

IMMERGAS ZEUS MINI

Instruction Booklet

**Wall Mounted, Room Sealed, Gas Fired
Combination Boiler with Unvented Hot Water
Storage**



Read these instructions completely before using or installing the Immergas Zeus Mini gas boiler

LEAVE THESE INSTRUCTIONS WITH THE USER



For Technical assistance, spare parts or for Service call:

RVR Limited, Kenmare, Co. Kerry Tel: 064 41344, Fax: 064 89520

Doc. Ref.: ALT104/181207

Introduction

The Immergas Zeus Mini boiler is a wall mounted, fan assisted room-sealed combination boiler, incorporating a 45 litre unvented hot water storage cylinder. Heat output is controlled by a modulating gas valve, with fully automatic direct burner ignition.

The boiler, providing both central heating and domestic hot water supply, is designed for use with a fully pumped, sealed and pressurised heating system using **Natural Gas or LPG**.

The boiler is supplied with a pump, diverter valve, pressure relief valve, expansion vessel and pressure gauge fully assembled and tested.

As supplied, the boiler will automatically modulate to provide central heating outputs between 9.3 and 23.3kW. The maximum output available for domestic hot water is 23.3 kW and provides hot water at temperatures of up to 55°C and flow rates of up to 18 litres/min.

IMPORTANT

All gas appliances must be installed by a competent and qualified person, in accordance with relevant clauses of applicable standards and recommendations. These include but may not be limited to the following:-

I.S. 813 Domestic Gas Installations

I.S. 820 Non-Domestic Gas Installations

All relevant Building Regulations.

Local Water Bye Laws

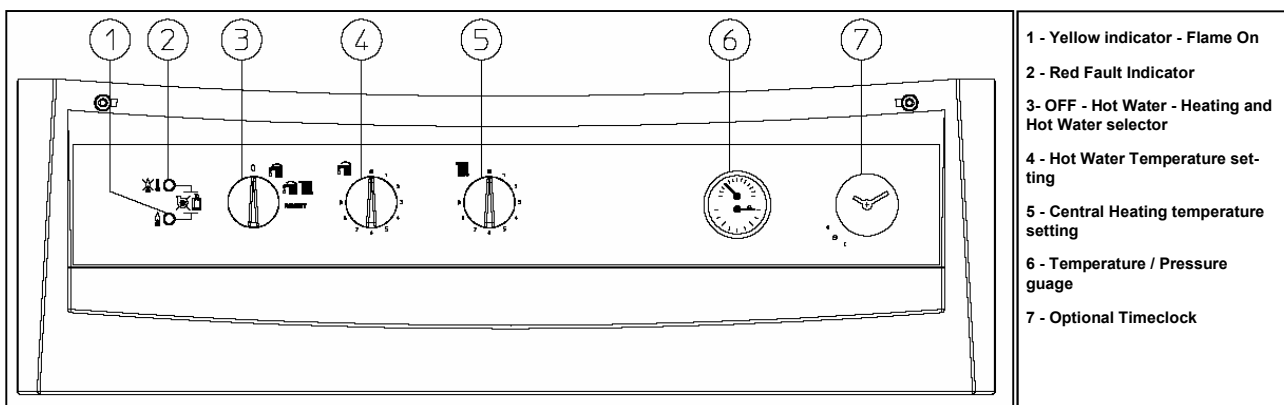
IEE Wiring Regulations

Health & Safety legislation

This appliance meets the requirements of IPX4D, ie degree of protection against moisture.

Failure to install this appliance correctly could lead to prosecution. It is in your own interest and that of safety to ensure that the law is complied with. Manufacturer's instructions must **NOT** be taken in anyway as over-riding statutory obligations.

Boiler Operating Instructions



Using the Boiler

Before lighting, make sure that the system is full of water and that the manometer (6) indicates a pressure of 1 - 1.2 bar.

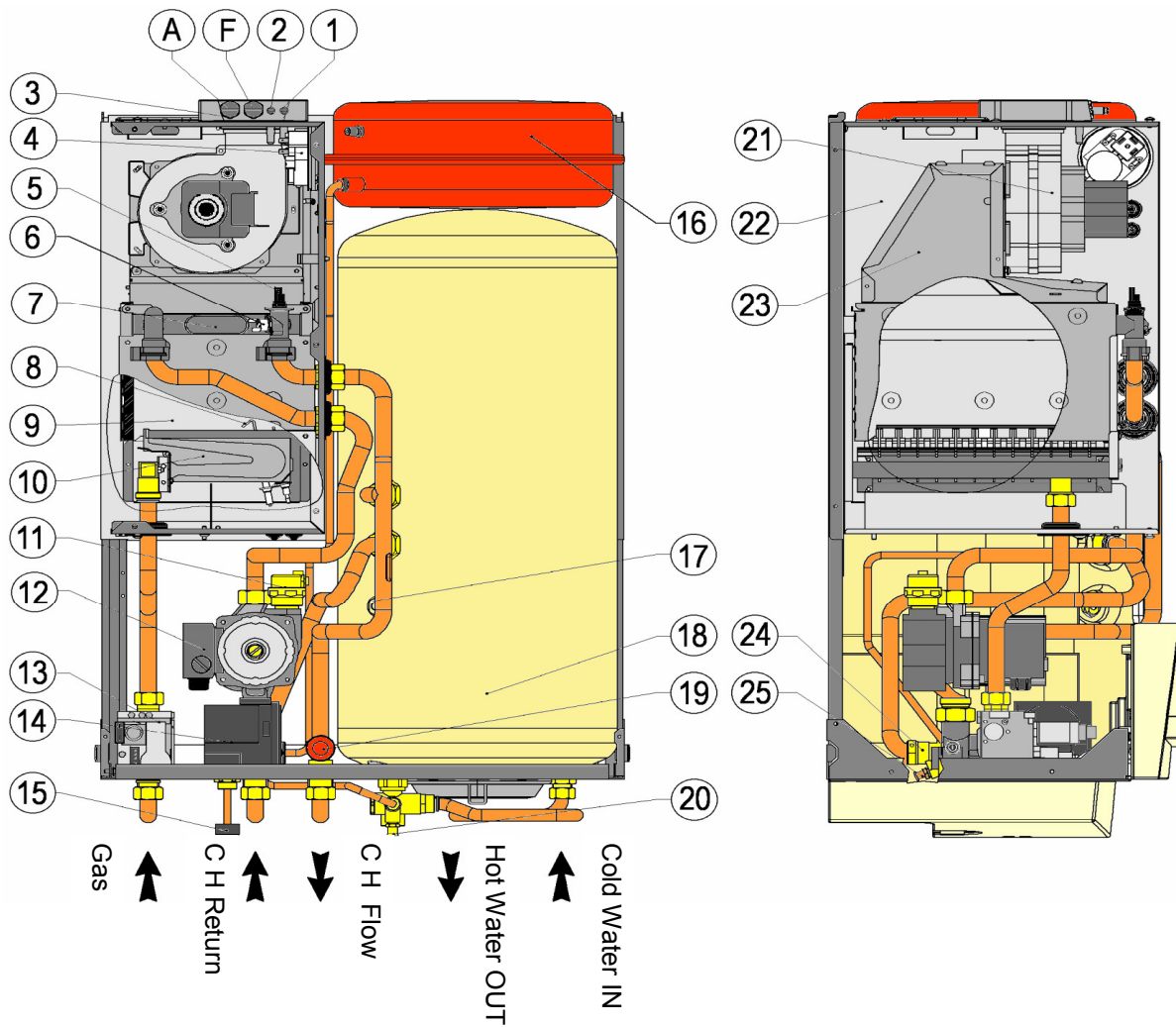
-Open the gas valve on the gas supply to the boiler.

