Central Heating
TRADE

Rinnai Zen Commissioning Guide

Rinnai

Contents

Rinnai Zen Commissioning Guide

This document must be read in association with the Zen Boiler Installation Manual provided with the unit. It is essential the manual is read and followed to ensure the installation is as per manufacturer's criteria. The purpose of this document is to assist with the commissioning of the boilers parameters and set up of the Rinnai controller or for the connection of third party controls.

1.0 Pre commissioning

- Ensure the boiler and flue are installed in accordance with the installation manual and the gas code.
- Ensure the power is isolated to the unit.
- Remove the front cover of the unit to expose the water pump, and electrical enclosure etc.
- Check the pre-charge of the expansion vessel is set to 1 bar with a static system pressure of 0 Bar.
- Ensure that the boiler is supplied with the correct static gas pressure.

  Natural gas - minimum supply pressure 1.7 kPa, maximum supply pressure 2.5 kPa. LPG - minimum supply pressure 2.0 kPa, maximum supply pressure 3.5 kPa

- Failure to observe the above may result in incorrect operation of the boiler.

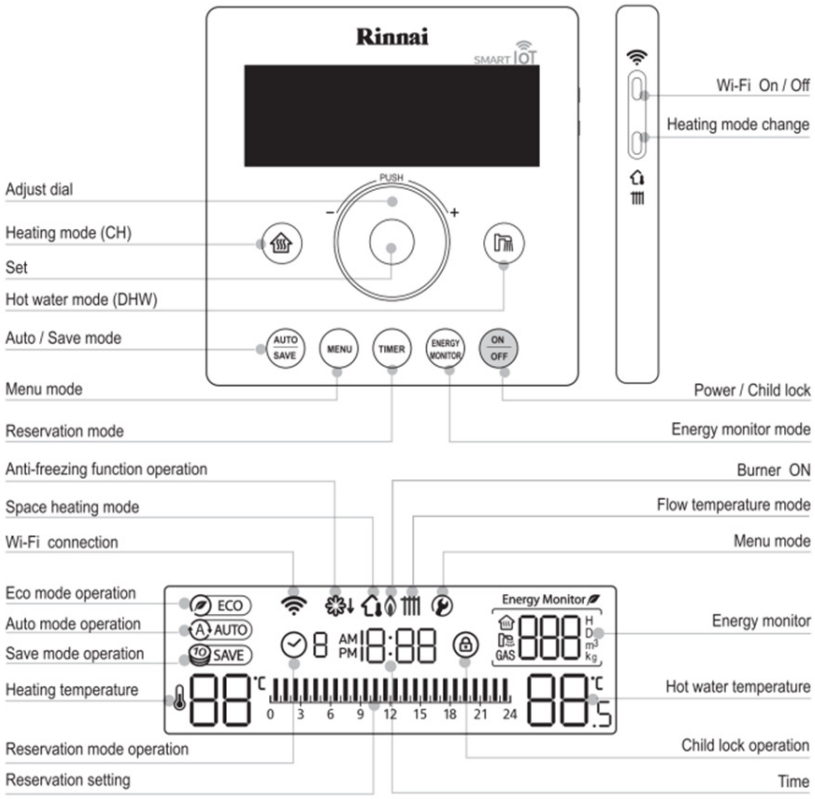
2.0 Filling the System with Water

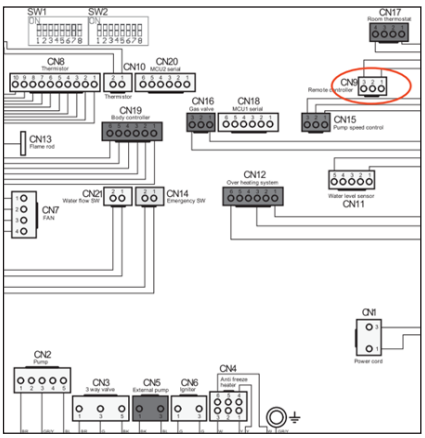
1. Ensure all valves are open and thoroughly flush the system with a flushing cart or suitable mains pressure, until there is no sign of air returning through the primary feed pipes. This will remove most of the air from the system.
2. Now pressurise the system to 1 Bar on the boiler pressure gauge. The boiler has a deaeration function that will automatically start the circulating pump when the boiler is powered on, this function is displayed as a circulation icon on the boilers body controller. This allows the circulation pump to be run manually for 1 hour to help vent the system of air. Ensure the automatic air vents in the system and boiler are open during this process. The deaeration function can be cancelled at any time by enabling heating or DHW on the boiler or Rinnai WIFI thermostat.

