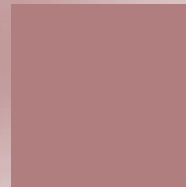
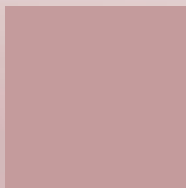
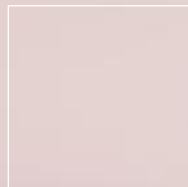


# Strata 3



Gas fired, ultra high efficiency, low NO<sub>x</sub>,  
condensing, fully modulating  
outputs from 41.1kW to 330kW



# Efficient controllable power



**T**he Strata 3 Boilers comprises of a range of gas-fired condensing, high efficiency, Low NOx boilers, specially designed for today's commercial needs, of high output, with clean emissions, all from a compact unit. This brochure relates to units that can return outputs up to 220 kW to 330 kW per unit.

Sensibly engineered to allow for quick and easy maintenance without the need for specialist tools, small foot print for greater siting flexibility, and including a wealth of standard operating features to provide optimum efficiency, and thus returns low running costs.

The boilers utilises a highly efficient pre-mix burner that is fully variable from 20% to 100%, which combined with precise Gas to Air mixing results in ultra clean emissions in the range of

< 40 mg/kWh NOx (28 ppm DAF)

< 20 mg/kWh CO (15 ppm DAF)

This combined with direct-on-boiler weather compensation allows efficiencies in the range of 109.7% nett to be returned.

The boilers can be installed in conjunction with a variety of matched intelligent controls for either an individual appliance, or a number of appliances, to optimize fuel consumption and therefore energy conservation.

## Standard features

### Compact Dimensions

The Strata 3 boilers covered in this brochure offer compact dimensions of 1755mm Long, 628mm Wide, with Heights from 1430mm to 1700mm High. Weighing from 277kg up to 315kg, the Strata 3 boilers provide high output from minimal dimensions without compromising serviceability.

### Fully Modulating with Low Harmful Emissions

The heat output is fully variable between 20% and 100%, this ensures that the boiler automatically matches the system loads, and minimizes On/Off cycling, and allows efficiencies in the range of 109.7% nett to be returned.

With the use of a 100% Pre-mixed combustion process, the flue emissions are kept low at only:

< 40mg/kWh NOx (28 ppm DAF)

< 20mg/kWh CO (15ppm DAF)

**Building Regulations 'Part L' compliant (Part J Scotland)**

**0.061kgC/kWh @ 100%**

**0.055kgC/kWh @ 30%**

### Comprehensive Control Panel

Each Strata 3 boiler is supplied with a comprehensive microprocessor control panel with user friendly controls, which manage the entire safety functions of the appliance, simple menu driven programming via a large LCD display, ECO operation selection function, frost and summer standstill protection, pump over-run and more.

The control panel can also be connected to a notepad computer via a dedicated RS232 communication port for connection, this allows access to fault history and full operating data logging.

### Direct-on-Boiler Weather Compensation

As part of the standard control panel, the boiler can operate to give automatic weather variable flow temperature depending on the outside air temperature.

This enables greater efficiency, and reduced running costs, as the boiler automatically matches the desired load of the building without the need for additional mixing valves.

### Optional Matched Controls for Optimum Efficiency

A versatile range of matched controls are available to work in conjunction with the boiler, and are available to provide Room Temperature Control, External System Pump Control, Underfloor Mixing Valve Control, etc.

### Room Sealed Flue

The Strata 3 boilers are supplied as standard to accept a ducted air supply, this allows the boiler to be completely room sealed, taking air for combustion directly from outside of the boiler. The boiler room will still require ventilation for cooling purposes.

### Heat Exchanger

The Strata 3 boilers utilize the scientifically tested 'Spiranox' heat exchangers fabricated from corrosion resistant 316L stainless steel.

