Firebird®
Central to Heating

Low Loss Header

Light Commercial Cascading System

Installation Manual

SUPERIOR HEATING SOLUTIONS
SINCE 1980

INDEX

SAFETY NOTES

- Installation must conform to all standards and regulations and operating accordingly.
- Ensure the following codes and standards are adhered to where applicable:

  - BS EN 14336:2004 Heating Systems in Buildings

    Installation and Commissioning of Water Based Heating Systems

  - BS EN 12828:2003 Heating Systems in Buildings

    Design of Water Based Heating Systems

  - BS EN 12831:2003 Heating Systems in Buildings

    Method of Calculation of the Design Heat Load

- All other relevant technical building guidance documents and/or codes should be adhered to.
- Please read this manual carefully prior to installation of the unit.

SYSTEM INSTALLATION

All installation work must be carried out by a qualified, competent person with a good knowledge of fitting these types of systems. A pressure relief valve must be fitted to the system.

The Low loss Header "LLH" is constructed from a 4mm steel plate with a dense insulation enclosed in a mild steel plastic coated casing.

All boilers connected to the low loss header must be of equal output.

Ensure that all pipes are sized appropriately for the installation, things to take into account are distance and flow rate.

This system must not be connected directly to under floor heating. It may be used for under floor heating via a mixing valve and the return temperature to the boiler must be over 40°C after the first heating cycle.

This LLH must be operated by the Firebird Cascading Management Controller. Please see separate manual for details on operating the controller.

SYSTEM LOCATION

The LLH must be attached vertically to a solid wall/object. Sufficient space should be left around the LLH to facilitate pipe work fittings and to allow access to the drain cock for servicing/draining the unit.

In order for the unit to work to its optimum, please review the schematics carefully, choosing the most appropriate set up for the installation, failure to do so may cause this unit to operate inefficiently.

kW Needed *	Boiler No.	Boiler kW **	LLH Size mm	LLH Code	Pump Size m	Flow Rate ltr/min.	No. of Pumps	No. of Non-Return Valves	No. of Pipe Thermo-stats	Oil Pipe Sizing mm	Flue Size for each Boiler mm	Min. dia. Main Flue Size mm
52	2	26	75	LLH3	6	65.52	2	2	2	15	80	115
70	2	35	75	LLH3	6	88.20	2	2	2	15	80	115
78	3	26	75	LLH3	6	147.42	3	3	3	15	80	140
88	2	44	75	LLH3	8	110.88	2	2	2	15	100	150
104	4	26	100	LLH4	6	262.08	4	4	4	20	80	160
105	3	35	100	LLH4	6	198.45	3	3	3	15	80	140
116	2	58	100	LLH4	8	146.16	2	2	2	20	100	150
132	3	44	100	LLH4	8	249.48	3	3	3	20	100	175
140	4	35	100	LLH4	6	352.80	4	4	4	20	80	160
146	2	73	100	LLH4	8	183.96	2	2	2	20	125	180
174	3	58	100	LLH4	8	328.86	3	3	3	20	100	180
176	4	44	100	LLH4	8	443.52	4	4	4	20	100	200
200	2	100	100	LLH4	8	252.00	2	2	2	20	150	220
219	3	73	100	LLH4	8	413.91	3	3	3	20	125	220
232	4	58	100	LLH4	8	584.64	4	4	4	20	125	200
292	4	73	150	LLH6	8	735.84	4	4	4	20	125	250
300	3	100	150	LLH6	8	567.00	3	3	3	20	150	260
400	4	100	150	LLH6	8	1,008.00	4	4	4	20	150	300

* Max. kW Needed

** Min. kW Needed eg. zone or lowest zone demand

2 SYSTEM LOCATION & 3 SYSTEM LAYOUT

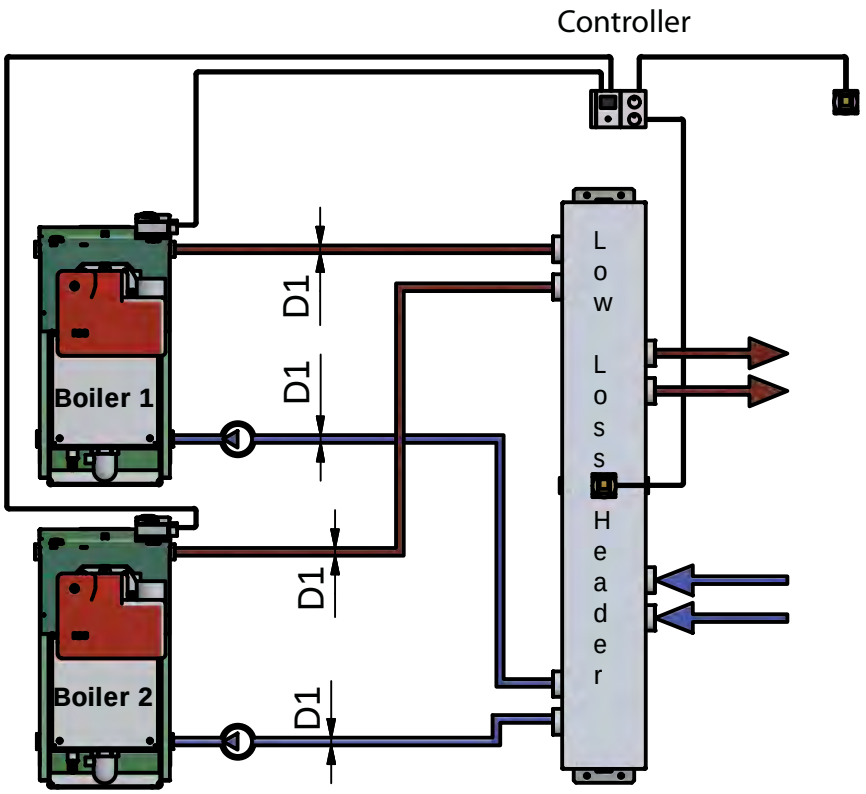
It is recommended by the burner manufacturers that at least 8mm id. supply pipe be used for a burner of up to 35kW and 10mm id. for a burner of up to 100kW in order to have an adequate supply of oil. Using a cross sectional calculation, 20mm id. pipe is sufficient to supply 4x100 and T'd off to each boiler with 10mm id. pipe. For smaller systems, 15mm is sufficient.

Note: these calculations are based on an oil tank level with or above the level of the burner.

The condensate from the boilers needs to be transferred to an appropriate disposal drain by means of a 40mm/1½" wastepipe made from a suitable material and T'd off so each boiler can be evacuated.