3.0 Connection of Rinnai WIFI Thermostat

The boiler is supplied ready to use with the Rinnai Wi-Fi thermostat. The controller is pre-set to operate by controlling the flow temperature of the heating system.

If using as a room thermostat, ensure the heating mode change button is set to "Space Heating" mode. This is found on the right-hand side under the WIFI button. To correctly operate, the Rinnai Wi-Fi Thermostat must remain connected.

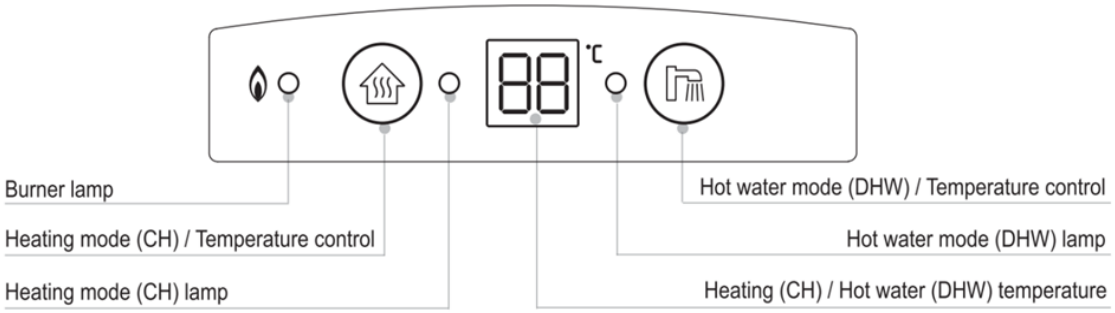




Isolate the power supply and remove black plastic cover from the PCB. Connect field wiring to the cable tail (two white wires) connected to the boilers CN9 PCB connector. Any field wiring must be a minimum of 0.5mm2 shielded cable and not exceed a total length of 50m. This connection to CN9 is low voltage only and **must not have 230VAC applied** to it.

4.0 Boiler Display

The boiler also has a display and buttons accessible with the case on and this allows some functions to be enabled.

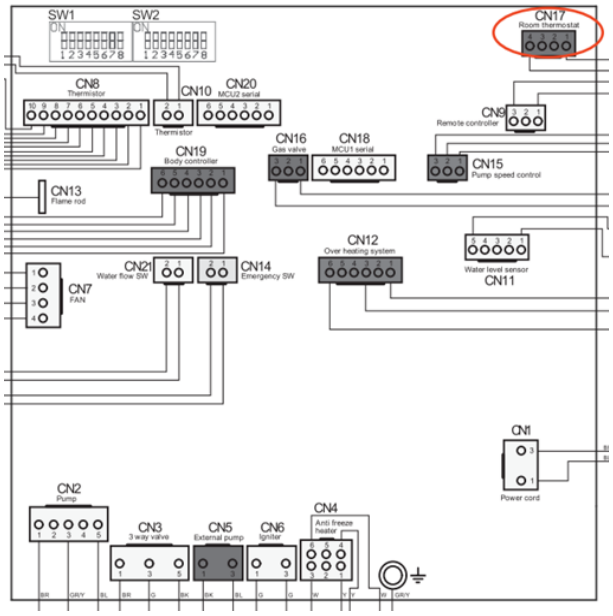


5.0 Connection of External Thermostat

The Rinnai Zen can be configured to use an external thermostat for heating control. Please note, the Rinnai Wi-Fi Thermostat must remain connected for normal boiler operation.

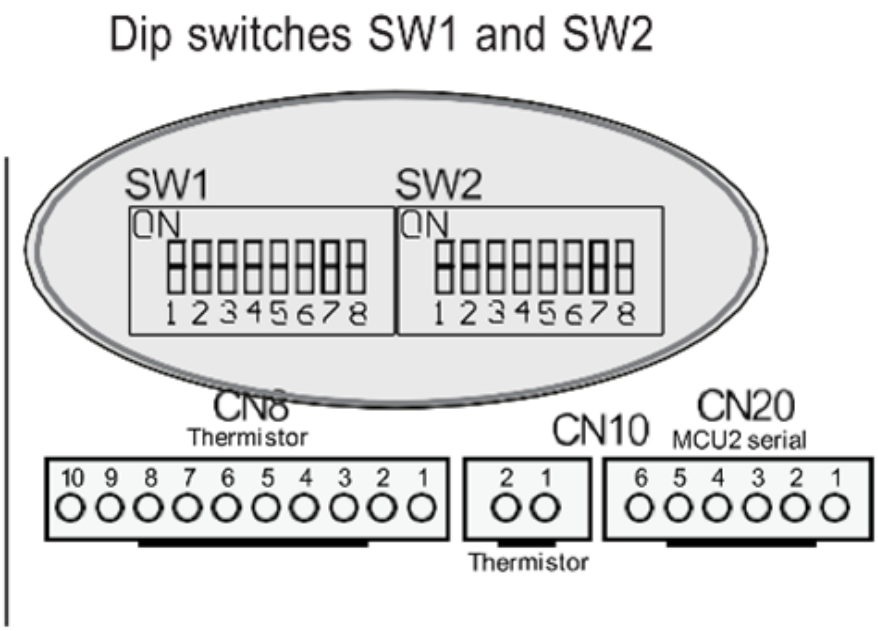
With the black plastic cover removed from the boilers PCB, install the supplied blue plug and cable tail to PCB connector CN17. To enable the boiler to use the external thermostat, ensure thermostat wiring is configured as Normally Open and parameter **B -14** is changed to **A** as seen in boiler configuration.