### Warranty

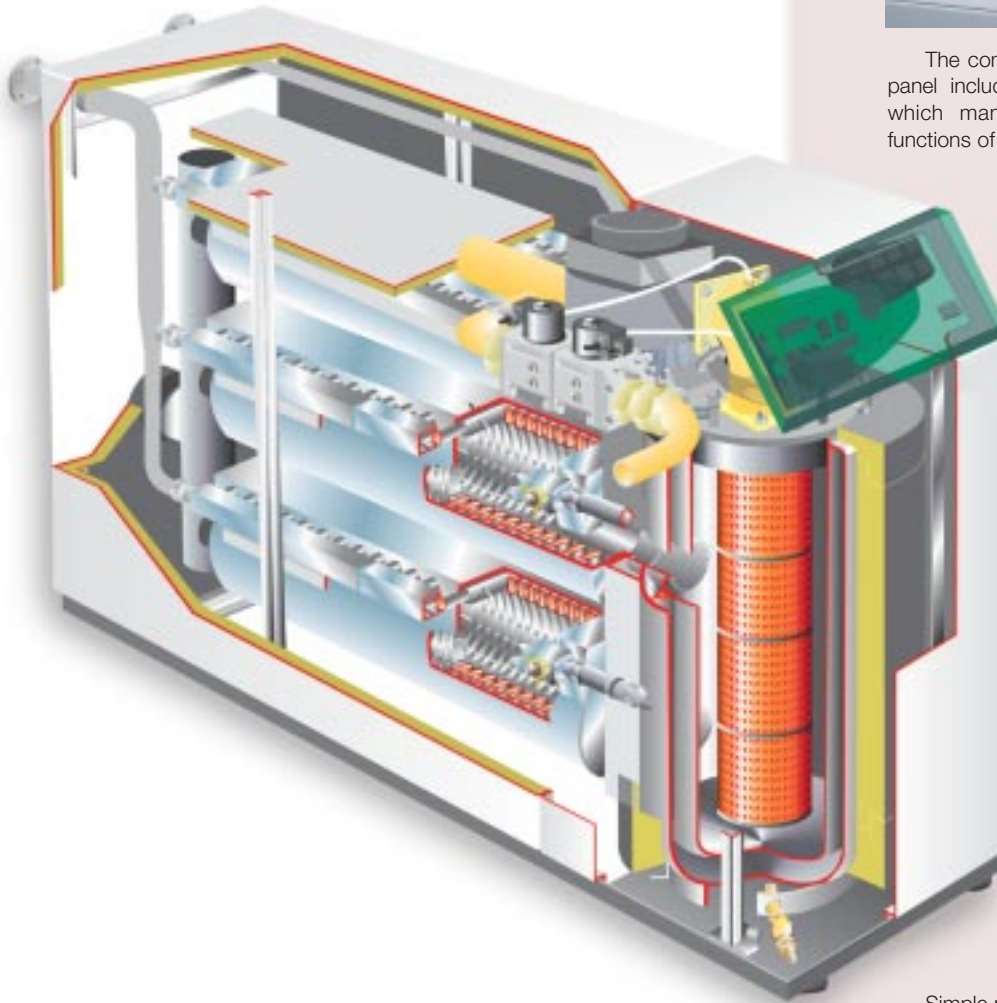
The stainless steel heat exchanger carries a 5 year guarantee, all other components carry a 12 month guarantee.

All guarantees are against manufacturing or material defects only.

# Ease of control



The comprehensive boiler control panel includes user-friendly controls which manages the entire safety functions of the appliance.



To aide the system designer, MHS can provide optional system controllers for the function of controlling the Heating System Pump (PR01), and/or control of an Underfloor Heating Pump and Mixing Valve (MR03).

These controllers, when matched with the intelligence of the boiler control panel allow for complete system control, and space frost protection, night setback, and optimum stop/start (with the use of the RE2132 Room Unit) without the need for specialist controls.

Simple menu driven programming via a large LCD display. With a choice of comprehensive matched controls that can offer, multiple boiler cascade (KKM2), room temperature controller (RE2132), 0-3volt or 0-10 volt(via Adapter) BMS variable temperature control, to mention a few.

