGURE 8 SEQUENCE CONTROL 1-16 BOILERS WITH A CT PUMP CIRCUIT



B1 Connections			
Inputs		Outputs	
Opentherm	RT-SC	Boiler run	
Room	S-RT-SC	Boiler fault	
Header	S-FT	P1 (0-10V) or P3	P-SC
Outside	S-OT		
SL1	Ext.Timer or Enable or Override	P2	B-V
VariCAN Adapter	B1..Bn		

*SL1 is Plant control

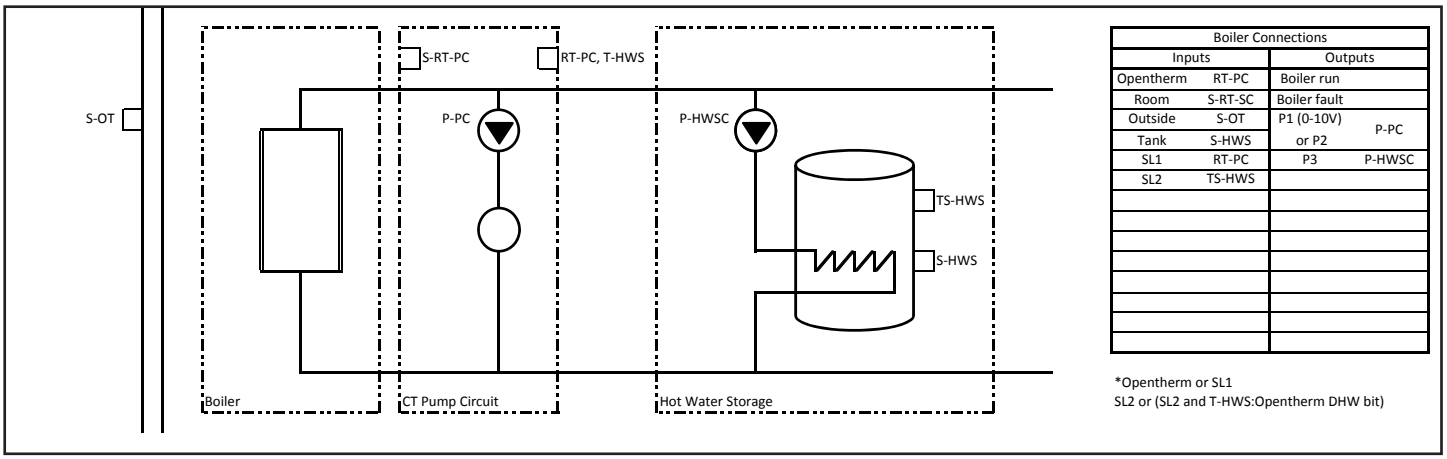
FIGURE 9 SEQUENCE CONTROL 1-16 BOILERS WITH COMMON PUMP AND OPTIONAL VALVES



B1 Connections			
Inputs		Outputs	
Opentherm	RT-SC	Boiler run	
Room	S-RT-SC	Boiler fault	
Header	S-FT	P1 (0-10V) or P2	P-B
Outside	S-OT		
Tank	S-HWS	P3	V-DHW
SL1	Ext.Timer or Enable or Override		
SL2	TS-HWS		
VariCAN Adapter	B1..Bn		

*SL1 is Plant control

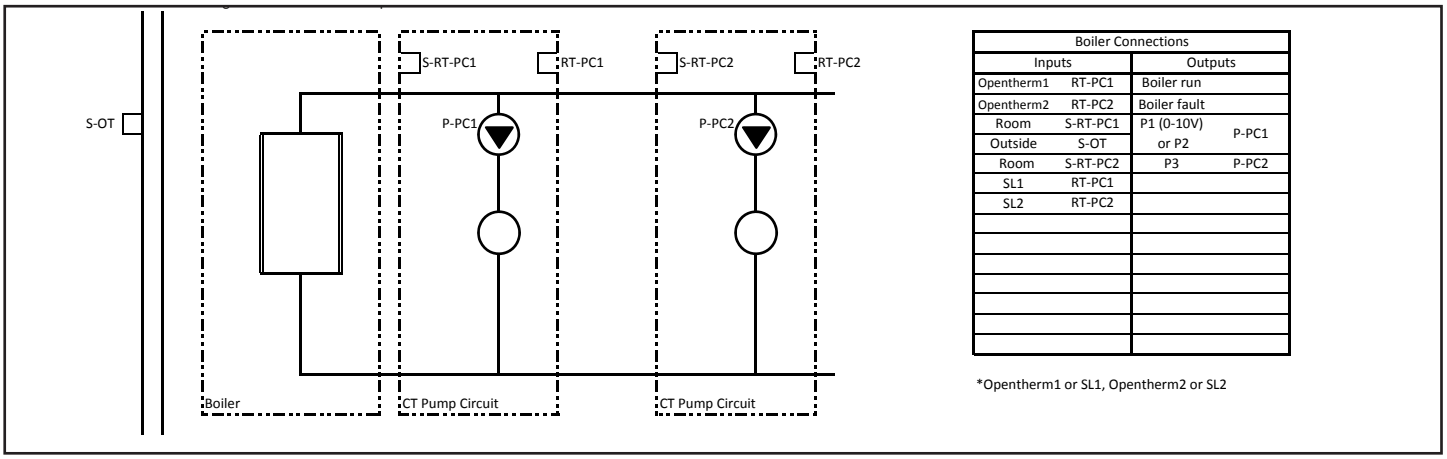
FIGURE 10 SEQUENCE CONTROL 1-16 BOILERS WITH LOCAL DHW DEMAND



Boiler Connections			
Inputs		Outputs	
Opentherm	RT-PC	Boiler run	
Room	S-RT-SC	Boiler fault	
Outside	S-OT	P1 (0-10V) or P2	P-PC
Tank	S-HWS		
SL1	RT-PC	P3	P-HWSC
SL2	TS-HWS		

*Opentherm or SL1
SL2 or (SL2 and T-HWS:Opentherm DHW bit)

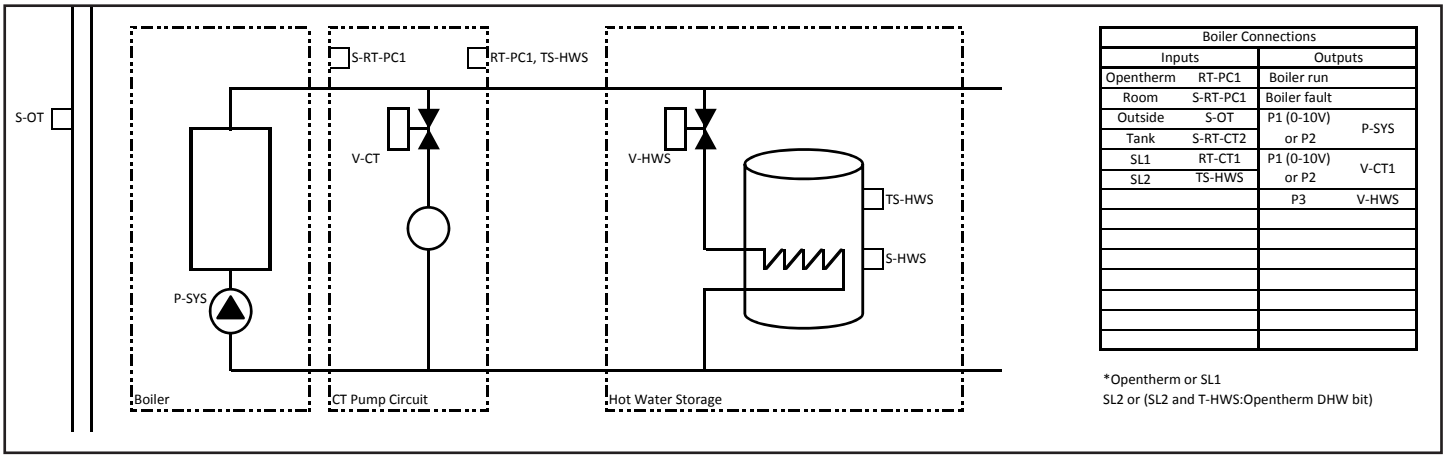
FIGURE 11 SINGLE BOILER WITH A CT PUMP CIRCUIT AND DHW TANK



Boiler Connections			
Inputs		Outputs	
Opentherm1	RT-PC1	Boiler run	
Opentherm2	RT-PC2	Boiler fault	
Room	S-RT-PC1	P1 (0-10V) or P2	P-PC1
Outside	S-OT		
Room	S-RT-PC2	P3	P-PC2
SL1	RT-PC1		
SL2	RT-PC2		

*Opentherm1 or SL1, Opentherm2 or SL2

FIGURE 12 SINGLE BOILER WITH 2 X CT PUMP CIRCUITS

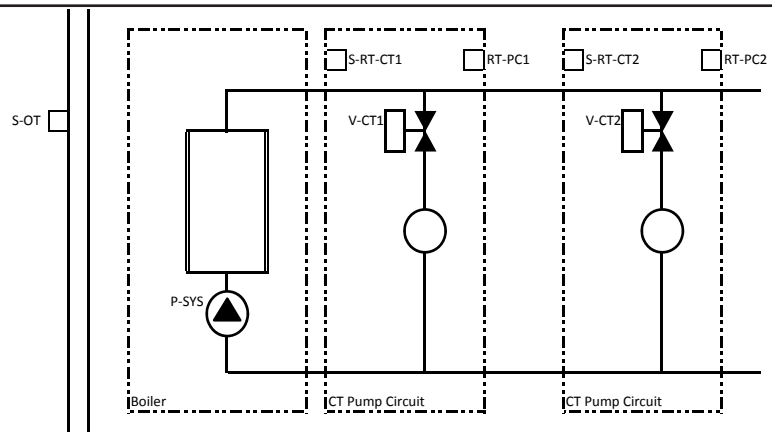


Boiler Connections			
Inputs		Outputs	
Opentherm	RT-PC1	Boiler run	
Room	S-RT-PC1	Boiler fault	
Outside	S-OT	P1 (0-10V) or P2	P-SYS
Tank	S-RT-CT2		
SL1	RT-CT1	P1 (0-10V) or P2	V-CT1
SL2	TS-HWS		
		P3	V-HWS

*Opentherm or SL1
SL2 or (SL2 and T-HWS:Opentherm DHW bit)

FIGURE 13 SINGLE BOILER WITH CT AND HWS ZONE CIRCUITS

PARTIAL HYDRAULICS - Continued

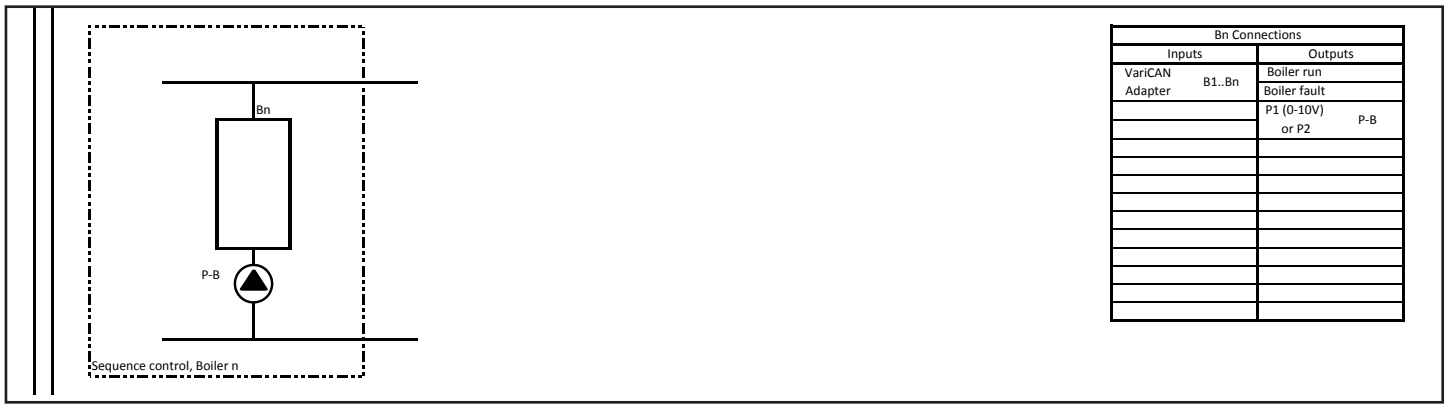


Boiler Connections			
Inputs		Outputs	
Opentherm1	RT-PC1	Boiler run	
Opentherm2	RT-PC2	Boiler fault	
Room	S-RT-PC1	P1 (0-10V)	P-SYS
Outside	S-OT	or P2	
Room	S-RT-CT2	P1 (0-10V)	V-CT1
SL1	RT-CT1	or P2	
SL2	RT-CT2	P3	V-CT2

*Opentherm1 or SL1, Opentherm2 or SL2

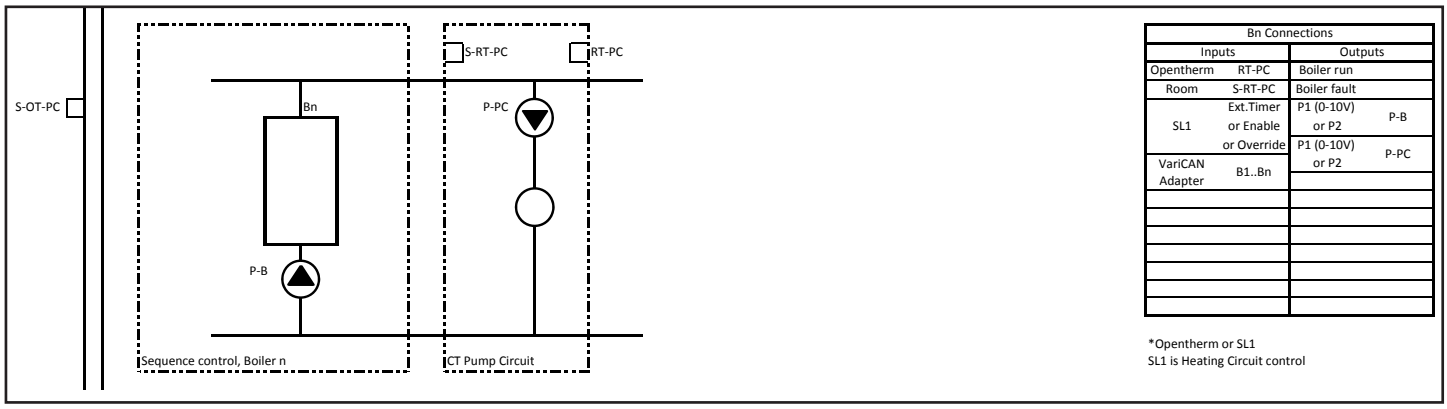
FIGURE 14 SINGLE BOILER WITH CT AND HWS ZONE CIRCUITS

PARTIAL HYDRAULICS - Boiler n Slave Configuration Options



Bn Connections			
Inputs		Outputs	
VariCAN Adapter	B1..Bn	Boiler run	
		Boiler fault	
		P1 (0-10V) or P2	P-B

