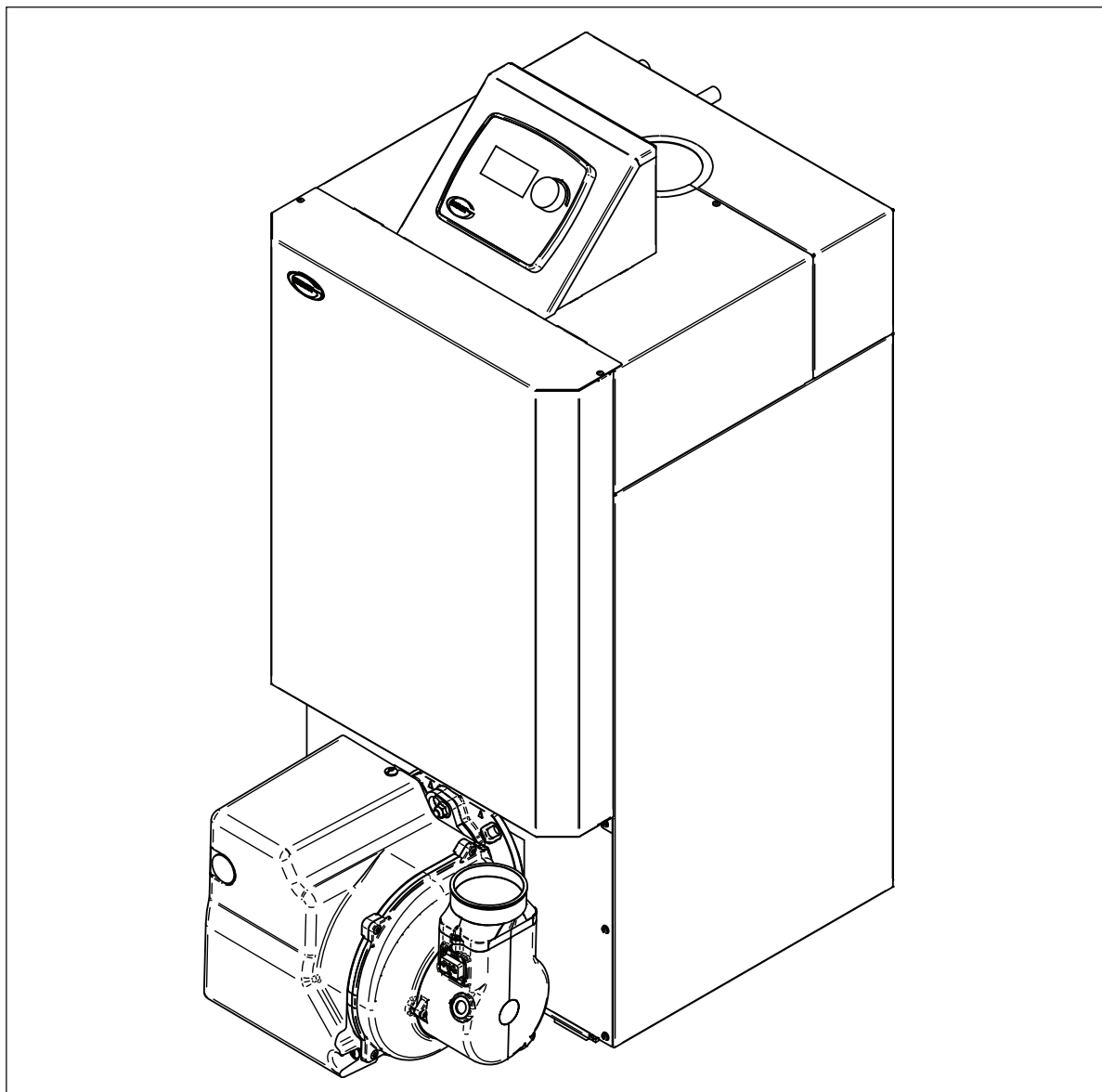


# Grant Vortex

## Boilerhouse Combi

### Range of oil condensing boilers

Installation, commissioning & maintenance instructions





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## IMPORTANT NOTE FOR INSTALLERS

These instructions are intended to guide installers on the installation, commissioning and servicing of the Grant Boilerhouse Combi oil boiler. After installing the boiler, leave these instructions with the user.

## SPECIAL TEXT FORMATS

The following special text formats are used in these instructions for the purposes listed below:



**Warning of possible human injury as a consequence of not following the instructions in the warning.**



**Caution concerning likely damage to equipment or tools as a consequence of not following the instructions in the caution.**



**Used for emphasis or information not directly concerned with the surrounding text but of importance to the reader.**

## PRODUCT CODES AND SERIAL NUMBERS COVERED

### COVERED

The serial numbers used on Grant oil boilers consist of a fifteen digit numerical code with the final three digits being the product identifier. For example:

100000200218460

These instructions cover the following product codes and serial numbers

Product code	Identifier Serial Number
001-01-CLN	460
001-02-CLN	461
001-03-CLN	462

## SERVICING

The boiler should be serviced at least every twelve months and the details entered in the Service Log in the user handbook.

## TYPE OF FUEL

All Grant boilerhouse combi boilers are suitable for use with Class C2 Kerosene.

The use of Class D Gas Oil on all Grant Low NOx and Blue Flame boilers DOES NOT comply with ErP requirements or EU regulations, and as a result Grant IRL does not condone its use.

To use Bio-Kerosene (B30K), refer to the information below:

## OPERATION ON BIO-FUEL

All Grant boilerhouse combi boilers manufactured since May 2011 are suitable for operation on both standard Kerosene (Class C2 to BS 2869) and also bio-kerosene - up to a 30% blend (B30K).

All burner settings and nozzle sizes (as detailed in Section 2.2 of these instructions) are correct for both standard kerosene and bio-kerosene (B30K).

In order to operate this boiler on bio-kerosene, it will be necessary to take the following actions:

- Use a bio-kerosene (B30K) compatible flexible oil line in place of the oil line supplied with the boiler.
- Have the oil storage tank and oil supply line (including all pipework, sight gauges, filters, isolating valves, fire valves, de-aeration devices, etc.) checked for their compatibility with bio-kerosene (B30K).  
Where necessary, some or all of these items may have to be replaced with a bio-kerosene compatible alternative.
- Check the suitability of the flue system with Grant Ireland.
- Use only bio-kerosene (B30K) that conforms to OPS24.

### IMPORTANT:

**Under no circumstances, should the boiler be used with bio-kerosene without the above actions being taken first**

**This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.**

**Children shall not play with the appliance.**

**Cleaning and user maintenance shall not be made by children without supervision.**

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# 1 INTRODUCTION

This manual is intended to guide installers in the installation, commissioning and maintenance of the Grant Boilerhouse Combi oil boiler. A user guide for the operation of this boiler is attached to the back of this manual.

## 1.1 LOW NOX TECHNOLOGY

All Grant oil condensing boilers are based on Low NOx technology. They are designed to meet both the European eco-design (ErP) emission limits introduced in September 2018 (<120mg / kwh) and to maintain the high yields expected from Grant Vortex oil boilers. They combine the proven technology of the Grant condensing boiler with the Cuenod MAX compact Low NOx flame burner.1.1

## 1.2 HOW A CONDENSING BOILER OPERATES

During the combustion process, hydrogen and oxygen combine to produce heat and water vapour. The water vapour produced is in the form of superheated steam in the heat exchanger. This superheated steam contains sensible heat (available heat) and latent heat (heat locked up in the flue gas). A conventional boiler cannot recover any of the latent heat and this energy is lost to the atmosphere through the flue.

The Grant Vortex Boilerhouse Combi boiler contains an extra heat exchanger which is designed to recover the latent heat normally lost by a conventional boiler. It does this by cooling the flue gases to below 90°C, thus extracting more sensible heat and some of the latent heat. This is achieved by cooling the flue gases to their dew point (approximately 55°C).

To ensure maximum efficiency, the boiler return temperature should be 55°C or less, this will enable the latent heat to be condensed out of the flue gases.

- The boiler will achieve net thermal efficiencies of 100%.

To achieve maximum performance from the Grant Vortex Boilerhouse Combi boiler, it is recommended that the heating system is designed so that a temperature differential of 20°C between the flow and return is maintained.

The Grant Vortex Boilerhouse Combi boiler will however still operate at extremely high efficiencies even when it is not in condensing mode and therefore is suitable for fitting to an existing heating system without alteration to the radiator sizes. The boiler is capable of a maximum flow temperature of 75°C.

## 1.3 BOILER DESCRIPTION

Grant Vortex Boilerhouse Combi boilers are designed to be installed inside the building in a dedicated and ventilated room called the boiler room.

The Grant Vortex range of automatic pressure jet oil boilers have been designed for use with a fully pumped central heating system with indirect domestic hot water cylinder.

They are not suitable for use with either a direct cylinder or a 'primatic' cylinder or gravity hot water.

The boilers are suitable for use on open vented or sealed central heating systems. System models are supplied with the necessary components factory fitted. Refer to Section 7.

All boilers are supplied with the control panel and burner factory fitted.

All the models in the current Grant vortex boilerhouse combi range of boilers are designed to comply with the maximum NOx emissions\* under the Energy-related Products Directive (ErP).

\* From the 26th September 2018, the maximum NOx emissions for all new oil fired boilers (up to and including 400kW for both new

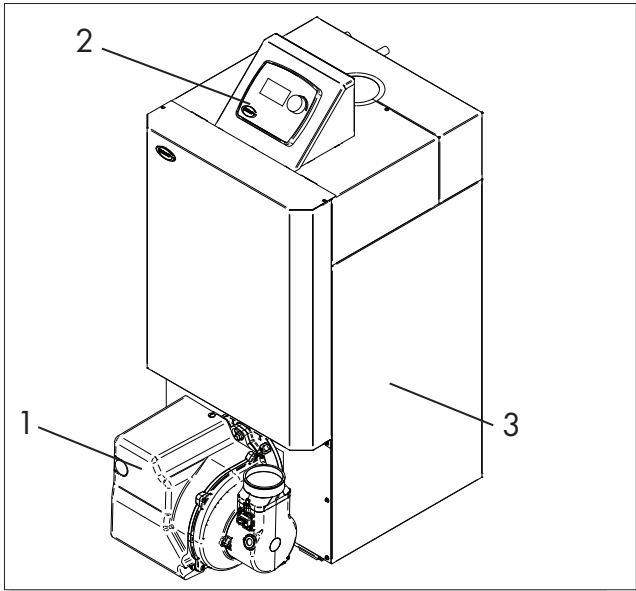
build and replacement boiler installations) is 120mg/kWh.

The boilers are supplied with:

- a separate Cuenod burner ready to be fitted,
- a 3bar valve + auto bleed valve to mount
- user manual - installer and commissioning Grant boiler.

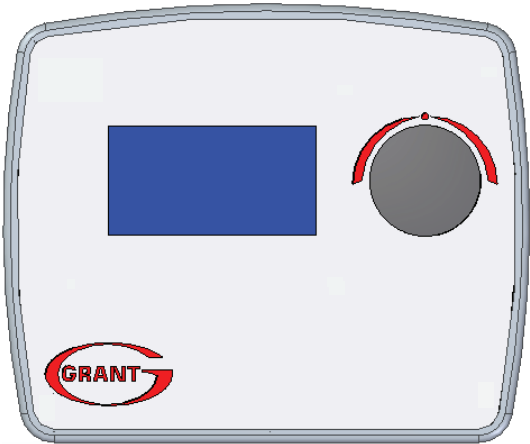
## 1.4 BOILER COMPONENTS

The boiler is fitted with a flue safety thermostat which automatically shuts down the boiler if the heat output exceeds a preset temperature of 90 ° C ± 3 ° C.



Item	Description
1	Cuenod Burner
2	Control Panel
3	Boiler

**Figure 1-1:** 18kW 24kW & 32kW components



**Figure 1-2:** Vortex boilerhouse combi control panel

## 2 TECHNICAL DATA

### 2.0 GRANT RESEARCH AND DEVELOPMENT COMBUSTION AT ALTITUDE

The R&D department of Grant Engineering located in Birr (Grant Headquarters) in Ireland, are aware of the challenges of fuel oil quality at altitude, has created an altitude chamber in its laboratory in order to test all the burners capable of operating on territory at any altitude.

The results allow Grant to guarantee the use of its boilers under normal conditions of use at the altitudes mentioned in Table 2.3 below. For an even better adaptation, we are preparing kits for operation at higher altitudes.

\* For altitude adaptation of Grant vortex boilerhouse combi 52kw and 66kw boilers, please contact us at [info@heatmax.gr](mailto:info@heatmax.gr)

**Table 2-1:** Burner power / altitude correspondence table

0-500m				500m-1000m				1000-1500m				1500-2100m			
Power	Jet	Pump pressure	Air diffuser adjustment	Power	Jet	Pump pressure	Air diffuser adjustment	Power	Jet	Pump pressure	Air diffuser adjustment	Power	Jet	Pump pressure	Air diffuser adjustment
18	0.40/80°S	13	26.3	16.3	0.40/80°S	11.5	26.3	15.8	0.40/80°S	11	26.3	15.3	0.40/80°S	10	26.3
24	0.55/80°S	11	26	22	0.55/80°S	9	26	21.2	0.55/80°S	9	26	20.5	0.55/80°S	8.5	26
32	0.65/80°S	12	27.2	29.3	0.65/80°S	10.2	27.2	27.9	0.65/80°S	9.5	27.2	27.2	0.65/80°S	8.5	27.2

**Table 2-2:** Technical data Boilers - GRANT VORTEX BOILERHOUSE COMBI

Data	Units	VORTEX BOILERHOUSE COMBI		
		18KW	24KW	32KW
Heating body volume	litre	13	13	21
Boiler packed complete	kg	121.250	121.250	135.140
Boiler & Burner floor weight	kg	111.95	111.95	125.845
Dry weight boiler only	kg	102.83	102.83	116.73
Maximum heating power	kW	18	24	32
Heating flow connection		22mm	22mm	28mm
Heating return connection		22mm	22mm	28mm
Minimum flow ( $\Delta T=10^{\circ}\text{C}$ ) l/h	l/h	1780	2200	2280
Minimum flow ( $\Delta T=20^{\circ}\text{C}$ ) l/h	l/h	890	1100	1490
Condensate outlet connection		22 mm (connect only with pvc pipes) (a neutralizer is recommended)		
Flue outlet diameter		18 & 24 kw =80mm		32kw =100mm
Waterside resistance $\Delta T=10^{\circ}\text{C}$	mbar	28.5		
Waterside resistance $\Delta T=20^{\circ}\text{C}$	mbar	10.0		
Maximum static height	m	20		
Minimum static height for pump operation	m	1		
Boiler thermostat range	$^{\circ}\text{C}$	55 à 75		
T ° limit before safety thermostat cut-off	$^{\circ}\text{C}$	110 ± 3		
Limit T ° of smoke before switching off the smoke safety thermostat (for plastic smoke)	$^{\circ}\text{C}$	90 $^{\circ}\text{C}$		
Boiler base temperature	$^{\circ}\text{C}$	less than 50		
Power supply		230/240 V ~ 50 Hz protected at 5 Amp		
Engine power	watts			
Oil connection		¼" BSP Male delivered with 1/4 1/8 reduced (on flexible oil outlet)		
Chimney draft (depression pipe)	N/m <sup>2</sup>	Minimum 8.7 - Maximum 37		
Maximum operating pressure - closed vessel	bar	2		
Maximum operating pressure - open vessel	bar	3		
Type boiler operation		ON / OFF ON ELECTRICAL BOX (EXTERNAL TO THE BOILER)		

1. The data in the table are given as an indication likely to be adjusted according to the constraints of the site
2. Household fuel oil, bio fuel oil ( $\leq 10\%$ ) and fuel oil with a low sulfur rate can be used
3. The smoke temperatures in the table are given at +/- 10%
4. When commissioning the air shutter must be adjusted to obtain the appropriate CO<sub>2</sub> rate
5. In red, the burner is factory preset at powers 18kw, 24kw, 32kw.
6. The measuring point on the door can only be used for CO<sub>2</sub> measurement and the smoke opacity test, but not for measuring the efficiency or temperature of the smoke
7. The installer must modify the data on the burner label if he changes the capacity.