-Turn main switch (3) to Hot Water or Hot Water/Heating.

N.B.: Once the main switch (3) is turned to one of these positions, the yellow boiler power indicator lamp (1) will start blinking at long intervals. With the switch set to (🏠) the central Heating temperature setting (5) is not active, and the domestic water temperature is controlled by selector (4). With the switch set to (🏠) (3) the central heating temperature is set using selector (5) while selector (4) is used for the domestic hot water. Turn the selectors clockwise to raise the temperature, anticlockwise to lower it. Boiler operation is now automatic.

PERFORMANCE:				
Nominal Heat Input	<i>kw</i>	25.6		
Min. Heat Input	<i>kw</i>	11.0		
Nominal Heat Output (useful)	<i>kw</i>	23.3		
Min. Heat Output	<i>Kw</i>	9.3		
GAS:				
Nozzle diam.	<i>mm</i>	<u>G20</u>	<u>G30</u>	<u>G31</u>
Supply Pressure	<i>mbar</i>	20	29	37
HEATING SYSTEM:				
Burner Pressure (Nom Output)	<i>mbar</i>	11.1	28.3	36.6
Gas Rate	<i>m³/h/kg/h</i>	27	2.01	1.98
Max working pressure heating circuit	<i>bar</i>	3		
Max working temp heating circuit	<i>°C</i>	90		
Adjustable temp heating	<i>°C</i>	38-85		
Expansion Tank Total Volume	<i>L</i>	8		
Expansion Tank preload	<i>bar</i>	1		
Water contained in boiler	<i>L</i>	3.5		
Available head with flow rate 1000/l/h	<i>kPa (mH2O)</i>	23.5(2.4)		
DOMESTIC HOT WATER:				
Useful heat output hot water production	<i>kw</i>	23.3		
Adjustable temp domestic hot water	<i>°C</i>	20-55		
Flow limiter	<i>l/min</i>	8		
Min pressure for flow limiter capacity	<i>bar</i>	1		
Min pressure (dynamic) domestic pressure	<i>bar</i>	0.1		
Hot water storage capacity	<i>L</i>	45		
Continuous hot water flow rate@ ΔT =30oC	<i>l/min</i>	11.1		
Boiler weight filled	<i>kg</i>	105		
Boiler weight empty	<i>kg</i>	56		
ELECTRICAL:				
Electrical connection	<i>v/hz</i>	230/50		
Nominal Absorption	<i>A</i>	0.75		
Electrical power	<i>W</i>	135		
Power absorbed by circulating pump	<i>W</i>	67		
Power absorbed by fan	<i>W</i>	45		
Equipment electrical system production	-	IPX4D		
FLUE GASES:				
Flue gas production @ nom output	<i>kg/h</i>	<u>G20</u>	<u>G30</u>	<u>G31</u>
Flue gas production @ min output	<i>kg/h</i>	62	62	62
CO2 at Q Nom/Min	<i>%</i>	66	66	63
CO at 0% O2 at Q Nom/Min	<i>ppm</i>	5.9/2.3	6.8/2.6	6.7/2.7
NOx at 0% O2 at Q Nom/Min	<i>ppm</i>	52/93	77/107	53/91
Flue gas temperature at nominal output	<i>°C</i>	125/86	344/113	353/199
Flue gas at minimum output	<i>°C</i>	117	119	118
		94	93	97
DIMENSIONS & INSTALLATION DATA:				
Height	<i>mm</i>	890		
Width	<i>mm</i>	580		
Depth	<i>mm</i>	380		
Gas Connection		3/4"		
CH Connection		3/4"		
DHW Connection		1/2"		
Minimum clearances for servicing				
Top	<i>mm</i>	200		
Bottom	<i>mm</i>	150		
Side	<i>mm</i>	10		
Front	<i>mm</i>	600		

Main Boiler Components



- 1 – Negative pressure test point
- 2 – Positive pressure test point
- 3 – Test opening A=air F=flue
- 4 – Air pressure switch
- 5 –NTC thermistor
- 6 – Over heat safety device
- 7 – Primary heat exchanger
- 8 – Ignition - detection electrodes
- 9 – Combustion chamber
- 10 – Burner
- 11- Automatic air vent
- 12- Circulating pump
- 13- Gas valve

- 14- Motorized 3 way valve
- 15- Filling valve
- 16- Expansion vessel
- 17- D.H.W. NTC thermistor
- 18-AISI 316 l Stainless steel storage tank
- 19- 8 BAR SAFETY VALVE.
- 20- Tank draining valve
- 21- Fan
- 22- Sealed chamber
- 23- Flue hood
- 24- 3 bar safety valve
- 25- Draining valve

General Installation Information

Gas Supply

The meter and supply pipes must be sized to deliver the gas rate and pressure given on page 3. The boiler requires at least a 22 mm (3/4") gas supply pipe.

The complete installation, including the meter, must be tested for gas soundness and purged as described in IS 813:2002.

Electrical Installation

The boiler requires a 220/240 V ~ 50 Hz mains supply, fused at 3 A. Polarity of the supply must not be reversed or the boiler will not function properly. The boiler will not function properly and may be damaged when connected to a generator which does produce a true sine wave type output.

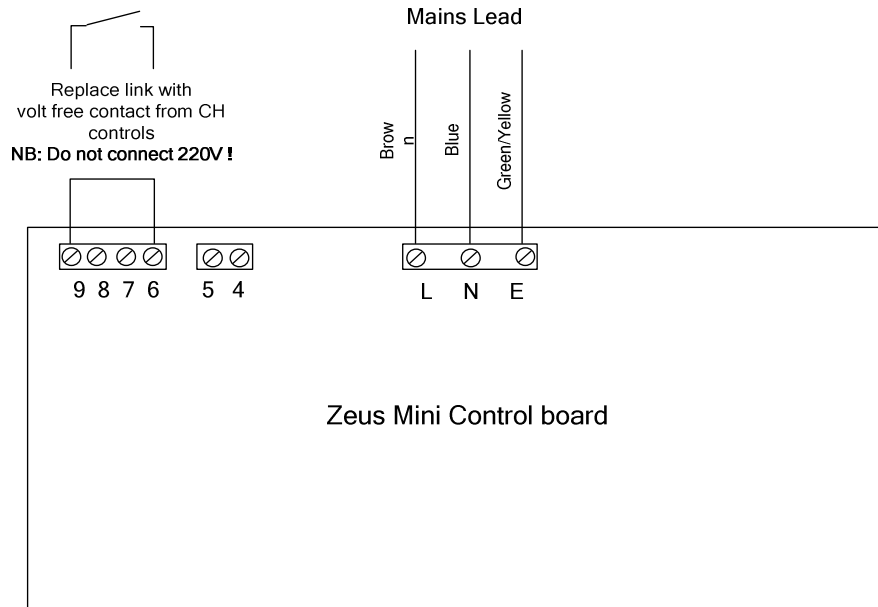
The boiler must be earthed.