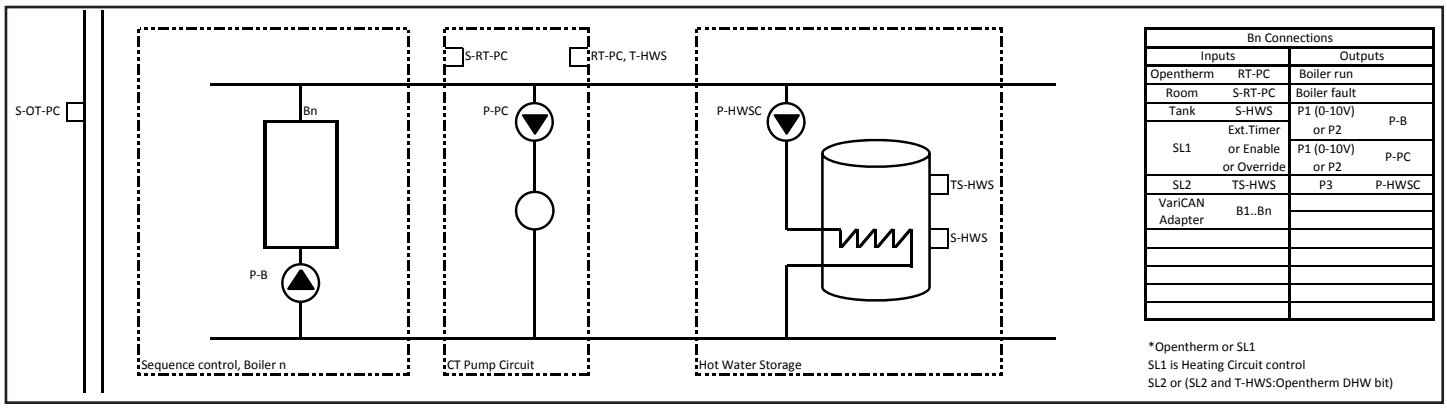
FIGURE 15 SEQUENCE CONTROL 1-16 BOILERS, BOILER N



Bn Connections			
Inputs		Outputs	
Opentherm	RT-PC	Boiler run	
Room	S-RT-PC	Boiler fault	
SL1	Ext.Timer or Enable or Override	P1 (0-10V) or P2	P-B
		P1 (0-10V) or P2	P-PC
VariCAN Adapter	B1..Bn		

*Opentherm or SL1
SL1 is Heating Circuit control

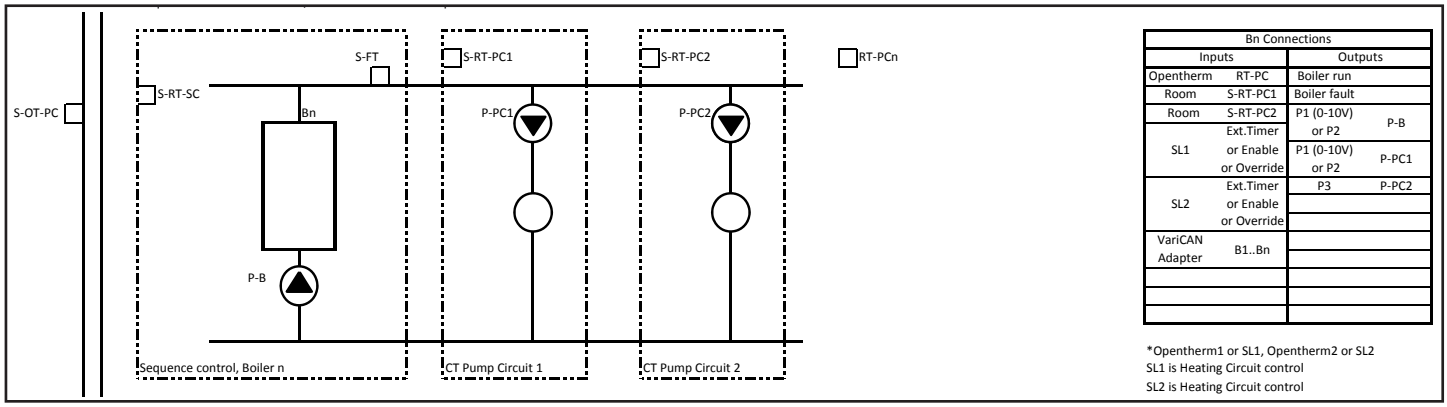
FIGURE 16 SEQUENCE CONTROL 1-16 BOILERS, BOILER N WITH CT PUMP CIRCUIT



Bn Connections			
Inputs		Outputs	
Opentherm	RT-PC	Boiler run	
Room	S-RT-PC	Boiler fault	
Tank	S-HWS	P1 (0-10V) or P2	P-B
SL1	Ext.Timer or Enable or Override	P1 (0-10V) or P2	P-PC
SL2	TS-HWS	P3	P-HWSC
VariCAN Adapter	B1..Bn		

*Opentherm or SL1
SL1 is Heating Circuit control
SL2 or (SL2 and T-HWS:Opentherm DHW bit)

FIGURE 17 SEQUENCE CONTROL 1-16 BOILERS, BOILER N WITH CT PUMP AND INDIRECT HWS CIRCUIT

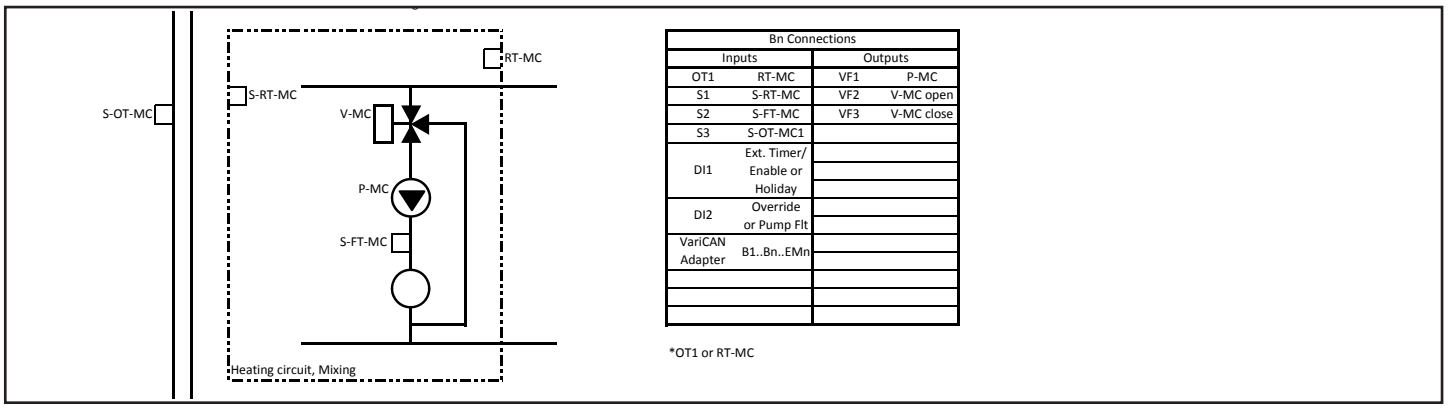


Bn Connections			
Inputs		Outputs	
Opentherm	RT-PC	Boiler run	
Room	S-RT-PC1	Boiler fault	
Room	S-RT-PC2	P1 (0-10V) or P2	P-B
SL1	Ext.Timer or Enable or Override	P1 (0-10V) or P2	P-PC1
SL2	Ext.Timer or Enable or Override	P3	P-PC2
VariCAN Adapter	B1..Bn		

*Opentherm1 or SL1, Opentherm2 or SL2
SL1 is Heating Circuit control
SL2 is Heating Circuit control

FIGURE 18 SEQUENCE CONTROL 1-16 BOILERS, BOILER N WITH 2 X CT PUMP CIRCUIT

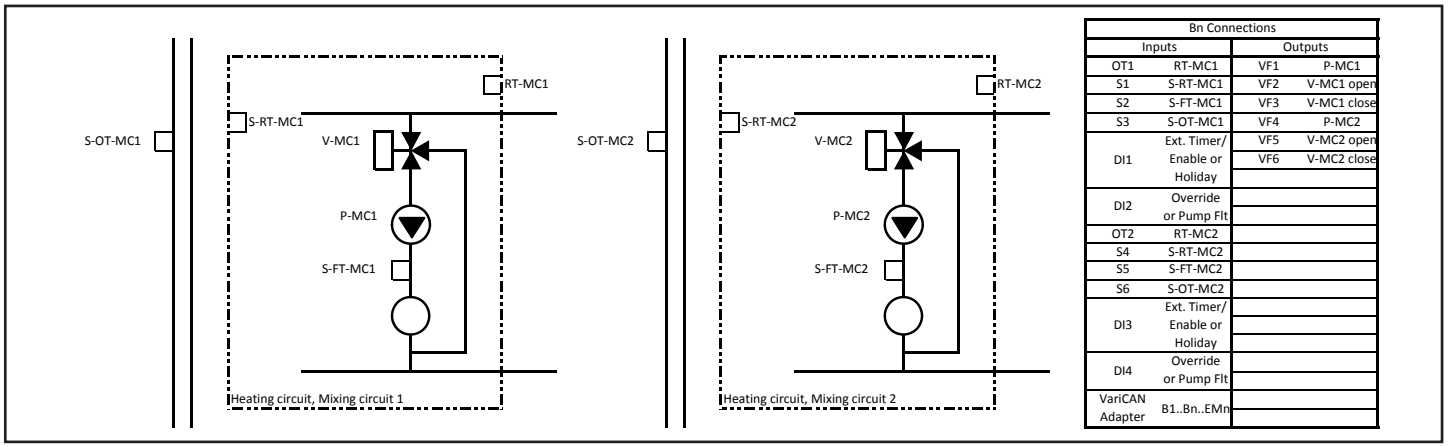
PARTIAL HYDRAULICS - Extension Module Configuration Options



Bn Connections			
Inputs		Outputs	
OT1	RT-MC	VF1	P-MC
S1	S-RT-MC	VF2	V-MC open
S2	S-FT-MC	VF3	V-MC close
S3	S-OT-MC1		
DI1	Ext. Timer/ Enable or Holiday		
DI2	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

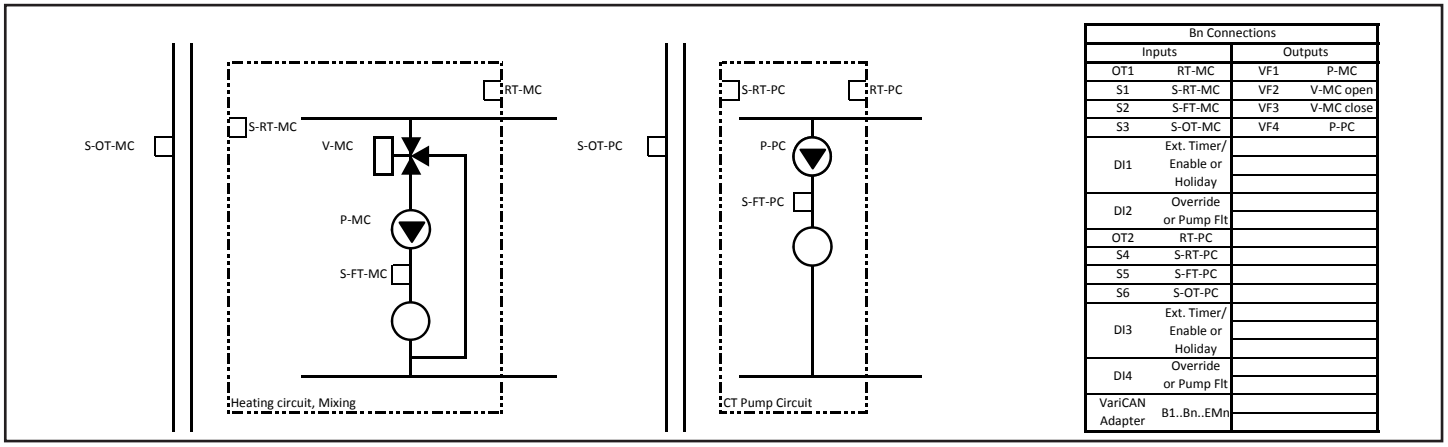
*OT1 or RT-MC

FIGURE 19 EXTENSION MODULE WITH 1 X MIXING CIRCUIT



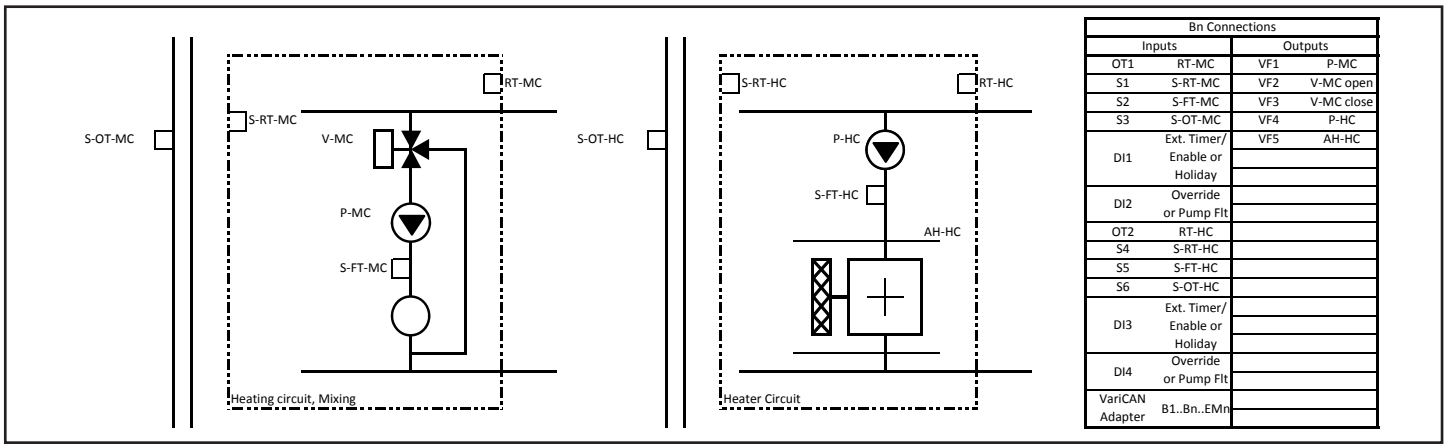
Bn Connections			
Inputs		Outputs	
OT1	RT-MC1	VF1	P-MC1
S1	S-RT-MC1	VF2	V-MC1 open
S2	S-FT-MC1	VF3	V-MC1 close
S3	S-OT-MC1	VF4	P-MC2
DI1	Ext. Timer/ Enable or Holiday	VF5	V-MC2 open
		VF6	V-MC2 close
DI2	Override or Pump Flt		
OT2	RT-MC2		
S4	S-RT-MC2		
S5	S-FT-MC2		
S6	S-OT-MC2		
DI3	Ext. Timer/ Enable or Holiday		
DI4	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