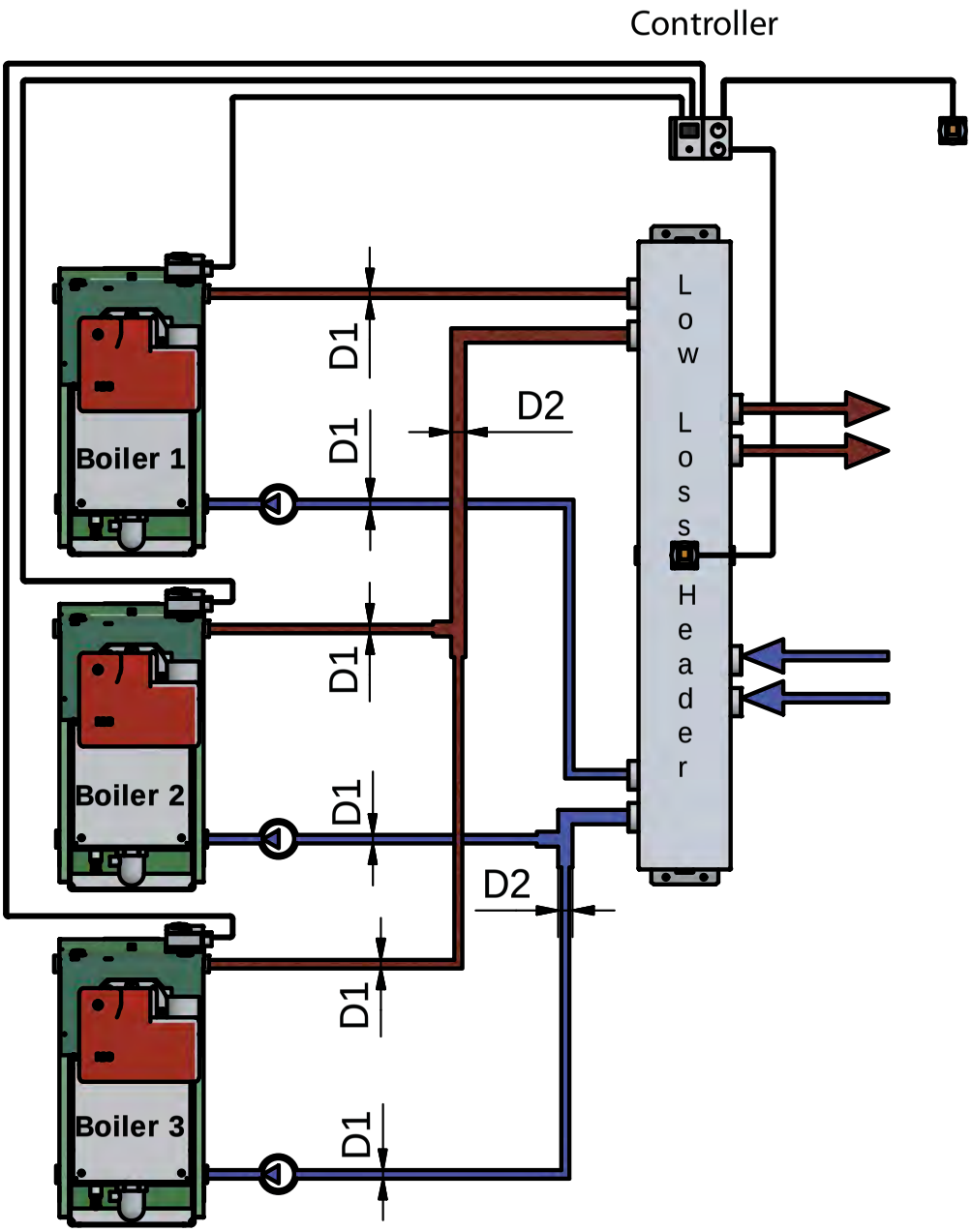
3.1 SYSTEM LAYOUT - TWO BOILER INSTALLATION

Below are some layout options for different numbers of boilers with different kW ranges. All boilers used must be of equal output.



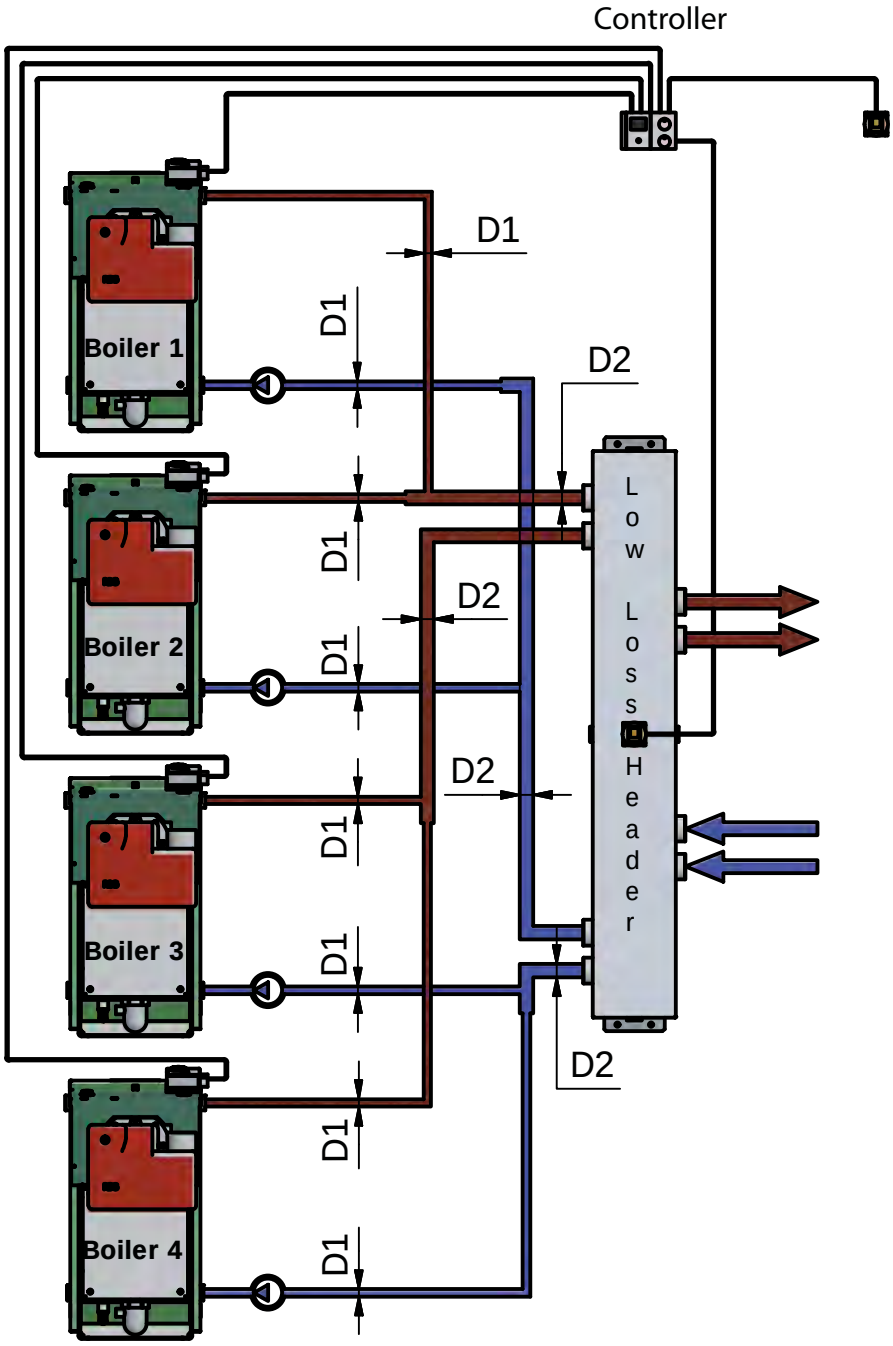
Boiler Output Range kW	Combined Output kW	Tapping Size BSP"	Flow Rate Each Boiler kg/s	D1 Pipe Size mm	Pump Size m	Total Flow kg/s	Header Size
20-26	52	1	0.310	28	6	0.620	LLH3
26-35	70	1	0.417	28	6	0.835	LLH3
36-44	88	1 ½	0.525	35	8	1.050	LLH3
58	116	1 ½	0.692	35	8	1.385	LLH4
73	146	1 ½	0.871	35	8	1.743	LLH4
73-100	200	2	1.194	35	8	2.388	LLH4