## 2.3 SEASONAL EFFICIENCY, ERP AND NOX CLASS (NITROGEN OXIDE)

**Table 2.3** Seasonal efficiency, ErP and NOx class

Boiler type	Power	Jet	Oil pressure (bar)	Smoke No.	Burner combustion head type	Deflector setting	Oil mass flow rate (kg / h)	Smoke temperature (° C)	CO <sub>2</sub> (%)	NOx	ErP Class	ErP Seasonal EFF
	(kW)											
EURFBH-18MAX4	18	0.40/80°S	13	0 - 1	EG	26.3	1.60	55 - 75	12.5	<120mg/kWh	A	93%
EURFBH-24MAX4	24	0.55/80°S	11	0 - 1	EG	26.0	2.13	55 - 75	12.5	<120mg/kWh	A	92%
EURFBH-32MAX4	32	0.65/80°S	12	0 - 1	EG	27.2	2.84	55 - 75	12.5	<120mg/kWh	A	92%

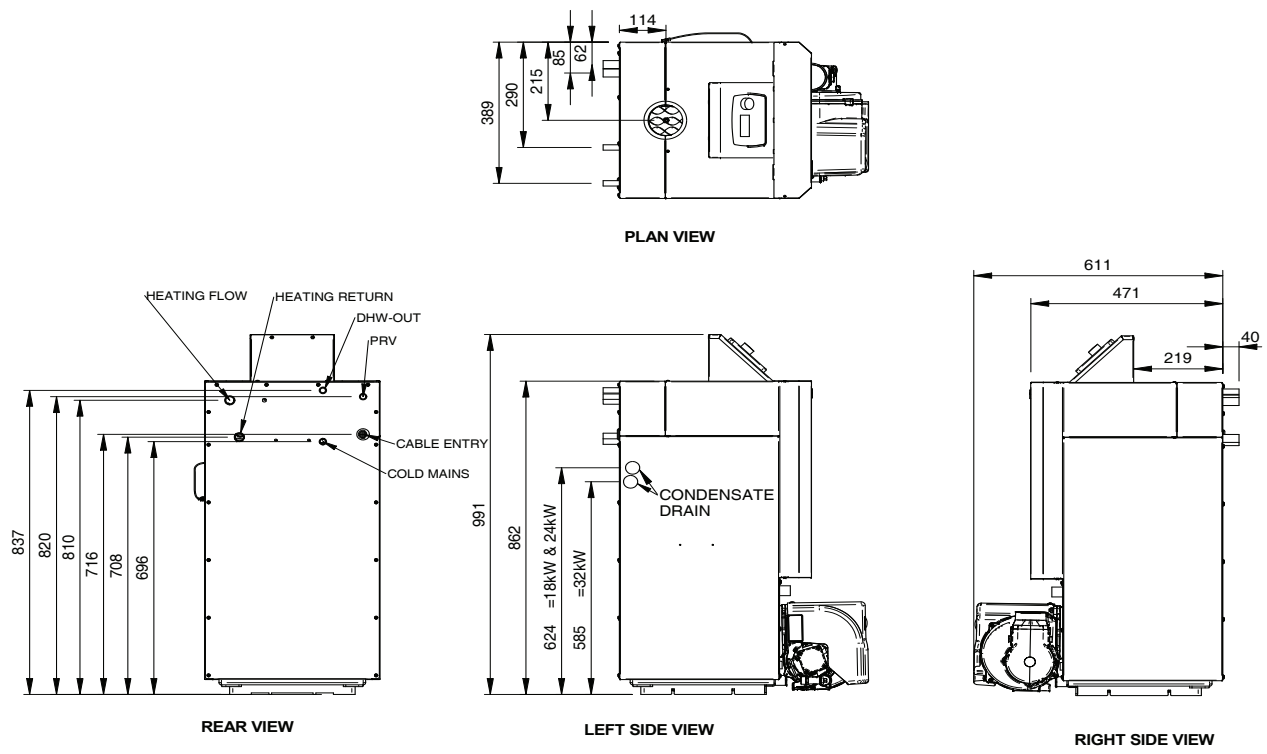
## 2.4 SMOKE ANALYSIS (COMBUSTION GASES)

To allow the boiler to be put into service and maintained, the boiler is supplied with a combustion test socket on the front cleaning door. When this test point is used, please note the following measures:

- The test sample relates only to the CO<sub>2</sub> readings and the smoke opacity test.
- The smoke output and temperature must be taken from a measurement point located on the starting element of the smoke pipes of the high, vertical and conventional outlet kits.
- The suction cups with low outlet do not contain a test point. The smoke temperature and efficiency readings must be taken at the outlet of the terminal duct.

To allow the boiler to be commissioned and serviced, the boiler is supplied with a combustion test point on the front cleaning door.

## 2.5 DIMENSIONS FOR GRANT VORTEX BOILERHOUSE COMBI BOILER



**Figure 2-5.1:** Vortex Boilerhouse Combi Dimensions 18kw, 24kw, 32kw

# 3 OIL STORAGE AND SUPPLY SYSTEM

## 3.1 OIL SUPPLY

### 3.1.1 FUEL STORAGE AND REGULATIONS

The tank must be placed in accordance with the recommendations of national and European standards. Legislation for tanks for heating or for tanks with pump Order of July 1, 2004 fixing the technical and safety rules applicable to the storage of petroleum products (NOR: INDI0403209A / Extracts) see site info@grantengineering.ie

which give details on filling, maintenance and protection against fire.



NOTE

#### Storage construction rules (extracts)

### STORAGE CONSTRUCTION RULES

Article 5.1:

- "Light" type steel tanks: National and European standards NF M 88-940
- Parallelepipedal steel tanks NF E 86-255
- Plastic tanks with secondary envelope: the harmonized standard NF EN 13341
- Double-walled steel tanks: European standard NF EN 12285-1 (buried) or NF EN 12285-2 (overhead)

### ARTICLE 5.2: ADDITIONAL PROVISIONS

- There must be no withdrawal point in the lower part.
- The tank must be equipped with a gauging device. Glass or plastic level tubes are prohibited.
- Any tank fitted with a filling connection must be fitted with a device to prevent the risk of overflowing during filling operations.

### NON-UNDERGROUND STORAGE

Article 11:

Tanks installed outdoors must be designed to store petroleum products outdoors. In particular, the opacity of the tank must be sufficient to prevent the characteristics of the petroleum product stored from deteriorating.

Article 12:

The receptacles or tanks must be equipped with a second waterproof envelope and be designed in such a way that it is possible to become aware of any loss of sealing of the interior envelope.

Article 13:

Depending on the overall storage capacity, a minimum distance must be respected between the wall of the tank and the nearest building:

- less than 2,500 liters: no distance is imposed.
- between 2,501 and 6,000 liters: 1 meter
- between 6,001 and 10,000 liters: 6 meters
- between 10,001 and 50,000 liters: 7 meters

### STORAGE ON THE GROUND FLOOR OR IN THE BASEMENT OF A BUILDING

Article 16.1 – Installation :

The tanks must be placed on a level masonry floor. The tanks must be fitted with a waterproof secondary fire-resistant enclosure.

Article 16.3 – Protection incendie :

The room where the storage facility is installed must be capable of being closed by a fire-resistant door: flame arresters of at least a quarter of an hour's degree. The walls as well as the upper and lower floors of the room must have a fire resistance: fire stop of degree at least half an hour.

Article 18:

The storage must be installed in an exclusive room if its overall capacity exceeds 2500 litres.

### UNDERGROUND STORAGE

Article 19:

Only the reinforced safety tanks mentioned in article 5 of this decree are authorized to be buried.



CAUTION

**A galvanized tank must not be used. A plastic tank can be used and must comply with standards (see above)**



NOTE

**Plastic tanks must be placed in a suitable and uniform manner on a flat and smooth surface, in continuity, that is to say the base all in contact with the ground.**

### 3.1.2 FUEL PIPES

Fuel supply pipes should be either copper or steel. Galvanized pipes or fittings should not be used.

Plastic oil supply pipe conforming to BS EN 14125 can be used for underground pipe runs, but must not be used above ground.

All soft copper pipe connections should preferably be made using flared fittings. If compression fittings are to be used, a suitable pipe insert must be fitted into the pipe end.

Soft soldered connections must NOT be used on oil supply pipework.

Fuel supply pipework should be of a suitable diameter, depending on the type of oil supply system being used. Refer to information given in sections 3.1.3, 3.1.4 or 3.1.5.

Run pipes as level as possible to prevent air being trapped. Take the most direct route possible from tank to burner whilst locating the pipe where it will be protected from damage.

Pipes should be supported to prevent sagging and sleeved where they pass through a wall.

A metal body fuel filter with a filtration size of no more than 50 µm (micron) or lower must be fitted in the oil supply pipe close to the tank. This should be fitted with sufficient clearance around and below it to allow easy access for maintenance.

An isolating valve should also be fitted at the tank, before the filter, to allow the oil supply to be shut off for the filter to be serviced.

A second filter (15 µm for Kerosene) must be located closer to the burner to protect the burner pump and nozzle from contamination. Refer to Figures 3-1 to 3-3.

A remote sensing fire valve must be installed in the fuel supply line in accordance with BS5410-1.

A fusible wheelhead type combined isolating/fire valve MUST NOT be used in place of a remote sensing fire valve.

The fire valve must be located outside; just before the oil line enters the building, with the fire valve sensor located above the burner. A spring clip for mounting the sensor is supplied fitted to the boiler, on the rear of the control panel.

The fire valve should be located after the second (15 micron) filter, i.e. between the filter and the point at which the oil line enters the building. Refer to Figures 3-1 to 3-3.

The fire valve must have an operating temperature of between 90 and 95°C to avoid unnecessary nuisance shut-offs to the oil supply.

A flexible fuel hose and ¼ isolating valve are supplied loose with the boiler, to make the final connection to the burner.

If a two-pipe system or deaerator is to be used, the deaerator must be fitted externally. A solid metal type can be fitted internally but must be vented to atmosphere externally. The following additional items will be required:

- Flexible fuel hose male x ¼ female (product code: RBS36 - 900 mm / product code: RBS36XS - 600mm)
- x ¼ BSP adaptor (product code: Z3003602)
- ¼ isolating valve (product code: ISOLATION1/4)

These are available to purchase from Grant Irl.

Metal braided flexible fuel hoses should be replaced ANNUALLY when the boiler is serviced.

Long life flexible fuel hoses should be inspected annually and replaced, if necessary, or after a maximum five years service life.

### 3.1.3 SINGLE PIPE (GRAVITY) SYSTEM - (REFER TO FIGURE 3-1)

Head A (m)	Maximum pipe run (m)	
	10 mm OD pipe	12 mm OD pipe
0.5	10	20
1.0	20	40
1.5	40	80
2.0	60	100

IF THE STORAGE TANK OUTLET IS AT LEAST 300 MM ABOVE THE LEVEL OF THE BURNER OIL PUMP, A SINGLE PIPE (GRAVITY) SYSTEM SHOULD BE USED.

The maximum height of the oil level above the burner oil pump when the tank is full, must not exceed four metres. If this height is exceeded, a pressure reducing valve must be fitted in the oil supply pipe between the tank and the burner oil pump.

The maximum length of pipe run from the tank to the burner is limited by the minimum head of oil (the height of the tank outlet above the burner oil pump).

### 3.1.4 TWO PIPE SYSTEM-(REFER TO FIGURE 3-2)

Height A (m)	Maximum hose length (m)	
	10 mm Diam ext.	12mm diam ext.
0	35	100
0.5	30	100
1.0	25	100
1.5	20	90
2.0	15	70
3.0	8	30
3.5	6	20

If the storage tank outlet is below the level of the burner oil pump, a two pipe (sub gravity) system can be used.

The return pipe should be at the same level as the tank outlet, between 75 to 100 mm above the base of the tank. The return pipe should be a sufficient distance from the tank outlet so as to prevent any sediment disturbed by the return entering the supply pipe from the tank.

A non-return valve should be fitted in the supply pipe, along with a fire valve and filters (refer to section 3.1.2 - fuel pipes). A non-return valve should also be fitted in the return pipe if the top of the tank is above the burner oil pump.

The maximum suction height (from the tank outlet to the level of the burner oil pump), must not exceed 3.5 metres.

The pump vacuum should not exceed 0.4 bar. Beyond this limit, gas is released from the oil.

For guidance on the installation of top outlet fuel tanks and suction supply pipe sizing, refer to OFTEC Technical Book 3: Storage and Supply, available for purchase from OFTEC.