FIGURE 20 EXTENSION MODULE WITH 2 X MIXING CIRCUITS



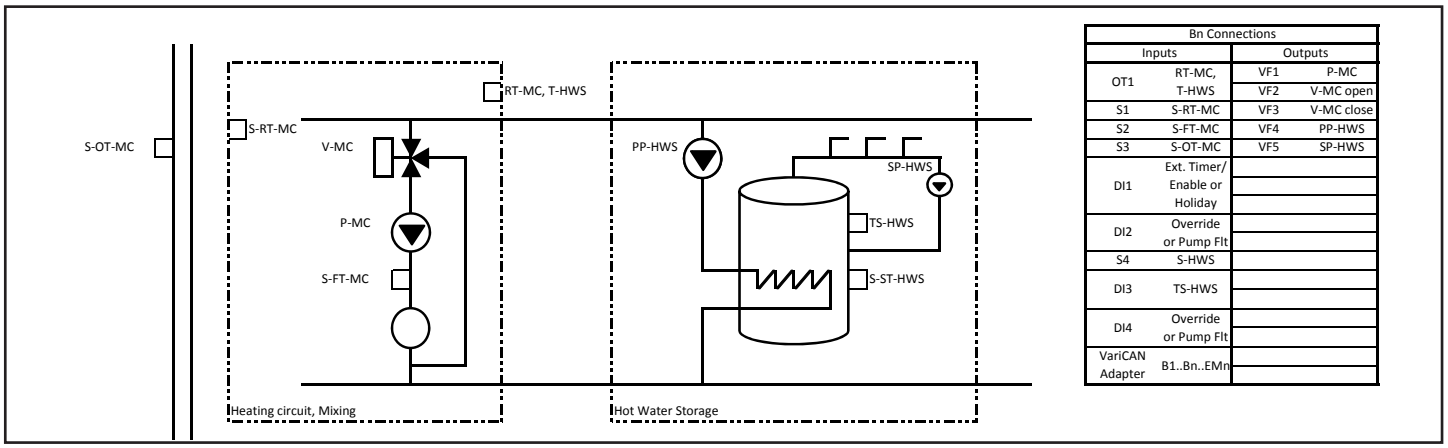
Bn Connections			
Inputs		Outputs	
OT1	RT-MC	VF1	P-MC
S1	S-RT-MC	VF2	V-MC open
S2	S-FT-MC	VF3	V-MC close
S3	S-OT-MC	VF4	P-PC
DI1	Ext. Timer/ Enable or Holiday		
DI2	Override or Pump Flt		
OT2	RT-PC		
S4	S-RT-PC		
S5	S-FT-PC		
S6	S-OT-PC		
DI3	Ext. Timer/ Enable or Holiday		
DI4	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

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



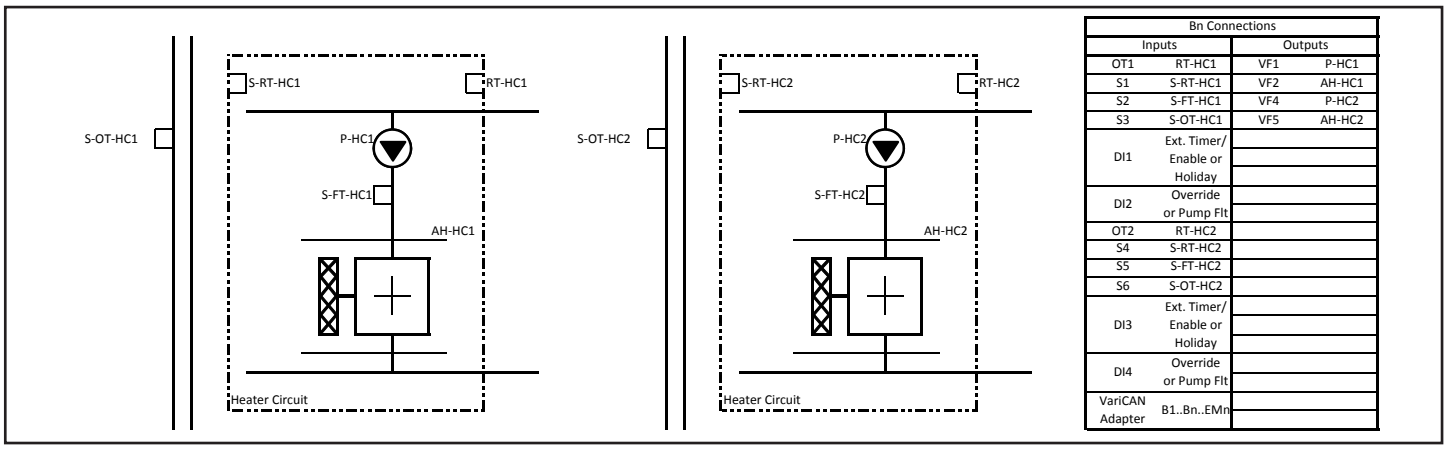
Bn Connections			
Inputs		Outputs	
OT1	RT-MC	VF1	P-MC
S1	S-RT-MC	VF2	V-MC open
S2	S-FT-MC	VF3	V-MC close
S3	S-OT-MC	VF4	P-HC
DI1	Ext. Timer/ Enable or Holiday	VF5	AH-HC
DI2	Override or Pump Flt		
OT2	RT-HC		
S4	S-RT-HC		
S5	S-FT-HC		
S6	S-OT-HC		
DI3	Ext. Timer/ Enable or Holiday		
DI4	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

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



Bn Connections			
Inputs		Outputs	
OT1	RT-MC, T-HWS	VF1	P-MC
		VF2	V-MC open
S1	S-RT-MC	VF3	V-MC close
S2	S-FT-MC	VF4	PP-HWS
S3	S-OT-MC	VF5	SP-HWS
DI1	Ext. Timer/ Enable or Holiday		
DI2	Override or Pump Flt		
S4	S-HWS		
DI3	TS-HWS		
DI4	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

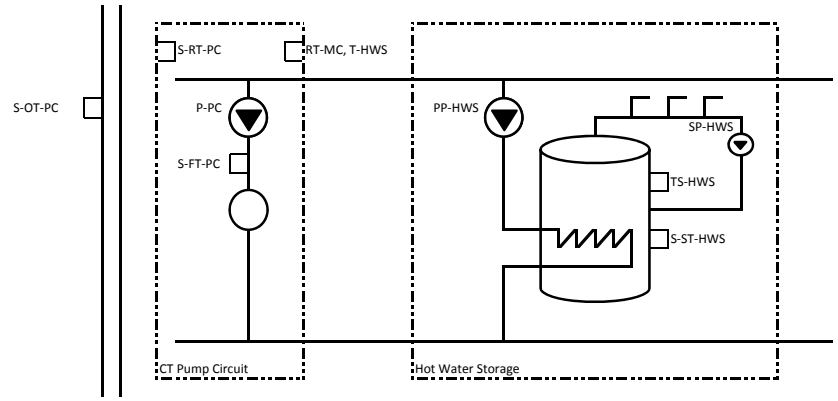
FIGURE 23 EXTENSION MODULE WITH 1 X MIXING CIRCUIT AND 1 X HWS CIRCUIT



Bn Connections			
Inputs		Outputs	
OT1	RT-HC1	VF1	P-HC1
S1	S-RT-HC1	VF2	AH-HC1
S2	S-FT-HC1	VF4	P-HC2
S3	S-OT-HC1	VF5	AH-HC2
DI1	Ext. Timer/ Enable or Holiday		
DI2	Override or Pump Flt		
OT2	RT-HC2		
S4	S-RT-HC2		
S5	S-FT-HC2		
S6	S-OT-HC2		
DI3	Ext. Timer/ Enable or Holiday		
DI4	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

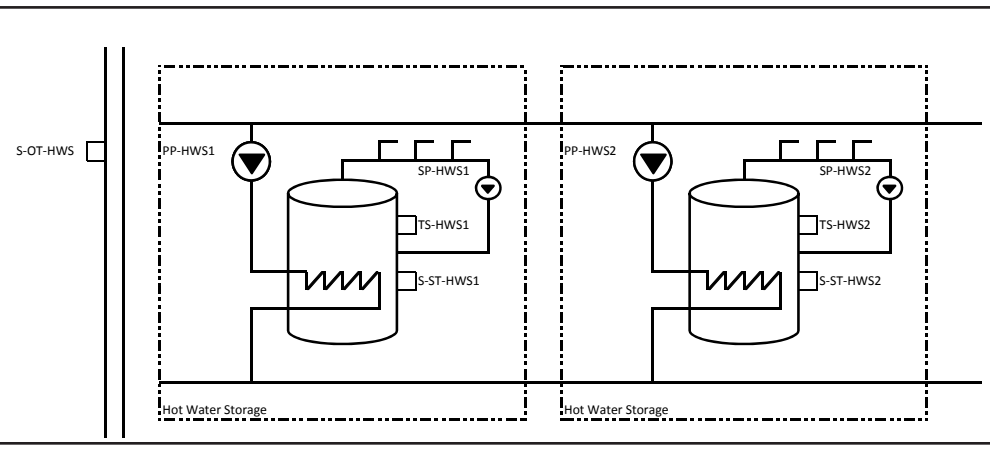
FIGURE 24 EXTENSION MODULE WITH 2 X AIR HANDLER CIRCUITS

PARTIAL HYDRAULICS - Extension Module Configuration Options Continued



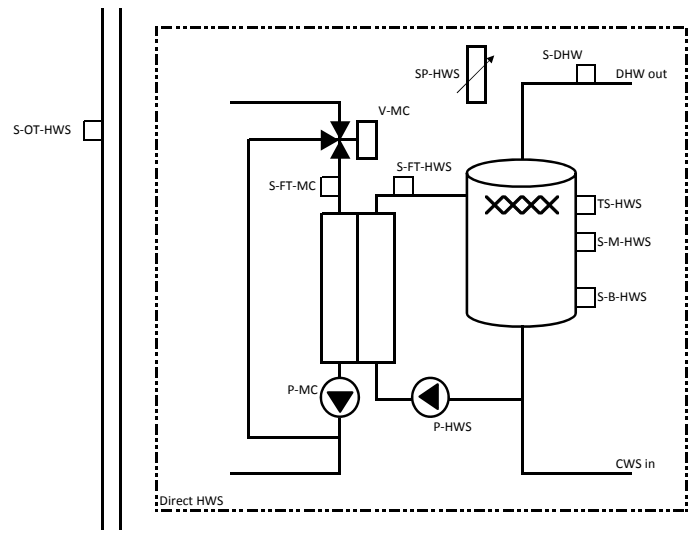
Bn Connections			
Inputs		Outputs	
OT1	RT-PC, T-HWS	VF1	P-PC
		VF4	PP-HWS
S1	S-RT-PC	VF5	SP-HWS
S2	S-FT-PC		
S3	S-OT-PC		
DI1	Ext. Timer/ Enable or Holiday		
DI2	Override or Pump Flt		
S4	S-HWS		
DI3	TS-HWS		
DI4	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

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



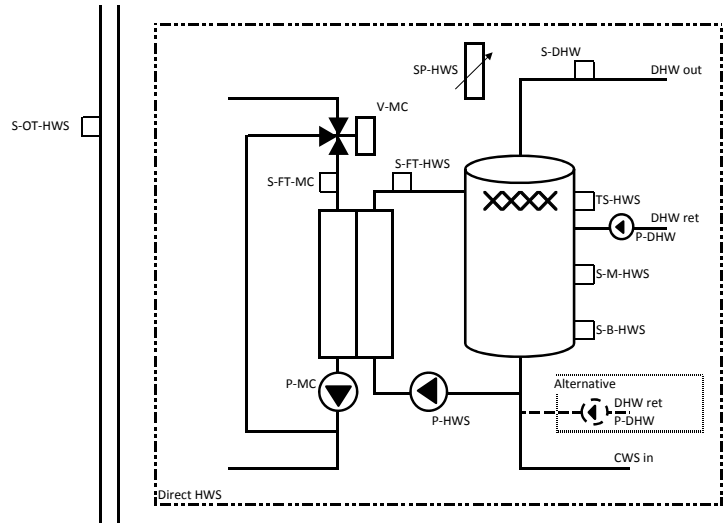
Bn Connections			
Inputs		Outputs	
S1	S-ST-HWS1	VF1	PP-HWS1
S3	S-OT-HWS	VF2	SP-HWS1
DI1	TS-HWS1	VF4	PP-HWS2
		VF5	SP-HWS2
DI2	Override or Pump Flt		
S4	S-ST-HWS2		
DI3	TS-HWS2		
DI4	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