There must only be one common isolator, providing complete electrical isolation, for the boiler and any external controls.

Using PVC insulated cable not less than 0.75 mm² (24 x 0.2 mm) to BS 6500 Table 16, the boiler should be connected to a fused three pin plug and unswitched shuttered socket outlet (both complying with BS 1363), or a fused double pole switch with a contact separation of at least 3 mm in both poles.

Wiring external to the boiler must be in accordance with the current IEE Wiring Regulations.

Note: External controls connected to the boiler must be of the volt free type and are connected to terminals 6 and 9 as shown above. Connection of a voltage to any boiler terminals other than the mains lead will result in destruction of the boiler control panel.

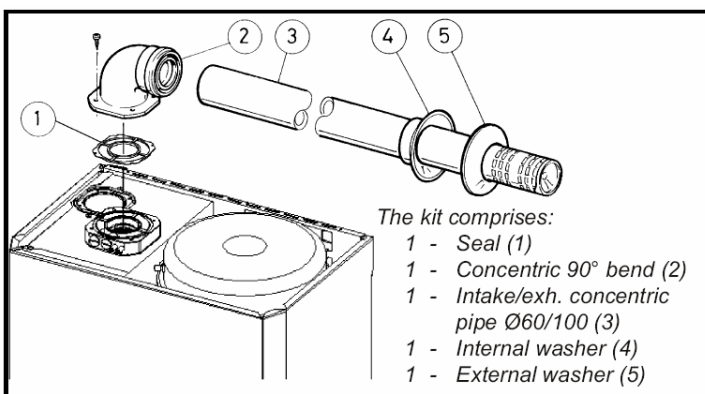


Clearances and Air Supply

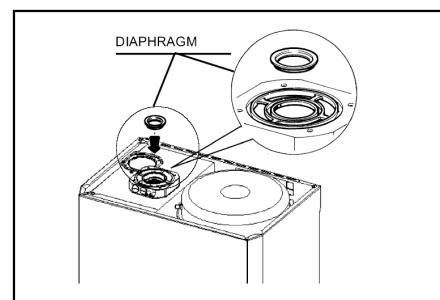
The boiler does not require any air vents for cooling in the room in which it is installed or when installed in a cupboard or compartment. The minimum clearances for servicing must always be maintained. Please see table on page 3.

Note: A cupboard or compartment used to enclose the boiler must be designed and constructed specifically for the purpose.

Flue System: When the boiler is installed on an external wall, the standard horizontal concentric 60/100 flue kit will be used to flue the boiler. This is shown below.



Note: a flue diaphragm is supplied with the boiler and must be fitted when the standard flue kit is used. It is not used when longer flue runs are required.



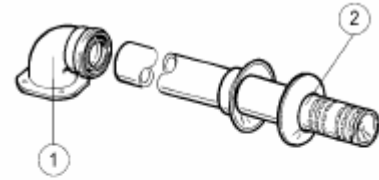
Extended Flue Systems

It is often necessary to install a longer flue system to cater for site conditions. There are several different flue system sizes available for the Zeus Mini boiler.

Horizontal concentric kit 60 /100

The exhaust pipe (\varnothing 60 mm) is fitted inside the air intake pipe (\varnothing 100 mm). Connection to the boiler is made using a 90° bend (1) which can be turned in any direction and can be connected to the terminal (2).

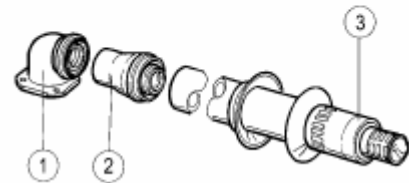
Max possible overall length after the first bend (1) is 3 straight and horizontal metres.



Horizontal concentric kit 80 /125

The exhaust pipe (\varnothing 80 mm) is fitted inside the air intake pipe (\varnothing 125 mm). Connection to the boiler is made using a 90° bend diameter 60/100 (1) which can be turned in any direction and connected using the adapter 60/100-80/125 (2) to the 80/125 terminal (3).

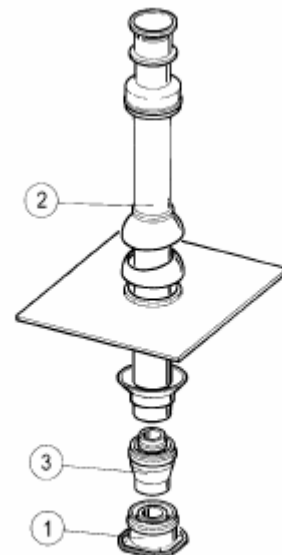
Max possible overall length beyond the first bend (1) is 7.3 straight and horizontal metres.



Vertical concentric kit 60 /100

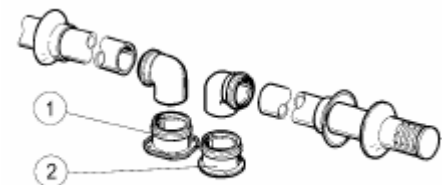
The exhaust pipe (\varnothing 60 mm) is fitted inside the air intake pipe (\varnothing 100 mm). Connection to the boiler is made using a flange (1) which may be connected to the 60/100 vertical terminal.

Max possible overall length is 4.7 straight and vertical metres.



Vertical concentric kit 80 /125

The exhaust pipe (\varnothing 80 mm) is fitted inside the Air intake pipe (\varnothing 125 mm). Connection to the boiler is made using a flange (1). The adapter 60/100-80/125 (3) is used to connect the 80/125 terminal (2). Max possible overall length is 12.2 straight and vertical metres.



Separated 80/80 flue kit

Both pipes have a diameter of 80 mm. Connections to the boiler are made using two special flanges for exhaust (1) from the centre pipe and extraction (2) from one of the two side holes.

Max possible length (extraction + exhaust) is 33 straight horizontal metres and 41 straight vertical metres.

To prevent condensation problems, the exhaust pipe should not be more than 5 m long. Advice on prevention of condensation is available from RVR Limited. Please contact us when designing longer flue systems.

Separated 80/80 insulated flue kit

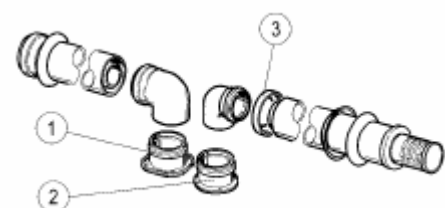
Both pipes have a working diameter of 80 mm.

Connections to the boiler are made using two special flanges for exhaust (1) from the centre pipe and extraction (2) from one of the two side holes.