## Dimensions & clearances

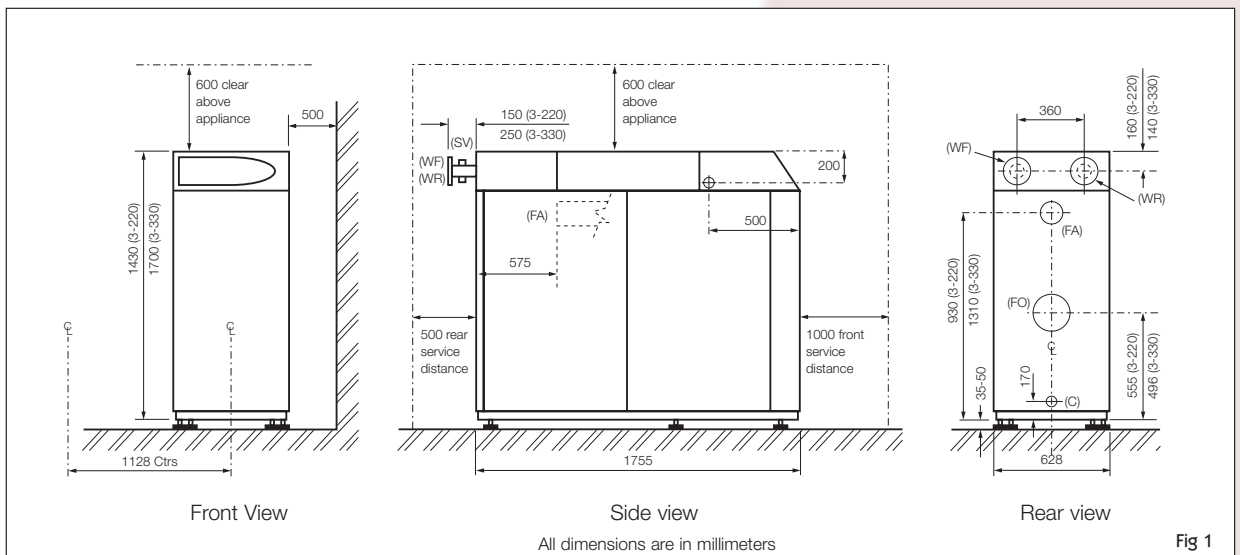


Fig 1

## Technical data

Boiler Model		220	330	
Water details	Nominal Heat Output to Water Max (50F/30R°C)	kW	220.5	331.8
	Nominal Heat Output to Water Min(50F/30R°C)	kW	44.1	66.1
	Nominal Heat Output to Water Max (80F/60R°C)	kW	200.0	300.0
	Nominal Heat Output to Water Min(80F/60R°C)	kW	40.0	60.0
	Nominal Heat Input	Max kW	210.0	316.0
	(Nett)	Min kW	42.0	63.0
	Max Flow Temperature	°C	95	95
	Water Content	ltrs	72	78
	Max Water Pressure (Hot)	bar	3.0	3.0
	Min Water Pressure (Cold)	bar	1.0	1.0
Gas details	Max Gas Consumption (G20)	m³/hr	18.87	28.31
	Max Gas Consumption (G31)	kg/hr	15.54	23.31
	Gas Inlet Press	Min / Max mbar	20 / 50	20 / 50
	Approx Flue Gas Volume (G20) (Primary Flue) @ 80°C Flow.	m³/hr	254.59	381.96
	Approx Flue Gas Volume (G30) (Primary Flue) @ 80°C Flow.	m³/hr	210.18	315.34
	Approx Flue Gas Temperature (Primary Flue) @ 80°C Flow.	°C	90	90
Connections	Water Flow (WF) Connection	PN6	DN40	DN50
	Water Return (WR) Connection	PN6	DN40	DN50
	Gas (G) Connection	BSP M	1"	1½"
	Flue Outlet (FO) Connection **	mm	150 Ø	200Ø
	Air Inlet (AI) Connection ***	mm	100 Ø	150Ø
	Safety Valve (SV) Connection.	BSP M	1"	1½"
	Condensate (C) Connection *	Plastic	DN40	DN40
	Nominal Weight (Dry)	kg	277	315
Electrical Supply (240V 50Hz)	Amps	5	5	