3 3.2 SYSTEM LAYOUT - THREE BOILER INSTALLATION



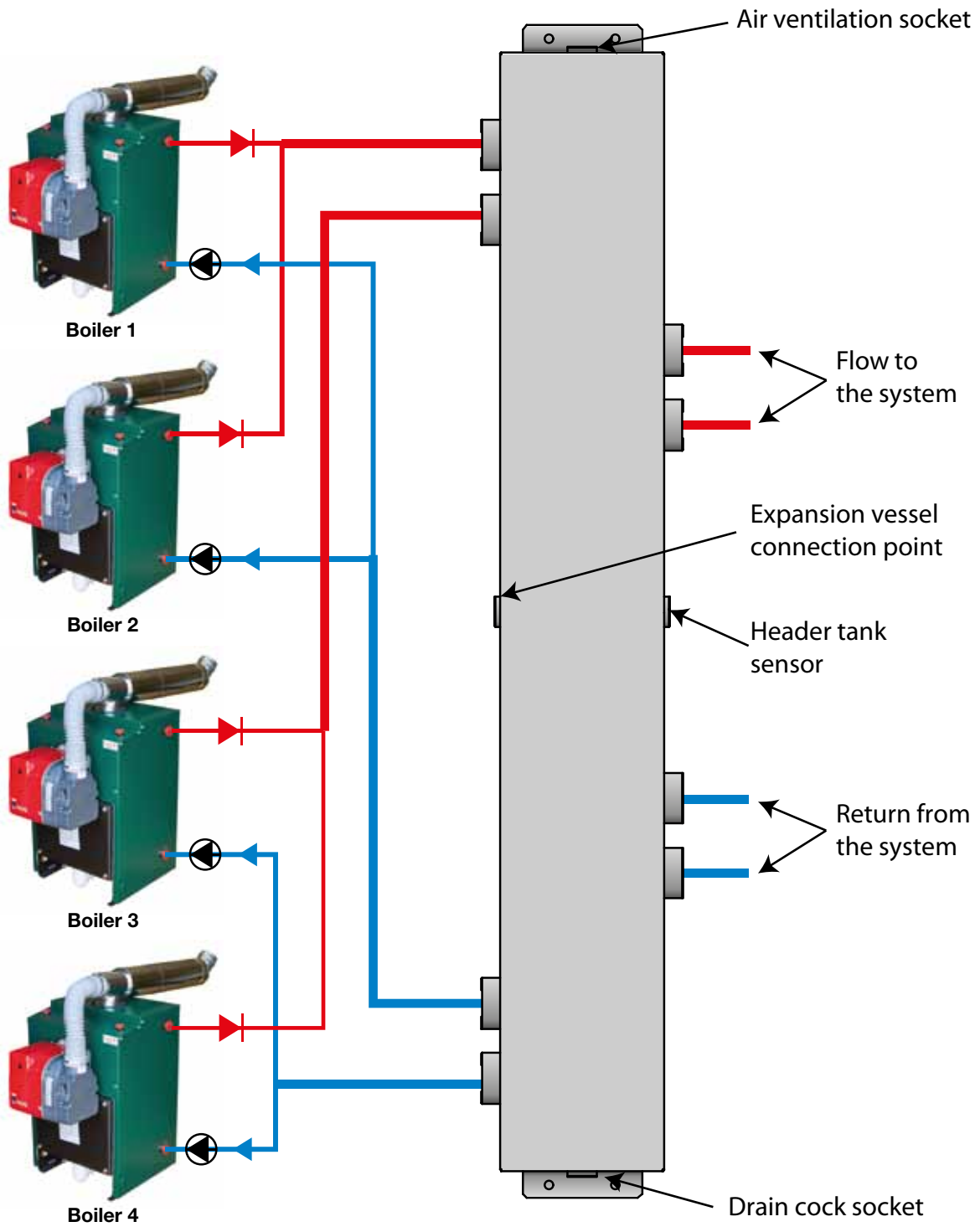
Boiler Output Range kW	Combined Output kW	Tapping Size BSP"	Flow Rate Each Boiler kg/s	D1 Pipe Size mm	D2 Pipe Size mm	Pump Size m	Total Flow kg/s	Header Size
20-26	78	1	0.310	28	28	6	0.930	LLH3
26-35	105	1	0.417	28	35	6	1.251	LLH3
36-44	132	1 ½	0.525	35	42	8	1.575	LLH4
58	174	1 ½	0.692	35	54	8	2.076	LLH4
73	219	1 ½	0.871	35	54	8	2.613	LLH6
73-100	300	2	1.194	35	54	8	3.582	LLH6

3 3.3 SYSTEM LAYOUT - FOUR BOILER INSTALLATION



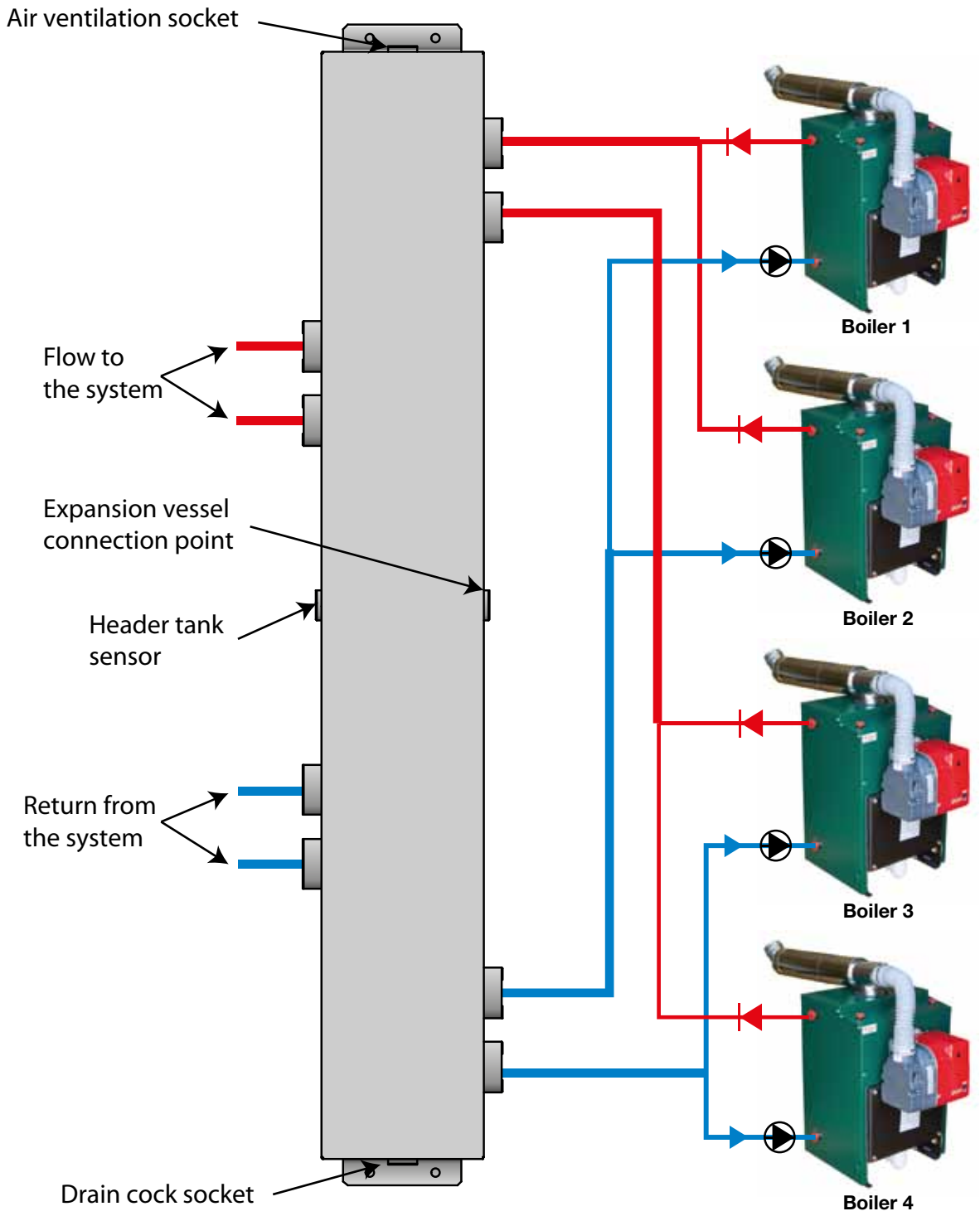
Boiler Output Range kW	Combined Output kW	Tapping Size BSP"	Flow Rate Each Boiler kg/s	D1 Pipe Size mm	D2 Pipe Size mm	Pump Size m	Total Flow kg/s	Header Size
20-26	104	1	0.310	28	28	6	1.240	LLH3
26-35	140	1	0.417	28	35	6	1.668	LLH4
36-44	176	1 ½	0.525	35	42	8	2.100	LLH4
58	232	1 ½	0.692	35	54	8	2.768	LLH6
73	292	1 ½	0.871	35	54	8	3.484	LLH6
73-100	400	2	1.194	35	54	8	4.776	LLH6

