Rinnai®

RS100 Control System
Applications Manual

for the installer

Low Loss Header

Table of Contents

1. Applications for the RS100 Room controller

This manual will cover two basic installation possibilities of the RS100. The RS100 is intended to work only with Rinnai boilers.

The RS100 has two programming possibilities; it can function as a room controller for a single zone system with night set back capabilities and is preprogrammed for this setup or it can also function as a clock to enable the outdoor reset day and night curves. The RS100 will need additional programming for this functionality. In both cases the RS100 has the capability to program daily and weekly heating time programs, domestic hot water programs, display fault codes, and provide system information to the installer and home owner.
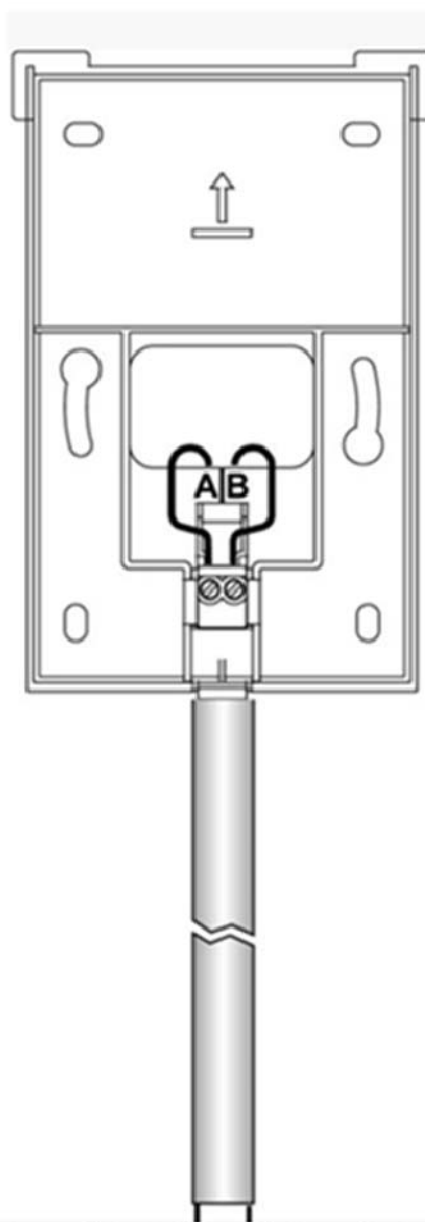
Note: When the RS100 is installed the TT terminals 22 and 23 are disabled and will not receive input signals from third party controls and therefore have no functionality.

2. RS100 Wiring Note

When wiring the RS100 please follow these instructions carefully. Connect the wires to the back panel of the controller. Ensure wire "A" from the room controller is connected to terminal 20 on the Boiler. Ensure wire "B" from the room controller is connected to terminal 21 on the Boiler. If these are swapped the RS100 will not exit "Auto Set" upon activation. Shielded wire is recommended especially in applications using long lengths of wire. Shielded wire is required when near high voltages.
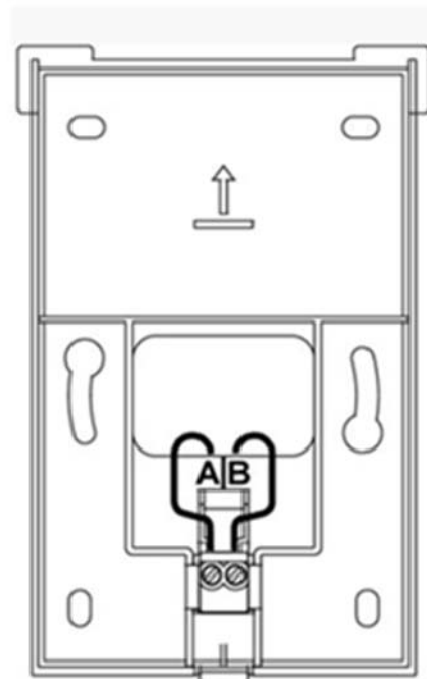
RS100 Wiring non shielded wire

Mounting base

120 V~ Power supply			120 V~ External pump			120 V~ External controller			120 V~			8U.35.22.00	Cylinder connection three-way valve			DHW sensor			Outside sensor		Bus Controller		Room therm. On / Off		External safety contact		24 V~ 100 mA	
⏚	N	L	⏚	N	L	⏚	N	L	⏚	N	L		CH	DHW	N							A	B						
1	2	3	4	5	6	7	8	9		10	11		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

RS100 Wiring shielded wire

Mounting base

| 120 V~ Power supply | | | 120 V~ External pump | | | 120 V~ External controller | | | 120 V~ | | | 8U.35.22.00 | Cylinder connection three-way valve | | | DHW sensor | | Outside sensor | | Bus Controller | | Room therm. On / Off | | External safety contact | | 24 V~ 100 mA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ⏚ | N | L | ⏚ | N | L | ⏚ | N | L | ⏚ | N | L | | CH | DHW | N | | | | | A | B | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | 10 | 11 | | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |

3. Single Heating Zone Systems

The RS100 is a room controller and not an on/off room thermostat. It is intended to work only with Rinnai boilers. When used in conjunction with a Rinnai boiler it will sense the room temperature and use it to influence the supply water temperature. This will allow less cycling of the boiler, a more efficient installation, and a more stable room temperature than any traditional on/off thermostat could provide.