FIGURE 26 EXTENSION MODULE WITH 2 X HWS CIRCUIT



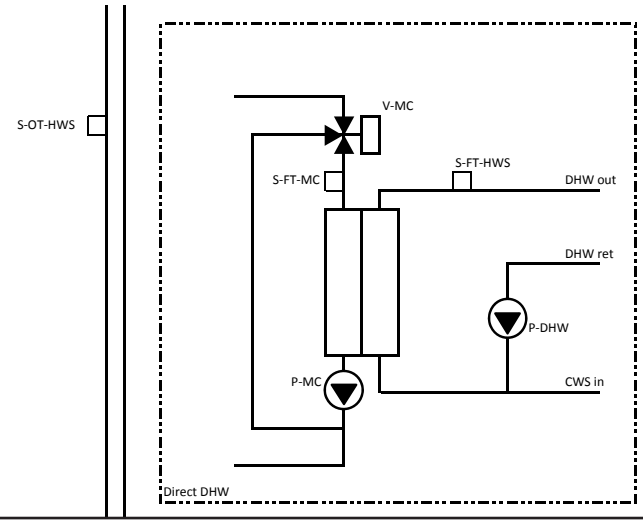
Bn Connections			
Inputs		Outputs	
S1	S-M-HWS	VF1	P-MC
S2	S-FT-MC	VF2	V-MC open
S3	S-FT-HWS	VF3	V-MC close
S5	S-B-HWS	VF4	P-HWS
S6	S-FT-DHW		
S7	SP-HWS		
DI1	TS-HWS		
DI2	Override or Pump Flt		
DI3	Ext. Timer/ Enable or Holiday		
VariCAN Adapter	B1..Bn..EMn		

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



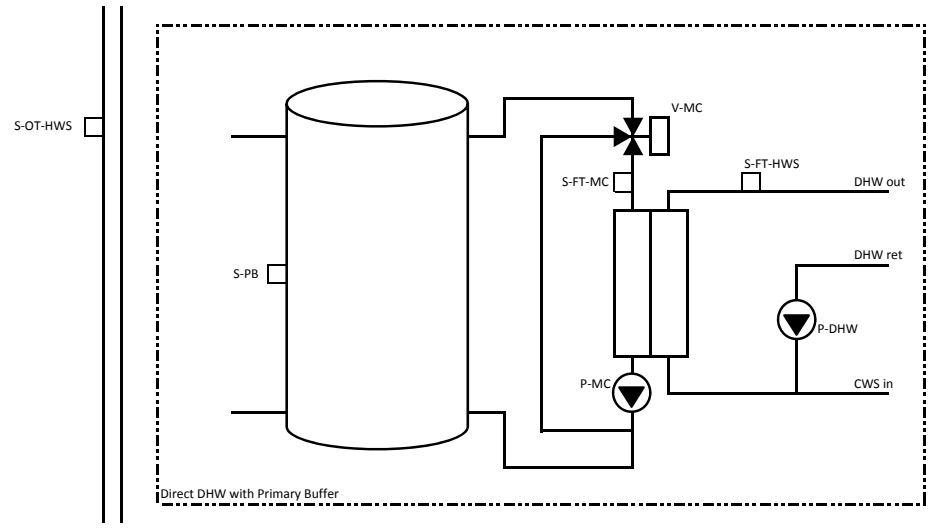
Bn Connections			
Inputs		Outputs	
S1	S-M-HWS	VF1	P-MC
S2	S-FT-MC	VF2	V-MC open
S3	S-FT-HWS	VF3	V-MC close
S5	S-B-HWS	VF4	P-HWS
S6	S-FT-DHW	VF5	P-DHW
S7	SP-HWS		
DI1	TS-HWS		
DI2	Override or Pump Flt		
DI3	Ext. Timer/ Enable or Holiday		
VariCAN Adapter	B1..Bn..EMn		

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

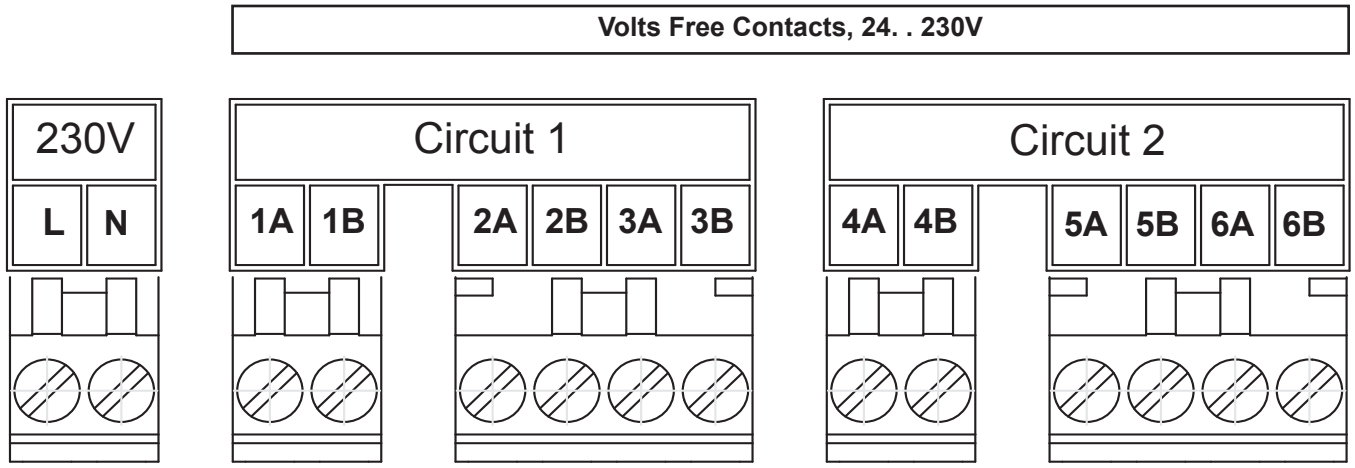


Bn Connections			
Inputs		Outputs	
S1	S-PB	VF1	P-MC
S2	S-FT-MC	VF2	V-MC open
S2	S-FT-MC	VF3	V-MC close
S6	S-FT-DHW	VF5	P-DHW
S7	SP-HWS		
DI1	Ext. Timer/ Enable or Holiday		
DI2	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		
VariCAN Adapter	B1..Bn..EMn		

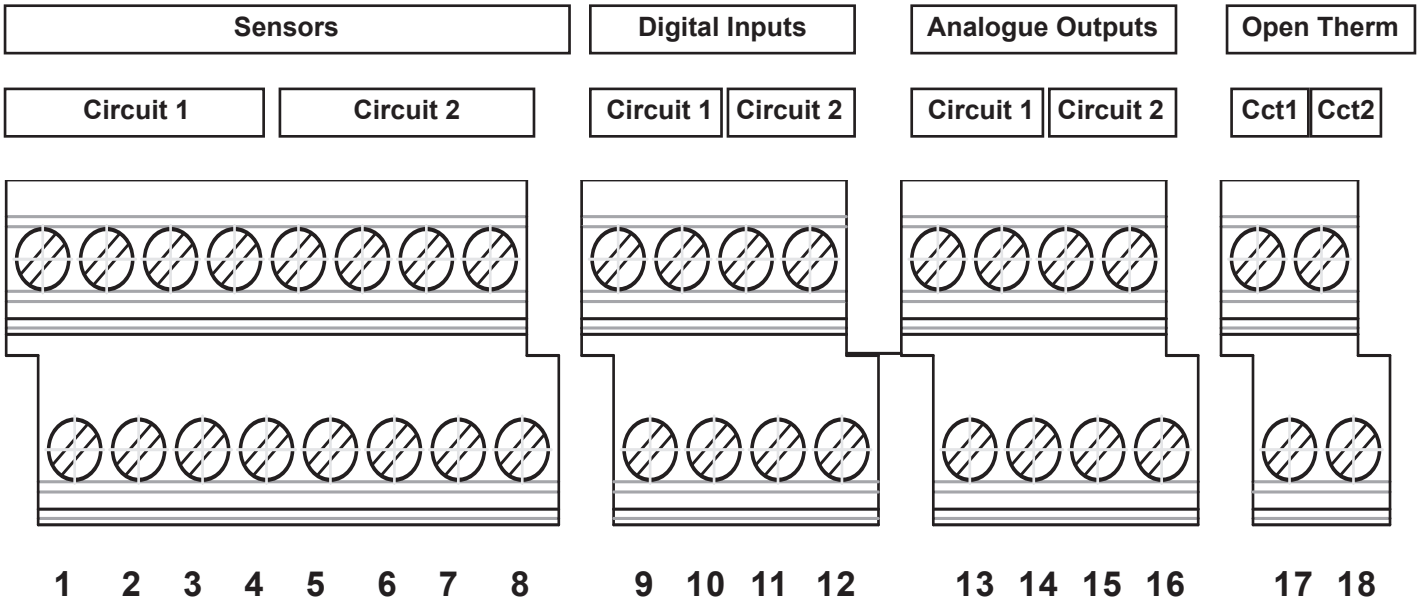
FIGURE 30 EXTENSION MODULE WITH PRIMARY BUFFER MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT DHW WITH PUMP

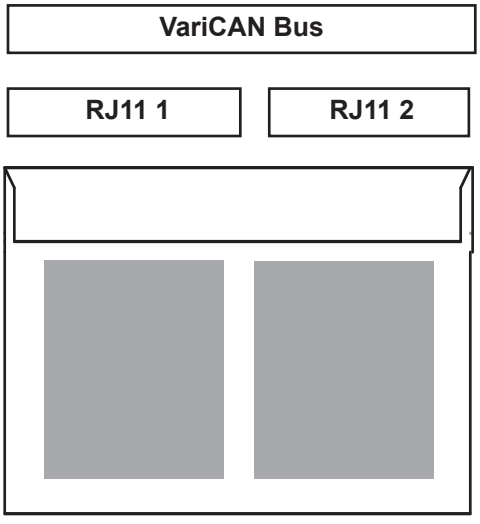
3 INSTALLATION

3.1 Electrical Connections



The supply connection only requires 230V 50Hz Live and Neutral as the EM is a double insulated design with no PE requirement or distribution of PE.





3.2 VariCAN Adapter

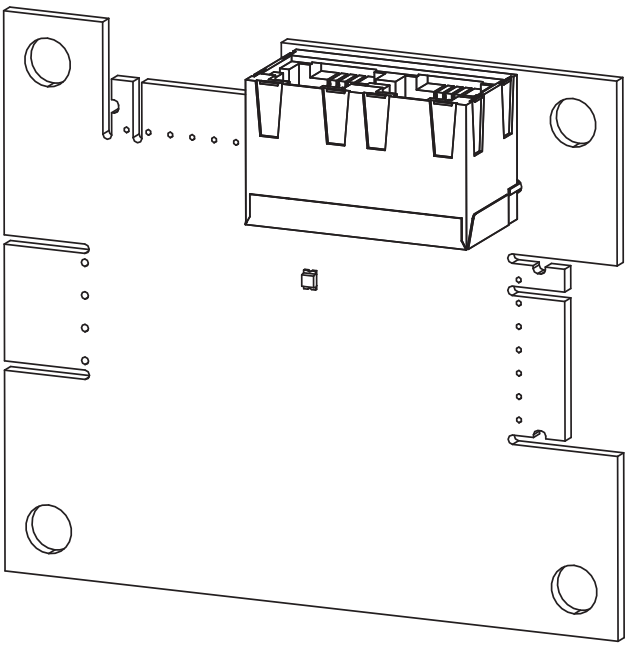


FIGURE 31 VARICAN ADAPTOR DIAGRAM

3.3 Extension Module

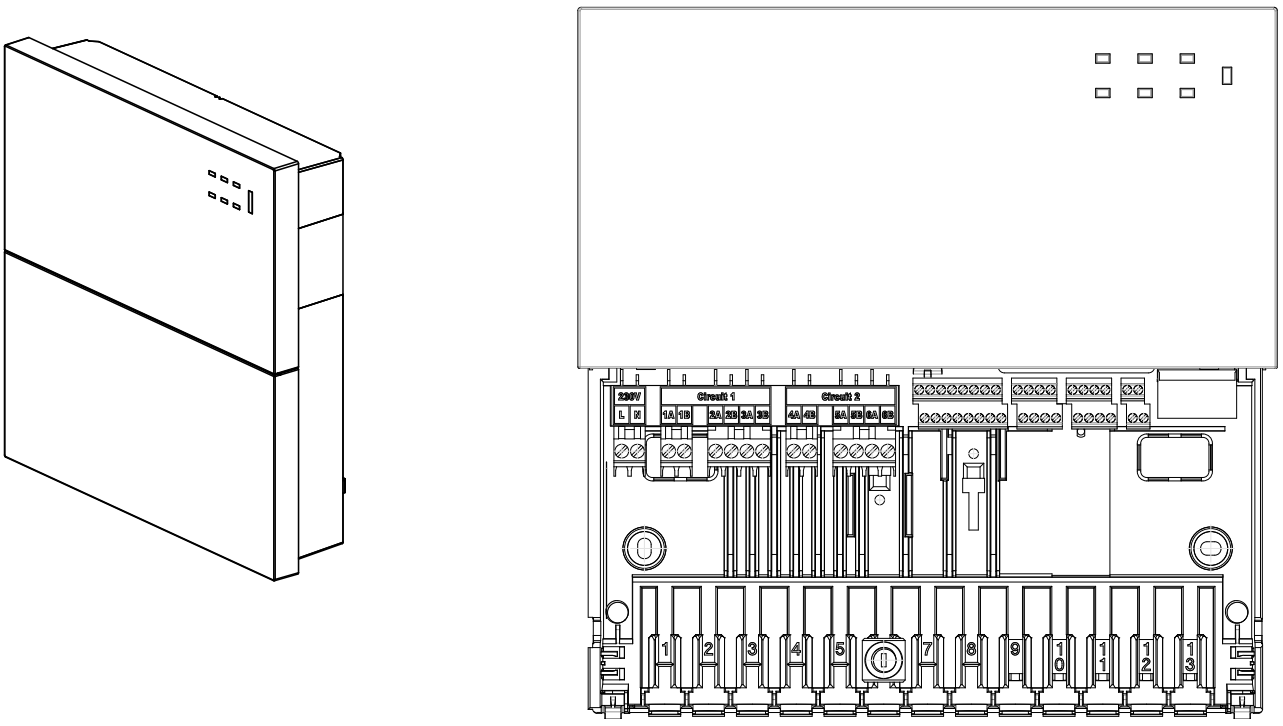


FIGURE 32 EXTENSION MODULE DIAGRAM

3.4 Heating Circuit Connections

Constant Temperature							
	HC Pump		Room sensor*	Flow sensor*	Outside sensor*	HC Enable, Override, Holiday, Frost*	OpenTherm*
Circuit 1	On/Off	1a, 1b	1	2	3	9	17
	0-10V	13					
Circuit 2	On/Off	4a, 4b	5	6	7	11	18
	0-10V	15					