If a two-pipe system is to be used, the following additional items will be required:

- Flexible fuel hose male x ¼ female (product code: RBS36 - 900 mm / product code: RBS36XS - 600mm)
- x ¼ BSP adaptor (product code: Z3003602)
- ¼ isolating valve (product code: ISOLATION1/4)

These are available to purchase from Grant IRL.



**IMPORTANT: If the oil supply piping is renovated with a twin-tube passage from the tank to the filter pot towards single-tube, then reduce the diameter of the copper piping.**



**The hoses must NOT be used outside the boiler. A metal bowl type filter pot with micron filter (consumable) must be installed on the oil supply line next to the boiler. This should be mounted leaving enough space around and below to service the filter. A shut-off valve must be installed before the filter pot to isolate it and allow its maintenance.**

**A second filter (10 to 15 µm requested by Grant) must be placed as close as possible to the burner to protect the pump and the burner nozzle from contamination. See Figures 3-1 through 3-3.**

**2 oil hoses with adapter and ¼" BSP isolation valve are supplied separately with the boiler for connection to the burner.**

**Braided metal hoses must be replaced annually when servicing the boiler. Long life hoses should be inspected annually and replaced at least every 60 months.**

**Grant IRL recommends TOC DUO type filter pots including an air separator.**



Refer to your oil tank supplier for any advice concerning the type of single-tube, two-tube oil supply, filter pot with separator, piping diameter, safety device, compliance with safety standards. Grant IRL cannot be held responsible for liability for a faulty fuel oil supply.

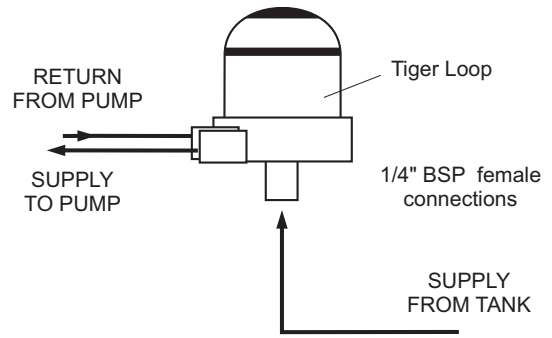


Figure 3-4: Tiger loop de-aeration device

Figure 3-2: Bitube oil supply

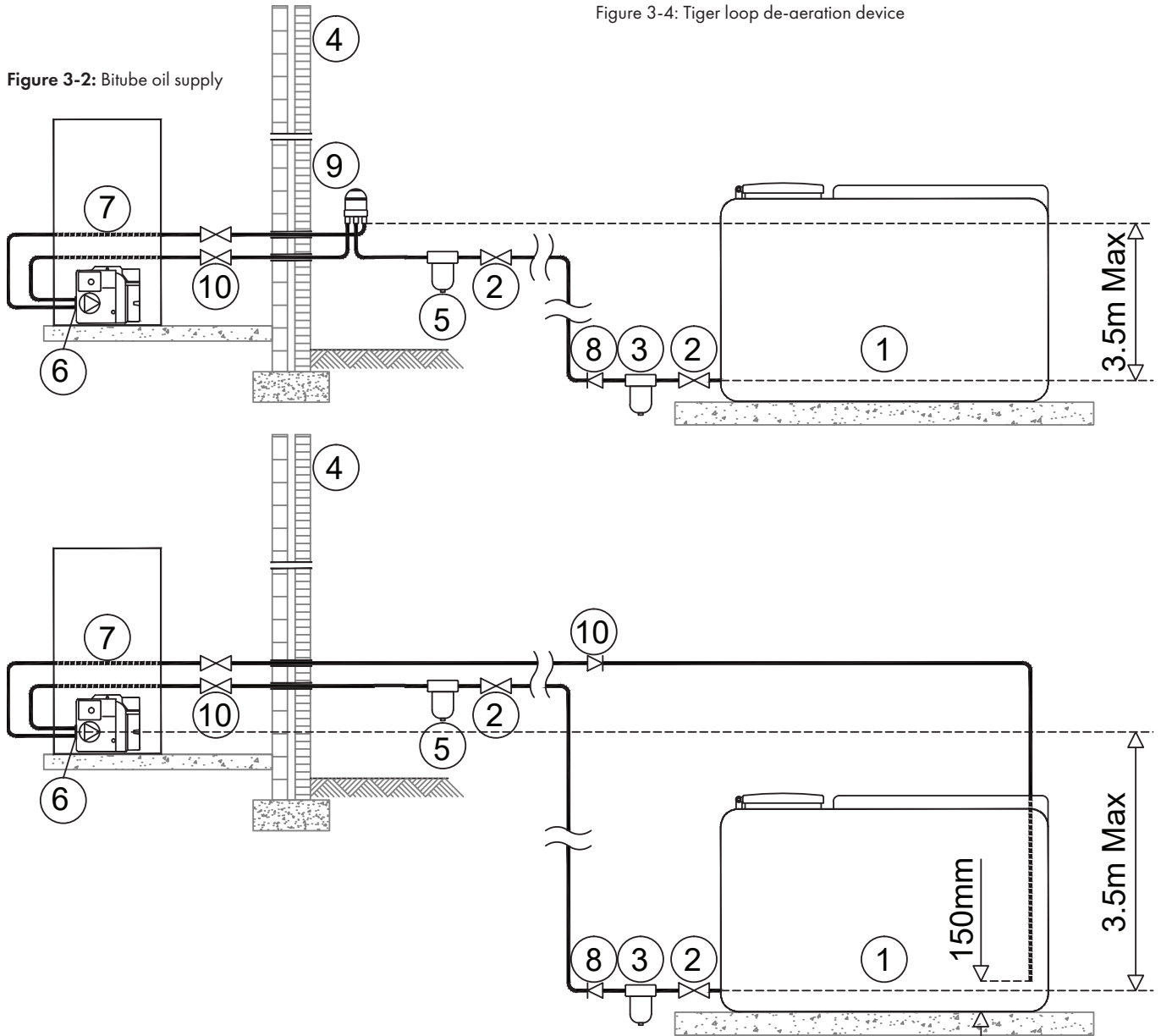


Figure 3-3: Supply with oil filter pot fitted with TOC DUO air separator

Number / item correspondence table diagrams fig 3-2/3-3

1	oil tank	exterior wall	7	burner
2	isolation valve	oil filter (max filtration 15µm)	8	non-return valve
3	oil strainer	oil pump	9	air separator
			10	boiler isolation valves

\* Position of de-aeration device must be level with or above the oil pump

\* The air separator must be positioned at the level of the oil pump or placed above

### 3.2 CONNECTING OIL SUPPLY TO THE BURNER IN SINGLE TUBE OR IN TWIN-TUBE.



The plug mounted in the intake (suction) port of the oil pump is made of plastic and does not provide an oil seal when the pump is running. Make sure that the oil supply from the tank is connected to this port and that the plastic plug is discarded.

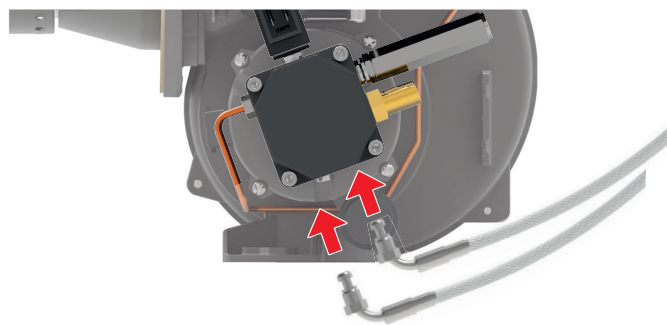
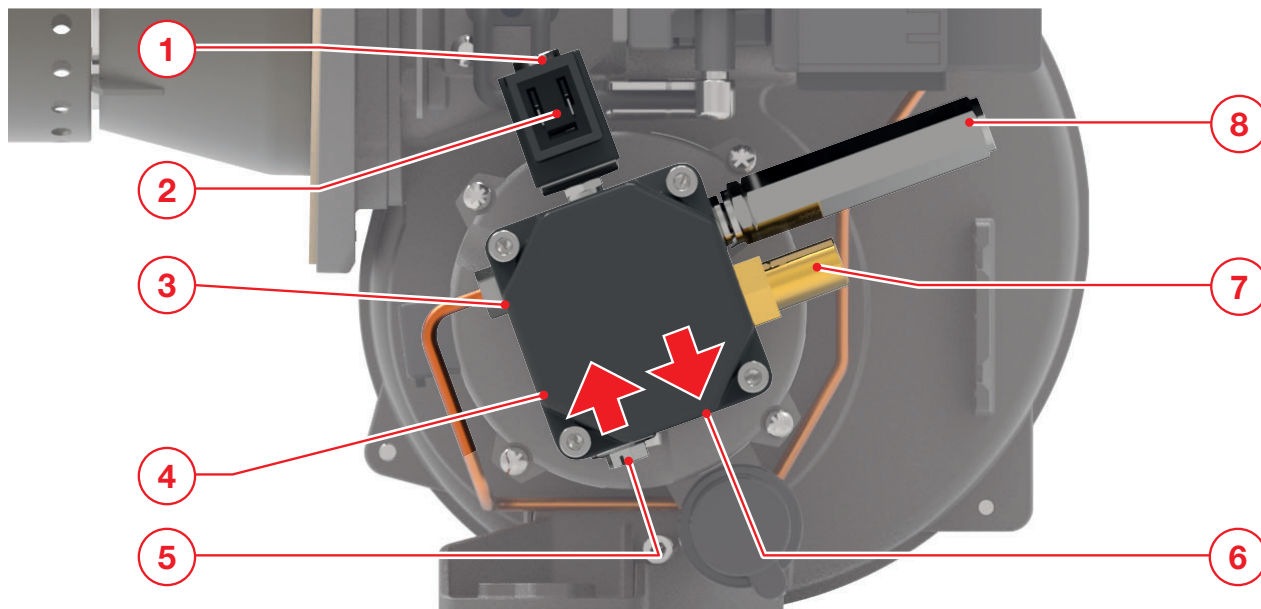


Figure 3-4: Two-pipe system (standard)



See figure 3-4.5.6

To facilitate access to the burner oil pump connections, the burner must be removed from the boiler as follows:

1. Remove the burner cover in white plastic.
  - Models 18kw, 24kw and 32kw: Unscrew and remove the 2 fixing screws of the white burner cover and remove the burner cover.
2. Unscrew and remove the single burner fixing nut from the burner flange stud (at the top of the burner) using a 13 mm wrench. Save the fixing nut to reassemble the burner.
3. Carefully remove the burner from the boiler

### 3.3 MAIN COMPONENTS OF THE BURNER

With all Grant Vortex Boilerhouse Combi, the burner and the boiler are supplied together but in separate boxes.

Install the burner on the boiler as follows:

1. Remove and save the bolt fixing nut on the burner flange at the front of the boiler.
2. Check that the O-ring around the burner combustion head collar is in place.
3. Mount the burner on the boiler by sliding the combustion head into the hole in the center of the mounting flange. Place the mounting bracket (on top of the burner) on the mounting bolt.
4. With the burner level and properly placed in the mounting flange, attach the nut (previously removed) to the mounting bolt and tighten with a 13mm wrench.

Figure 3-6: CUENOD pump description

Item	Description
1	Fuel solenoid valve
2	Electrical connection of the solenoid valve
3	Fuel supply hose
4	Connection of the vacuum pressure gauge
5	Suction connection
6	Return connection
7	Fuel pressure regulator
8	Fuel pressure gauge connection



The pump has a suction filter and a fuel pressure regulator. Before putting the equipment into service, connect pressure gauges to measure the vacuum.



Before starting the burner, check that the return pipe is open. Any obstruction could damage the pump seal.

# 4 INSTALLATION INFORMATION

## 4.1 INTRODUCTION

1. The Grant Vortex Boilerhouse Combi boiler models are supplied in two boxes:

- one containing the boiler and
- the other the burner, the condensate trap.

2. Carefully remove the packaging from the boiler and unpack the box containing the other elements.

## 4.2 LOCATION OF THE BOILER

The boiler must rest on a firm, level and non-combustible ground capable of supporting the weight of the boiler when it is in water. Refer to chapter 2.1 to check the weights of the boiler to be installed. It does not require a special hearth as the temperature of the boiler base is less than 50°C.

Sufficient clearance must be allowed at the front of the boiler to remove the burner and the smoke baffles for maintenance.

## 4.3 COMPLIANCE WITH REGULATIONS

Installation of a Grant Vortex boiler must be in accordance with the following recommendations:

- Building Regulations, national and european and the Building Standards issued by the Department of the Environment and any local Byelaws which you must check with the local authority for the area.
- Model and local Water Undertaking Byelaws.
- Applicable Control of Pollution Regulations.
- National Building Regulations and any local Byelaws.
- Model Byelaws and the Water Supply Regulations.
- The following OFTEC requirements:
  - OFS T100 Polythene oil storage tanks for distillate fuels.
  - OFS T200 Fuel oil storage tanks and tank bunds for use with distillate fuels, lubrication oils and waste oils.Further information may be obtained from the OFTEC Technical Book 3 (Installation requirements for oil storage tanks) and OFTEC Technical Book 4 (Installation requirements for oil fired boilers).

The installation should also be in accordance with the latest edition of the following National Standard Codes of Practice (and any relevant amendments):

- BS 5410-1: 2019 (Code of practice for liquid fuel firing. Installations for space heating and hot water supply purposes for domestic buildings)
  - This standard covers domestic installations up to 70kW.
- BS 5410-2: 2018 (Code of practice for liquid fuel firing. Non-domestic installations)
  - This standard should be followed with regard to installations with an output capacity in excess of 70kW.
  - Where the combined outputs of multiple appliances located together at a domestic dwelling exceed 70kW then then a dedicated plant room as specified in BS 5410-2 is recommended.
- BS EN 12828 (Heating systems in buildings. Design for water-based heating systems)
- BS EN 12831-1 (Energy performance of buildings. Method for calculation of the design heat load)
- BS EN 14336 (Heating systems in buildings. Installation and commissioning of water based heating systems)
- BS 7593 (Code of Practice for treatment of water in domestic hot water central heating systems)
- BS 7671 (Requirements for Electrical installations, IET Wiring Regulations)
- BS 7291 (Thermoplastics pipe and fitting systems for hot and

cold water for domestic purposes and heating installations in buildings. General requirements)

- BS 7074-1 (Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems. Code of practice for domestic heating and hot water supply)
- BS 2869 (Fuel oils for agricultural, domestic and industrial engines and boilers. Specification)



NOTE

**A removable section of worktop above the boiler is required to provide access for servicing.**



NOTE

**Failure to install and commission appliances correctly may invalidate the boiler guarantee.**



WARNING

**BS5410-1: 2019 requires that appliances located in a building or structure or within a restricted area externally should have a CO detector conforming to BS EN 50291-1 installed in the same room/space.**

## 4.4 HEATING SYSTEM DESIGN CONSIDERATIONS



WARNING

**Before starting any work on the boiler or fuel supply, please read the Health and Safety information given in Section 15.**

To achieve the maximum efficiency possible from the Grant Vortex boiler, the heating system should be designed to the following parameters:

### RADIATORS:

- Flow temperature 70°C
- Return temperature 50°C
- Differential 20°C

Size radiators with a mean water temperature of 60°C.