The RS100 can be used to control a single heating zone system. A single heating zone system has only one loop of heating. The placement of the RS100 is very important; it must be placed in the coldest area in the single zone system. If the RS100 is not placed in the coldest area there is a chance that the coldest area will not receive enough heat and therefore not be comfortable. The RS100 needs no additional installer level programming to work for this installation.

3.1 Single Zone Boiler Wiring
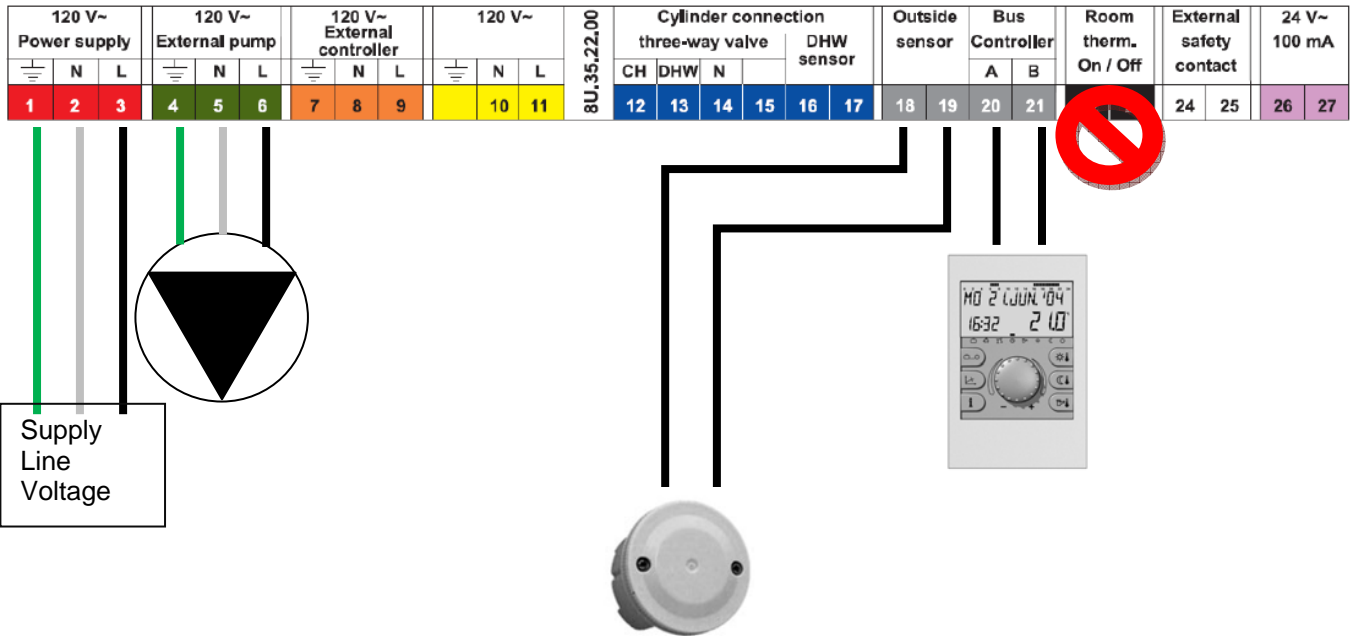
3.2   Single Zone Boiler Piping

RS100

Low Loss Header
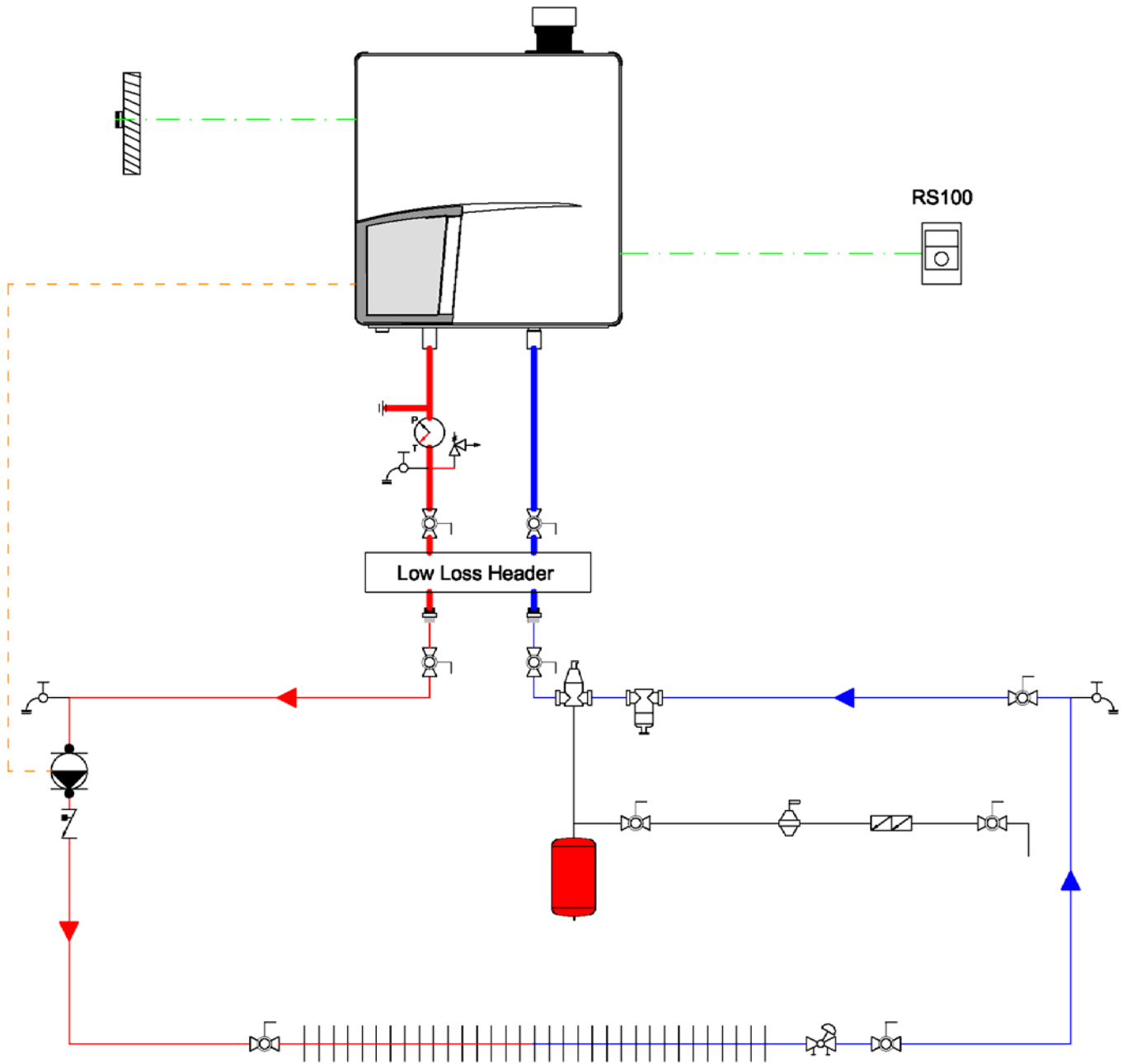
# 4. Multiple Heating circuit system (zone valves or pumps)

The RS100 can be used as a clock to enable and disable both day and night curves based on 100% outdoor reset. When installed in this fashion, it must be understood that the RS100 will not function as a room thermostat or sensor in any way at all. The RS100 will solely function as a clock and allow the boiler to switch between day and night outdoor reset curves. The RS100 will also have the capability to program daily and weekly heating time programs, domestic hot water programs, display fault codes, and provide system information to the installer and home owner. When the RS100 is installed the TT terminals 22 and 23 are disabled and will not receive input signals from third party controls and therefore have no functionality. The boiler is operating as 100% outdoor reset and no input from room thermostats (on/off) or 3rd party controls. Therefore all 3rd party relay panels will only enable and disable pumps and/or zone valves. Third party controls will **NOT** tie into the boilers control circuit.