Mixing (Variable Temperature)							
	HC Pump		Valve				
			Open	Close			
Circuit 1	On/Off	1a, 1b	2a, 2b	3a, 3b			
	0-10V	13	14				
Circuit 2	On/Off	4a, 4b	5a, 5b	6a, 6b			
	0-10V	15	16				
	Room sensor*		Flow sensor		Outside sensor*	HC Enable, Override, Holiday, Frost*	OpenTherm*
Circuit 1	1		2		3	9	17
Circuit 2	5		6		7	11	18

Air Blower						
	HC Pump		Fan			
Circuit 1	On/Off	1a, 1b	2a, 2b			
	0-10V	13	14			
Circuit 2	On/Off	4a, 4b	5a, 5b			
	0-10V	15	16			
	Room sensor*		Flow sensor	Outside sensor*	HC Enable, Override, Holiday, Frost*	OpenTherm*
Circuit 1	1		2	3	9	17
Circuit 2	5		6	7	11	18

3.5 DHW circuit connections

DHW Storage Tank						
	Primary Pump		Circulation Pump*	Tank sensor	HC Enable, Override, Holiday, Frost*	OpenTherm*
Circuit 1	On/Off	1a, 1b	2a, 2b	1	9	17
	0-10V	13	14			
Circuit 2	On/Off	4a, 4b	5a, 5b	5	11	18
	0-10V	15	16			

4 CONFIGURATION

4.1 System Manager Interface

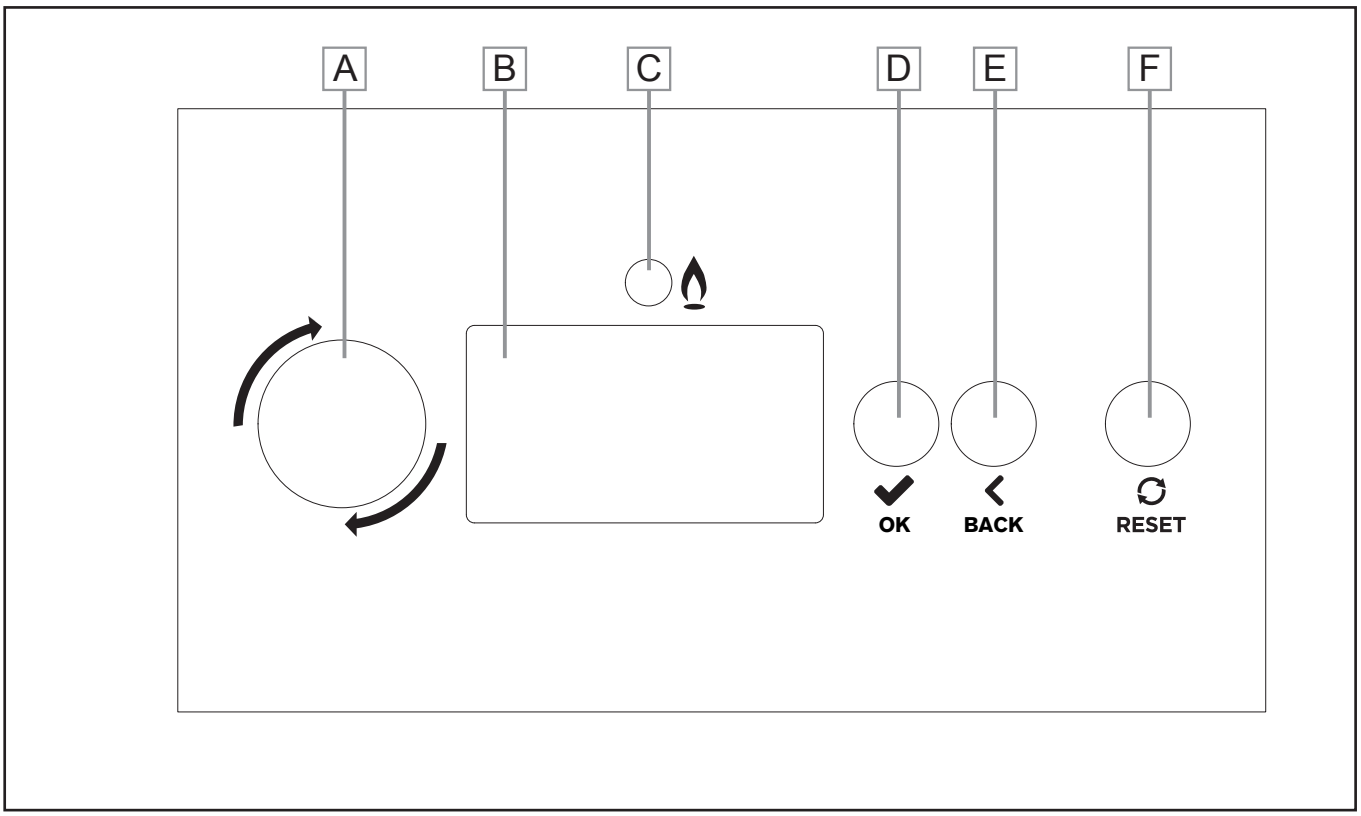


FIGURE 33 SYSTEM MANAGER INTERFACE

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.

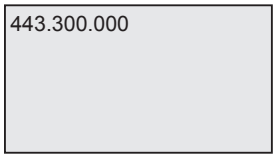
4.2 Cascade and/or Extension Modules

Once the VariCAN adapters have been installed and connected into each Boiler and/or Extension Module/s in the cascade then the system can be configured.

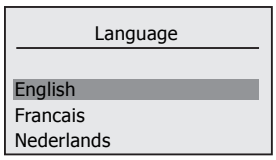
Power up each Boiler and/or Extension Module in the system then return to the Master boiler to start the configuration. The following screens will be displayed on each boiler at power up:

The screens assume two Boilers and one Extension Module, however the configuration is similar for any number of Boilers, up to 16 and Extension Modules, up to 4.

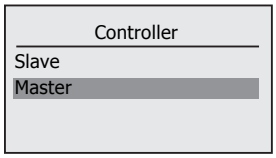
System manager software revision:



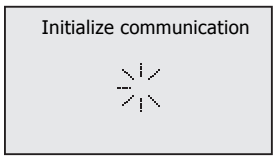
Initial configuration

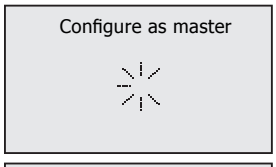


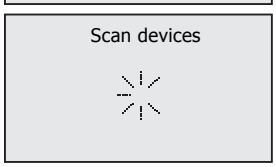
The default language will be selected and highlighted.

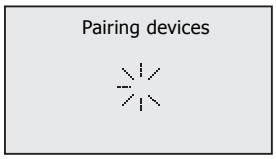


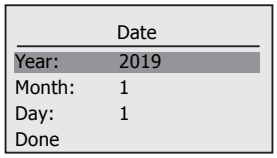
On the Master boiler in the cascade, select “Master”, the following screens will appear in the order shown below:



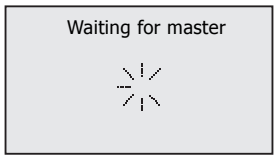






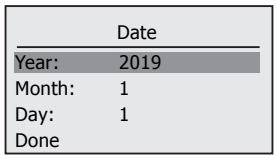


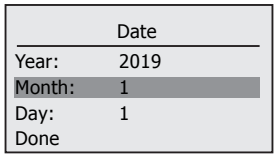
Once the master boiler System Manager has been selected and the Scan Devices completed, all Slave boilers will display the following screen.

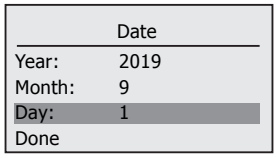


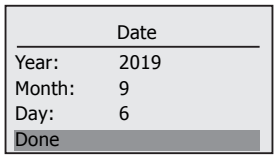
The Extension Module/s will show alternating illuminated Green LEDs.

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

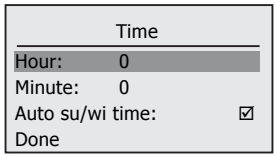




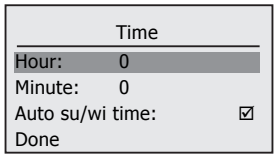


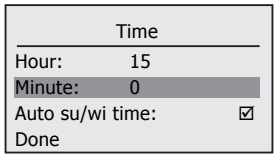


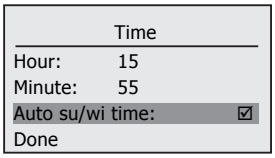
Once the date is set and “Done” is selected the following screen is displayed:

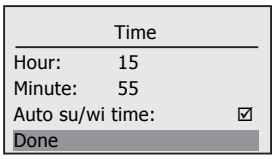


On the Master boiler now set the time and settings for Summer/Winter time change, followed by “Done”:



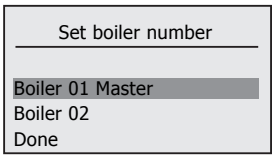






Once the Master boiler has the date and time set then all slave boilers will adopt these settings.

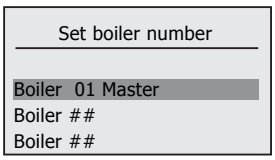
Once ‘Done’ is selected, the following screen will appear:



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.

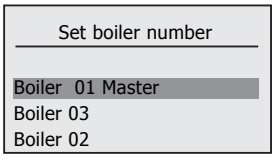
There is also one Extension Module which is detected and listed separately to the Boilers.

The Boiler 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 in this example 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:



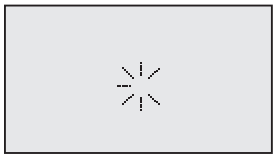
If any Slave boilers are not listed, check that they are connected correctly to the bus and that they have their power switched on.

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

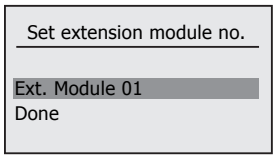


In the case above, the second Slave boiler highlighted was identified as Boiler 03 in the cascade, and the third Slave as Boiler 02, adjacent to the Master boiler.

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



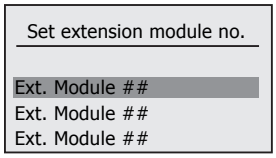
The Master boiler is now scanning the installation to locate any Extension Modules.



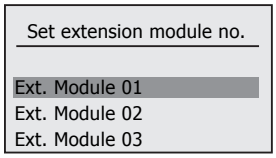
In this example there was only one Extension module, therefore it was automatically allocated as 01.

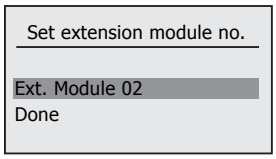
If any Extension modules are not listed, check that they are connected correctly to the bus and that they have their power switched on.

If there are more than one Extension module the display will show them as all unallocated. When an Extension module is highlighted in the menu, the corresponding Extension module LEDs will flash:



Each Extension module can be selected and a number allocated, usually corresponding to their physical location in the installation:

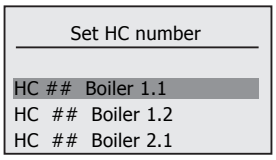




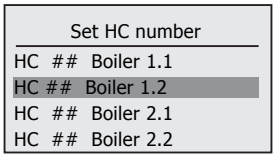
One the Extension module numbers have been set, select ‘Done’ to continue.

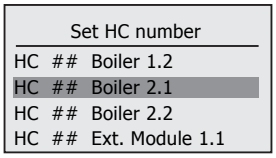
The Master boiler is now scanning the installation to locate all of the connected Heating Circuits.