Design system controls with programmable room thermostats or use weather compensating controls to maintain return temperatures below 55°C.



NOTE

**The boiler should not be allowed to operate with return temperatures of less than 40°C when the system is up to temperature.**

The use of a pipe thermostat is recommended to control the return temperature when using weather compensating controls.

### UNDERFLOOR:

- Flow temperature 50°C
- Return temperature 40°C
- Differential 10°C

In underfloor systems, it is essential that the return temperature must be maintained at or above 40°C to prevent internal corrosion of the boiler water jacket.

Refer to Section 2.5 for the size and type of the connections and Section 5 for the position of the connections.

## OPEN VENTED SYSTEMS:



NOTE

**The presence of 'pumping over' in an open vented heating system connected to the Grant Vortex boiler will invalidate the product guarantee.**

Open vented systems must be correctly designed and installed. The open safety vent pipe must be positioned to prevent 'pumping over' (i.e. the discharge of water from the open safety vent pipe into the feed and expansion cistern under the pressure created by the circulator). Failure to do so can cause oxidization to occur and invalidate the warranty. For detailed information on the correct design of open vented heating systems, and the correct location of the open safety vent pipe, refer to the CIBSE Domestic Heating Design Guide and OFTEC Technical Book 4 (Installation).

## 4.5 PIPEWORK MATERIALS

The Grant Vortex boiler is compatible with both copper and plastic pipe. Where plastic pipe is used it must be of the oxygen barrier type and be the correct class (to BS 7291-1) for the application concerned.

On either sealed or open-vented systems; where plastic pipe is used a minimum of ONE metre of copper pipe (or as per pipe manufacturers instructions) MUST be connected between both the boiler flow and return connections and the plastic pipe.



NOTE

**Do not connect plastic pipe directly to the boiler.**

Grant IRL does not accept any responsibility for any damage, however caused, to plastic piping or fittings.

## SEALED SYSTEMS

If plastic pipe is to be used, the installer must check with the plastic pipe manufacturer that the pipe to be used is suitable for the temperature and pressures concerned.

Plastic pipe must be Class S to BS 7291-1.



WARNING

**When plastic pipe is used, the system MUST incorporate a low pressure switch to shut off power to the boiler if the system pressure drops below 0.2 bar. A suitable low pressure switch kit is available to purchase from Grant IRL (product code: ZPRESSURESWITCH).**

## UNDERFLOOR PIPEWORK

Plastic pipe may be used on underfloor floor systems where the plastic pipe is fitted after the thermostatic mixing valve. Copper tube must be used for at least the first metre of flow and return primary pipework between the boiler and the underfloor mixing/blending valves.

## 4.6 CONNECTIONS

### 4.6.1 FLOW AND RETURN CONNECTIONS

Refer to Section 5.

### 4.6.2 CONDENSATE CONNECTION

Grant Vortex boilerhouse combi boilers are supplied with a factory-fitted condensate trap to provide the required 75 mm water seal in the condensate discharge pipe from the boiler.

Refer to Section 6 for details of the condensate disposal pipework.

### 4.6.3 DRAIN COCK

A drain cock is fitted at the bottom on the front of the boiler to allow the heating system to be drained.

## 4.7 PREPARATION FOR INSTALLATION

1. Carefully remove the packaging from the boiler and remove it from the transit pallet.
2. Pull the front panel forward at the top to disengage the fixing clips then lift it up and off the boiler. Remove the literature pack.
3. Lift off the case top panel(s) and remove the water connecting fittings.

## 4.8 INSTALLING THE BOILER

1. Having decided upon the position of the boiler and type of flue, prepare the wall as described in Section 9. Ensure that the flue terminal position complies with the necessary clearances.
2. Make the water connections as described in Section 5. If access will be restricted, make any connections to the boiler before placing it in its final position. Refer to Section 7 if the boiler is to be used on a sealed system. Ensure the requirements are met for the disposal of condensate as described in Section 6.
3. Connect the power supply as described in Section 8.
4. Connect the flue and ensure there is an adequate air supply as described in Section 9.

## 4.9 FILLING THE HEATING SYSTEM

Refer to Section 7.2 (Filling the Sealed System)

## 4.10 BEFORE COMMISSIONING

To avoid the risk of contamination of dirt and foreign bodies in the boiler, the entire heating network must be completely flushed before the boiler is connected, then again after the heating circuit has been heated for the first time and either still hot. This is particularly important when the boiler is used with an existing heating installation.

**IMPORTANT:** For optimal performance after installation, this boiler and its associated heating circuit must be emptied in accordance with the guidelines given for water treatment in hot water central heating systems. This involves the use of a heating circuit cleaner.

After cleaning, it is extremely important that all traces of the cleaning agent are carefully removed from the circuit (abundant rinsing).

For long-term protection against corrosion and scale, it is recommended, after washing, to use an inhibitor in accordance with the recommendations.

If the boiler is installed in a garage or outside, if frost protection conditions are not guaranteed or if the boiler is left off during the heating period (holiday home, etc.) in order to provide additional protection in the event of a power failure in cold weather, an antifreeze and a corrosion inhibitor must be combined (MGP Neutragard type, Sentinelle X500 or equivalent, it must include inhibitors).

Failure to follow these guidelines will void the warranty.



**Grant IRL strongly recommends installing a Grant Mag One magnetic filter (or equivalent \*) in the piping of the heating installation. This must be installed and regularly maintained in accordance with the filter manufacturer's instructions.**

**\* As measured by Gauss. The MagOne magnetic filter has a Gauss value of 12000.**

## 4.11 END OF THE WORKS

1. Please make sure that the BOILER PASSPORT - report commissioning the installation supplied with the boiler - is completely filled.
2. Leave a copy for the user
3. Keep a copy.
4. Make sure that the user manual (supplied with the boiler) is given to the owner or user of the boiler.
5. Inform the user of the operation of the boiler, boiler controls, heating controls and safety devices.
6. Make sign at the bottom of the last page of the User manual to validate that the user training has been carried out.

If several heating starts, the use of a primary boiler circulator associated with a separating bottle is highly recommended add. 4-way hydraulic modules are recommended by GRANT.

Refer to chapter 2.5 for the size and type of the connections and to chapter 5 for the position of the connections.

## 4.12 HEATING CIRCUITS WITH UNDERFLOOR HEATING

In heating circuits with floor heating transmitters, it is essential that the boiler return temperature is maintained above 40 ° C to avoid internal corrosion of the boiler's heating body. (see pdf: REGULATION GRANT 850i4)

## 4.13 UNDERFLOOR PIPING

If PER BAO or MULTI-LAYER plastic pipes can be used for underfloor heating, copper pipes must be used for at least the first flow meter return from the primary piping between the boiler and the underfloor mixing valves.

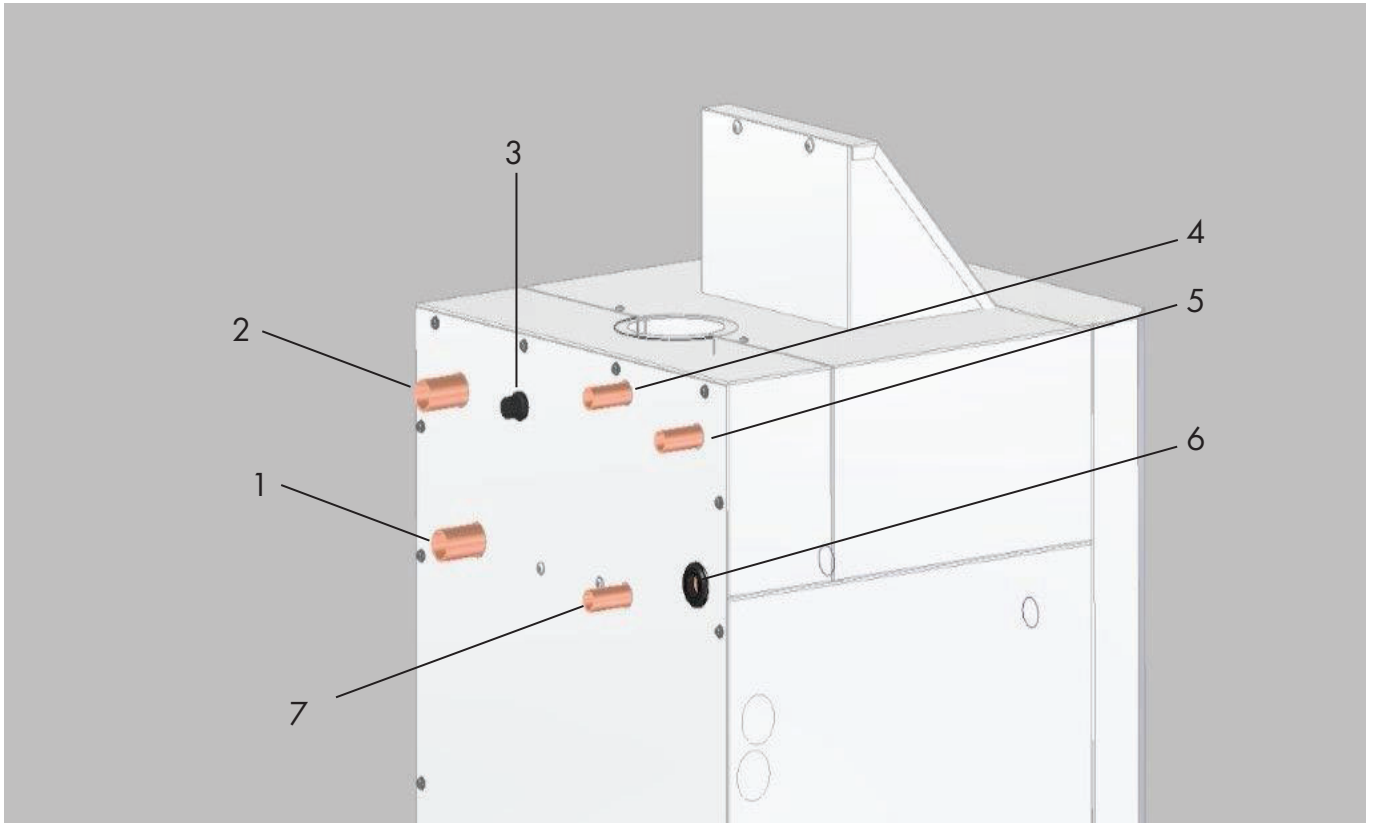


**The first meter of piping connected to both the boiler heating flow / return circuit must be made of copper on all types of circuits - with closed vessel or open vessel.**



**The boiler must not be allowed to operate with return temperatures below 40 ° C when the heating circuit is in normal operating mode (after ignition and T ° rise of the boiler with heating of the circuits)**

## 5 PIPE CONNECTIONS



**Figure 5-1:** Pipe connections for 18kW 24kW & 32kW

Item	Description
1	Heating Return (22mm copper)
2	Heating Flow (15mm copper)
3	High Limit Stat Reset
4	Direct Hot Water-OUT
5	Pressure Release Valve (15mm copper)
6	Cable Entry
7	Cold Mains

# 6 CONDENSATE DISPOSAL

## 6.1 GENERAL REQUIREMENTS

When in condensing mode the Grant Vortex Boilerhouse Combi boilers produce condensate from the water vapour in the flue gases.

This condensate is moderately acidic with a pH value of around 3.27 (similar to orange juice).

Provision must be made for the safe and effective disposal of this condensate.

Condensate can be disposed of using one of the following methods of connection:

### Internal connection (preferred option)

- into an internal domestic waste system (from kitchen sink, washing machine, etc.)
- directly into the soil stack

### External connection

- into an external soil stack
- into an external drain or gully
- into a rainwater hopper (that is part of a combined system where sewer carries both rainwater and foul water)
- purpose made soakaway

All condensate disposal pipes must be fitted with a trap - whether they are connected internally or externally to a domestic waste system/soil stack or run externally to a gully, hopper or soakaway.

## 6.2 CONNECTIONS

Connections into a rainwater hopper, external drain or gully should be terminated inside the hopper/drain/gully below the grid level but above the water level.



**Condensate disposal pipes must not be connected directly into rainwater downpipes or to waste/soil systems connected to septic tanks.**

Condensate should not be discharged into 'grey water' systems that re-use water used in the home (not including water from toilets).

It should be noted that connection of a condensate pipe to the drain may be subject to local Building Control requirements.

## 6.3 PIPEWORK

Condensate disposal pipework must be plastic (plastic waste or overflow pipe is suitable).



**Copper or steel pipe is NOT suitable and MUST NOT be used.**

NOTE

Condensate disposal pipes should have a minimum 'nominal' diameter of 22 mm (3/4) - e.g. use 21.5 mm OD polypropylene overflow pipe.

Condensate disposal pipes must be fitted with a fall (away from the boiler) of at least 2.5° (~45 mm fall per metre run).



**Where it is not possible for the pipe to fall towards the point of discharge - either internally into a waste system or externally to a gully (e.g. for boilers installed in a basement), it will be necessary to use a condensate pump.**

NOTE

Condensate disposal pipes should be kept as short as possible and the number of bends kept to a minimum.

Pipes should be adequately fixed to prevent sagging, i.e. at no more than 0.5 metre intervals.

## 6.4 EXTERNAL PIPEWORK

Ideally, external pipework, or pipework in unheated areas, should be avoided. If unavoidable, external pipework should be kept as short as possible (less than 3 metres) and 32 mm waste pipe used to minimise the risk of ice blocking the pipe in freezing conditions.

The number of bends, fittings and joints on external pipes should be kept to a minimum to reduce the risk of trapping condensate.