4 4.1 PLUMBING - BOILERS ON THE LEFT



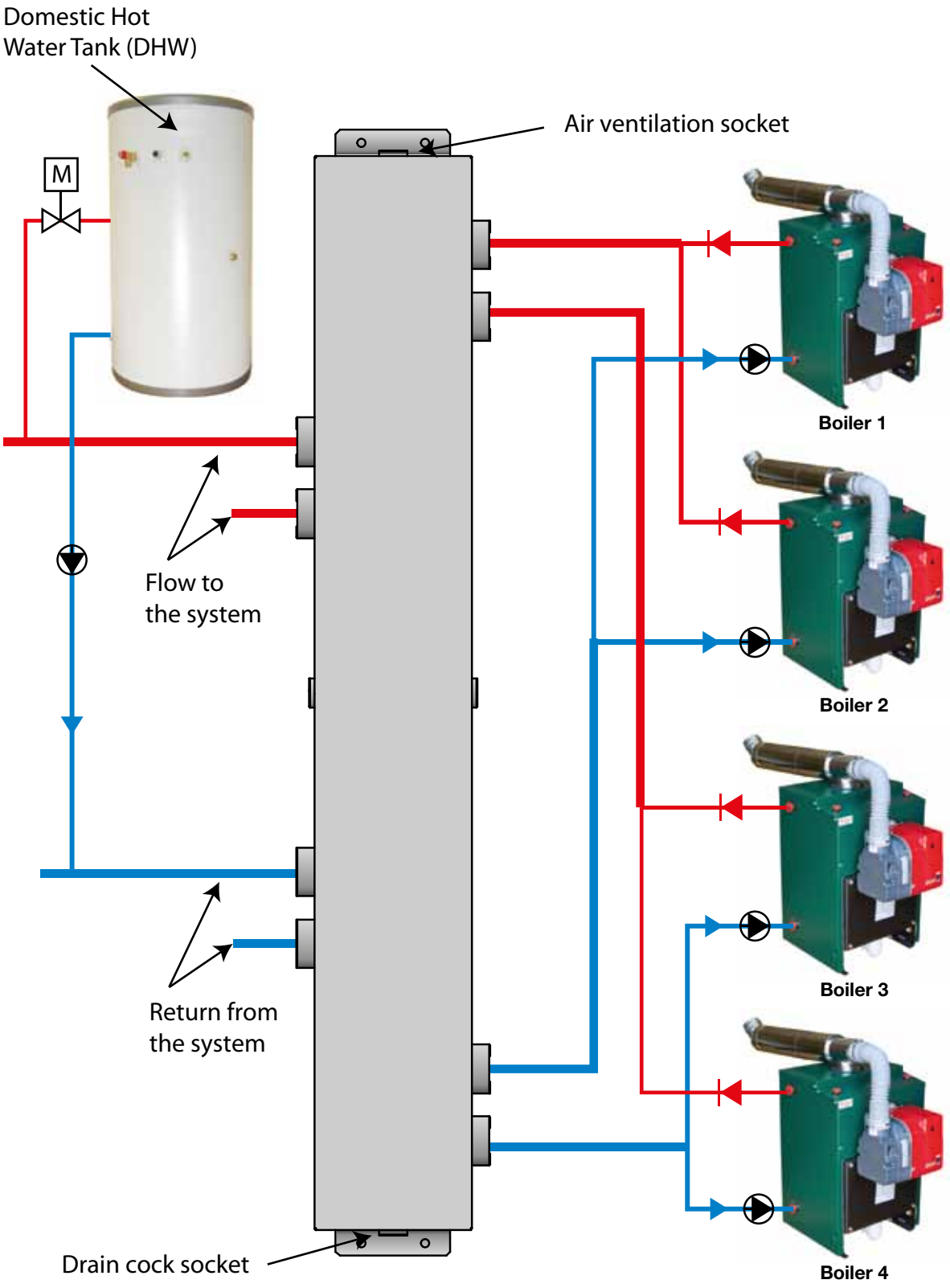
Note: all Low Loss Headers have 2" fittings.

4.2 PLUMBING - BOILERS ON THE RIGHT



Note: all Low Loss Headers have 2" fittings.

5 DOMESTIC HOT WATER SCHEMATIC



Note: all Low Loss Headers have 2" fittings.