Any field wiring must be a minimum of 0.5mm2 shielded cable and not exceed a total length of 50m. This connection to CN17 is low voltage only and **must not have 230VAC applied** to it.



6.0 Understanding and Making Changes to SW1 and SW2 Dipswitches

At the top of the PCB, on the left, there are two banks of eight microswitches each (SW1 and SW2):



The manual includes tables that show the full functions of each dip switch, although most of these so not need to be changed by the installer.

For both banks of switches before any changes are made, 2 switches on each back need to be switched on to enable the boiler to accept the microswitch changes;

- For switch bank 1 (SW1) – set switches 7 and 8 to on before making any changes.
- For switch bank 2 (SW2) – set switches 6 and 7 to on before making any changes.

Once these setting changes have been made the microswitch changes can set back to off to confirm the change.

For most installations only the following changes to these microswitch settings are required, sections 6.1 and 6.2 of this guide provides further details on these changes.

6.1 Switch Bank 1 (SW1):

Use switch bank 1 to change the gas type that the boiler is running on.

<table>
<tr><th>#</th><th colspan="4">Bank SW1</th></tr>
<tr><td>1</td><td>OFF</td><td rowspan="2">NG (G20)</td><td>ON</td><td rowspan="2">LPG (G30)</td></tr>
<tr><td>2</td><td>OFF</td><td>ON</td></tr>
<tr><td>3</td><td>OFF</td><td colspan="3" rowspan="4">No changes required</td></tr>
<tr><td>4</td><td>OFF</td></tr>
<tr><td>5</td><td>OFF</td></tr>
<tr><td>6</td><td>OFF</td></tr>
<tr><td>7</td><td>OFF</td><td rowspan="2">Normal operation mode</td><td>ON</td><td rowspan="2">Microswitch setting change enabled</td></tr>
<tr><td>8</td><td>OFF</td><td>ON</td></tr>
</table>

To change the gas type from natural gas to LPG use the following steps:

1. Set switches 7 & 8 to on.
2. Change the setting of switches 1 & 2 to on
3. Set switches 7 & 8 back to off.

For all steps of the gas conversion process please refer to the gas conversion section (section 7) of this guide.

6.2 Switch Bank 2 (SW2):

Use switch bank 2 to change the boilers operating mode from intermittent combustion to continuous combustion, this will allow the boiler to better maintain a steady flow temperature.

CHNZ recommend changing switch 1 of bank SW2 to setting ON for all installations as this ensure more standard boiler operation is achieved.

<table>
<tr><th>#</th><th colspan="4">Bank SW2</th></tr>
<tr><td>1</td><td>OFF</td><td>Intermittent Combustion</td><td>ON</td><td>Continuous combustion</td></tr>
<tr><td>2</td><td colspan="4" rowspan="4">No changes required</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td></tr>
<tr><td>6</td><td>OFF</td><td rowspan="2">Normal operation mode</td><td>ON</td><td rowspan="2">Microswitch setting change enabled</td></tr>
<tr><td>7</td><td>OFF</td><td>ON</td></tr>
<tr><td>8</td><td colspan="4">No changes required</td></tr>
</table>

To change the combustion mode use the following steps:

1. Set switches 6 & 7 to on.
2. Set switch 1 to on.
3. Set switches 6 & 7 back to off.

7.0 Gas Conversion

The Zen boiler is factory configured to operate on **Natural Gas** (G20). If your installation is operating on NG there is no need to change anything relating to this process. Please proceed to the next step.

If your installation is operating on **LPG** (G30), please follow the list of instructions below.