### Note

- \* The condensate pipework MUST be installed in Plastic or Stainless Steel pipework suitable for the acidic nature of condensate.
- \*\* Flue Outlet Connection, female socket with FO Ø + 10mm ID.
- \*\*\* Air Inlet Connection, male spigot with AI Ø + 10mm OD.

## Hydraulic system design

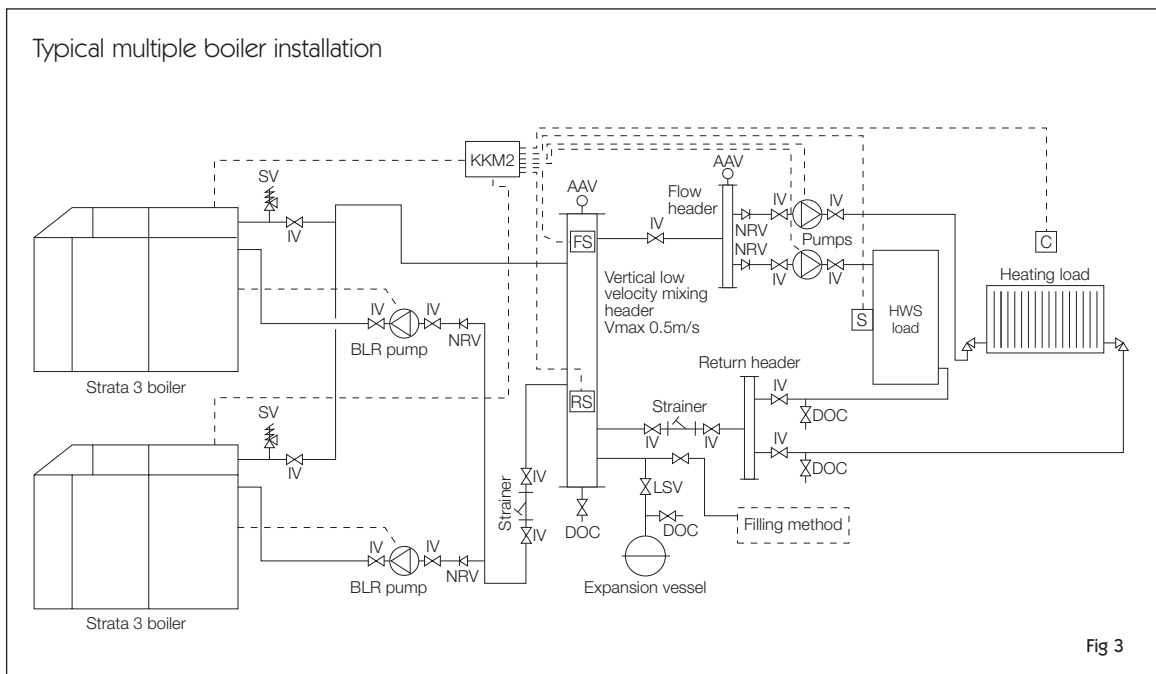
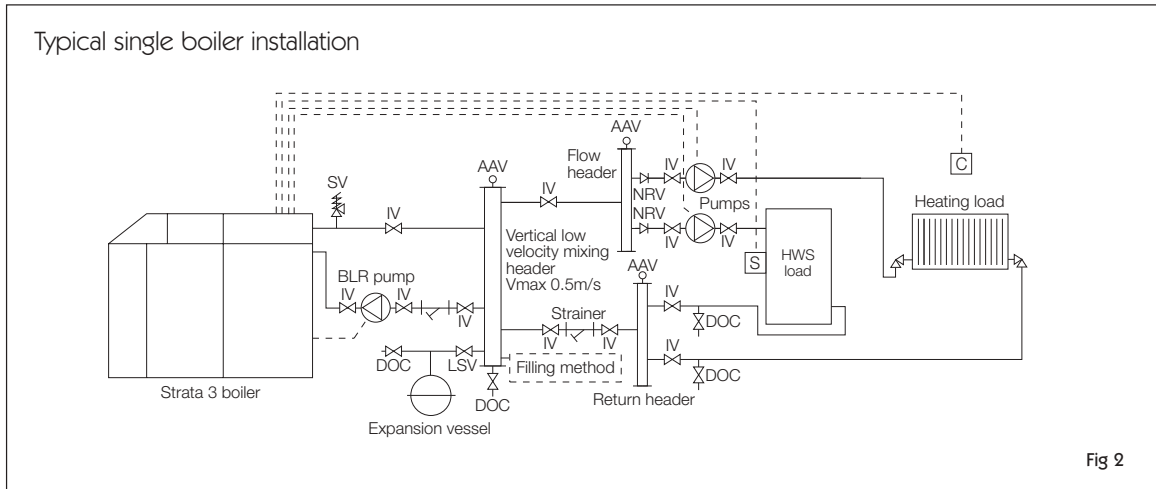
The Strata 3 range of boilers are fully condensing boilers and are designed to operate with a system  $\Delta T$  of 20°C. It is imperative that all circuits, both heating and hot water are designed for a 20°C  $\Delta T$ , otherwise problems may be experienced, a reduced  $\Delta T$  will result in a reduction of the outputs quoted. The heating system must be sealed and pressurized, the Strata 3 range of boilers MUST NOT be used on Open Vented systems. The expansion capacity of the system should be designed not to exceed a Final Working Pressure of 2.3 bar. The heating system water MUST be treated in accordance with BS 7593 – 1992, Code of Practice for treatment of water in hot water central heating systems.