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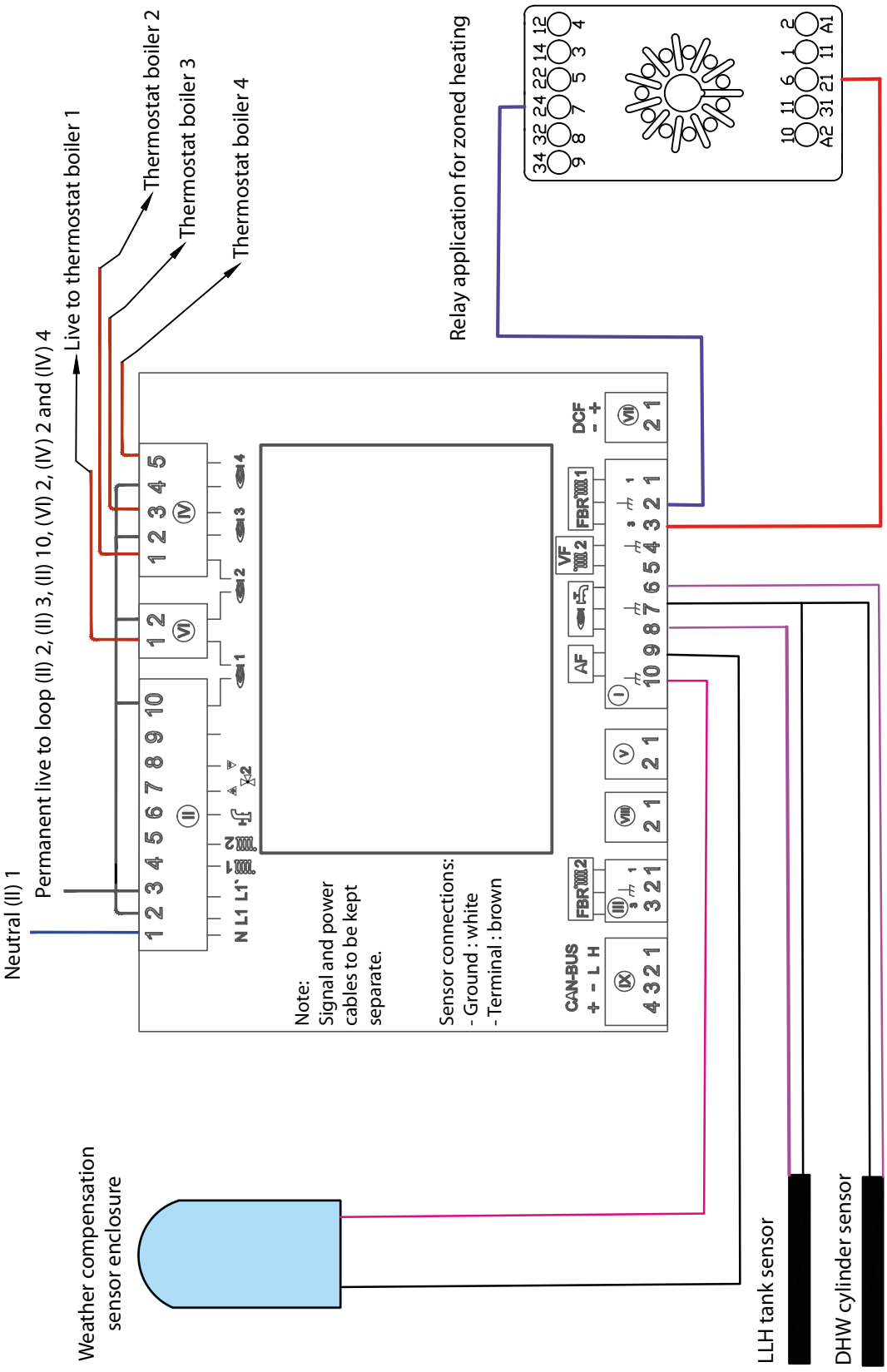
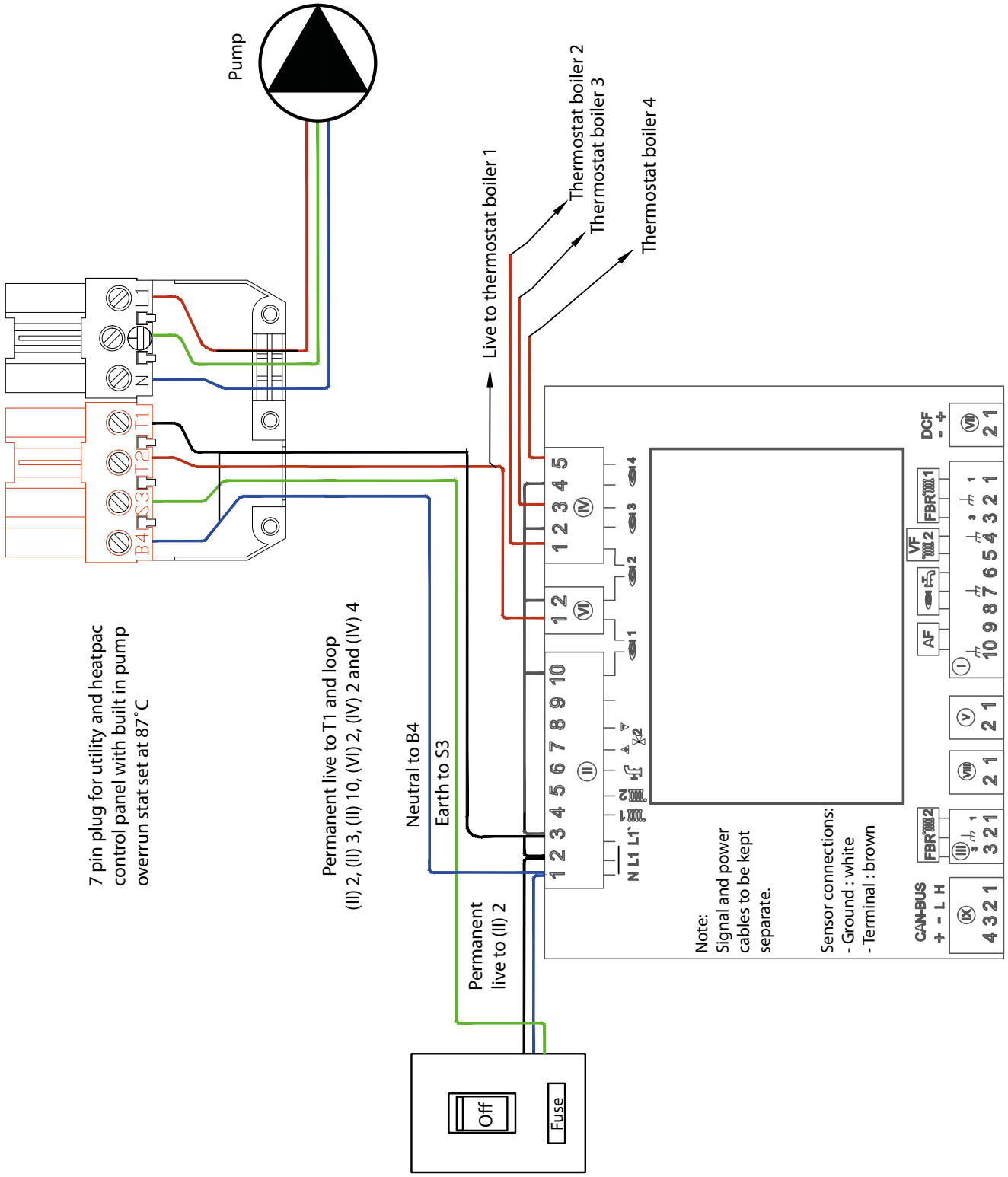
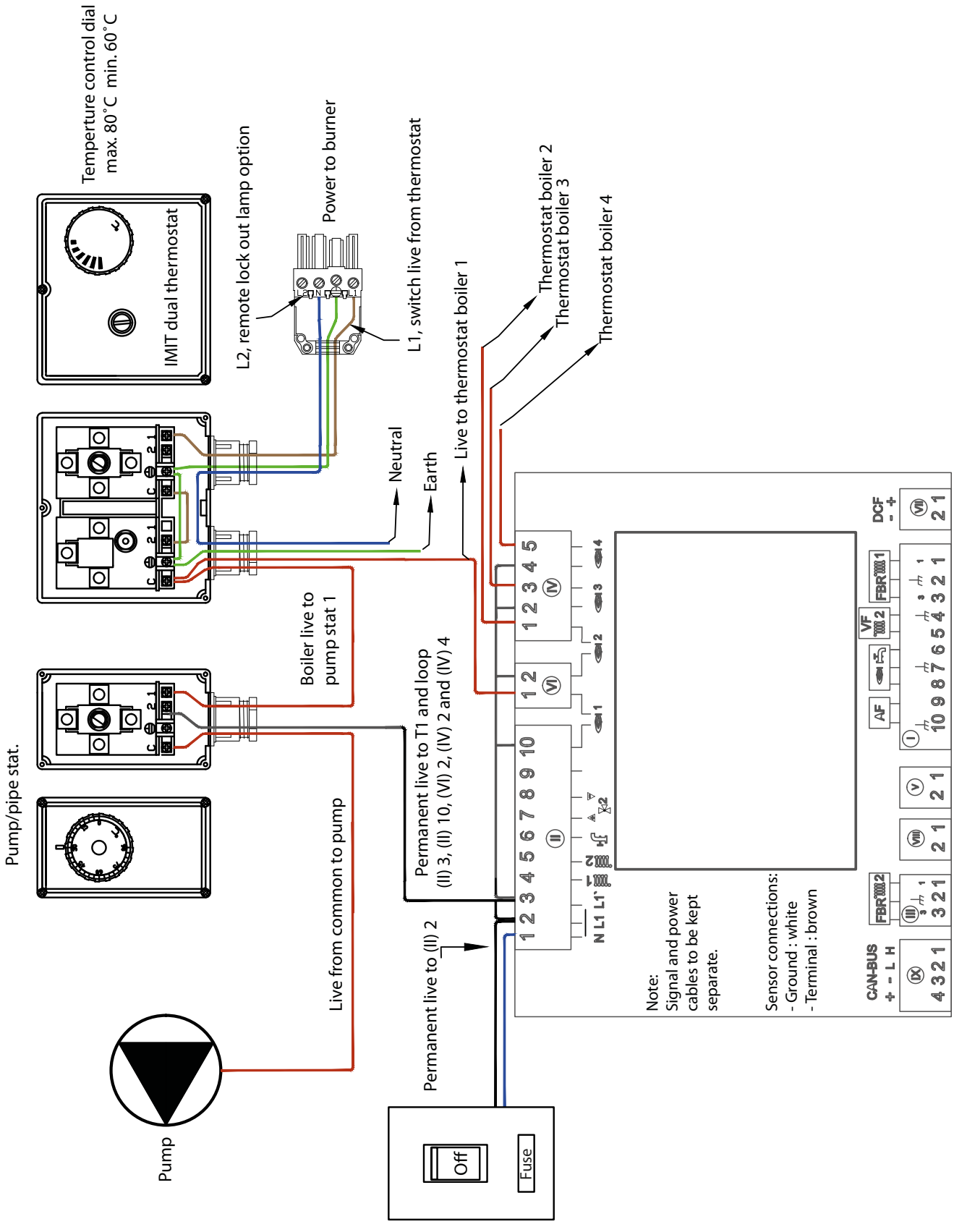