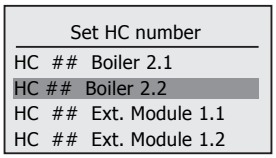
Upon completion the following screen will be displayed showing all available Heating Circuits in relation to all boilers and Extension modules:

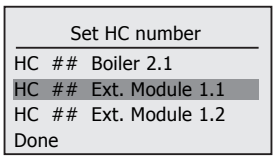


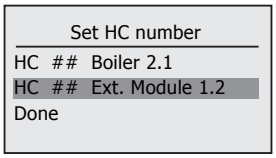
In this example each boiler has 2 heating circuits that may be selected for use. By scrolling down all boiler Heating Circuits can be selected and allocated a unique number in the system. For example in a two boiler cascade:

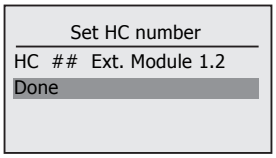




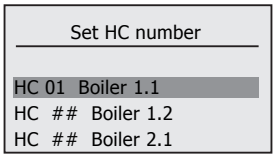


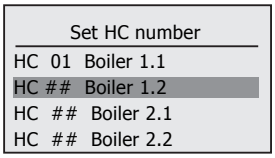


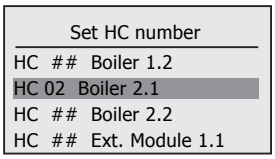


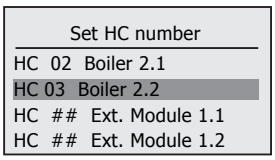


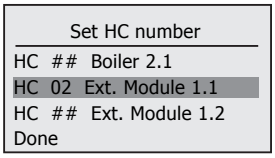
Once you have selected and allocated a number to the Heating Circuits that you wish to use and configure, for example a single HC on the Master boiler, no HCs on the Slave boiler and a single HC on the Extension module:

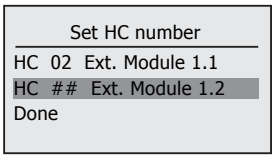


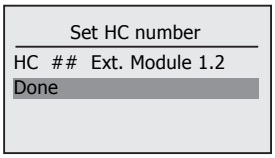




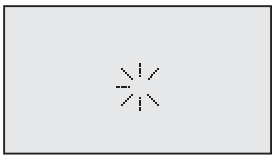


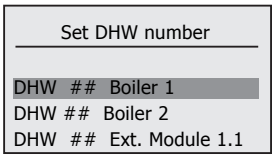


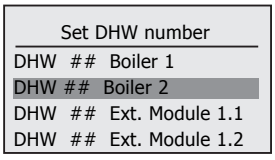


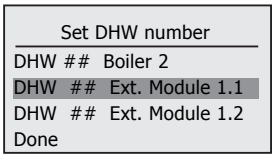


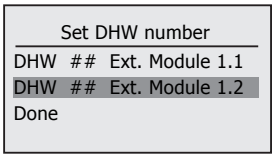
Select ‘Done’ and the following screens will appear:

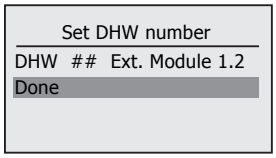






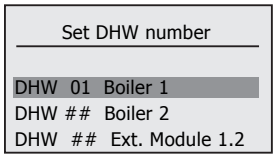


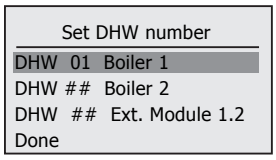


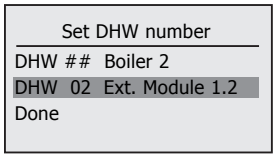


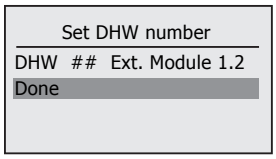
Note: The DHW circuit shares resources with the second Heating Circuit on each boiler, therefore if a second HC is present and it is already allocated then a DHW circuit will not be available for selection. The extension module also has two circuits that may be allocated, however it can support two DHW circuits rather than one. It can also support a single HWS.

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 DHW circuit on the Master boiler, no DHW circuits on the Slave boiler with a single DHW circuit on the Extension module:

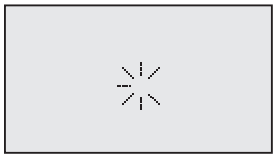




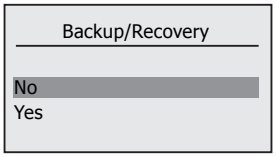




Select ‘Done’ and the following screen will appear:

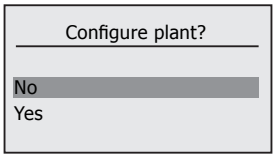


4.3 Backup/Recovery



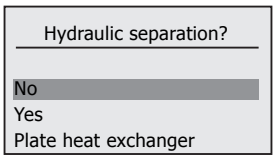
If you have replaced the System Manager you can recover the full configuration of the system provided that you had allocated a slave boiler and made a backup previously, otherwise select ‘No’

4.4 Plant Configuration

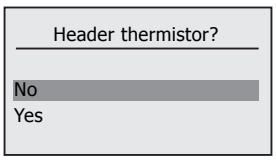


Plant configuration is related to the shared resources necessary for the operation of the complete cascade/plant. To configure these select ‘Yes’ and then follow the screens.

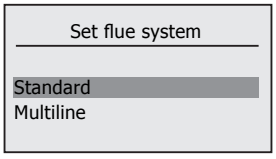
If you are in a cascade and have hydraulic separation then select the type of separation that is present.



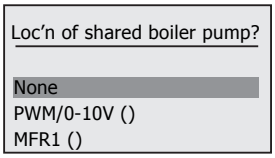
If you have a header thermistor select ‘Yes’ if not then the average flow temperature of the active boilers will be used to calculate the average flow temperature which will then be used for the cascade.



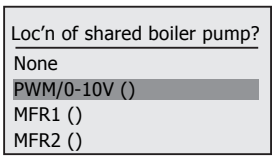
If you are using a Cascade flue system that requires an increase in the minimum fan speed then select ‘Multiline’

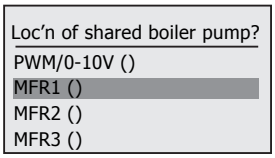


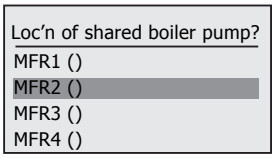
If the boiler cascade has a common pump that circulates water through all the boilers in the Cascade the select the output of the Master boiler that controls this pump. Otherwise select ‘None’.

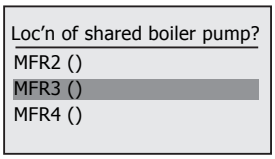


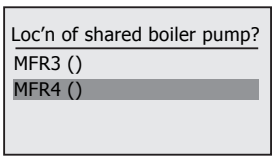
The following outputs can be configured for this function:





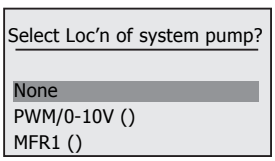




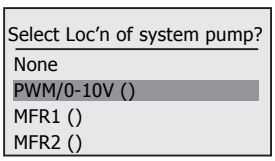


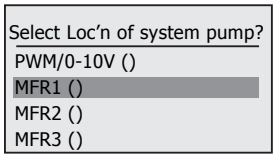
Note: Once a programmable has been selected the function will appear within the parenthesis at the right of the designated output name.

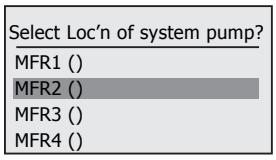
If the boiler cascade has a common pump that circulates water through either the boiler cascade or cascade header and supplies the heating load then select the output of the Master boiler that controls this pump. Otherwise select ‘None’.

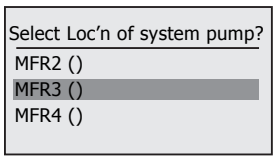


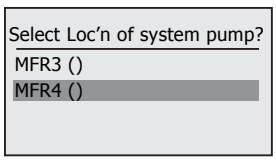
The following outputs can be configured for this function:



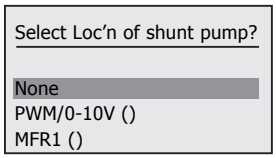




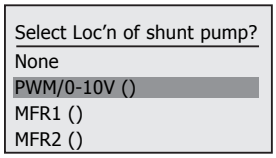


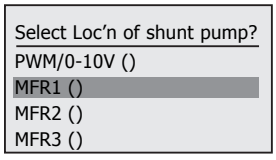


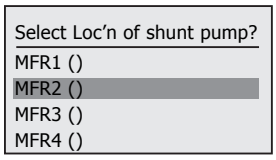
If the boiler cascade has a shunt pump to control the temperature differential of the cascade flow to return then select the output of the Master boiler that controls this pump. Otherwise select 'None'.

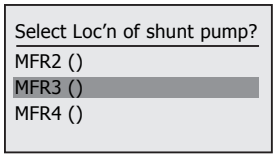


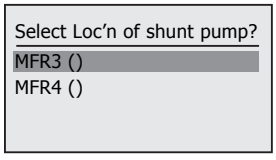
The following outputs can be configured for this function:



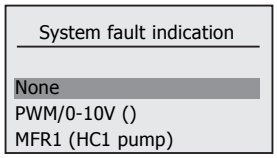




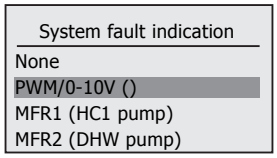


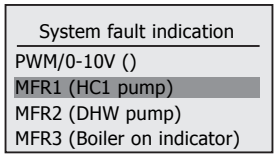


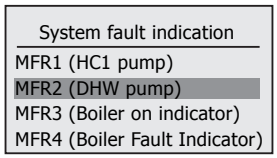
The Master boiler in a cascade can indicate if a system fault condition exists, so any boiler fault, Master or Slave. This can then be used to indicate to plant monitoring equipment if any fault exists in the complete system. If this is required then select the output of the Master boiler that controls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

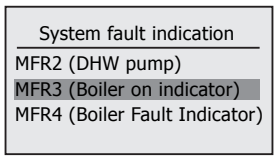


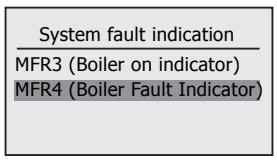
The following outputs can be configured for this function:









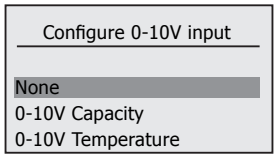


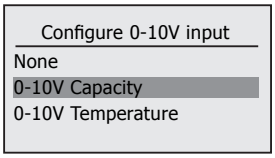
The plant may be controlled in a number of ways:

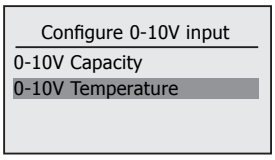
1. 0-10V analogue input
2. 230V 50Hz switched live input via a 'Volts Free' contact
3. OpenTherm Master controller
4. OpenTherm On/Off input via a SELV 'Volts Free' contact

0-10V analogue input control

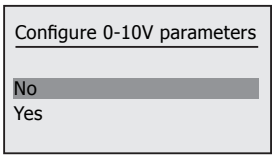
If the Plant cascade control is via a BMS with a 0-10V signal then this can be selected and configured next. The following options are available:



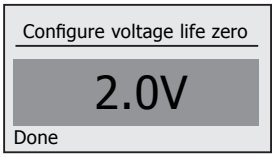




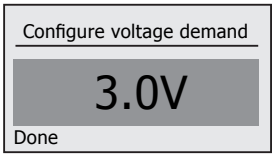
Once 0-10V control is selected a number of parameters must be defined. The default settings are as shown below but these can be hanged if required. To configure the parameters select 'Yes', to accept the current default settings select 'No'.



Once 'Yes' is selected the parameters can be set using the following screens. Firstly the 'Voltage Life Zero is set, this is the minimum voltage that is required to be present on the 0-10V input to indicate that the electrical connection to the BMS is present. If the voltage is not at or above this level then a fault will be indicated, this confirms that the BMS is connected to the Master boiler 0-10V input and the wiring is intact.

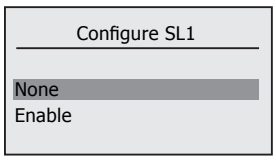


Once this level is set, 'Done' may be selected and then the voltage that starts a demand on the Plant can be set. So any voltage above this level will generate a demand.

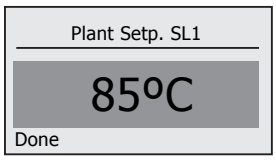


Once this level is set, 'Done' may be selected. The next plant control signal that may be configured is where a Switched Live signal is used to generate a demand to enable the cascade.

SL1 230V Demand



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.



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

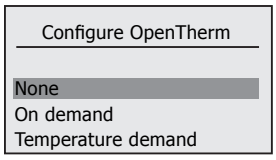
The next plant control signal that may be configured is the OpenTherm Bus signal which is a bidirectional signal to the cascade.

OpenTherm

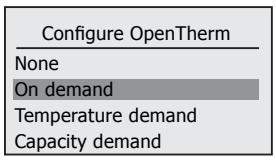
This bus signal can both control and monitor the status of the cascade via the Master boiler. It has a number of modes of operation:

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

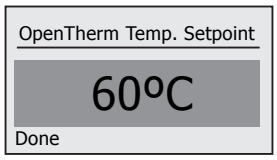
If no OpenTherm control of the cascade is required then 'None' may be selected.



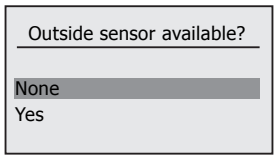
The options that may be selected are as below, if 'On demand' is selected this is effectively a PELV 'volts free' enable signal.



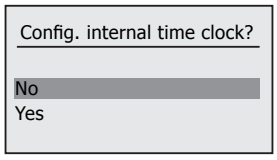
If 'On demand' is configured then this will then prompt for a Cascade flow temperature set point, which will be the target temperature for the cascade under direct OpenTherm control.



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'.



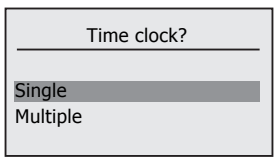
An internal timeclock can be configured to control the operating times of the Plant cascade. If this is required then multiple or single days can be programmed, within these programmed days three periods can be set. If no internal timeclock is required then select .No'.



The next prompt asks if you wish to configure individual days or multiple days for the timeclock programmes.

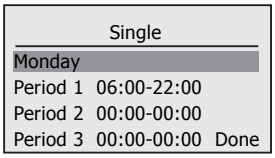
A single day is for individual programmes for every day of the week, Monday through to Sunday.

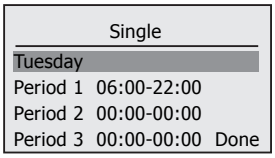
Multiple days are defined as Mon-Fri, or Sat-Sun. Where the same programme times are set for each group.