4.1 Programming the boiler for 100% Outdoor Reset

Enter the installer code by pressing down the heating and hot water buttons simultaneously for three seconds until "CODE 0000" appears.
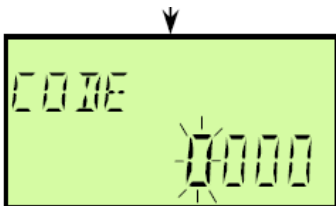
Using the rotary push button change the code to "1234". The code is set by turning the push button until the correct number is displayed then pressing the button to move onto the next number until all four numbers have been set. When "INSTALLER OK" appears the code has been entered correctly.
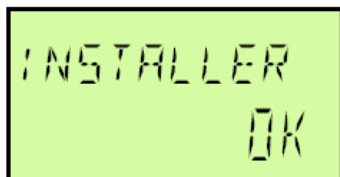
Turn the rotary push button until "UMIXED CIRC HC" appears then press the push button.

Turn the button until "PARAMETER 03 HC 1" is displayed and press the push button. Then turn the button to change the parameter to either "PARAMETER 03 HC 3" or "PARAMETER 03 HC OFF" see the descriptions below for information on these two parameters. Push the button in to select the parameter then press the [**i**] button twice to exit out to the home screen.

- Level Unmixed Circuit (page 13 Operating and Installation manual RS100)

- Parameter 3 "Room intrusion" can be changed to either "OFF" or "3"

  ♦ If "OFF" is selected then the RS100 will not display the room temperature. Instead boiler supply temperature T1 will be displayed. If the pushbutton is pressed a theoretical room temperature can be entered that will create a parallel shift in the outdoor reset curve.

  ♦ If "3" is selected the room temperature will be displayed, but this will not allow the control to function as a room thermostat. If the pushbutton is pressed a theoretical room temperature can be entered that will create a parallel shift in the outdoor reset curve.