Insulation is obtained thanks to special seals (3) whereby an air space can be created by means of a \varnothing 125 mm external concentric pipe.

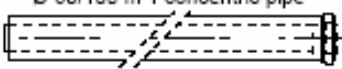


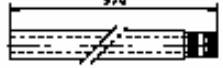

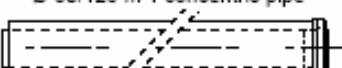


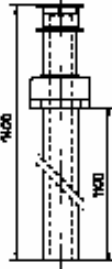
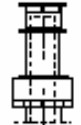
Max possible length (extraction + exhaust) is 33 straight metres.

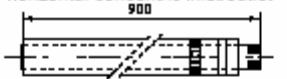
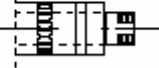


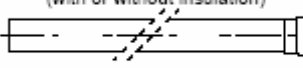
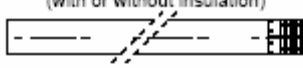



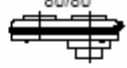
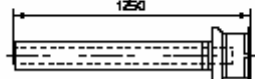
To prevent condensation problems, the exhaust pipe should not be more than 12 m long



Flue calculations for more complex systems

Each component of the air inlet/flue system has a resistance factor . These are given in the following tables. The resistance factor varies depending on whether the component in question is conveys fresh inlet air or hot combustion gases. All boilers have a maximum resistance factor of 100. The sum of all components in the flue system must not exceed the maximum overall resistance factor of 100.

TYPE OF PIPE	Resistance factor (R)	Equivalent length in m of \varnothing 60/100 concentric pipe	Equivalent length in m of \varnothing 80/125 concentric pipe	Equivalent length in m of \varnothing 80 concentric pipe
\varnothing 60/100 m 1 concentric pipe 	Inlet and outlet 16,5	m 1	m 2,8	Inlet m 7,1 Outlet m 5,5
\varnothing 60/100 concentric 90° elbow 	Inlet and outlet 21	m 1,3	m 3,5	Inlet m 9,1 Outlet m 7,0
\varnothing 60/100 concentric 45° elbow 	Inlet and outlet 16,5	m 1	m 2,8	Inlet m 7,1 Outlet m 5,5
End piece complete with \varnothing 60/100 horizontal concentric inlet/outlet 	Inlet and outlet 46	m 2,8	m 7,6	Inlet m 20 Outlet m 15
\varnothing 60/100 horizontal concentric inlet/outlet end piece 	Inlet and outlet 32	m 1,9	m 5,3	Inlet m 14 Outlet m 10,6
\varnothing 80/125 m 1 concentric pipe 	Inlet and outlet 6	m 0,4	m 1,0	Inlet m 2,6 Outlet m 2,0
\varnothing 80/125 concentric 90° elbow 	Inlet and outlet 7,5	m 0,5	m 1,3	Inlet m 3,3 Outlet m 2,5
\varnothing 80/125 concentric 45° elbow 	Inlet and outlet 6	m 0,4	m 1,0	Inlet m 2,6 Outlet m 2,0
End piece complete with \varnothing 80/125 vertical concentric inlet/outlet 	Inlet and outlet 33	m 2,0	m 5,5	Inlet m 14,3 Outlet m 11,0
\varnothing 80/125 vertical concentric inlet/outlet end piece 	Inlet and outlet 26,5	m 1,6	m 4,4	Inlet m 11,5 Outlet m 8,8

TYPE OF PIPE	Resistance factor (R)	Equivalent length in m of Ø 60/100 concentric pipe	Equivalent length in m of Ø 80/125 concentric pipe	Equivalent length in m of Ø 80 concentric pipe
End piece complete with Ø 80/125 horizontal concentric inlet/outlet 	Inlet and outlet 39	m 2,3	m 6,5	Inlet m 16,9 Outlet m 13
Ø 80/125 horizontal concentric inlet/outlet end piece 	Inlet and outlet 34	m 2,0	m 5,6	Inlet m 14,8 Outlet m 11,3
Concentric adapter from Ø 60/100 to Ø 80/125 with condensation trap 	Inlet and outlet 13	m 0,8	m 2,2	Inlet m 5,6 Outlet m 4,3
Concentric adapter from Ø 60/100 to Ø 80/125 	Inlet and outlet 2	m 0,1	m 0,3	Inlet m 0,8 Outlet m 0,6
Ø 80 m 1 pipe (with or without insulation) 	Inlet 2,3	m 0,1	m 0,4	Inlet m 1,0
	Outlet 3	m 0,2	m 0,5	Outlet m 1,0
Ø 80 m 1 complete inlet end piece (with or without insulation) 	Inlet 5	m 0,3	m 0,8	Inlet m 2,2
Ø 80 inlet end piece Ø 80 outlet end piece 	Inlet 3	m 0,2	m 0,5	Inlet m 1,3
	Outlet 2,5	m 0,1	m 0,4	Outlet m 0,8
Ø 80 90° elbow 	Inlet 5	m 0,3	m 0,8	Inlet m 2,2
	Outlet 6,5	m 0,4	m 1,1	Outlet m 2,1
Ø 80 45° elbow 	Inlet 3	m 0,2	m 0,5	Inlet m 1,3
	Outlet 4	m 0,2	m 0,6	Outlet m 1,3
Ø 80 parallel split from Ø 60/100 to Ø 80/80 	Inlet and outlet 8,8	m 0,5	m 1,5	Inlet m 3,8 Outlet m 2,9
Ø 60/100 vertical concentric inlet/outlet end piece 	Inlet and outlet 41,7	m 2,5	m 7	Inlet m 18 Outlet m 14

Example:

Flue system consists of 9m of 80mm air intake pipe with 3 x 90 bends and 6m of exhaust pipe with 2 x 90 bends.

Component Resistances:

Component	Resistance	Quantity	Total
80mm Intake pipe	2.3	9	20.7
90° air intake bend	5	3	15
80mm Flue pipe	3	6	18
90° Flue bend	6.5	3	19.5
Total Flue Resistance			73.2

In this case the total resistance of the system is less than 100. The flue design is acceptable.

Care should be taken to insulate the exhaust flue pipe to ensure that condensation is not possible.

FLUE TERMINAL LOCATION



Fig. 4

Terminal Position	Min. Distance
A Directly below an opening, air brick, windows, etc.	300 mm
B Below gutters, soil pipes or drain pipes	75mm
C Below eaves	75mm
D Below balconies or car port roof	75mm
E From a vertical drain pipe of soil pipe	75mm
F From an internal or external corner	75mm
G Above ground, roof or balcony level	300mm
H From a surface facing the terminal	600mm
I From a terminal facing a terminal	1200mm
J From an opening in the car port (door, window) into dwelling	1200mm
K Vertically from a terminal on the same wall	1500mm
L Horizontally from a terminal on the same wall	300mm
M Horizontally from an opening, air brick, window etc.	300mm
Below horizontally hinged windows where exhaust is directed upwards	3000mm
Below horizontally hinged windows where exhaust is not directed upwards	1000mm

The flue terminal must be exposed to the external air and the position must allow the free passage of air across it at all times. In certain weather conditions the terminal may emit a plume of steam. Avoid positioning the terminal where this may cause a nuisance. If the terminal is fitted within 850 mm of a plastic or painted gutter or 450 mm of painted eaves or 300 mm of a plastic car port roof, an aluminium shield at least 1 m long should be fitted to the underside of the gutter or painted surface. If the terminal is fitted less than 2 m above a surface to which people have access, the terminal must be protected by a terminal guard.