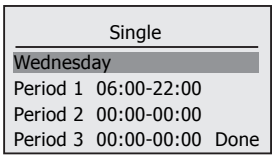


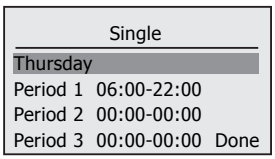
Single Days

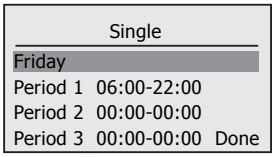
The individual days can be selected as highlighted, then each of the program periods and Start/Finish times. As shown below:

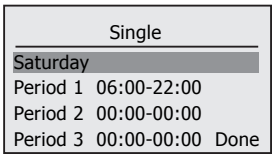


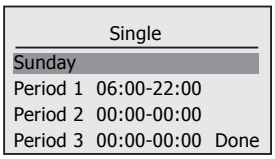




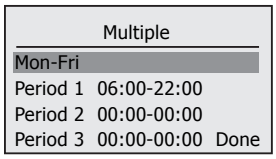


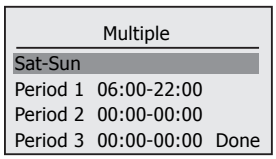






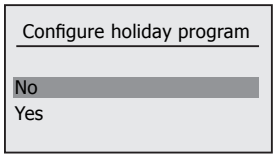
Multiple Days



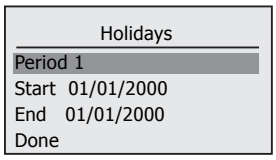


The cursor can then scroll through the setting for each period in order, Hours followed by Minutes. Once the timeclock settings are completed, select 'Done'

Holiday programmes may also be set for the Plant cascade where the operation of the Plant can be set to Holiday mode. Eight holiday periods may be set with Start and End dates. If no Holiday periods need to be set then select 'No'.



To set holiday periods select the period, 1-8 and set the Start and End date. Once completed select 'Done'.

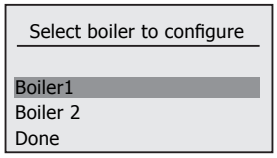


This is now the end of plant configuration.

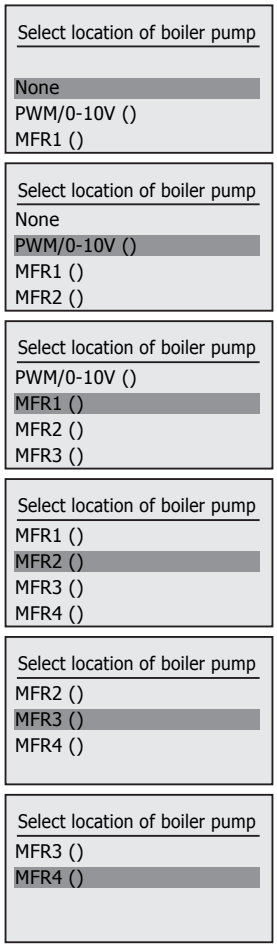
4.5 Boiler Configuration

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.

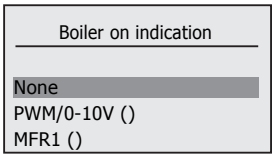


If the selected boiler has its own unique primary water circulation pump this is where it is configured. Once again one of the programmable outputs from the boiler can be used to control this pump function. If no individual boiler pump is present then select 'None'.

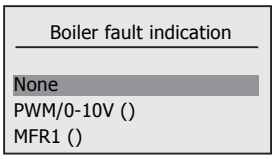


The next boiler configuration step is the Boiler On indication output. Once again any of the programmable outputs may be selected. Usually MFR3 is allocated.

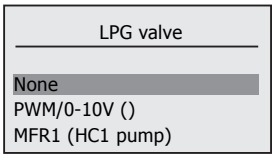
The full screens list is omitted for simplicity.



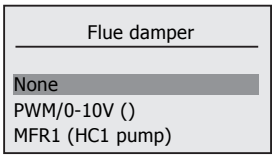
The next boiler configuration step is the Boiler Fault indication output. Once again any of the programmable outputs may be selected. Usually MFR4 is allocated. The full screens list is omitted for simplicity.



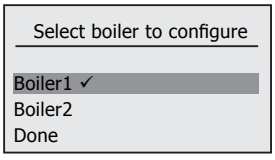
The next boiler configuration step is the LPG valve control output. This function is for control of an external LPG valve in series with the Gas line as an additional safety feature. It is opened during the burner phase of the Boiler. Once again any of the programmable outputs may be selected. The full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



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.



Once completed the following screen will be displayed:



Note: The boiler that has just been configured will now have a 'tick' nest to its designation.

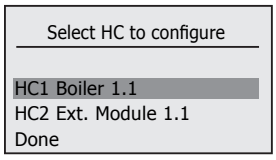
The next boiler to configure can now be selected. The process above is then repeated for all boilers in the cascade.

After all Boilers have been configured, select 'Done'.

4.6 Heating Circuit Configuration

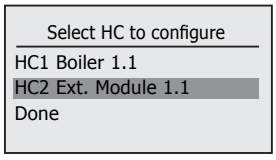
If heating circuits were located and allocated during initial setup then they will now appear here to be configured. There is a maximum number of heating circuits for each boiler, in this case two circuits identified by boiler number and HC number. E.g. Boiler 1.1 is boiler 1 HC 1.

The following screens are based upon the example configuration as selected above.

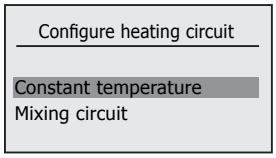


At the end of the list of allocated HCs 'Done' is displayed.

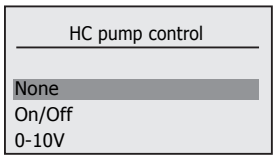
Firstly select the HC you wish to configure, in this instance we are configuring the HC2 on the Extension module:



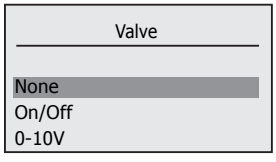
Nest select the type of heating circuit that is required:



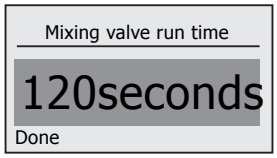
The next step is to configure the HC pump control signal if it has its own unique circulation pump. If you have already configured a System pump this may not be required so 'None' may be selected. One of the programmable outputs can be selected for this function. The following screen will be displayed.



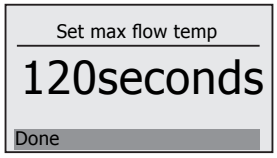
If the heating circuit selected is a Mixing circuit then an additional signal must be configured for the mixing valve:



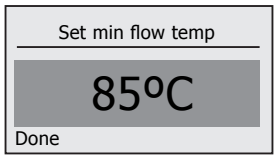
The mixing valve run time, end to end, can be set as required:



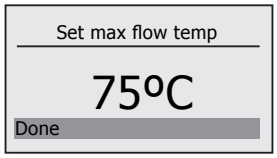
Select the time and adjust to the desired setting, confirm and then select 'Done'.

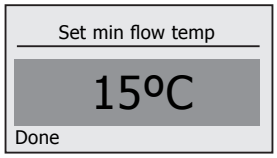


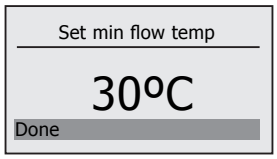
Once completed the next step is to set the Maximum and Minimum flow temperature for the HC.



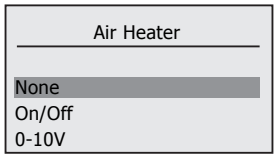
Select the temperature and adjust to the desired setting, confirm and then select 'Done'.



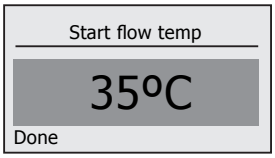




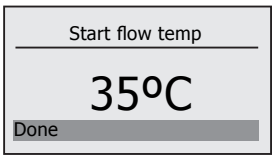
If the HC is providing control for an Air heater then the Air heater fan control signal needs to be selected:



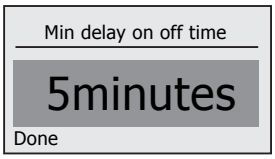
If an Air heater fan control signal is selected, then the control parameters for this function are then set. The start flow temperature is the flow temperature into the Air heater at which the fan is switched on, this allows the Air heater matrix to be pre-heated prior to operation.



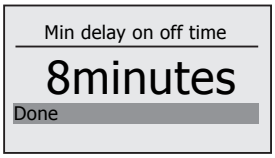
Select the temperature and adjust to the desired setting, confirm and then select 'Done'.



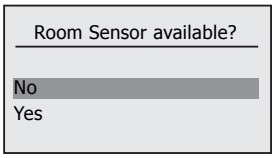
The minimum Air heater fan overrun time can be set as required:



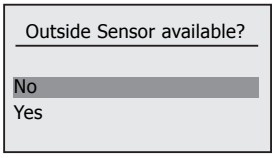
Select the time and adjust to the desired setting, confirm and then select 'Done'



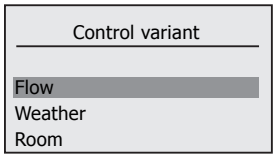
Once completed the next step is to confirm if a Room Temperature sensor is connected and being used control the room temperature for this HC.

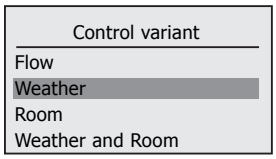


The next step is to confirm is an Outside Temperature sensor is connected and being used as an input to the HC to calculate the required flow temperature.



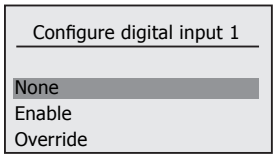
Depending upon the two item selection above the next screen will show what options are available for control of the flow temperature for that specific HC.

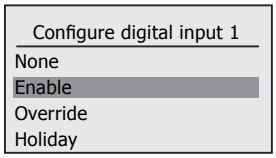


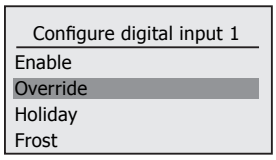


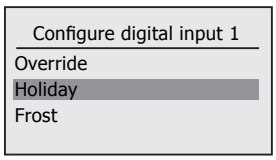
The next step is to select the function for the SL1 230V switched live input in relation to this HC, if it is required.

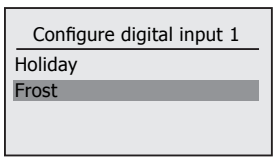
It can be used as a HC enable signal, an Override signal, a Holiday signal or a Frost protection input from an external 'Volts Free' contact for that specific HC. If this input is already configured, you will be queried, or if not required then 'None' can be selected.



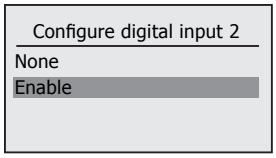




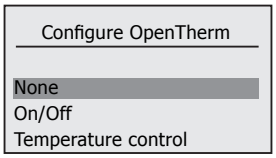


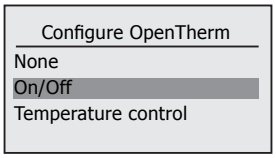


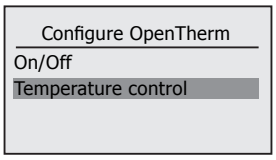
If the first digital input is configured as either Override or Holiday, then the second digital input may be configured as Enable. This allows the forced requests to take priority.



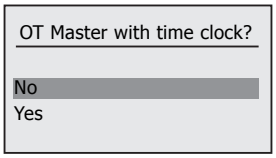
The next step is to configure the OpenTherm input if it is to be used for this specific HC. The OpenTherm interface can be operated in a number of modes, On/Off as a 'volts free' PELV signal, Temperature control from an OpenTherm master, or if already configured you will be prompted, or if not used select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



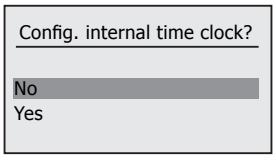




If On/Off or Temperature control is selected then the system needs to know of the OpenTherm Master has a built in timeclock.



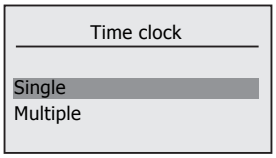
The next step is to configure the HC timeclock. If no internal timeclock is required then select .No'.



The next prompt asks if you wish to configure individual days or multiple days for the timeclock programmes.

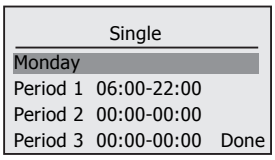
A single day is for individual programmes for every day of the week, Monday through to Sunday.

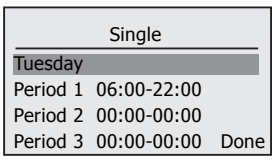
Multiple days are defined as Mon-Fri, or Sat-Sun. Where the same programme times are set for each group.

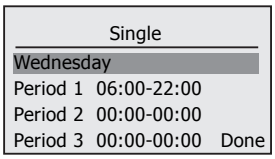


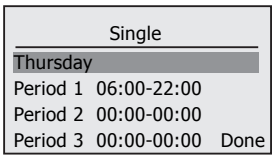
Single Days

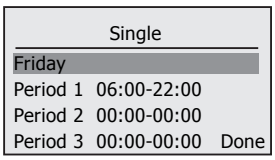
The individual days can be selected as highlighted, then each of the program periods and Start/Finish times. As shown below:

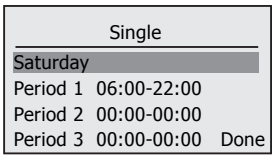


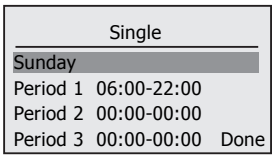




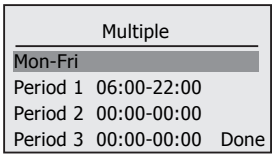


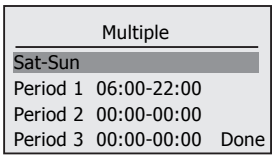






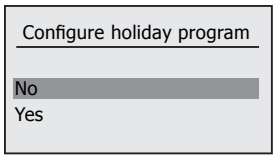
Multiple Days



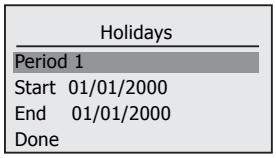


The cursor can then scroll through the setting for each period in order, Hours followed by Minutes. Once the timeclock settings are completed, select 'Done'.

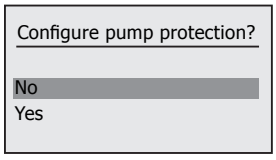
Holiday programmes may also be set for the Heating Circuit where the operation of the Heating Circuit can be set to Holiday mode. Eight holiday periods may be set with Start and End dates. If no Holiday periods need to be set then select 'No'.