**For boilers installed in an unheated area such as a loft, basement, outhouse or garage, all condensate pipework should be as 'external'. The pipework should be insulated using suitable waterproof and weather resistant insulation.**

NOTE

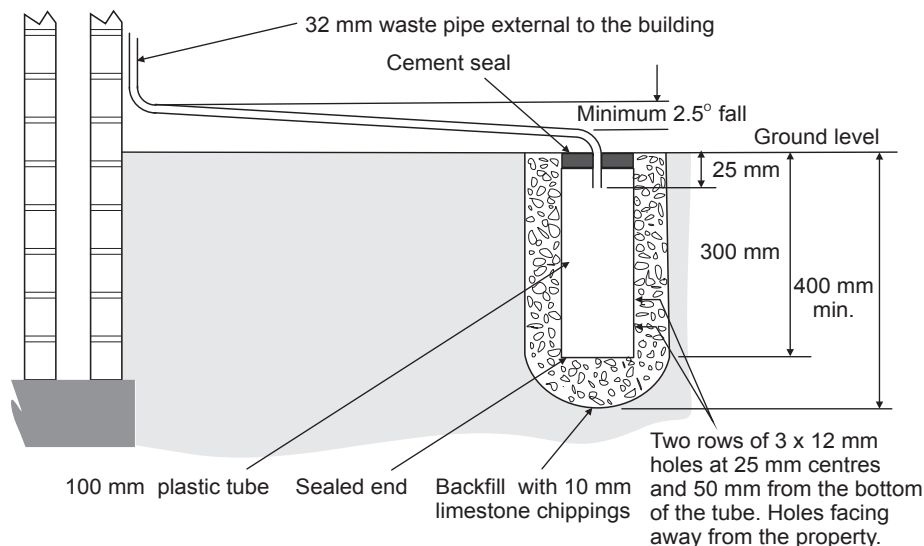


Figure 6-1: Purpose made condensate soakaway



NOTE

**Access must be available to allow easy maintenance**

## 6.5 CONDENSATE SOAKAWAY

To keep external pipework to a minimum, locate the soakaway as close as possible to the boiler but ensure it is at least 500 mm from building foundations and away from other services, e.g. gas, electricity, etc.

The condensate pipe may be run above or below ground level and can enter either the top or side of the soakaway tube. Refer to Figure 6-1.

Ensure that the drainage holes in the soakaway tube face away from the building.

Backfill both the soakaway tube, and the hole around it, with 10 mm limestone chippings.

Only use a soakaway where the soil is porous and drains easily. Do not use in clay soils or where the soil is poorly drained.



CAUTION

**Any damage due to condensate backing up into the boiler due to a high water table, in the case of a soakaway, or flooded drains when the condensate disposal is via a gulley or soil stack, is not covered by the Grant product guarantee.**

## 6.6 CONDENSATE TRAP

Grant vortex boilerhouse combi boilers are supplied with a condensate trap to provide the required 75 mm water seal in the condensate discharge pipe from the boiler.

The condensate trap is factory fitted inside the boiler casing - mounted on the inside of the left hand side panel - in an accessible position to allow for routine maintenance.



NOTE

**If required, this condensate trap may be re-located outside the boiler casing. Refer to the procedure given in Section 6.9. This procedure must be carried out before the boiler is installed.**

## 6.7 DISPOSAL OF CONDENSATES

The outlet of the siphon requires a polypropylene pipe with an outside diameter of 21.5 to 23mm for the condensate drain pipe. Possible routes for the evacuation pipes.

The boiler casing has several 35mm diameter openings on the sides and on its base. These are designed to allow the passage of piping, depending on the installation. These openings can be used to allow the condensate drain pipe to exit the housing in one of the following ways:

Side outlet -

The lower openings on each side of the casing can allow the installation of the condensate drain pipe as follows:

- Connection to the sewer inside the building by passing through the wall of the house.
- Connection to the sewer outside next to the boiler
- Discharge into an adjacent drain or ditch
- Discharge to a sump with drainage pipe passing above or below ground level.

## 6.8 INSPECTION AND CLEANING OF TRAP

The trap must be checked at regular intervals (e.g. on every annual service) and cleaned as necessary to ensure that it is clear and able to operate.

The bottom bowl can be unscrewed from the trap body for inspection and cleaning.

To inspect and clean the trap:

1. Disconnect flexible condensate hose from inlet connector.
2. Unscrew the inlet connection nut.
3. Remove the inlet connector and nut from trap.
4. Disconnect the condensate disposal pipe from the trap outlet.
5. Remove trap from bracket.
6. Remove float from trap – clean if necessary.
7. Inspect inside of trap and clean as necessary.
8. Check the condition of the flexible condensate hose between the trap and the boiler.
9. Re-assemble trap, re-fit to boiler and re-connect flexible hose. Ensure that hose is fully pushed onto the trap inlet connector.



**Failure to regularly check and clean the condensate trap may result in damage to the boiler and will not be covered by the product guarantee.**



**When connecting a plastic drain hose, make sure that the hose is fully inserted into the outlet end of the flexible hose to prevent possible leakage.**

## 6.9 EXTERNAL CONDENSATE TRAP FITTING



**This process is carried out before the boiler is installed.**



**The top of the siphon must be installed below the condensate outlet of the boiler.**

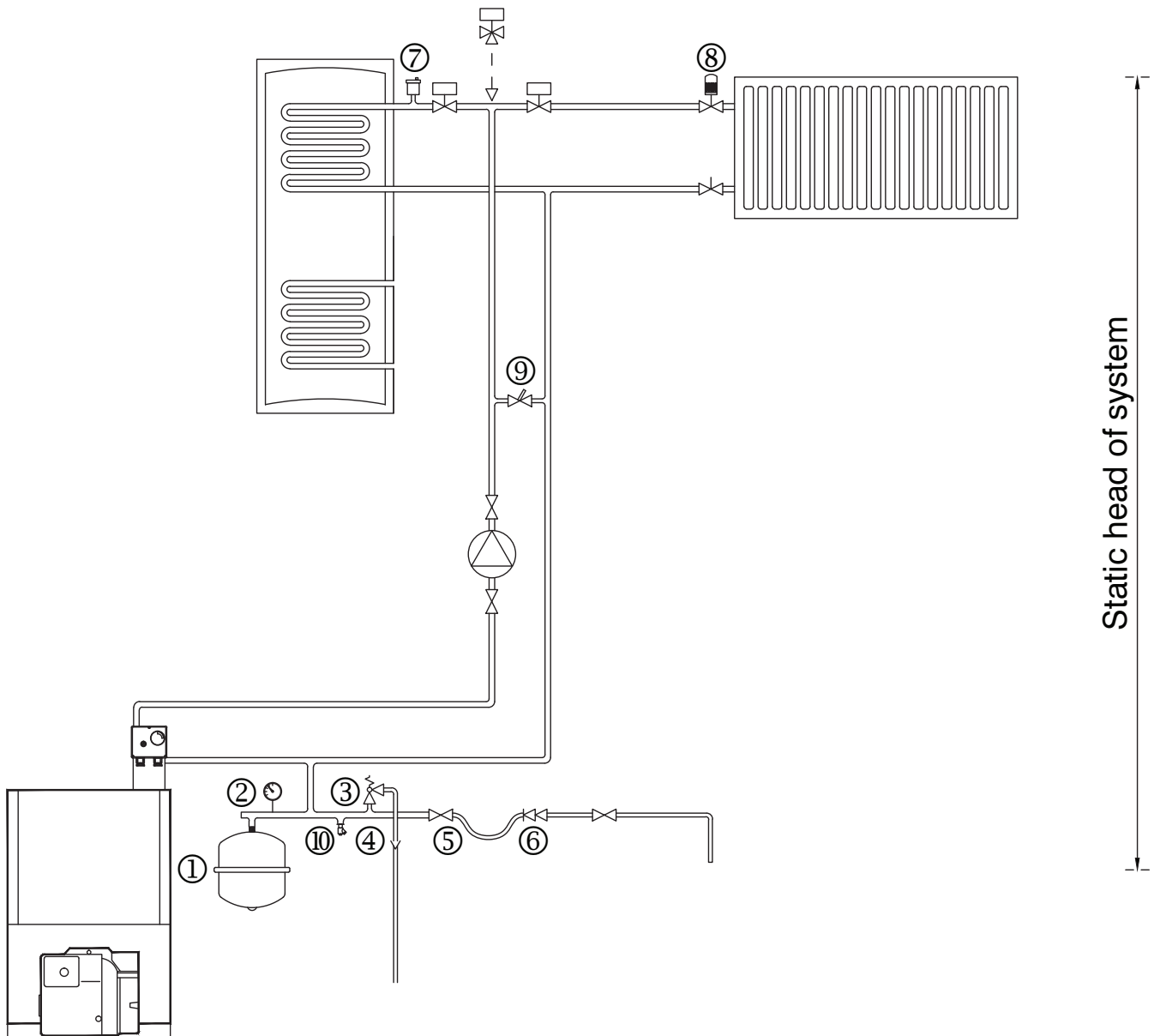


**The flexible hose must keep a slope of 2.5 ° minimum (4%) permanently from the boiler outlet to the summit of the siphon.**

To re-locate the factory-fitted trap outside the boiler casing, use the following procedure:

1. Remove both the top casing panel(s) from the boiler.
2. Unscrew and remove the screws securing the bottom of the rear panel to the base tray of the boiler casing. This must be done before fitting of the boiler as the screws are in-accessible otherwise.
3. Grip the top of the rear panel and pull it upwards. Slide it all the way up and out of the channels on the rear edge of the two casing side panels to remove it from the boiler. Refer to Figure 6-3.
4. Push out pre-cut 'knock-out' from condensate outlet hole in rear of left side casing panel.
5. Disconnect condensate discharge hose from heat exchanger and condensate trap and remove it from the boiler.
6. Replace with condensate trap hose (Grant product code: ZCONHOSE2646).
7. Pass the straight connector end of the hose through the new hole in the left hand casing panel. Push the straight connector firmly onto the condensate outlet connection of the condensing heat exchanger as far as possible.
8. Refit the rear casing panel. Ensure that both edges of the rear panel are correctly located into the channels in the rear edge of both side casing panels. Then carefully slide the rear panel fully down until the top edges is level with the top edges of the side panels.
9. Secure the bottom of the rear panel to the base tray with the screws previously removed.
10. Remove the trap from the mounting bracket.
11. Unscrew and remove the trap mounting bracket from the left side panel.
12. Fix the trap mounting bracket to the wall adjacent to the boiler in the required position.
13. Re-fit the trap to the mounting bracket. The mounting bracket supplied with the trap must be used - the trap should not be supported by the condensate pipework only.
14. Connect the flexible condensate hose to the trap - pushing the right angle hose connector onto the trap inlet connection

# 7 SEALED SYSTEM



**Figure 7-1:** Heating system with closed expansion vessel

**Figure 7-2:** Correspondence table n ° / parts in Figure 7.1

Key	
1	Expansion vessel
2	Manometer
3	Safety valve 3b
4	Distributor
5	Backflow preventer (here flexible + double check valve)
6	Double check valve
7	Automatic air vent
8	Thermostatic radiator valve
9	Differential valve
10	Installation drain

## 7.1 SEALED SYSTEM REQUIREMENTS

All Grant Vortex Boilerhouse Combi models are suitable for use with sealed systems complying with the requirements of BS EN 12828, BS EN 12831 and BS EN 14336.

The system must be provided with the following items:

- Diaphragm expansion vessel complying with BS EN 13831
- Pressure gauge
- Pressure relief (safety) valve
- Approved method for filling the system

### 7.1.1 EXPANSION VESSEL

The expansion vessel should be fitted in the return pipework as shown in Figures 7-1 and 7-2. To reduce the operating temperature of the expansion vessel, position it below the pipe to which it is connected.

The expansion vessel may be positioned away from the boiler, providing the connecting pipe is not less than 13 mm in diameter. If the expansion vessel is connected via a flexible hose, care must be taken to ensure that the hose is not twisted or kinked.



NOTE

**Ensure that the expansion vessel used is of sufficient size for the system volume.**  
**Refer to BS 7074-1 or The Domestic Heating Design Guide for sizing the required vessel. A undersized expansion vessel may invalidate the warranty.**

### 7.1.2 PRESSURE GAUGE

The pressure gauge must have an operating range of 0 to 4 bars. It must be located in an accessible location next to the system filling loop.

### 7.1.3 PRESSURE RELIEF (SAFETY VALVE)

The pressure relief (safety) valve should be fitted in the flow pipework near to the boiler.

The pipework between the pressure relief (safety) valve and boiler must be unrestricted, i.e. no valves. The pressure relief (safety) valve should be connected to a discharge pipe which will allow the discharge to be seen, but cannot cause injury to persons or damage to property.

### 7.1.4 FILLING / DISCONNECTOR

Arrangements must be made to replace the water lost from the installation.

The departmental health regulations provide in Article 16.3 to provide for a cut-off or a disconnection tank between the drinking water network and the closed circuit of the heating installation. The sets of protection against potentially polluted water returns are defined in standard NF EN 1717 for heating systems with a single exchanger with a calorific power of less than 70kW, a backflow preventer is used, with areas of reduced pressure that cannot be controlled type CA).

"... Heat emitters, when technically possible, must be provided, at the owner's expense, with regulating devices depending on the interior temperature of the room, in particular thermostatic valves in working condition" - According to the " decree of May 30, 2016 taken for application of article 131-4 of the decree of April 23, 2012.

### 7.1.5 HEATING SYSTEM

The maximum set temperature of the central heating water is 75 ° C. See chapter 1.1.

An automatic air vent must be installed in the flow and return piping lines from the highest point of the system.

If thermostatic valves are installed on all radiators, an automatic type differential valve must be installed.

All fittings used in the system must be able to withstand pressures of up to 3 bar. Thermostatic radiator valves must comply with the requirements of standard NF EN215.

One or more drain valves must be used to allow the circuit to drain completely. (one on low boiler and one on low heating installation)

### 7.2 FILLING THE INSTALLATION WITH CLOSED EXPANSION VESSEL

The air vent (s) are installed on top of the boiler (see Figure 7-2). Check that the small cap on top of each trap is screwed in completely, then unscrew it one full turn - the cap now remains in this position. The procedure for filling the installation with a closed vessel is as follows:

1. Fill the heating circuit with water only when it is cold and the boiler is off. Do not overfill.
2. Make sure that the supplied filling kit is connected and that the double stop valve connecting it to the drinking water network is closed. Attention, the installation of a standard backflow preventer is recommended.

The valve is open when the control lever is parallel with the valve body and closed when the latter is perpendicular to the latter.