The Strata 3 range of boilers can operate a dedicated boiler pump directly from it's control panel, this enables correct pump over-run to minimise over temperature situations due to residual heat. The pump electrical load (240V 50Hz) must not exceed 480 watts (2 Amps).

Boiler Model		220	330
Mass Flow Rate (80°C Flow / 60°C Return)	kg/s	2.38	3.57
Boiler Resistance (80°C Flow / 60°C Return)	KPa	65.0	62.5
Mass Flow Rate (50°C Flow / 30°C Return)	kg/s	2.62	3.95
Boiler Resistance (50°C Flow / 30°C Return)	KPa	82.5	74.0

For optimum efficiency a variable speed pump should be used, and both the 80/60°C and 50/30°C flow rates and resistances should be referenced. If however a fixed head pump is being used we would recommend that the 50/30°C flow rates and resistances should be referenced.

# Typical pipework schematics



## Low loss header sizing guide

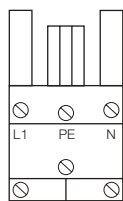
The table below is for reference purposes only. Vertical low loss headers must be sized on water flow velocity not exceeding 0.5 m/s. The tube diameters detailed below refer to steel pipe and are calculated using data from CIBSE guide C4.

Output (kW) 50°C Flow / 30°C Return	Number of Boilers	Diameter based upon 20°C ΔT
220.5	1 x Strata 3 - 220	100mm Ø
331.8	1 x Strata 3 - 330	125mm Ø
441.0	2 x Strata 3 - 220	125mm Ø
661.5	3 x Strata 3 - 220	150mm Ø
663.6	2 x Strata 3 - 330	150mm Ø
882.0	4 x Strata 3 - 220	175mm Ø
995.4	3 x Strata 3 - 330	175mm Ø
1102.5	5 x Strata 3 - 220	200mm Ø
1372.5	4 x Strata 3 - 330	200mm Ø
1659.0	5 x Strata 3 - 330	225mm Ø

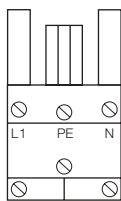
# Electrical connections

The electrical connections are located at the rear of the boiler's control panel. Care must be taken when routing the cables from the rear of the boiler to ensure that the cable are not fixed to the boiler casing, and cannot be damaged by the fitting and removal of the casing panels.