4.2 Factory Settings

Parameter	Designation	Setting range / Setting Values	Factory Setting	Individual Setting
RED HEATING	Type of reduced operation	**ECO** switch off operation **RED** set-back operation	RED	
HEAT SYSTEM	Heating system (exponent)	1.00 … 10.00	1.3	
03	Controller function (in connection with room sensor)	**OFF** 100% Outdoor Reset (boiler temperature is displayed) **1** Room Control (RC) - room sensor **3** 100% Outdoor Reset (room sensor function disabled, room temperature displayed)	1	
04	Room effect factor	OFF, 10...500%, RC (only room control)	RC	

Settings after installer has changed Parameter 3:

Parameter	Designation	Setting range / Setting Values	Factory Setting	Individual Setting
03	Controller function (in connection with room sensor)	**OFF** 100% Outdoor Reset (boiler temperature is displayed) **1** Room Conrol (RC) - room sensor **3** 100% Outdoor Reset (room sensor function disabled, room temperature displayed)	1	3

or

| Parameter	Designation	Setting range / Setting Values	Factory Setting	Individual Setting
03	Controller function (in connection with room sensor)	**OFF** 100% Outdoor Reset (boiler temperature is displayed) **1** Room Conrol (RC) - room sensor **3** 100% Outdoor Reset (room sensor function disabled, room temperature displayed)	1	OFF

If further adjustment of this parameter is required, please contact Rinnai.

4.3 Multiple Zone Valves

4.3.1 Multiple Zone Valve Boiler Wiring with Differential Pressure Bypass
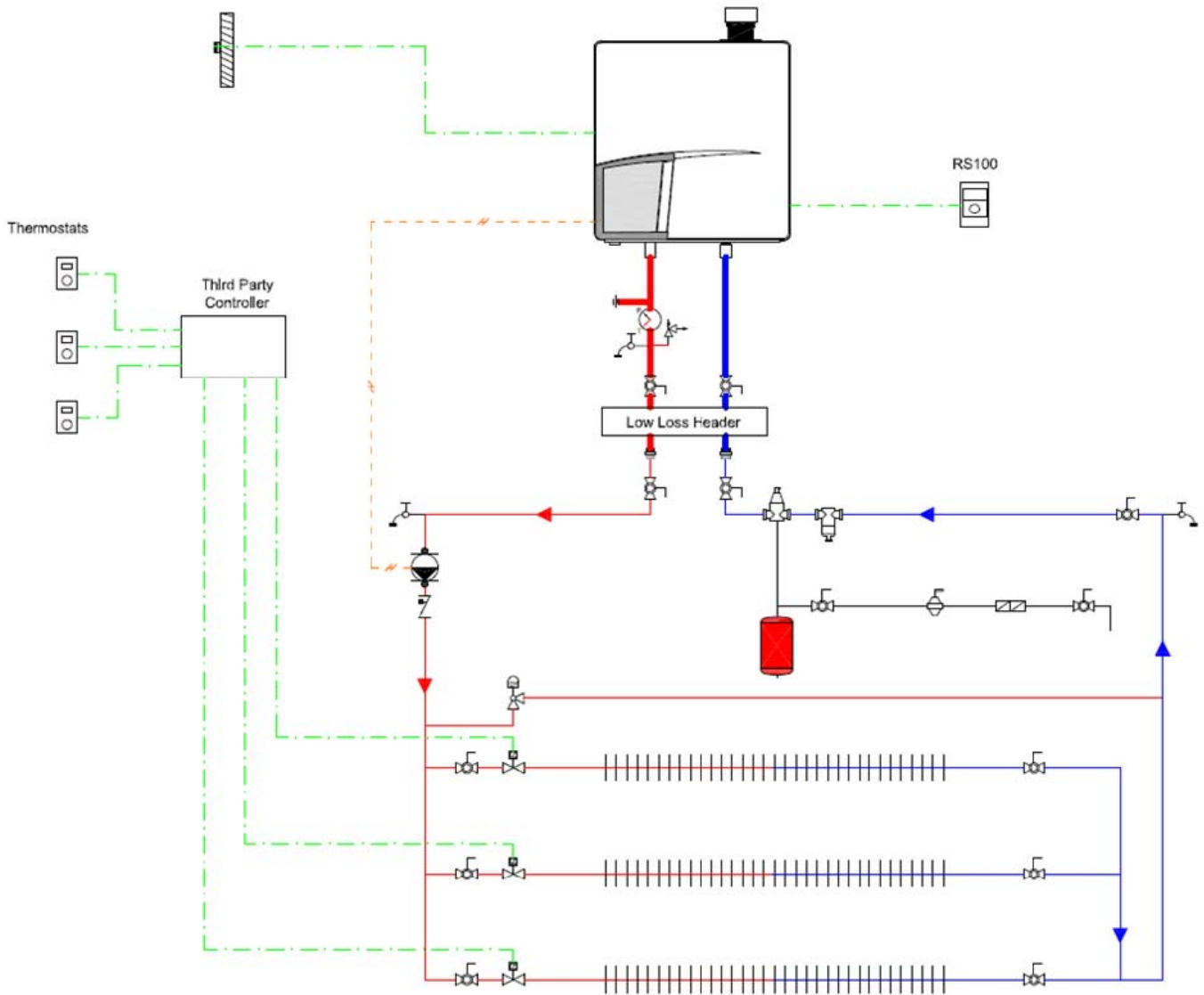
Wiring for the boiler when a differential pressure by pass is used and the system pump is wired directly to the boiler.