IMPORTANT— Failure to install flue systems correctly may lead to serious injury or death. Ensure that:

- The flue slopes slightly towards the outlet by between 1° and 2° to ensure any condensate moves to the discharge point.
- The flue is adequately supported along its length so that it is straight.
- No chemicals, detergents or solvents of any kind are used in the assembly of the flue system. Clean water may be used as to lubricate seals where necessary.
- The flue is thoroughly tested for leaks after installation.

Boiler Location

The boiler is not suitable for external installation.

The boiler must be installed on a flat vertical wall which is capable of supporting the weight of the boiler. The boiler can be fitted to or adjacent to a wall comprising of a combustible material without the need for a special thermal insulation barrier.

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current IEE Wiring Regulations. Where a room sealed boiler is installed in a room containing a bath or shower, it must not be possible for a person using the bath or shower to touch any electrical switch or boiler control utilising mains electricity.

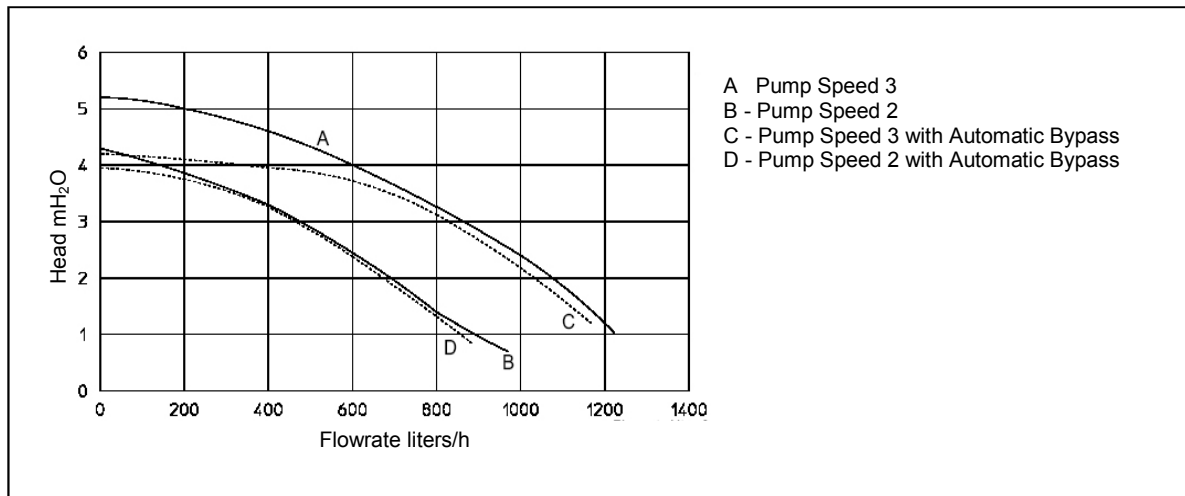
The boiler may be installed in a cupboard or compartment, provided it is correctly designed for that purpose.

NB: Adequate clearances are required to allow servicing of the boiler. Please see page 3.

Central Heating System

The boiler is designed for use in a sealed central heating system. The system should be designed to operate with flow temperatures of up to 80°C. When designing the system, the pump head, expansion vessel size, mean radiator temperature, etc. must be taken into account. The pressure losses in the system must be compatible with the boiler circulation pump. See pump performance graph below.

Pump performance curves



System volume - The 8 liter expansion vessel incorporated into the boiler is pre-charged to 1.0 bar and is suitable for a sealed heating system with a maximum water content of 80 litres (18 gal). Above 80 litres, consideration should be given to fitting an additional expansion vessel fitted in the position shown on the schematic below. To check correct operation of the expansion vessel(s) the system pressure should not be more than 2.5 bar when the system is at maximum operating temperature.

The boiler is supplied with the following components built in:-

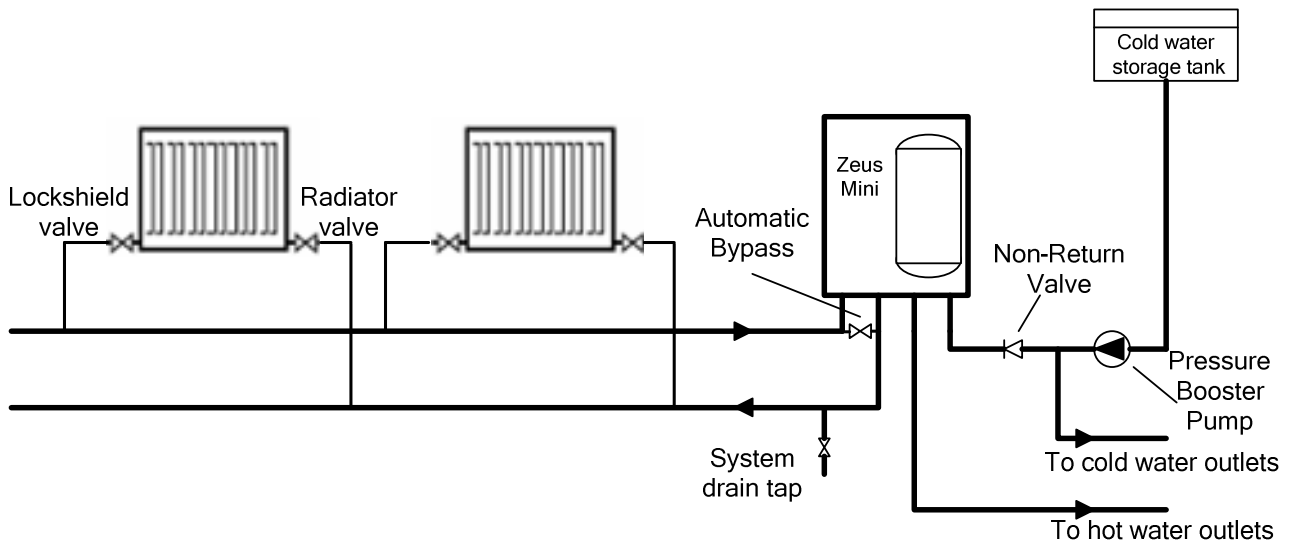
Central Heating Pressure relief valve - complying with BS 6759 and set to operate at 3 bar. The discharge pipe must be routed clear of the boiler to a drain, so that it can be seen, but cannot cause injury to persons or property.

A Pressure gauge is included to indicate the pressure of the central heating system.