Neutral (II) 1
Permanent live to loop (II) 2, (II) 3, (II) 10, (VI) 2, (IV) 2 and (IV) 4
Live to thermostat boiler 1
Thermostat boiler 2
Thermostat boiler 3
Thermostat boiler 4
Relay application for zoned heating
Weather compensation sensor enclosure
LLH tank sensor
DHW cylinder sensor
Note:
Signal and power cables to be kept separate.
Sensor connections:
- Ground : white
- Terminal : brown
CAN-BUS
+ - L H
DCF
- +
AF
VF
FBR1
FBR2
N L1 L1'

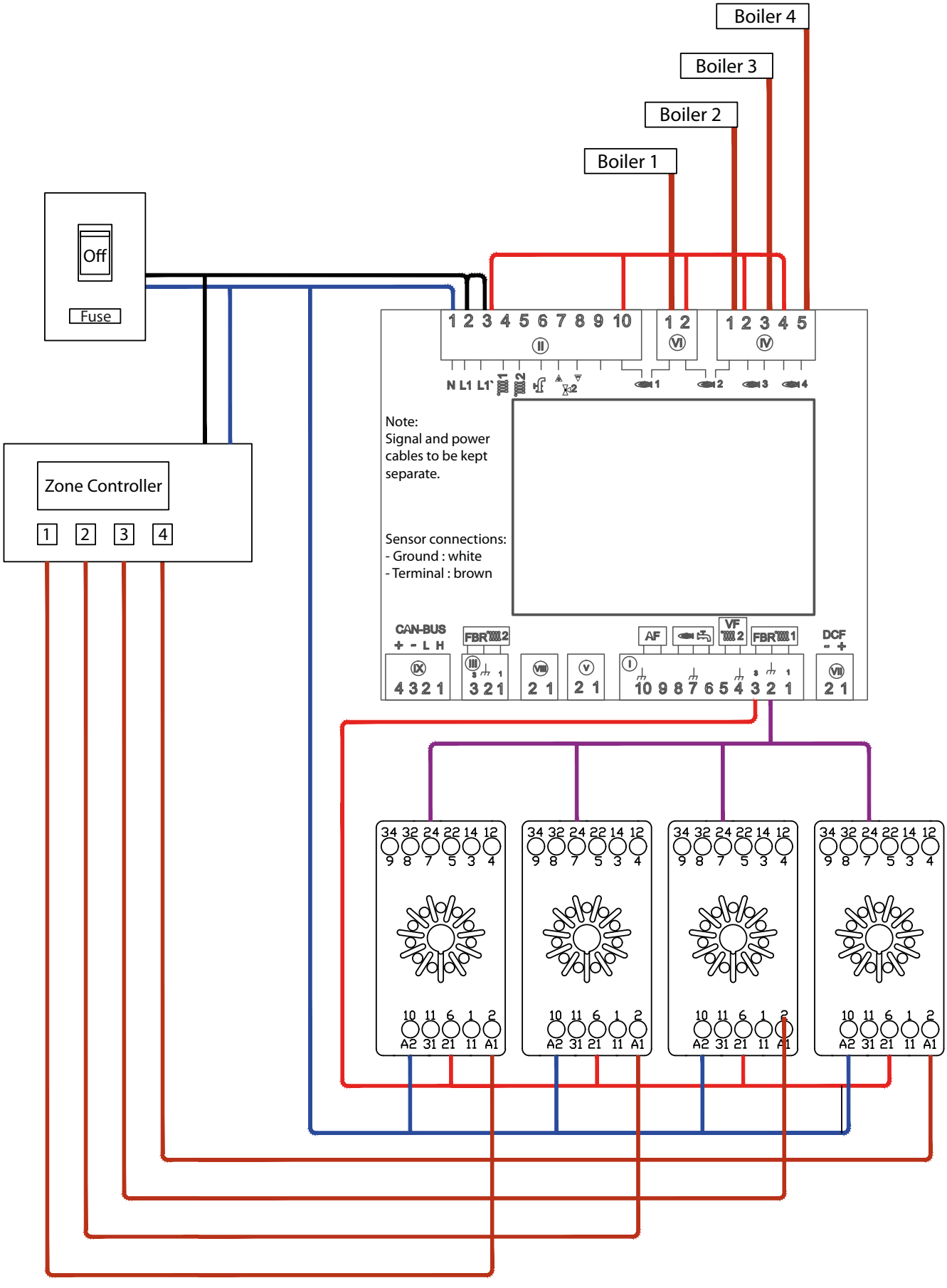
6 6.2 WIRING - BOILER WITH ELECTRONIC CONTROLLER



6 6.3 WIRING - POPULAR BOILER WITH DUAL STAT.