Do Not Connect 3rd Party Controls

Supply Line Voltage
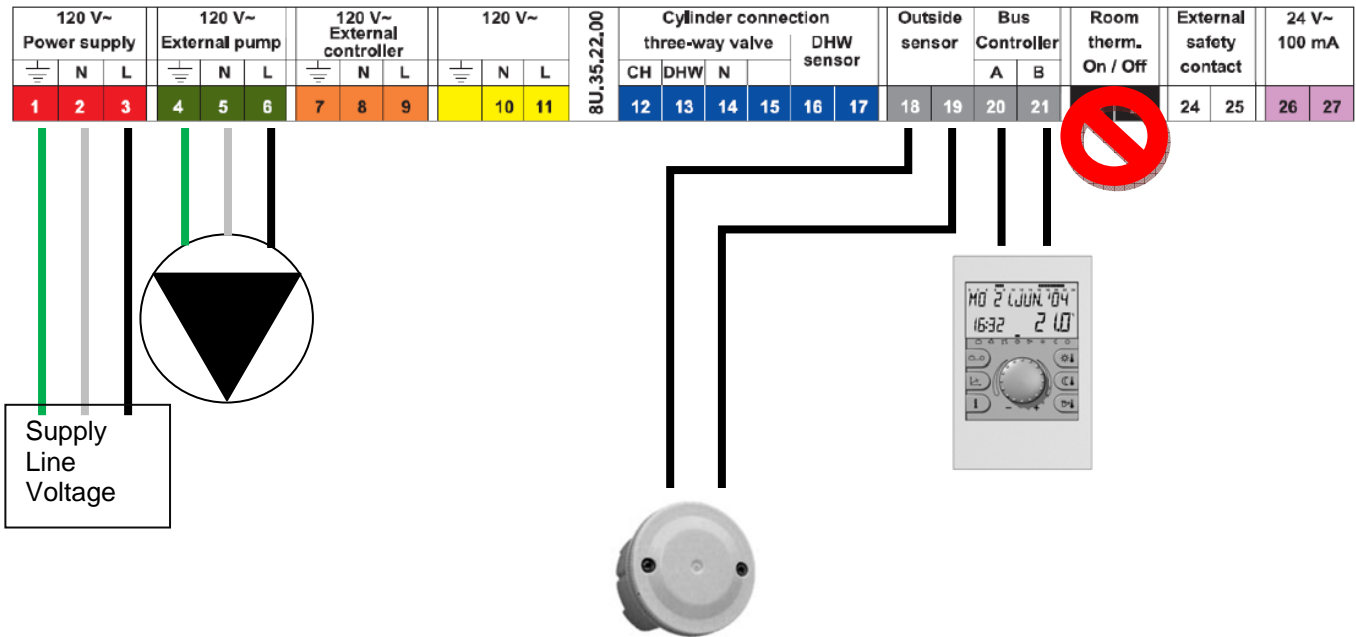
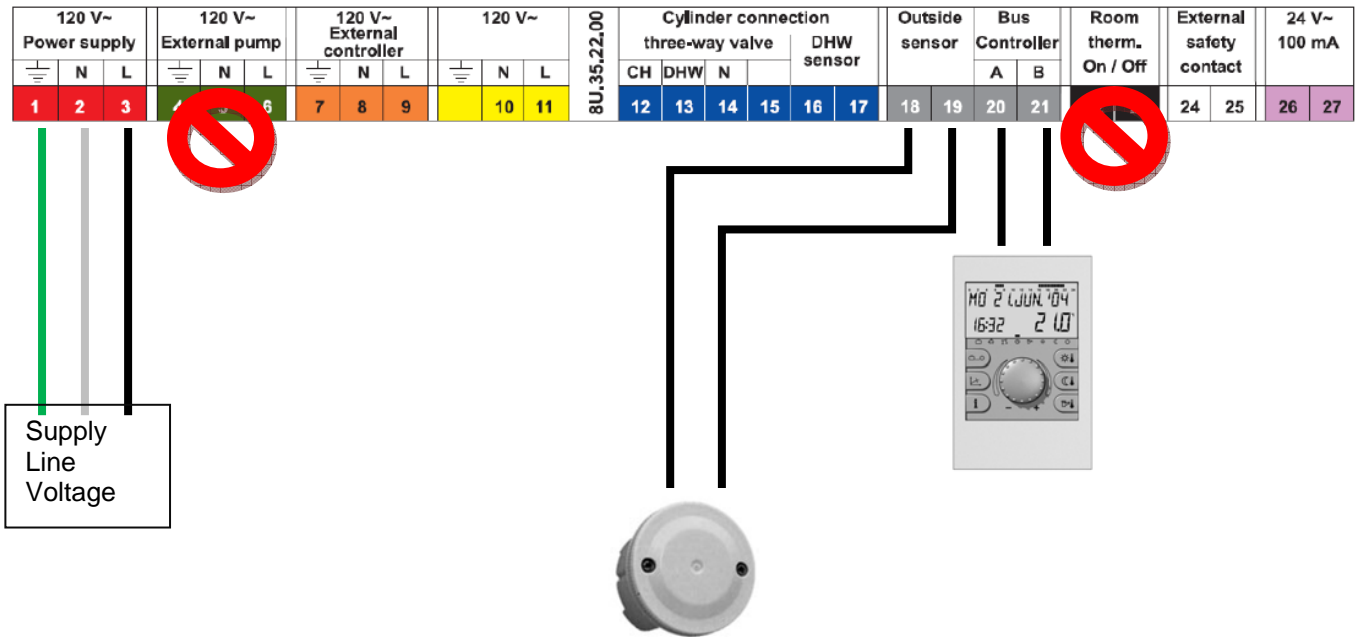### 4.3.2 Multiple Zone Valve Piping with Differential Pressure Bypass