3. Open the fill valve.
4. Gradually open the double valve of the water supply network until water flows out.
5. When the pressure gauge indicates a value between 0.5 and 1.0 bar, close the valve.
6. Bleed each radiator in turn, starting at the bottom of the installation, to exhaust the air.
7. Continue to fill the installation until the pressure gauge indicates a value between 0.5 and 1.0 bar. Close the filling valve.
8. Repeat steps 4 and 5 if necessary.
9. Close the filling valve on each side of the filling loop and disconnect the loop. (or otherwise close the backflow preventer)

### 7.3 PURGE OF THE PUMP (ON HEATING PUMP, OR PRIMARY PUMP OR DHW PUMP)

However in many cases, it is important to mount a primary pump (between Boiler and pressure case bottle)

It is important that the pump is properly vented to prevent it from running dry, heating and damaging its bearings. The procedure is as follows:

1. Remove the cap, then unscrew and remove the cap screw in the center of the pump.
2. Using an appropriate screwdriver, rotate approximately one turn.
3. Replace the pump cap and cap.

### 7.4 SAFETY VALVE 3B

The operation of the safety valve must now be checked and adjusted. The procedure is as follows:

1. Check the operation of the safety valve (see Figure 7-2) by

turning the head counterclockwise until you hear a click. The click is the head of the safety valve lifting its seat, allowing water to escape from the system.

2. Check that water is escaping from the circuit.
3. Continue to fill the system until the pressure gauge indicates between 0.5 and 1.0 bar.
4. Close the filling valve and check the balance of the installation, correcting if necessary.
5. Water can be drained from the installation by manually operating the safety valve until the desired pressure is reached. The pressure of the cold installation must be between 0.5 bar and 1.0 bar. The pressure is equivalent to the maximum static height in bars + 0.3 (1 bar = 10.2 meters of water), where the static height corresponds to the vertical height between the center of the expansion tank and the most top of the installation.

Now close the valves on each side of the filling loop and disconnect the loop. Or close the backflow preventer.

# 8 ELECTRICAL CONNECTIONS



WARNING

**Ensure that the electrical supply has been isolated before making any connections to the boiler.**

## 8.1 GENERAL

Grant Vortex boilerhouse combi models require a ~230V 1ph 50Hz supply. It must be protected by a 5 Amp fuse.

Refer to Figures 8-1 and 8-2 for typical control system wiring diagrams for all models.



WARNING

**The Vortex boiler contains electrical switching equipment and must be earthed.**

The supply must be fused at 5 Amp and there must only be one common isolator for the boiler and control system, providing complete electrical isolation.

A fused double pole switch or a fused three pin plug and shuttered outlet socket should be used for the connection.

The power supply cable should be at least 0.75 mm<sup>2</sup> PVC as specified in BS 6500, Table 16.

All the wiring and supplementary earth bonding external to the boiler must be in accordance with the current IET Wiring Regulations.

Any room thermostat or frost thermostat used must be suitable for use on mains voltage.

In the event of an electrical fault after installation of the boiler, the following electrical system checks must be carried out:

- Short circuit
- Polarity
- Earth continuity
- Resistance to earth



NOTE

**If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.**

## 8.2 CONNECTING THE POWER SUPPLY

It is recommended that the boiler should be connected to a switched mains power supply from a programmer or control system.

A three core cable is required to connect the boiler terminal block to the live supply.

Refer to Figures 8-1 for typical control system wiring diagram.



NOTE

**Ensure that the route and length of the supply cable is such that the boiler front cover plate can be easily removed without disconnecting the supply cable from the terminal block**

The procedure is:

1. Lift off the boiler case top panel, if it has not already been removed.
2. Remove the top of the control panel and open the cable clamp. Route the supply cable through the hole in the rear panel (using the grommet supplied) up to the control panel, pass it through the cable clamp and connect to the boiler terminal as follows:
  - Brown to live (terminal 1)
  - Blue to mains neutral (terminal 2)
  - Green/Yellow to mains earth (terminal 3)



NOTE

**Ensure that the wire link, between terminals 5 and 8 on the boiler terminal block is fitted.**

1. Make the remaining required connections to the control panel, as detailed in Figures 8-1 and 8-2.
2. Secure the cable in the cable clamp.
3. Place the wiring cover in position over the terminal block, taking care not to trap any wires and secure in position with the two M4 screws provided.
4. Ensure that all external wiring is adequately supported.



WARNING

**After completing electrical connections and before reconnecting the electrical supply to the boiler, replace the terminal block cover and secure it using the screws provided.**

5. Re-connect the electrical supply and check operation of heating system controls (programmer, room thermostats, etc.).
6. Refer to Instructions provided with the programmer for operation and setting.
7. Leave the Programmer and Thermostat Instructions with the user after installation for their future reference.

## BURNER LEAD PLUG/SOCKET CONNECTOR

On all models, the electrical cable between the boiler control panel and burner is now fitted with an in-line 3-way plug and socket connector. This enables the burner to be easily disconnected from the boiler control panel for ease of removal and servicing.

## 8.3 FROST PROTECTION

For additional protection of either the entire heating system, or the boiler and localised pipework, it is recommended that a frost thermostat be installed.

Refer to Figures 8-1 and 8-2 (as appropriate) for connection details.

To protect the heating system, the frost thermostat should be sited within the house in such a place that it can detect any rise and fall in the ambient air temperature, i.e. in a room with a radiator.

Where the frost thermostat is installed outside the house (to protect a boiler installed in an external boiler room or garage) or in an attic, it is recommended that it be used in conjunction with a pipe thermostat to avoid unnecessary and wasteful overheating of the property.

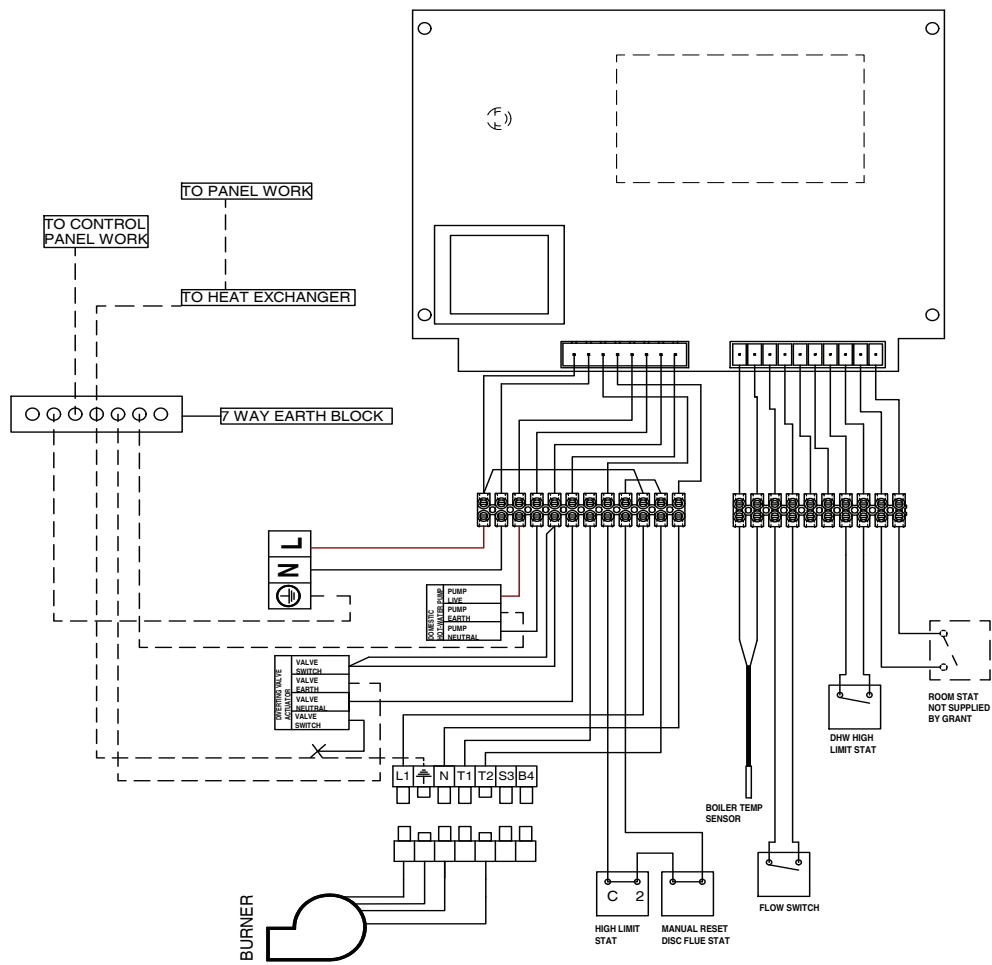
The pipe thermostat should be located on the boiler return pipe, and set to operate at 25°C.



NOTE

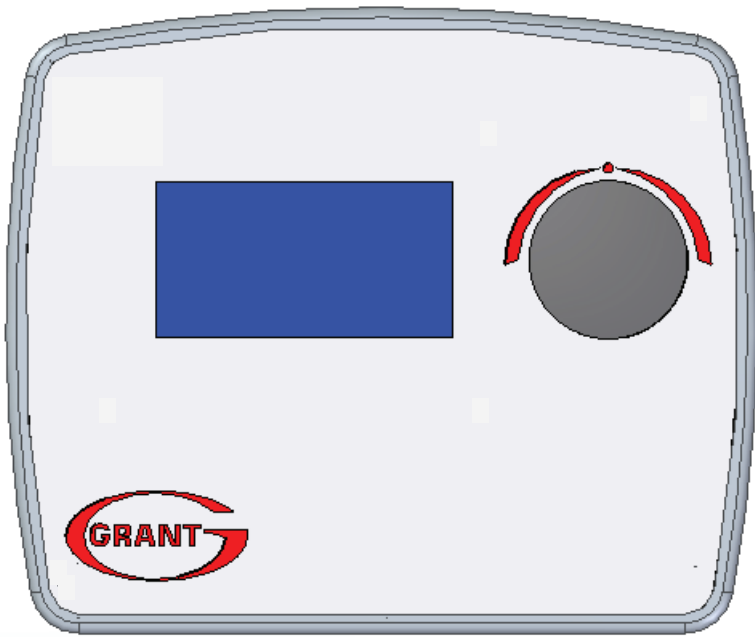
**For total system protection against freezing, particularly during extended periods without electrical power, Grant recommend the use of a combined heating system antifreeze and corrosion inhibitor, used in accordance with the manufacturer's instructions.**

## 8.2 POWER SUPPLY CONNECTION

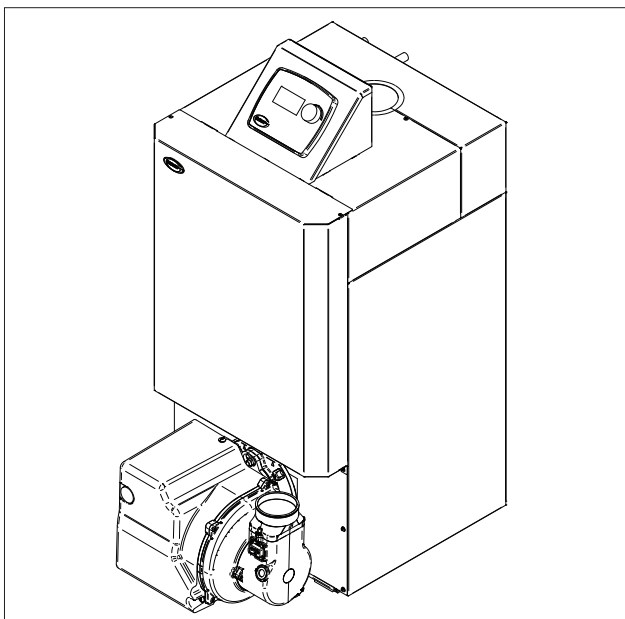


**Figure 8-1:** Control system diagram

# 9 COMMISSIONING



**Figure 9-1:** Vortex Boilerhouse Combi boiler control panel



**Figure 9-2:** Vortex Boilerhouse Combi

## 9.1 BEFORE SWITCHING ON

1. Ensure the boiler is isolated from the electrical supply and the boiler On/Off switch is set to OFF.
2. Check that the high limit thermostat bulb and boiler thermostat bulb are correctly located in their respective pockets. Refer to Figures 5-1 and 5-2. Check condition of both thermostat capillaries. Ensure they are not damaged, broken, kinked or crushed.
3. Remove the nuts and washers securing the front cleaning door. Withdraw the door – take care as it is heavy!
4. Check that the turbulators are in position and that the ends are vertical. Refer to Figure 11-3.
5. Check that the baffles are in position. Refer to Figures 11-1, or 11-2 as required.
6. Re-fit cleaning door and check it is fitted correctly and that a good seal is made.
7. Unscrew the burner fixing nut (located at the top of the mounting flange) and remove the burner from the boiler.
8. Check/adjust the burner settings as described in Section 10.2 (Burner Settings).
9. Re-fit the burner to the boiler and tighten the fixing nut. **DO NOT OVERTIGHTEN!**
10. Check that the sealed system has been vented and pressurised and there are no leaks.
11. Ensure that the condensing heat exchanger has been vented via the manual air vent (on heating return connection). Refer to Section 5.3
12. Ensure that the air vent on the heating flow pipe (system version only) is open. Refer to Section 5.3.
13. Check that all fuel line valves are open.
14. Remove the plastic burner cover if it was not previously removed.
15. Connect a combined vent manifold and pressure gauge to the pressure gauge connection port on the oil pump. See Figure 3-5. Open the vent screw on the vent manifold to vent the oil supply whilst the pump is running.
16. Check that all system controls are calling for heat and turn the boiler thermostat to maximum.