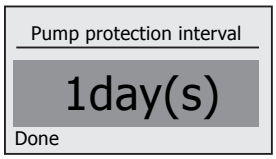
To set holiday periods select the period, 1-8 and set the Start and End date. Once completed select 'Done'.

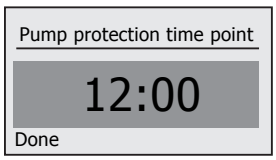


The next step is to configure the pump protection function for this specific heating circuit.

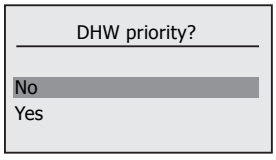


If Pump protection is selected then an associated period can be set, the time duration between protection cycles and the time point at which the function should start to operate the pump.

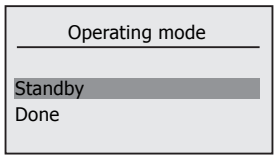


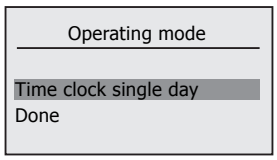


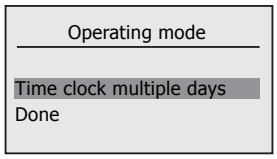
The next step is to select if any DHW circuit demand configured in the system has priority over this specific heating circuit. If 'Yes' is selected than any DHW circuit demand will interrupt the HC function.

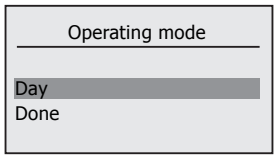


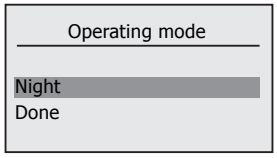
The next step is to set the initial mode of operation for this HC. By selecting the highlighted field the choices are shown in the following screens. Once selected then select 'Done'.

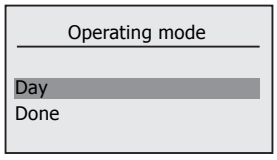




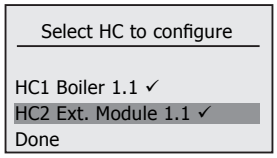








Once completed the following screen will be displayed:

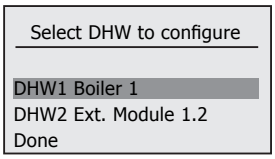


Note: The HC that has just been configured will now have a '✓' next to its designation.

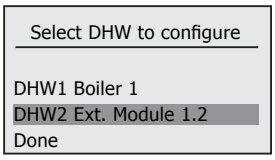
After all HCs have been configured, select 'Done'.

4.7 DHW Circuit Configuration

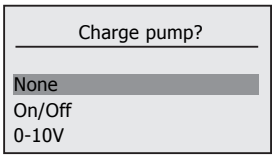
If DHW circuits were located and allocated during initial setup then they will now appear here to be configured. There is a maximum number of local DHW circuits for each boiler, in this case one circuit identified by boiler number and HC number. E.g. Boiler 1 is boiler 1 DHW circuit.



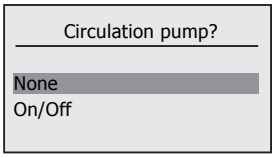
Firstly select the DHW circuit you wish to configure, in this instance we are configuring the DHW2 on the Extension module:



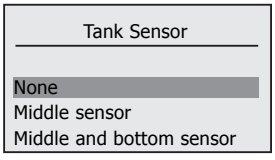
If the selected DHW circuit has its own unique primary DHW charge pump this is where it is configured. Once again one of the DHW signal output from the Extension module can be used to control this pump function. If no individual charge pump is present then select 'None'.



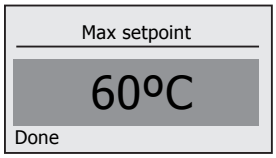
If the DHW circuit uses a Circulation or de-stratification pump then this can be configured:

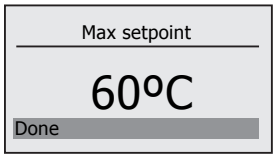


The DHW circuit on an Extension module may have a single or two tank temperature sensors, typically one is used in the middle pocket of the tank, but two can be configured with the additional one placed in a pocket at the bottom of the tank.



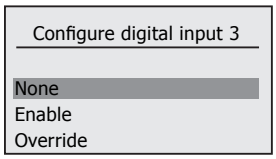
Once completed the next step is to set the Maximum tank temperature for the DHW circuit, followed by ‘Done’.



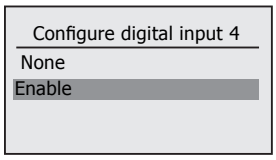


The next step is to select the function for the SELV Digital Input signal in relation to this DHW circuit, if it is required.

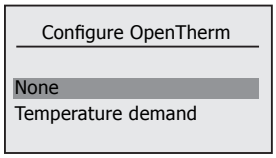
It can be used as a DHW circuit enable signal or an Override signal input from an external ‘Volts Free’ contact for that specific DHW circuit. If this input is already configured, you will be queried, or if not required then ‘None’ can be selected.

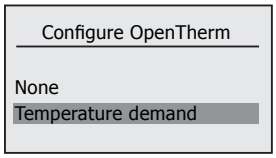


If the first digital input is configured as Override, then the second digital input may be configured as Enable. This allows the Override to take priority.

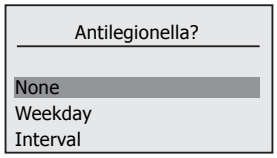


The next step is to select if the OpenTherm interface is capable of controlling the DHW setpoint and time. If this is not used select ‘None’.

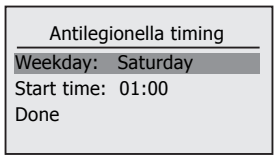




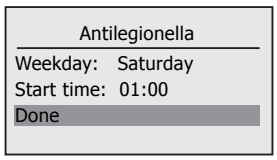
The next step is to set the Antilegionella operating parameters. The options allow for setting a fixed day and time, or a fixed interval between cycles. Both have the ability to set the Tank temperature that the tank must achieve during the cycle. If the function is not required, ‘None’ may be selected.



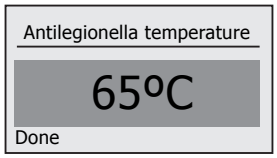
On selecting weekday the following screens with options are shown, the weekday and Start time can be set:



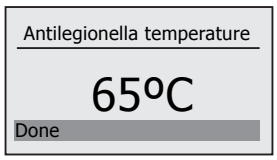
Once set select ‘Done’ to continue:



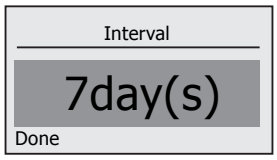
Next you will be prompted to set the Tank temperature for the Antilegionella cycle:



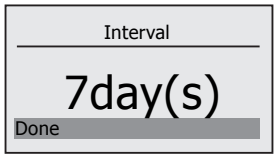
Once the required temperature has been set select ‘Done’ to confirm and continue:



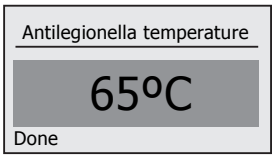
If Interval is selected then the following screen will be shown and the interval between Antilegionella cycles can be set:

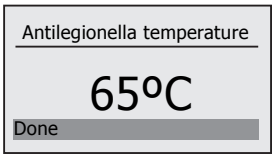


Once the interval is set select ‘Done’.



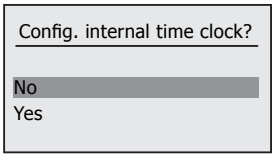
Once again the Antilegionella Tank temperature can be set followed by ‘Done’.





The next step is to configure the internal timeclock function for the DHW circuit if it is required, this is the same as all other occurrences but is repeated below for ease of reference.

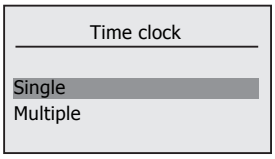
If no internal timeclock is required then select .No’.



The next prompt asks if you wish to configure individual days or multiple days for the timeclock programmes.

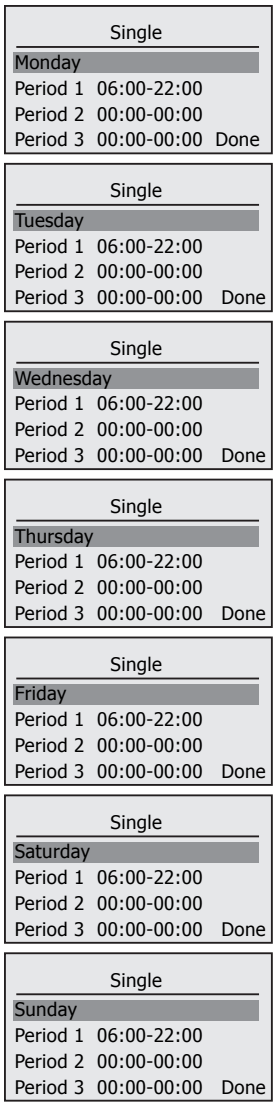
A single day is for individual programmes for every day of the week, Monday through to Sunday.

Multiple days are defined as Mon-Fri, or Sat-Sun. Where the same programme times are set for each group.

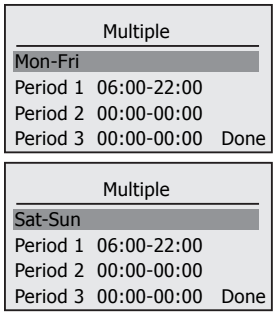


Single Days

The individual days can be selected as highlighted, then each of the program periods and Start/Finish times. As shown below:

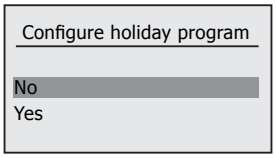


Multiple Days

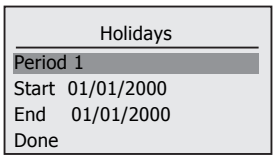


The cursor can then scroll through the setting for each period in order, Hours followed by Minutes. Once the timeclock settings are completed, select 'Done'.

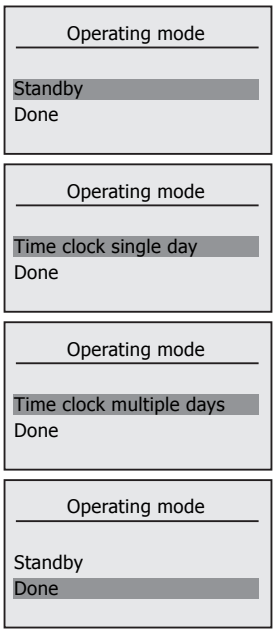
Holiday programmes may also be set for the DHW circuit where the operation of the DHW circuit can be set to Holiday mode. Eight holiday periods may be set with Start and End dates. If no Holiday periods need to be set then select 'No'.



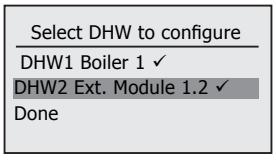
To set holiday periods select the period, 1-8 and set the Start and End date. Once completed select 'Done'.



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

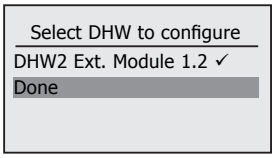


Once completed the following screen will be displayed:



Note: The DHW circuit that has just been configured will now have a '✓' nest to its designation.

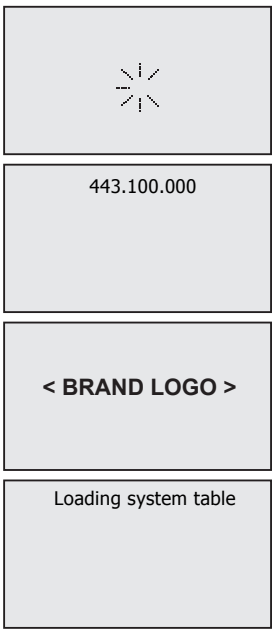
The next allocated DHW circuit to configure can now be selected. The process above is then repeated for all DHW circuits in the cascade.



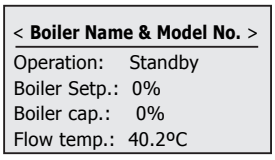
After all HCs have been configured, select 'Done'.

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

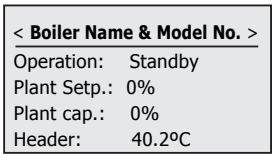
The system will now reboot and the following screens will be displayed:



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 know 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.

5 TECHNICAL SPECIFICATIONS

General	
Dimensions	224mm x 232mm x 55mm
Weight	0.9kg
Nominal supply voltage	230V 50Hz
Power consumption	10 Watts
Supply fuse rating	1A
Safety class	Protection class II
EMC suppression	Category 3 (surge immunity)
Max. Ambient temperature. (Storage)	-25oC to 60oC
Max. Ambient temperature. (Operation)	0-50oC
Max. Relative humidity	<=95%
Pollution degree	2
Software safety class	A
ELV limits	On the PCB < 36V idle, on the connectors < 25V
Relay load switching cycles	< 3/Min
Protection	IP21
Relay Outputs	
Number	6
Type	Volts free normally open
Make-Break capacity	Max. 250 VAC, Max 3A
Terminal connection	0.5 – 2.5 mm2
Analog inputs	
Number	8
Type	Type 1
Application	NTC sensor, 10K B3977
Terminal connection	0.14 – 1.5 mm2
Analog outputs	
Number	4
Type	SELV
Application	0-10V control
Terminal connection	0.14 – 1.5 mm2
Digital inputs	
Number	4
Type	SELV
Application	Volts free switch contact
Terminal connection	0.14 – 1.5 mm2
OpenTherm® Slave	
Number	2
Application	Communication with OpenTherm room control
Terminal connection	0.14 – 1.5 mm2
Communication	
Number	2
Application	VariCAN multi-drop Bus
Terminal connection	RJ11 6P4

Technical Training

The Ideal Boilers Technical Training Centre offers a series of first class training courses for domestic, commercial and industrial heating installers, engineers and system specifiers. For details of courses please ring: 01482 498 432

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