1. Isolate gas and power supply
2. Remove the black plastic cover from the boilers main PCB
3. Change the gas type on microswitch bank 1 (SW1) as described in the previous section.
4. Isolate power supply
5. Disconnect the gas valve supply cable wiring
6. Unscrew the Phillips screws (x3) that fix the gas valve
7. Remove the gas valve taking care not to damage or drop the O-rings.
8. Fit the new brass gas nozzle. 24kW nozzle will have 29/G31 stamped on the face. 35kW will have 35/G31 stamped on the face. Ensure correct nozzle used for boiler output capacity.
9. Fit the gas valve back in place taking care not to damage or drop the O-rings.
10. Connect gas valve supply cable wiring.
11. Open gas valve and turn on power.
12. Ensure parameter **B-1** is set to **4**

8.0 Boiler parameters

The boiler has 4 parameter menus that can be accessed with the remote controller, A, B, C, & D. These menu's are accessed by pressing the Menu button on the WiFi thermostat, please note that menu A and B will not be available if Heating or DHW are enabled. Below are the steps to access the boiler parameters:

1. To make parameter changes cycle through the menus with the menu button until the desired menu is displayed on the screen.
2. Use the rotary dial on the Wi-Fi thermostat to scroll through each parameter.
3. Push in the dial once and rotate to change the setting (for menu A&B only).
4. Push in the dial again once to confirm a parameter change (for menu A&B only).

8.1 Boiler Configuration – Menu A & B

Below is the list of parameters within Menu A & B that might need to be changed for most common installations:

Menu	Parameter #	Parameter	Value	Description of Parameter	Initial Value	CHNZ recommended settings
A	8	Limit of maximum discharge temperature	35~80°C	Limits the max. flow temperature that the boiler can reach, in every kind of functioning/mode/function.	80°C	Use this parameter to limit max flow ie. 45°C for underfloor with no mixing station.
	13	Burner ignition delay	OFF, 1~50	It enables the boiler to delay the ignition of the burner to a max. of 500 seconds to assist slow opening zone valves or reduce short cycling issues. Value x10 = delay	OFF	Set to **18** (180 seconds) if using independent manifold zone control with no hydraulic separation.

Menu	Parameter #	Parameter	Value	Description of Parameter	Initial Value	CHNZ recommended settings
B	1	Gas type	1~4	1: NG - G20; 2: Propane; 3: Air/Propane; 4: ULPG - G30.	-	Change to setting **4** if the gas conversion to LPG has been made.
	10	Power limiter CH	Min~100%	The boiler power is limited to the set % value, de-powering the CH function only (range rated boiler).	100%	Set this accordingly to reduce the boilers output relative to the designed heat load.
	12	Pump activation	ON/OFF	OFF: pump active during combustion; ON: pump always active.	OFF	Set to **ON**, the pump will only operate when there is a heat demand
	14	Room thermostat type	A = closed B = open	Type of contact of the room thermostat. (Closed contact = heat request with closed circuit) Switch to A for External Room Thermostat	B	Set to **A** if using an external 3rd party thermostat.

Refer to the installation manual for the complete list of parameters. Changes to other parameters can be done to suit certain installations but consult the boiler manual or CHNZ Aftersales first for guidance.

8.2 Boiler Diagnostics – Menu C & D

Menu C & D can be used to view the boilers fault history and current status and is useful for checking boiler operation and diagnostics.

Menu	Parameter #	Parameter	Value	Description of Parameter
C	1	Error code 01	Error code & number of events	Shows: • the last twenty error codes registered (position 1 = the most recent) • the number of events occurred.
	2	Error code 02	Error code & number of events	
	....	....	....	
	20	Error code 20	Error code & number of events	
	21	Total error codes		Total of all error codes detected.

Menu	Parameter #	Parameter	Value	Description of Parameter	Unit / Default Value
D	1	Outdoor temperature	-50°C~50°C	Detected temperature by the external temperature sensor.	°C
	2	Flow temperature (CH)	-9°C~161°C	Flow temperature of heating circuit.	°C
	3	Return temperature (CH)	-9°C~161°C	Return temperature from the heating system.	°C
	4	Hot water temperature (DHW)	-9°C~161°C	Hot water temperature.	°C
	5	Antifrost sensor temperature	-50°C~50°C	Detected temperature by the antifrost sensor.	°C
	6	Exhaust sensor temperature	-9°C~161°C	Detected temperature by the exhaust sensor.	°C
	7	Fan speed (Input)	-	It shows the rotation speed required to the fan.	RPM
	8	Fan speed (Output)	-	It shows the detected rotation speed of the fan.	RPM
	9	PWM of the fan (Input)	0~1023	It shows the PWM of the fan.	BIT

CHNZ's aftersales team can guide you through understanding these readings and using these to diagnose faults.

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