6 6.4 WIRING - EXTERNAL SWITCHING OF CONTROLLER



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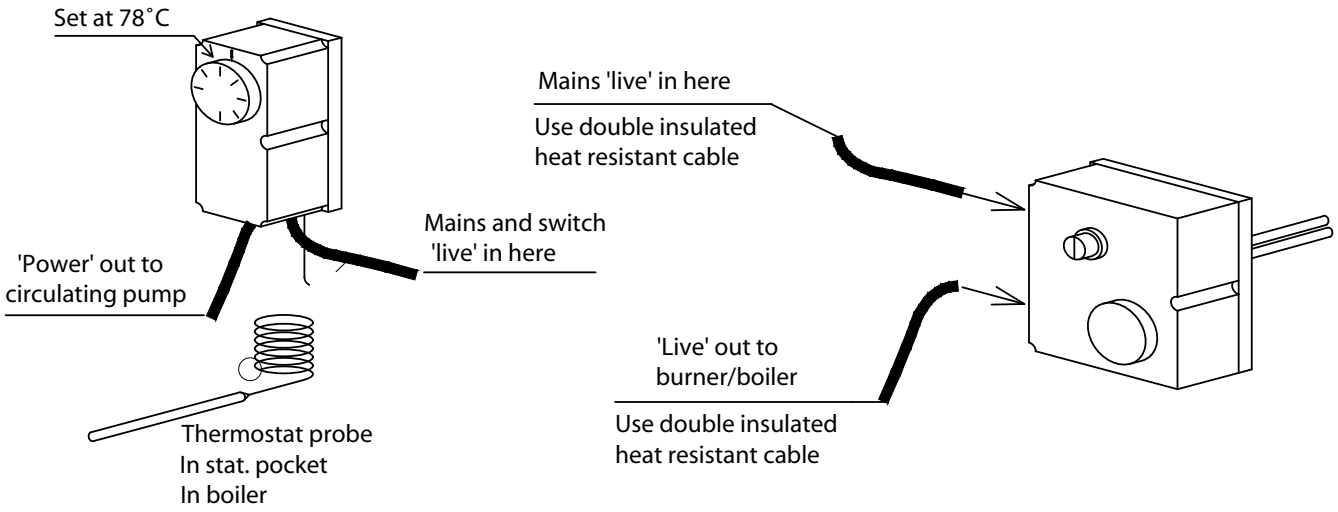
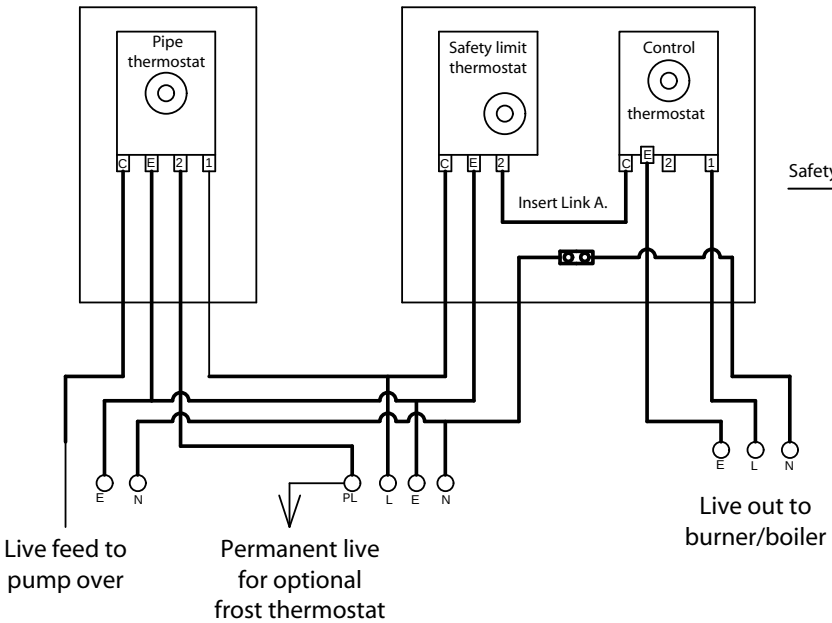
INSTALLING A PUMP OVERRUN STAT. WITH A FIREBIRD POPULAR BOILER



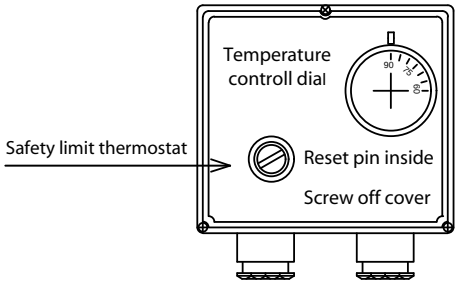
IMPORTANT

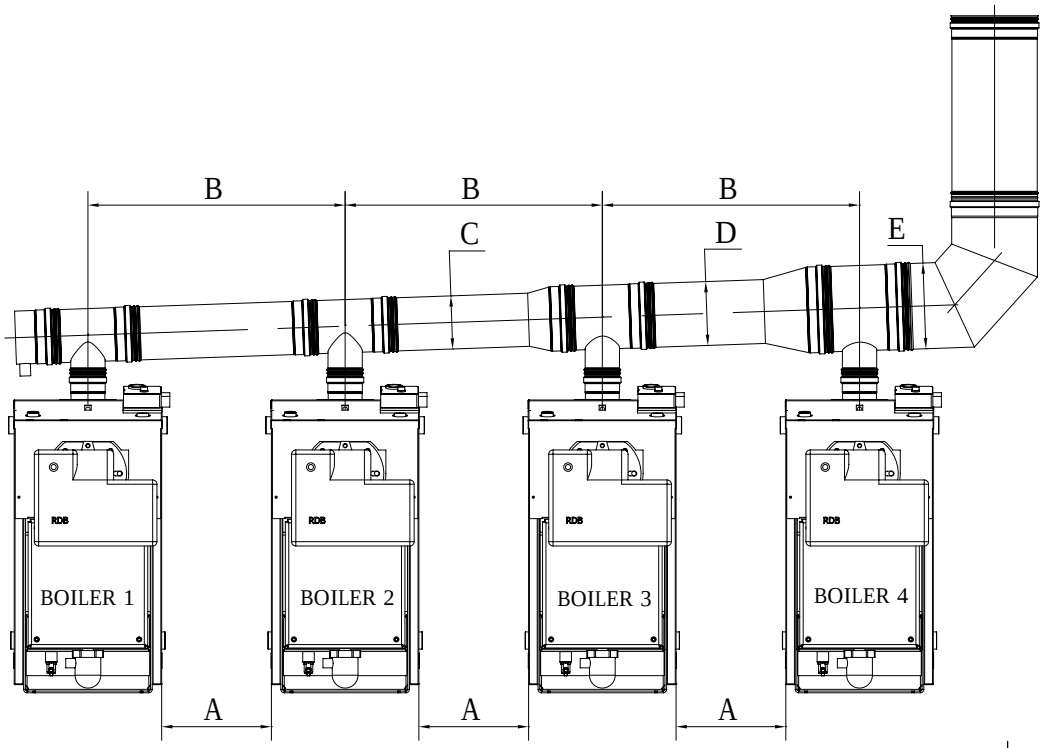
When connecting the mains supply to this unit ensure that:
1. Double insulated heat resistant cable is used (core cable).
2. No single insulated cable is exposed at connection points on the thermostat, burner, plug and socket.
3. Rubber grommets are replaced on control box base of the burner after completing wiring.
4. All relevant lids and covers are properly replaced and secured correctly.