NOTE

**It is important that the oil pressure is correctly adjusted.**



NOTE

**This measuring point is not suitable for measuring the efficiency of the boiler or the flue draft.**



NOTE

**After commissioning the boiler, complete the commissioning report at the beginning of this manual. Leave a copy for the user and keep one.**



NOTE

**If it is possible that the boiler is left switched off and unused in a climatic zone with risk of frost, the boiler and the installation must be emptied. Alternatively, an MPG type antifreeze (with inhibitors) must be dosed to protect the installation at the outdoor base temperature.**

## 9.2 SWITCHING ON

1. Check that all system controls are calling for heat and turn the boiler thermostat to maximum.
2. Switch on the electricity supply to the boiler.
3. Set the boiler On/Off switch to ON. A neon on the switch lights when it is in the ON position. The boiler will now light automatically. Note that the neon lights when the boiler is switched on, but does not necessarily indicate the burner is firing. The burner should then fire. Open the vent screw on the vent manifold to vent the supply while the oil pump is running
4. The burner fan should start and the burner should light within about 12 seconds. If the burner does not light and the 'Lock-out' reset button on the burner lights, wait about 45 seconds and press the reset button to restart the ignition process. This procedure may have to be repeated several times during first lighting.
5. With the burner alight, check the fuel pressure. Refer to Section 2.3 (burner settings).
6. Adjust the pressure if necessary - refer to Section 11.8 (burner components).
7. Operate the boiler until it reaches normal operating temperature. Check oil supply/return pipe for leaks, rectifying where necessary.
8. Check the operation of the boiler thermostat. Ensure that by turning it anticlockwise it switches the burner off.
9. With the burner alight, re-check the fuel pressure and re-adjust if necessary. Turn the boiler off, remove the pressure gauge and replace the plug in the pump.
10. Ensure that there are no oil leaks, replace the burner cover.
11. On balanced flue installations - Ensure the flexible air inlet tube is correctly connected to both the burner air inlet and the flue system.

## 9.3 COMPLETION

1. With the system hot, check again for leaks, rectifying where necessary. Drain the system while it is hot to complete the flushing process. Refill and vent the sealed system.
2. A suitable central heating system inhibitor must be added to protect the system against the effect of corrosion.
3. A suitable antifreeze should be used to prevent damage to the boiler in areas where electrical power failure can occur in winter months.
4. Replace the top, front and rear panels as necessary.



CAUTION

**If there is any possibility of the boiler being left during freezing conditions, then the boiler and system should be drained. Alternatively, a suitable heating system antifreeze should be used.**

## 9.4 INFORMATION FOR THE USER

The User must be advised (and demonstrated if necessary) of the following important points:-

- How to start and switch off the boiler and how to operate the system controls.
- The precautions necessary to prevent damage to the central heating system and to the building, in the event of the boiler not being in operation during frost conditions.
- The importance of servicing the boiler to ensure safe and efficient operation. This should normally be required only once a year.
- The type of fuel used.
- That any servicing or replacement of parts must only be carried out by a suitably qualified engineer.
- Ensure that the boiler controls and room thermostat (if fitted) are set to the User's requirements.
- Tell the User the system pressure and show them the position of the safety valve discharge pipe.
- Show the User how to reset the overheat thermostat and how to restart the boiler if it goes to 'Lockout'.

# 10 MAINTAINING YOUR BOILER

## 10.1 GENERAL

To ensure efficient operation of the boiler, it is recommended to check and repair it at least every 12 months. The frequency of maintenance will depend on the specific installation and usage conditions, but in general, once a year this is adequate.

Maintenance and replacement of parts must only be carried out by a duly qualified technician.



CAUTION

**The details of each maintenance must be entered in the maintenance pages of the user manual.**



DANGER

**Before starting any work on the boiler or the oil supply, read the health and safety information given in chapter 15.**

## 10.2 PRE-SERVICE CHECKS

The following procedural checks must be performed before each maintenance:

1. Check the smoke terminal and make sure it is not blocked or damaged.
2. Operate the boiler and check the operation of its controls.
3. Make sure that all of the water and fuel system connections and fittings are sound and tight. Redo all the seals and check the tightness of the leaking connectors.
4. If the boiler is used on a sealed central heating circuit, check the circuit pressure, check the operation of the safety valve and check the air pressure of the expansion tank. See section 7.2.
5. Fill, bleed and refill the circuit as needed. See chapter 7.3.
6. Check that the automatic vent openings are in good condition. See chapter 9.1.
7. Remove any sludge / water from the Oil tank by opening the drain valve (if present) at the bottom end of the tank.
8. With the oil supply tap closed, clean / replace the filter in the filter pot and clean the bowl in the filter pot.
9. The braided oil supply hoses (supplied with the boiler) must be replaced annually. If long life hoses have been installed, these should be inspected annually. Replace the hoses if in doubt. In any case, these pipes must be replaced every five years

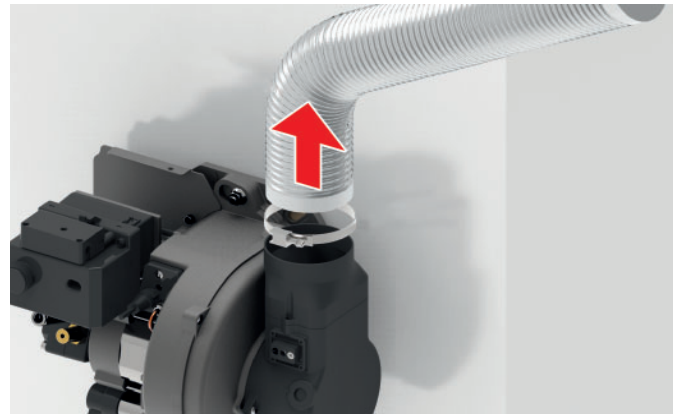
Before carrying out maintenance, cut off the electrical supply to the boiler and close the oil supply valve.

Let the boiler cool down. The data label on the top panel of the boiler models will indicate the fuel used and the nozzle installed.

## 10.3 DISASSEMBLY BEFORE SERVICING

The procedure for dismantling the boiler is as follows:

1. Disconnect the air supply hose from the burner.



**Figure 11-1:** Flexible air intake

2. Remove the burner mounting nut (at the top of the mounting flange) and remove the burner. If necessary, disconnect the oil hose (s), use an appropriate container to prevent any oil leakage. (Protect your hands with suitable gloves)



CAUTION

**If 2 hoses are connected to the burner, identify them (mark if necessary), i.e. indicate the supply and return (if they must be disconnected).**

## 10.4 CLEANING THE BOILER

The procedure for cleaning the boiler is as follows:

1. Remove the upper front panel. Unscrew and remove the two screws located on each side of the panel, just below the overhang. Refer to Figure 10-1.
2. Lift the upper front panel and remove it from the boiler. See Figure 10-2.
3. Unscrew and remove the nuts and washers holding the front cleaning door and remove the door. Be careful - it's heavy.
4. Remove the deflectors (baffles) as shown in figures 11-1, 11-2, 11-3, 11-4 or 11-5.
5. Remove all deposits from the deflectors and all internal surfaces of the boiler using a stiff brush and a scraper if necessary.
6. Check the condition of the flue, clean it if necessary.
7. Check the condition of the front cleaning door gasket, replace it if necessary.
8. Replace the baffles making sure they are in the correct position. See Figures 11-1, 11-2, 11-3, 11-4 or 11-5.
9. Remove the spiral turbulators from the tubes of the heat exchanger. Refer to Figure 11-4.
10. Clean the turbulators using a stiff brush
11. Test the condenser siphon of the heat exchanger by pouring water into one of the lower tubes and observe if the water flows through the 22 mm condensate outlet. Refit the turbulators.

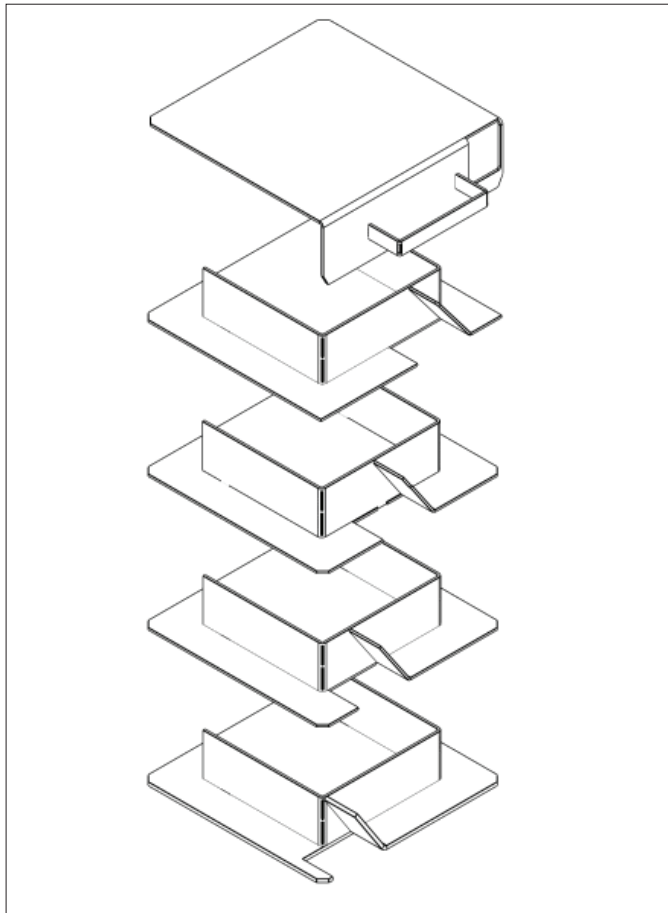
12. Replace the front cleaning door making sure the gasket is in good condition and secure it in place with the nuts and washers previously removed. Tighten to form a seal.

13. Remove the condensate trap and check that it is not clogged and functioning properly, that is to say that the float is free to move. Clean the siphon and the float if necessary. Refer to chapter 6.8.

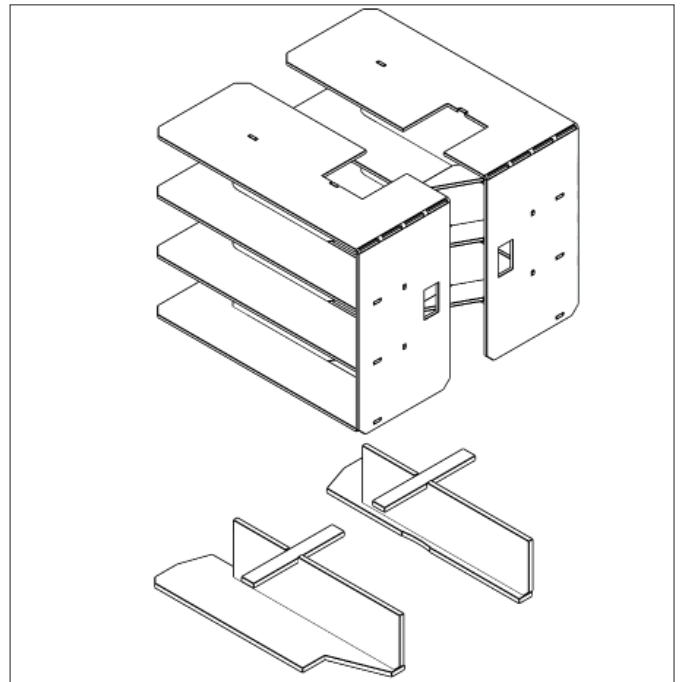
14. Check that the condensate outlet of the boiler is not blocked. Clean if necessary.



**The condensate trap and the condensate outlet must be checked at each service and cleaned if necessary.**



**Figure 10-2:** 18kw and 24kw deflectors



**Figure 10-3:** 32kw deflectors

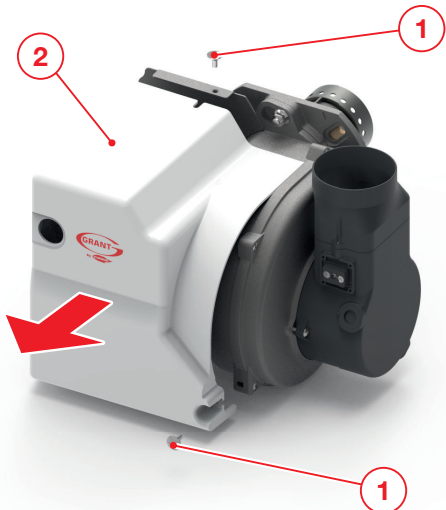
## 10.5 REMOVING THE BURNER



**Danger to life due to live components! Before any intervention on the burner, use the main switch of the system to cut off the power supply.**

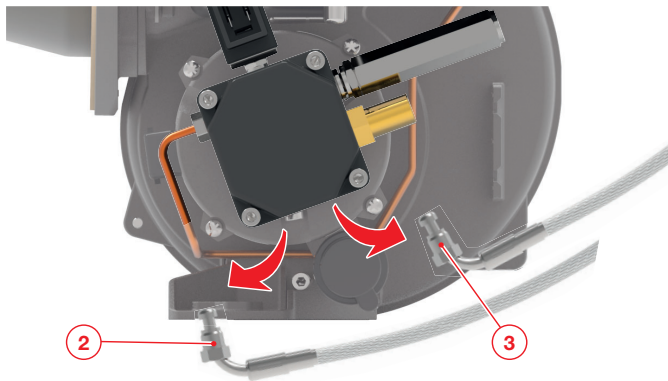
To remove the burner from the boiler, proceed as follows:

- close the fuel taps upstream of the burner
- loosen the two screws (1) then slide the burner cover (2) to remove it, taking care not to damage it.

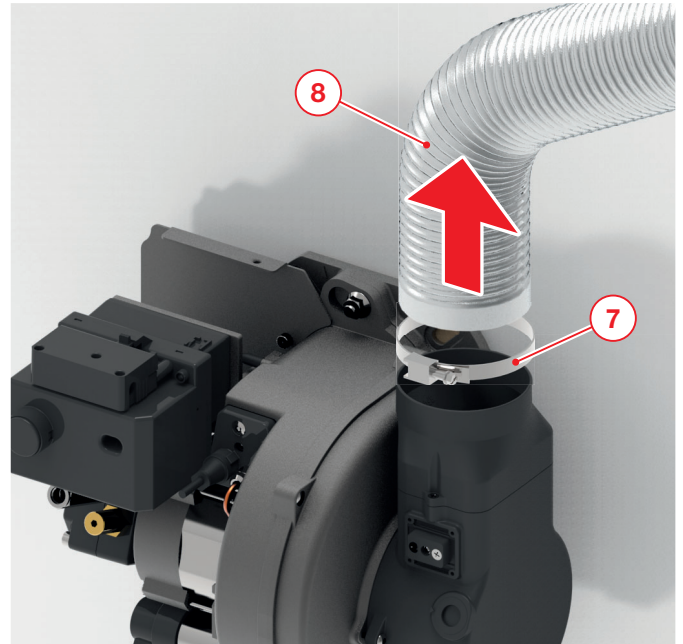


- remove the fuel supply pipe (5) and the return pipe (6)

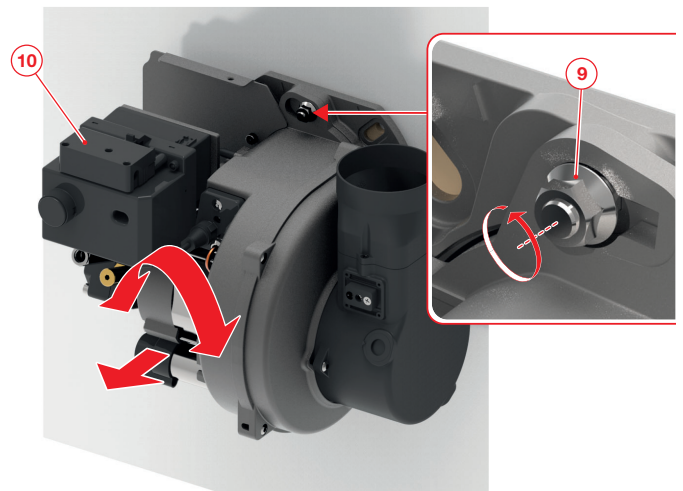
- disconnect the 7-pin plug (1) from the burner



- drain any fuel that may have remained inside the burner and in the fuel supply pipe and collect it in a bowl
- loosen the clamp (7) and remove the air intake pipe (8)



- loosen the nut (9) which fixes the burner to the boiler and, turning the burner (10) slightly to the right, slide it out of the boiler.