Piping for the boiler when a differential pressure by pass is used and the system pump is wired directly to the boiler.

### 4.3.3 Multiple Zone Valve Boiler Wiring with 3rd Party pump control

Wiring for the boiler when a differential pressure by pass is not used and the system pump is wired to the 3rd party relay panel.

Do Not Connect 3rd Party Controls

120 V~ Power supply			120 V~ External pump			120 V~ External controller			120 V~			8U.35.22.00	Cylinder connection three-way valve				DHW sensor		Outside sensor		Bus Controller		Room therm. On / Off		External safety contact		24 V~ 100 mA	
⏚	N	L	⏚	N	L	⏚	N	L	⏚	N	L		CH	DHW	N						A	B						
1	2	3	4	5	6	7	8	9		10	11		12	13	14	15	16	17	18	19	20	21			24	25	26	27

Supply Line Voltage

4.3.4 Multiple Zone Valve Piping with 3rd Party pump control

Piping for the boiler when a differential pressure by pass is not used and the system pump is wired to the 3rd party relay panel
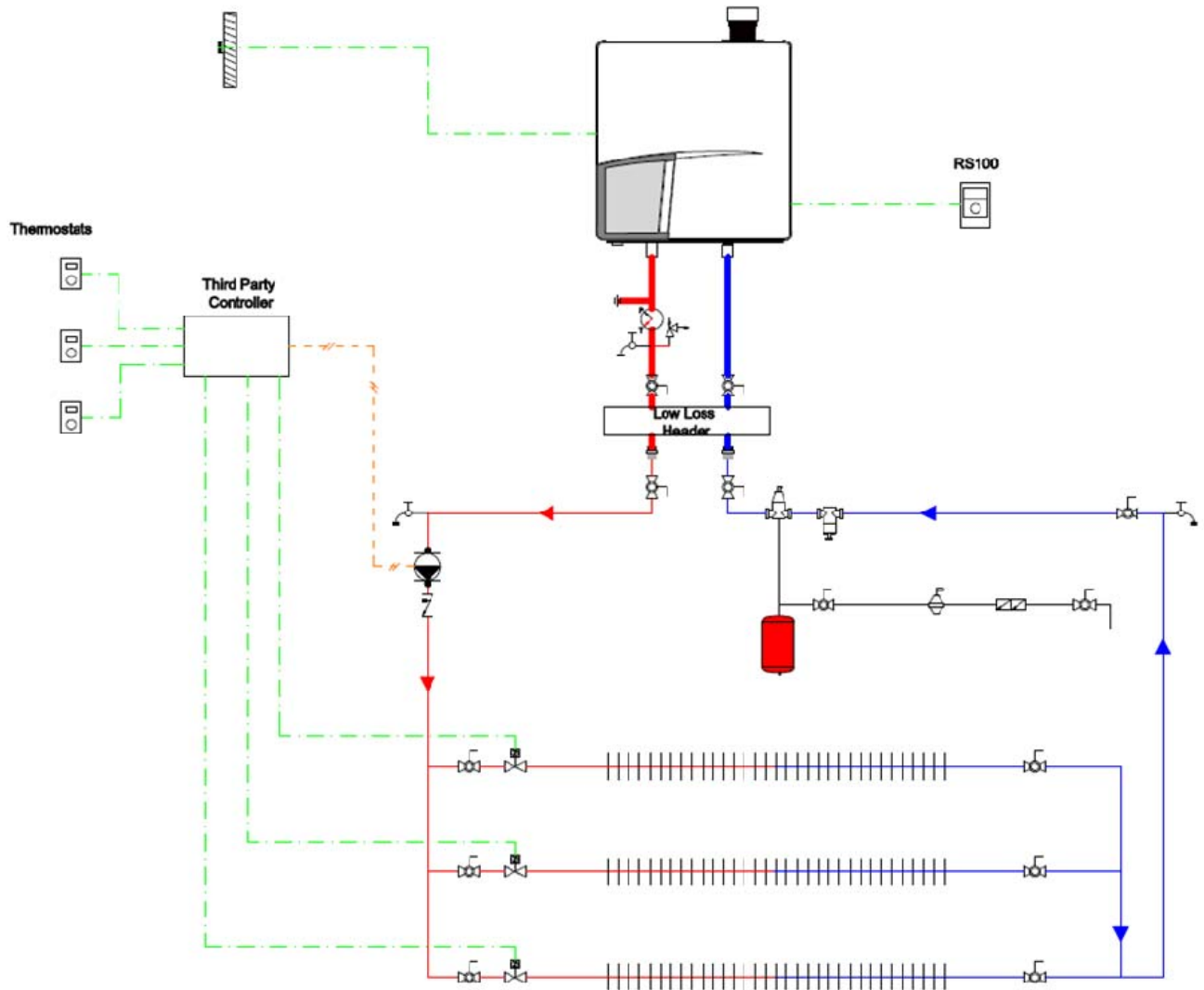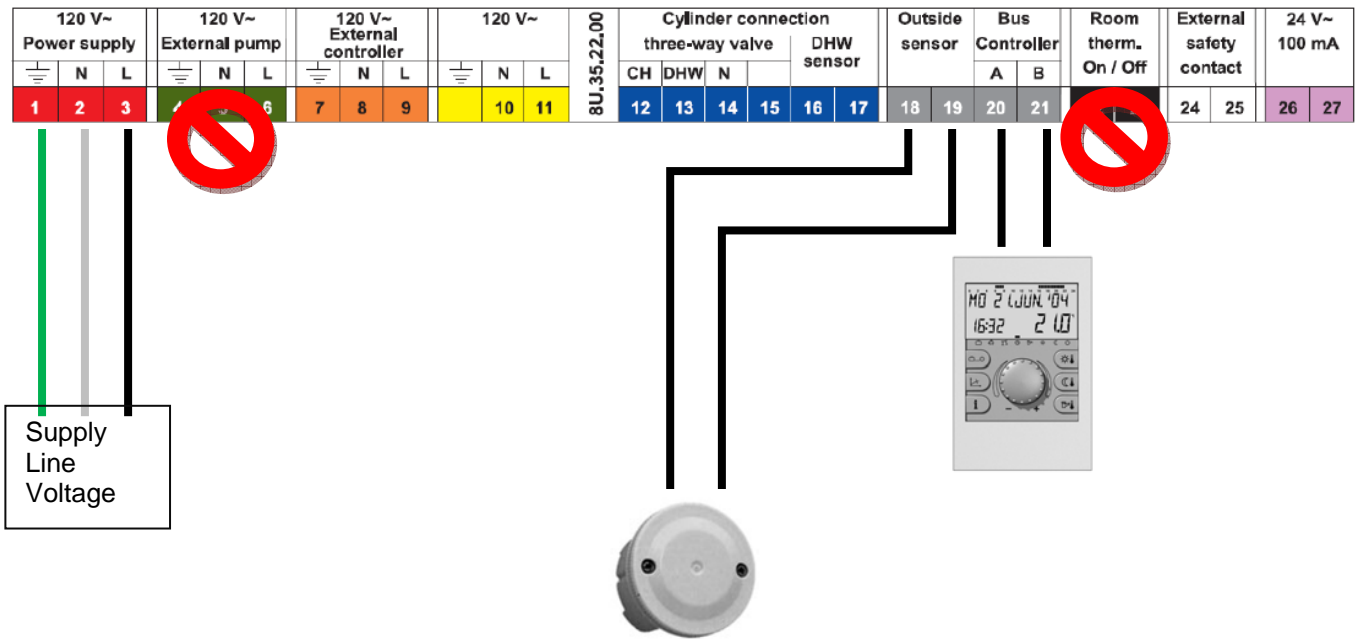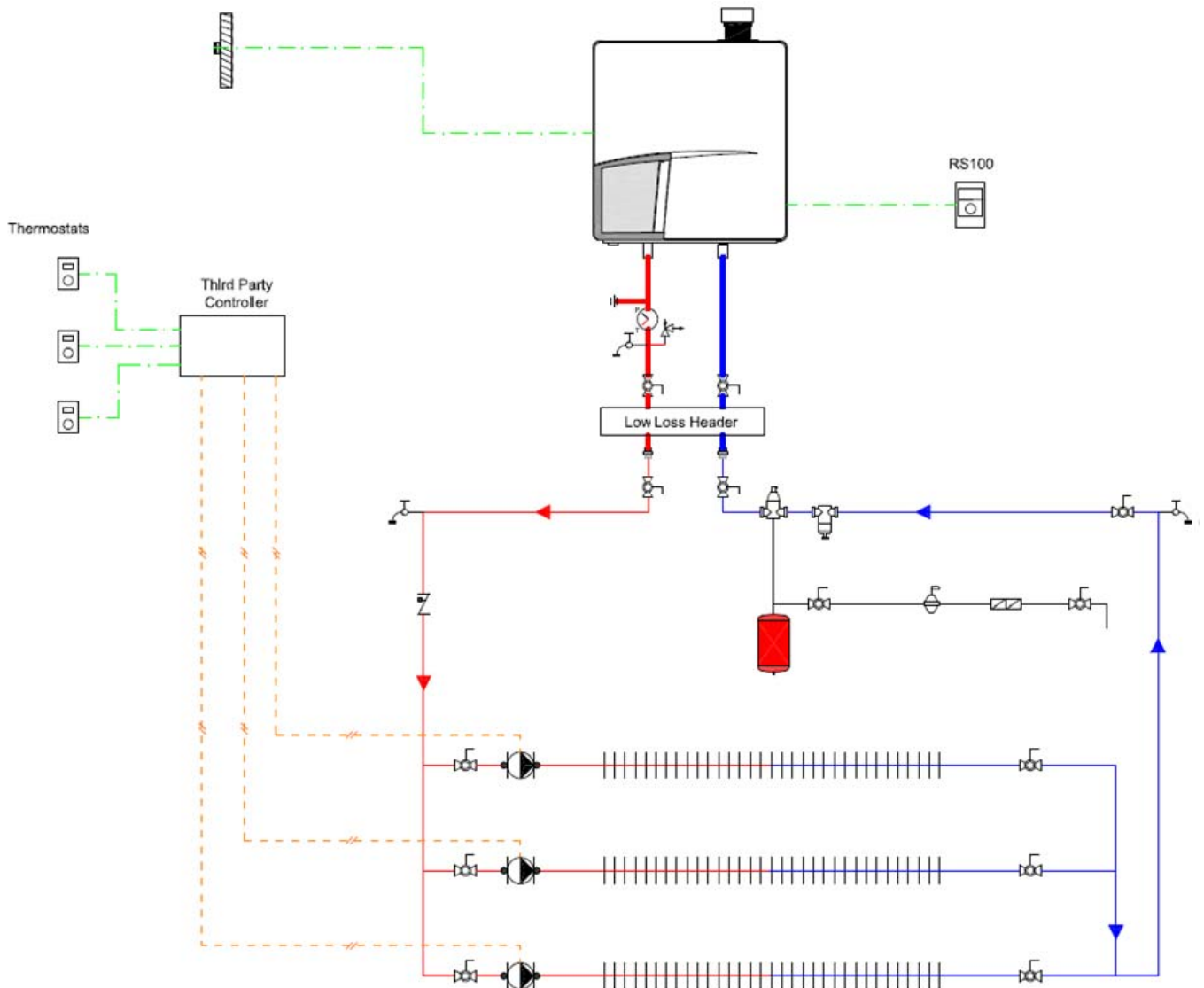
4.4 Multiple Pumped Zones