Important Note: In a central heating system where it is possible to shut off system circulation, such as a system with zone valves or where all radiators are fitted with thermostatic radiator valves, an external bypass should be fitted. An optional automatic bypass is available as an accessory for the Zeus Mini boiler. This may be fitted directly to the boiler central heating flow and return connections.

The most important components of the system are shown in the diagram below.

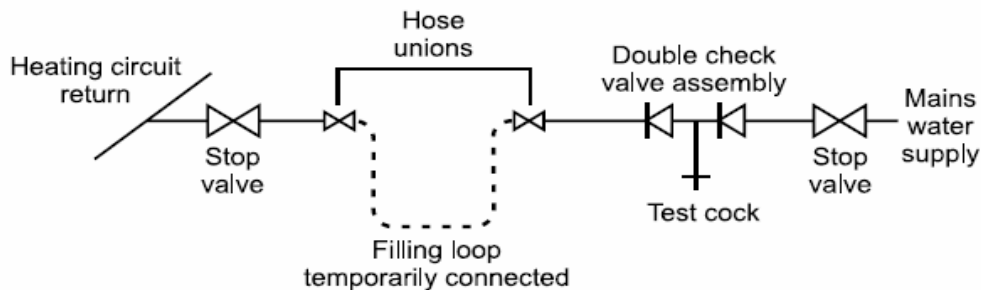
- The cold water supply for the water heating side of the system may come from a booster pump or the cold water mains where this is permitted by the local authority.
- A non-return valve must be installed on the cold feed to the boiler. This prevents expanding hot water back-feeding into the cold side of the system.
- An automatic bypass should be fitted in systems where central heating circulation can be shut off. (by zone valves or thermostatic radiator valves).



Filling the central heating system

The system design pressure (cold) should be set to 1.0 bar. This pressure is equivalent to a static head of 10.2 metres of water. Provision should be made to replace water lost from the system. This can be by manual or automatic means.

Filling of the system must be carried out in a manner approved by the local authority. Where allowed, the system may be filled via a temporary connection as shown below or by using the integrated filling valve in the boiler. After filling, always disconnect the flexible hose of the filling loop if used and close the filling valve in the boiler.



All fittings used in the system must be able to withstand pressures up to 3 bar. Drain taps (to BS 2879) must be used to allow the system to be completely drained. The heating system should be thoroughly flushed before the boiler is connected and again after the first heating. If it is necessary to add inhibitor to the central heating system, contact RVR Ltd. for guidance.

Domestic Hot Water System

Mains water pressurised unvented systems are generally not permitted in Ireland. A cold water storage tank and a pressure boosting pump will normally provide a pressurised cold water supply. The pressurisation pump should provide a water pressure of between 1 and 3 bar. However, all taps and mixing valves used with the hot water system must be suitable for operating at a pressure of up to 5.5 bar.

To ensure economic use, the pipe runs between the boiler and taps should be in 15 mm copper pipe and be as short as possible. Where possible the pipework should be insulated to reduce heat loss.

Before the cold water supply pipe is connected to the boiler, it should be thoroughly flushed out to avoid the danger of dirt or foreign matter entering the boiler.

The stored water temperature is adjustable to a maximum of 55°C. In hard water areas this should avoid possible scale build-up. However, if descaling is necessary contact RVR Limited for guidance.

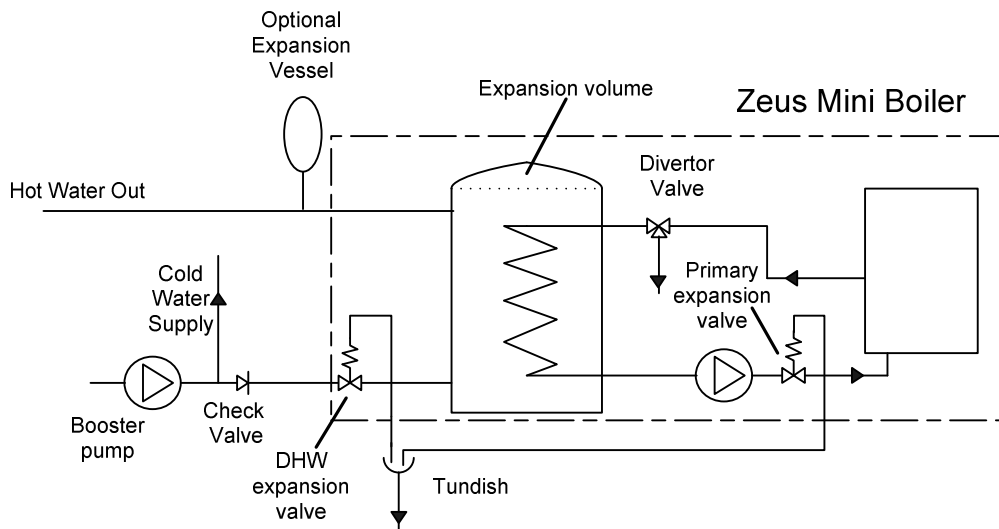
Unvented Hot Water Storage System

The installation is subject to Building Regulations and the Water Bye Laws of the Local Authority.

The Immergas Zeus Mini boiler is supplied with all the components required for a safe and efficient unvented hot water system. An air cushion which is present at the top of the 45l storage vessel provides sufficient expansion for the domestic hot water system. An optional additional DHW expansion kit is available for situations where the inlet pressure exceeds 3 bar or other situations where the expansion capacity may not be adequate.

NOTE: In the Dublin City Council area the optional expansion vessel must be fitted to comply with the approval requirements of the council. The council also requires that the minimum internal diameter of pipes connected to the boiler DHW connections should not be less than 13mm. As 1/2" thermoplastic pipe does not provide the minimum diameter, the minimum suitable thermoplastic pipe size is 3/4"

Discharge pipe - The discharge pipes from the expansion relief valves must be routed to a tundish in 1/2" (or 15 mm) pipe. The discharge pipework from both relief valves may be joined together in the same sized pipe, providing at least 3/4" (or 22 mm) pipework is connected downstream of the tundish.



Tundish - The tundish must be positioned within 500 mm of the appliance, so that it is visible to the User and away from electrical devices. The minimum size of the discharge pipe downstream of the tundish is given in the following table.