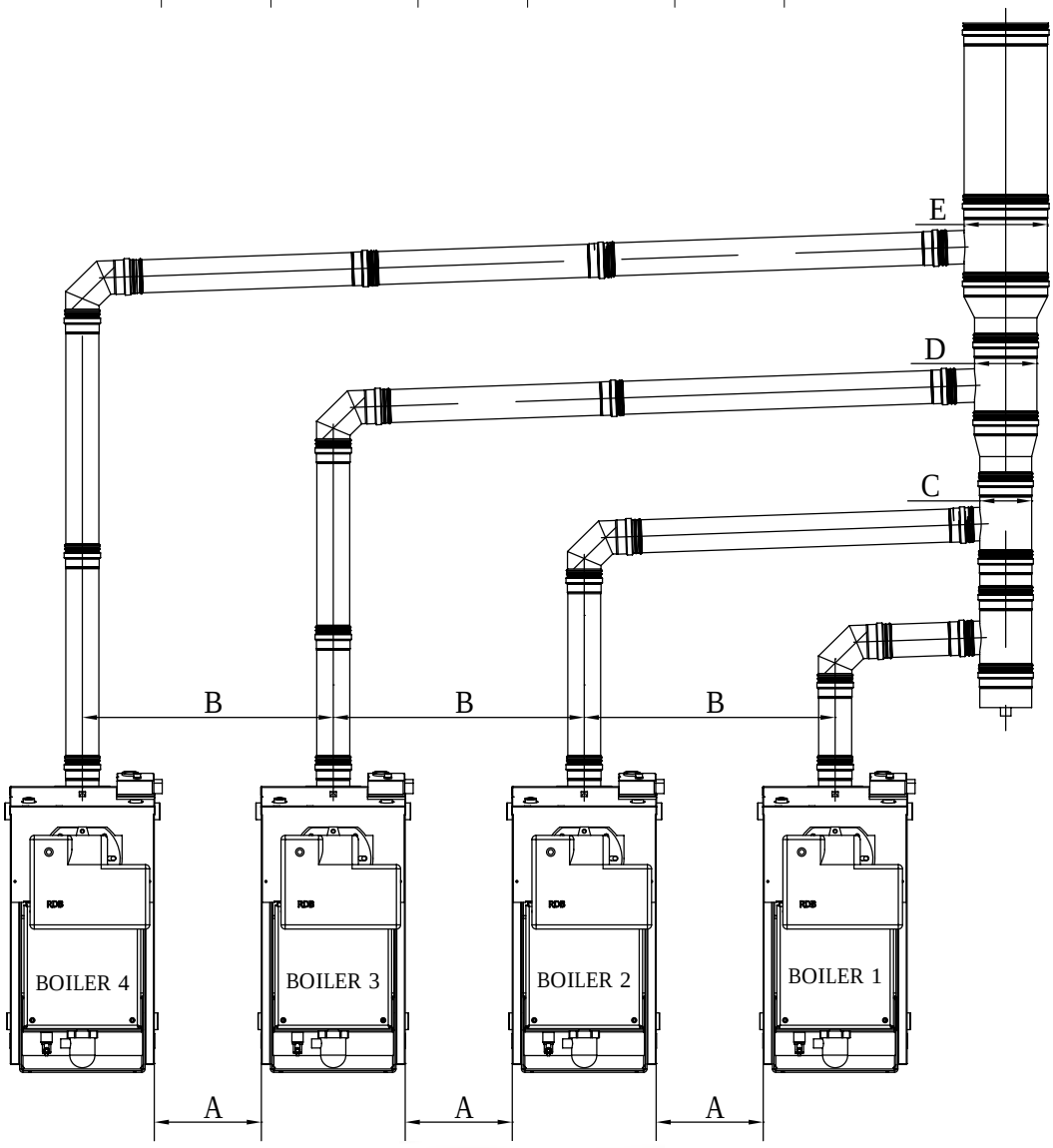
OVER HEAT THERMOSTAT



IMIT DUAL THERMOSTAT




B
B
B
C
D
E
BOILER 1
BOILER 2
BOILER 3
BOILER 4
A
A
A


E
D
C
B
B
B
BOILER 4
BOILER 3
BOILER 2
BOILER 1
A
A
A

7 FLUE OPTIONS

Boilers kW	H	W	D	Flue dia. for Each Boiler	A Min. Space Between Boilers	B Space + Flue Center to Center	C Main Header Size for 2 Boilers	D Main Header Size for 3 Boilers	E Main Header Size for 4 Boilers
100	1052	625	745	150	150	775	250	300	300
73	873	530	525	125	150	680	250	250	250
58	815	470	531	100	150	620	150	200	200
44	815	470	531	100	150	620	150	200	200
35	684	441	381	80	150	591	125	150	200
26	684	441	381	80	150	591	125	150	200
20	684	441	381	80	150	591	125	150	200
18	684	344	381	80	150	494	125	150	200
12	684	344	381	80	150	494	125	150	200

All dimensions are in mm.

Sales Codes	Description
PDK080RTA	PDK 80mm into 125mm Reducing Tee
PDK080RTB	PDK 80mm into 150mm Reducing Tee
PDK080RTC	PDK 80mm into 150mm Reducing Tee
PDK100RTA	PDK 100mm into 150mm Reducing Tee
PDK100RTB	PDK 100mm into 200mm Reducing Tee
PDK125RTA	PDK 125mm into 250mm Reducing Tee
PDK150RTA	PDK 150mm into 250mm Reducing Tee
PDK150RTB	PDK 150mm into 300mm Reducing Tee

For all other flue parts or boiler product codes, please refer to our Boiler Handbook or visit www.firebird.uk.com.

8 TERMS AND CONDITIONS OF WARRANTY

This Firebird product is designed and manufactured to give many years of trouble-free service. We provide a comprehensive warranty of 5 years on the Low Loss Header.

The warranty will only apply if the appliance is installed by a competent, qualified person and is checked annually thereafter.

The following terms, laid out in the warranty must be adhered to:

(a) All claims under the warranty programme must be received within 5 years from the date of installation.

(b) Installation of the Low Loss Header must be in accordance with this manual and all relevant standards and codes of practice.

(c) Firebird will not accept any liability in respect of any defect arising from incorrect installation, negligence, fair wear and tear, misuse, alteration or repair by unqualified persons.

(d) The warranty programme extends to reasonable labour costs except under clause (a) where any valid claim made after 3 years will not include labour costs.

(e) Firebird's prior authorisation must be obtained before examination or repair of the appliance takes place.

(f) Firebird will examine all claims made under the warranty programme and for any claims deemed invalid, costs incurred will be borne by the owner.

(g) In the case of a warranty claim, the Low Loss Header must be returned to Firebird.

(h) Any defective part removed under any or all of the warranty programmes must be returned to Firebird.

This system is designed to be used in a pressurised system.

Note: all regulations with respect to pressurised heating systems must be adhered to.

THE STATUTORY RIGHTS OF THE CUSTOMER ARE NOT AFFECTED BY THIS WARRANTY.

8 TERMS AND CONDITIONS OF WARRANTY

Please complete the following details to register your Firebird Low Loss Header Warranty/Commissioning Card.

CUSTOMER

Name: .....

Address: .....

.....

.....

Tel: .....

INSTALLER

Name: .....

Address: .....

.....

.....

Tel: .....

LOW LOSS HEADER

- ☐ Serial Number: .....
- ☐ Combined boiler output to system ..... kW.
- ☐ Total number of boilers connected to the LLH .....
- ☐ System is installed in accordance with manual guidelines.
- ☐ System is installed in accordance with building regulations.

Commissioning and Handover Details

- ☐ System brought up to temperature by undersigned, operating safely and transferring heat.
- ☐ Manuals handed to householder.

Installer Signature: .....

Date: .....

CUT ALONG DOTTED LINE

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