4.4.1 Multiple Pumped Zones Boiler Wiring

Wiring for the boiler when a 3rd party pump relay panel is used.

Do Not Connect 3rd Party Controls
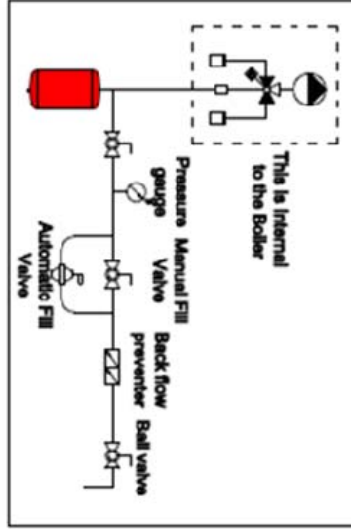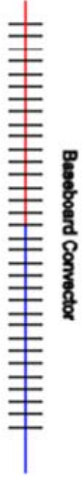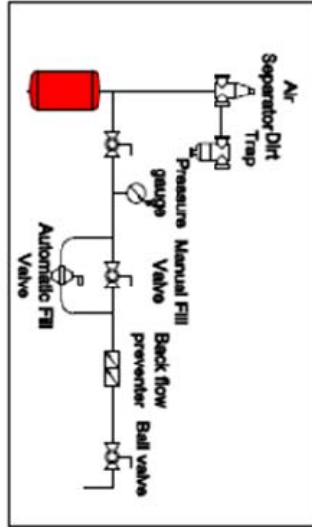
Supply Line Voltage

4.4.2   Multiple Pumped Zone Piping

Thermostats

Third Party Controller

RS100

Low Loss Header

5. Symbols Key

Rtmal Air Handler

Cast Iron Radiator

Panel Radiator

Expansion tank

Baseboard Convector

The following picture illustrates a suggested arrangement. Some of the fittings are optional.

This is internal to the Boiler

Pressure gauge

Manual Fill Valve

Back flow preventer

Ball valve

Automatic Fill Valve

Outdoor Sensor

Three way motorized valve

Four way motorized valve

Boiler Drain

Differential Pressure Bypass

Pressure Reducing Valve

Ball valve

Back flow preventer

Balancing Valve

Two way motorized valve

Automatic Fill Valve

Zone valve

Thermostatic mixing valve

Y Strainer

Pressure relief valve

Air vent Float type

Dielectric union

Swing Check valve

Flow Check valve

Spring Loaded Check Valve

Air Separator

Dirt Trap

Pump Isolation Flanges

RS100

Heat exchanger

Pressure and Temperature gauge

Pressure gauge

Air Separator/Dirt Trap

The following picture illustrates a suggested arrangement. Some of the fittings are optional.

Pressure gauge

Manual Fill Valve

Back flow preventer

Ball valve

Automatic Fill Valve

High Voltage

Low Voltage

Temperature gauge

Diverter Tee

Return Manifold

Supply Manifold

Snow Melt System

Commercial Dirt Trap

Commercial Air Separator

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