Valve outlet size	Minimum size of discharge pipe 'D1' to tundish	Minimum size of discharge pipe 'D2' from tundish	Maximum resistance allowed, expressed as a length of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend
G½	15mm (1/2")	22mm (3/4")	up to 9 m	0.8 m
		28mm (1")	up to 18 m	1.0 m
		35mm (1 1/4")	up to 27 m	1.4 m

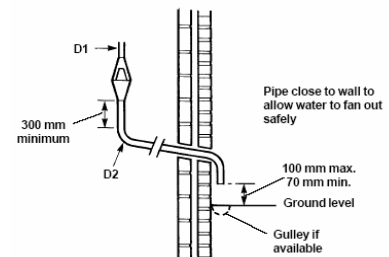
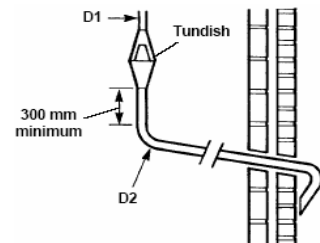
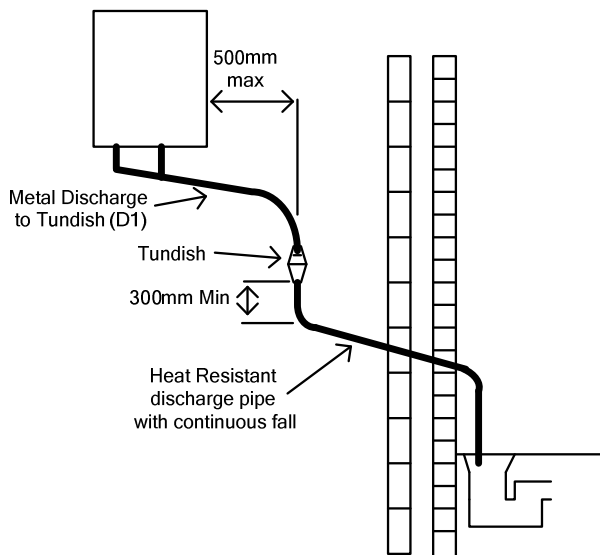
Tundish installation

The discharge pipework from the tundish:-

1. Shall fall continuously through its length.
2. Shall be of a heat resistant material, e.g. metal.
3. Shall not be fitted with any valves or taps.
4. Shall discharge to a safe visible position, e.g. onto the surface of an external wall or into a gully.
5. Shall have a minimum of 300 mm straight pipework directly from the tundish.

Note: Where children may play or otherwise come into contact with discharges, a wire cage or similar guard must be positioned to prevent contact whilst maintaining visibility.

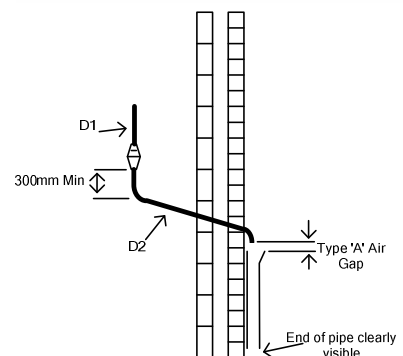
Please see the diagrams below for suggested methods of terminating the discharge pipe safely. Where a single pipe serves a number of discharges, such as in blocks of flats, the number served should be limited to not more than 6 systems so that any installation can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe to be connected. If the system is installed where discharges from safety devices may not be apparent, i.e. in dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.



High Level Termination

At high level, discharge onto a roof is acceptable providing the roof is capable of withstanding high temperatures and there is a distance of 3 m from any plastic guttering systems that would collect such discharge.

Note: The discharge may consist of scalding water and steam. Asphalt, roofing felt and non-metallic materials may be damaged by such discharges.



Example:-

The example below is for a G $\frac{1}{2}$ temperature relief valve with a discharge pipe (D2) having four elbows and a length of 7 m from the tundish to the point of discharge.

From Table :-

Maximum resistance allowed for a straight length of 22 mm copper discharge pipe (D2) from a G $\frac{1}{2}$ temperature relief valve is 9 m. Subtract the resistance for four 22 mm elbows of 0.8 m each = 3.2 m. Therefore the maximum permitted length equates to 9 - 3.2 = 5.8 m

5.8 m is less than the actual length of 7 m therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28 mm pipe (D2) from a G $\frac{1}{2}$ temperature relief valve equates to 18 m.

Subtract the resistance for four 28 mm elbows at 1.0 m each = 4 m.

Therefore the maximum permitted length equates to 18 - 4 = 14 m

As the actual length is 7 m, a 28 mm (D2) copper pipe will be satisfactory.

Operation and Maintenance Instructions

An annual maintenance of the boiler and heating system is recommended. This ensures that the optimal safety, performance and operation characteristics of the boiler remain unchanged over time.

Warnings

Never expose the wall-mounted boiler to direct vapours from a cooking surface. Use of the boiler by unskilled persons or children is strictly prohibited.

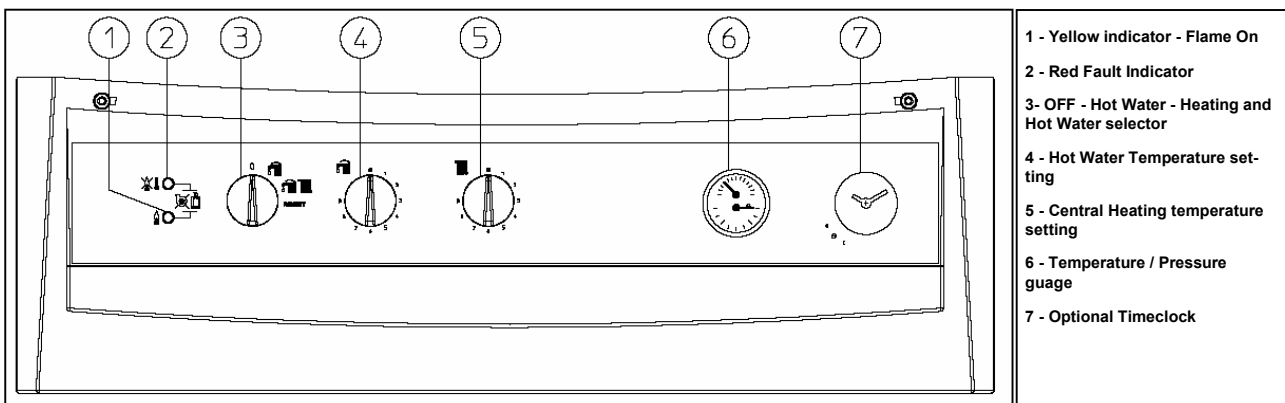
Never touch the flue extraction terminal (if fitted) due to the risk of burning caused by high temperatures; For safety purposes, check that the concentric air intake/flue exhaust terminal (if fitted), is not blocked. If temporary shutdown of the boiler is required, proceed as follows:

- a) drain the heating system if anti-freeze is not used;
- b) shut off all electrical, water and gas supplies.

When building or renovation work is carried out in the vicinity of the flue outlet, switch off the boiler and on completion of work ensure that a qualified technician checks the safety of the installation. Never clean the appliance or connected parts with flammable substances. Never leave containers or flammable substances in the same environment as the appliance.

Electrical Safety

- never touch the appliance with wet hands or other parts of the body and never touch when barefoot.
- never pull electrical cables or leave the appliance exposed to atmospheric agents (rain, sunlight, etc.);
- the appliance power supply cable must never be replaced by the user;
- in the event of damage to the cable, switch off the appliance and contact a qualified service technician.
- in the event of prolonged periods when the boiler is not in use, turn off the main power switch.



Using the Boiler

Before lighting, make sure that the system is full of water and that the manometer (6) indicates a pressure of 1 - 1.2 bar.

- Open the gas valve on the gas supply to the boiler.
- Turn main switch (3) to Hot Water or Hot Water/ Heating.