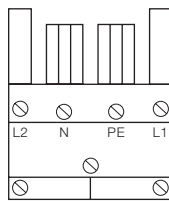
## Weiland plug and sockets



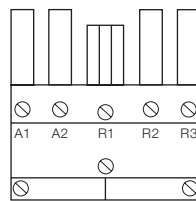
Permanent Power Supply via Low Pressure Switch  
**240V 50Hz**



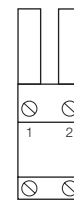
External Gas Safety Shut-Off Valve Output - LPG  
**240V 50Hz**



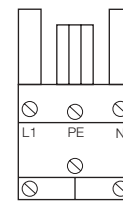
Room Thermostat Volt Free Switch Enable (L1, L2)  
PR01 (L1, N, PE)  
MR03 (L1, N, PE)  
**240V 50Hz**



Outside Air Sensor (A1 & A2)  
RE2132 (R1, R2 & R3)  
KKM2 (R2 & R3)  
0-10V via Adapter (R2 & R3)  
0-3V (R2 & R3)  
**Low Voltage**



HWS Sensor or Volt Free Cylinder Thermostat  
**Low Voltage**



HWS Primary Pump or Divertor Valve Output  
**240V 50Hz**

**Note.** All Low Voltage cables **MUST** be screened and earthed.

Fig 4

## Flue system design

The Strata 3 range of boilers should be installed with individual flues. Where this is not achievable it is possible to connect multiple boilers into a common flue system. However, particular care must be taken and the separate flues from each boiler **MUST** only connect to the common flue in the vertical and **NOT THE HORIZONTAL**. See Fig 5

Due to the positive outlet pressure of 200 Pa, available from the Pre-mixed combustion process, this pressure can be utilized to help overcome the resistance of the flue, thereby allowing the use of smaller flue components when compared to atmospheric boilers of similar outputs.

The components used within the flue system must be of a grade suitable for the acidic nature of the flue gases from condensing boilers, and for the positive pressures generated by the combustion fan, up to the maximum pressure of 200 Pa.

The flue system should be installed in such a manner that enables local means for disconnection at the appliance and the entire flue system must be self-supporting. Any horizontal sections of flue must have at least a 3° fall towards the boiler to allow for any condensate that may form within the flue system to drain through the boiler. Where possible, the flue should terminate above roof level, where this is not possible guidance should be taken from the Clean Air Act Memorandum on Chimney Heights.

If the boiler is to be connected as Room Sealed, an air duct fabricated from a suitable material must be routed to take air for combustion directly from outside of the building. The combined resistance of the Air Duct and Flue System must not exceed 200 Pa.

Under all circumstances the boiler room shall be ventilated in accordance with either BS 6644:1991, IGE/UP10 as applicable for combustion and cooling, or cooling purposes only, depending on the type of flue installation used.

### Multiple flue application conventionally flued

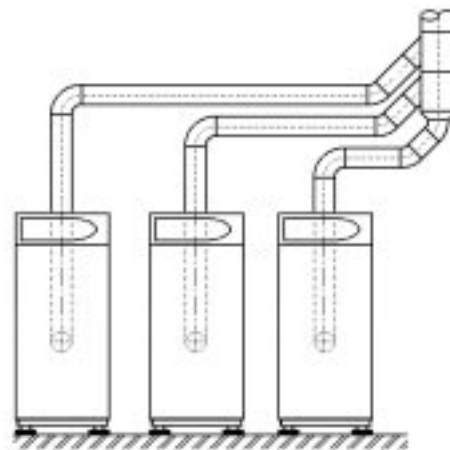


Fig 5

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