N.B.: Once the main switch (3) is turned to one of these positions, the yellow boiler power indicator lamp (1) will start blinking at long intervals. With the switch set to (🔌) the central Heating temperature setting (5) is not active, and the domestic water temperature is controlled by selector (4). With the switch set to (🔌🔌) the central heating temperature is set using selector (5) while selector (4) is used for the domestic hot water. Turn the selectors clockwise to raise the temperature, anticlockwise to lower it. Boiler operation is now automatic.

Fault and anomaly signalling.

	Red LED 🔴	Yellow LED 🟡
Boiler off	Off	Off
Boiler on Stand-by	Off	Flash
Flame presence	Off	On
No power block	On	Off
Overtemperature thermostat block	Intermittent flash	Off
Broken air pressure switch	Intermittent flash	Intermittent flash
Delivery NTC sensor anomaly or domestic NTC sensor anomaly	Off	Intermittent flash
No water or no circulation	On	Intermittent flash

Troubleshooting

Ignition lockout. Each time heating or hot water production is required the boiler is turned on automatically. If this does not occur within 10 seconds, the boiler activates an "ignition lockout" (red indicator lamp 2 ON). To eliminate the lockout, rotate the main switch (3) temporarily to the Reset position. On initial ignition or following a prolonged period of disuse the ignition lockout may occur several times. If lockout occurs repeatedly, contact a qualified technician for assistance.

Over temperature lockout. During operation, if a fault causes excessive overheating inside, the boiler goes to over temperature lockout (indicator lamp 2 flashing). To eliminate the "over temperature lockout", turn the main switch (3) temporarily to the Reset position. If lockout occurs repeatedly, contact a qualified technician for assistance.

Air pressure switch activation failure. This fault condition occurs if the intake or exhaust pipes are blocked or there is a fan fault or a flame check unit fault. If normal conditions are restored the boiler resumes operation without requiring reset. If this problem persists, contact a qualified technician for assistance.

Lack of water in boiler. Not enough water pressure detected in the heating circuit to guarantee correct boiler operation. Make sure that the pressure in the system is between 1 and 1.2 bar.

System flow NTC sensor fault. If the unit detects a problem with the system delivery NTC sensor, the boiler will not start; call a qualified technician.

Domestic circuit NTC sensor fault. If the unit detects a problem in the domestic circuit NTC sensor, the boiler will not produce domestic hot water; call a qualified technician.

No water circulating. This occurs if there is overheating in the boiler due to insufficient water circulation through the boiler - check that no shutoff devices are closed and that the system is free of air. Check that the circulating pump is running freely. If necessary, remove the pump cover screw and manually rotate the pump impeller using a flat bladed screwdriver. If lockout occurs repeatedly, contact a qualified technician for assistance.

Draining the system.

To drain the boiler, use the special drain cock.

Before draining, ensure that the filling valve is not connected closed.

Draining the boiler.

To drain the boiler, use the special drain cock.

N.B.: Before carrying out this operation, close the boiler cold water inlet cock and open any domestic circuit hot water cock to allow air to enter the boiler.

Anti-freeze protection.

The boiler comes standard with an anti-freeze function that starts the pump and burner when the water temperature inside the boiler falls below 4°C and stops on exceeding 42°C. The anti-freeze function is guaranteed if the boiler is fully operative and not in "lockout" status, and is electrically connected with the main switch is set to Summer or Winter.

To avoid continued operation in the event of prolonged absence, the system must be drained completely or anti-freeze substances should be added to the heating system water. In both cases the boiler domestic water circuit must be drained. In appliances subject to frequent draining, the system must be refilled with suitably treated water to eliminate hardness that may cause lime scale formation.

Annual maintenance procedures

The following checks and maintenance should be performed at least once a year.

- Clean the flue side of the heat exchanger.
- Clean the main burner.
- Make a visual inspection of the flue extraction hood for wear or corrosion.
- Ensure correct ignition and operation.
- Ensure correct settings of the burner in domestic water and heating modes.
- Verify correct operation and adjustment of the boiler, in particular:
 - operation of the electrical main switch on the boiler;
 - operation of the system control thermostat;
 - operation of the domestic water control thermostat.
- Ensure gas soundness of the gas intake circuit; insert a "U" or digital type pressure gauge in the pressure test point upstream of the gas valve and then close the boiler shutoff valve. No pressure variation must occur in the next five minutes on the gauge.
- Ensure activation of the device for protection against the ionisation flame control gas; activation time must be less than ten seconds
- Visually inspect to check for leakage of water or oxidation of fittings.
- Check visually that the water safety valve outlets are not blocked and that the tundish is clear.
- Check that the charge of the expansion vessel after discharging system pressure to the zero setting (check via boiler pressure gauge), is at 1,0 bar.
- Check that the system static pressure (in cold conditions and after system recharging via the filling valve) is between 1 and 1.2 bar.
- Check visually that the safety and control devices have not been tampered with and/or shorted, in particular:
 - temperature safety thermostat;
 - air pressure switch.
- Check the integrity of boiler Magnesium Anode.
- Ensure correct maintenance and condition of the electrical installation with particular reference to:
 - electrical cables must be correctly routed
 - no traces of black marking or burns

Zeus Mini variable heat output.

		NATURAL GAS (G20)			BUTANE (G30)			PROPANE (G31)		
HEAT OUPUT (kcal/h)	HEAT OUPUT (kW)	BURNER GAS FLOW RATE (m ³ /h)	BURNER NOZZLE PRESS. (mbar) (mm H ₂ O)		BURNER GAS FLOW RATE (kg/h)	BURNER NOZZLE PRESS. (mbar) (mm H ₂ O)		BURNER GAS FLOW RATE (kg/h)	BURNER NOZZLE PRESS. (mbar) (mm H ₂ O)	
20000	23,3	2,70	11,1	114	2,01	28,3	289	1,98	36,6	373
19000	22,1	2,58	10,1	103	1,92	25,7	262	1,89	33,2	339
18000	20,9	2,45	9,2	94	1,82	23,2	236	1,80	30,1	307
17700	20,6	2,32	9,0	92	1,73	22,6	230	1,70	29,3	299
16000	18,6	2,19	7,4	76	1,63	18,6	190	1,61	24,2	247
15000	17,4	2,07	6,6	68	1,54	16,5	169	1,52	21,5	220
14000	16,3	1,94	5,9	60	1,45	14,6	149	1,42	19,0	194
13000	15,1	1,81	5,2	53	1,35	12,7	130	1,33	16,7	170
12000	14,0	1,69	4,5	46	1,26	11,0	112	1,24	14,4	147
11000	12,8	1,56	3,9	39	1,16	9,4	96	1,14	12,4	126
10000	11,6	1,43	3,3	34	1,06	7,9	81	1,05	10,4	107
9000	10,5	1,30	2,7	28	0,97	6,5	66	0,95	8,7	88
8000	9,3	1,17	2,2	23	0,87	5,3	54	0,86	7,0	72

N.B.: Pressure values specified in the table indicate the difference of pressure values between the gas valve outlet and the combustion chamber. Adjustments are carried out using a differential pressure gauge.

Zeus Mini wiring diagram.