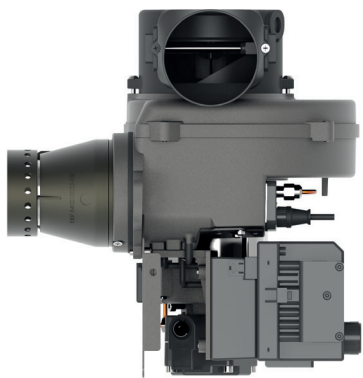
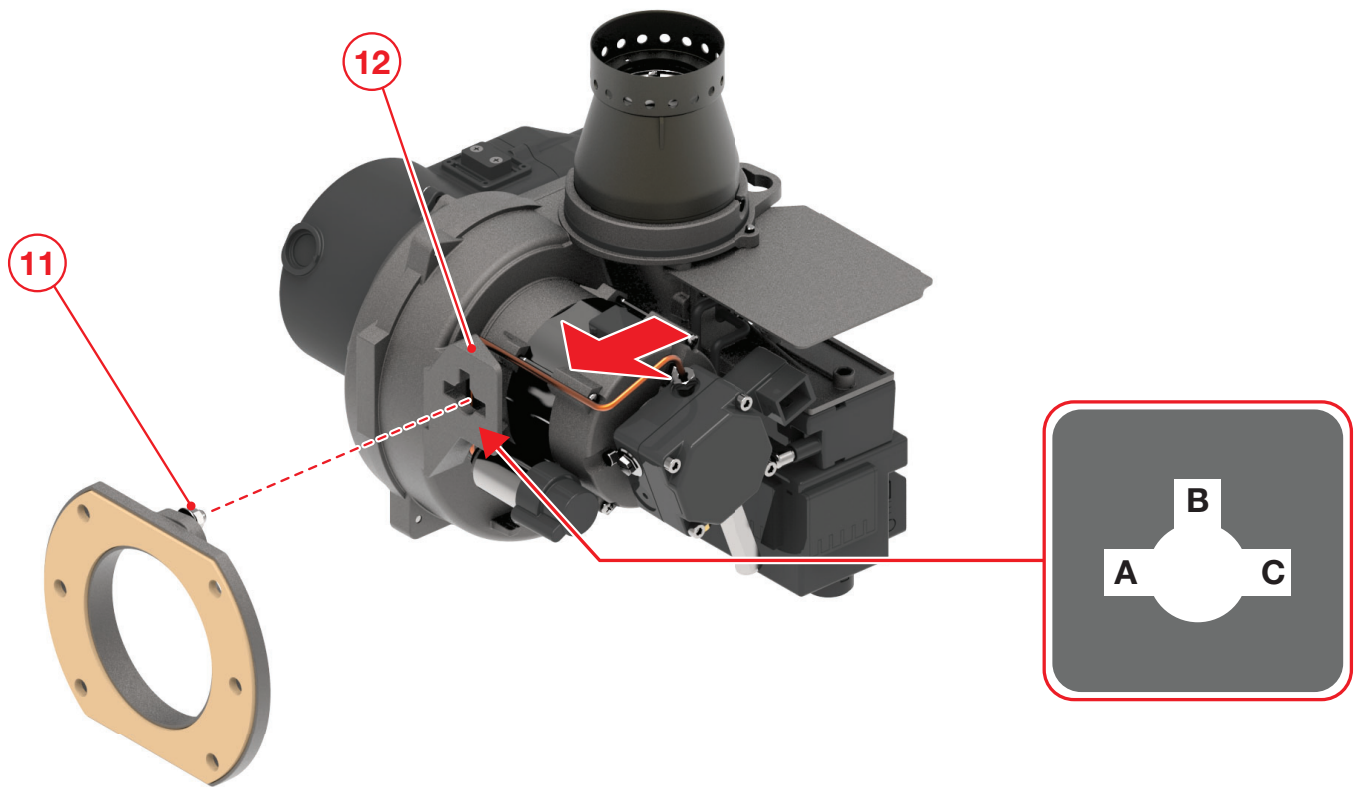


**Please dispose of the oil leaving the burner in accordance with the legislation applicable in the country of destination. Selective sorting of waste avoids potential damage to the environment and human health. It also allows many recyclable materials to be recovered, resulting in significant savings in money and energy.**



**Once the burner has been removed from the boiler, it can be placed on a rigid, level surface. The burner should only be placed on the floor if it rests on its base and should never be turned over.**

To facilitate maintenance operations, fix the burner to the boiler by inserting the fixing screw (11) in the hole (12) located on the base of the burner. Use one of the three square grooves located on the base of the burner to fix the burner, which must be turned to the position most suitable for carrying out the maintenance operation.



**A**

Position A:

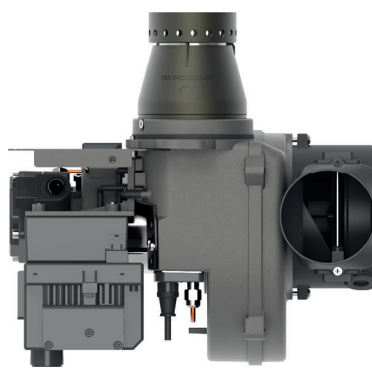
- inspection and cleaning of the internal rotor.

Position B:

- combustion head inspection
- inspection and maintenance of the nozzle
- inspection and maintenance of the electrode group

Position C:

- pump inspection and maintenance
- coil inspection and maintenance
- inspection and maintenance of the capacitor.



**B**

- Check that the electrical connection and connection cables are not damaged, and replace them if necessary.

- Check the pump filter and clean it if necessary.

- Clean the fan and its housing and check that they are not damaged.

- Check and clean the combustion head.

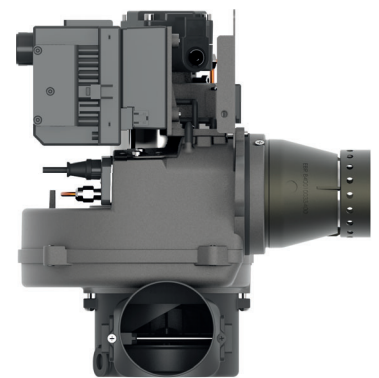
- Check the ignition electrodes, adjust or replace them if necessary.

- Replace the nozzle.

- Fit the combustion head. Respect the adjustment dimensions.

- Install the burner.

- Start the burner, check the exhaust gas data and adjust the burner settings if necessary.



**C**

## 10.6 BURNER MAINTENANCE

- Check the oil supply components (hose, pump, fuel supply hose) and their connections to detect leaks and signs of wear, and replace the parts if necessary.

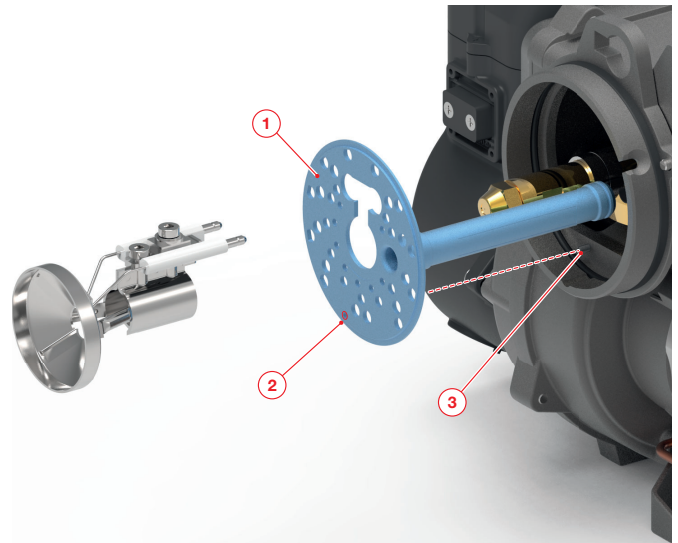
- The fuel supply pipes must be checked every year and replaced every 2 years.
- Check and clean the components located on the main burner.

## 10.7 CLEANING AND REPLACING THE COMBUSTION HEAD COMPONENTS

- Remove the screws (1) using a screwdriver and slide the combustion head (2) to remove it
- loosen the screw (3) using the hexagonal wrench provided and remove the diffuser (4) with the group of electrodes (5)
- a flat wrench of suitable size must be used on the fuel supply line to remove the nozzle (6)
- make sure that all components are in good condition, have not been damaged by high temperatures, are clean and have no traces of soot. Replace damaged components.
- clean all components carefully.
- put the components back in place, performing the above procedure in reverse.



**If the air distributor (1) is removed from its housing, it must be repositioned, making sure that the hole (2) is aligned with the pin (3).**

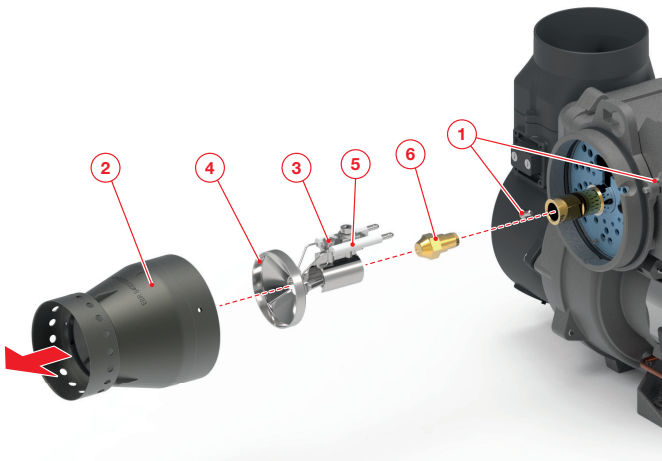


18kW, 24kW & 32kW

## 10.8 CHECKING THE DEFLECTOR POSITION

To check the position of the diffuser:

- remove the combustion head as described in paragraph "6.4.1 Cleaning and replacing the combustion head components" on page 44
- use the key provided to loosen the screw (8) and allow the position of the diffuser to be checked. One turn of the key is sufficient.



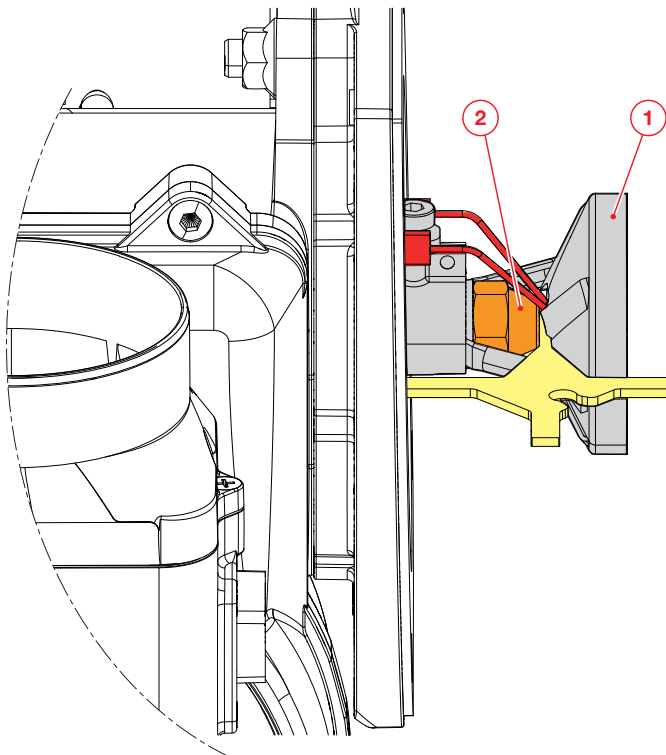
18kW, 24kW & 32kW



**The template must be kept in the position shown in the figure.**

NOTE

- check the distance between the diffuser (1) and the nozzle (2) as illustrated in the figure.

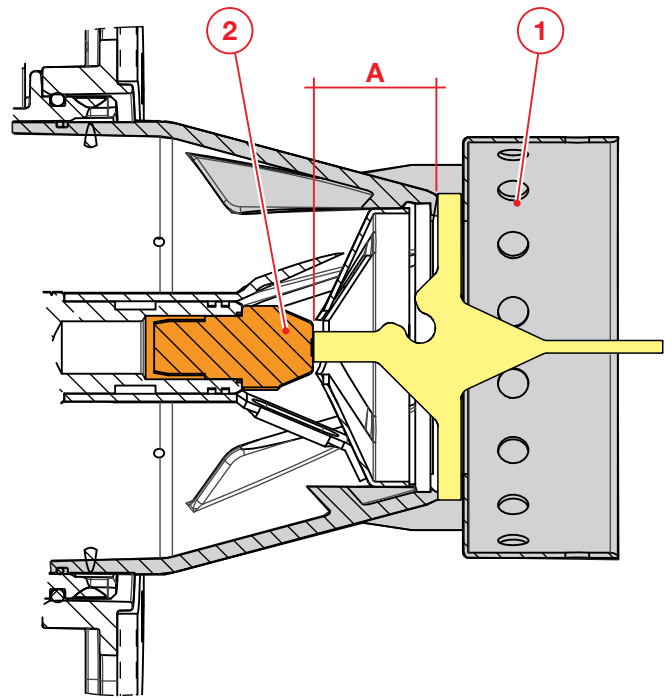


- after adjusting the position of the diffuser, tighten the screw (8).  
- replace the combustion head.

### 10.9 CONTROL OF THE COMBUSTION HEAD POSITION

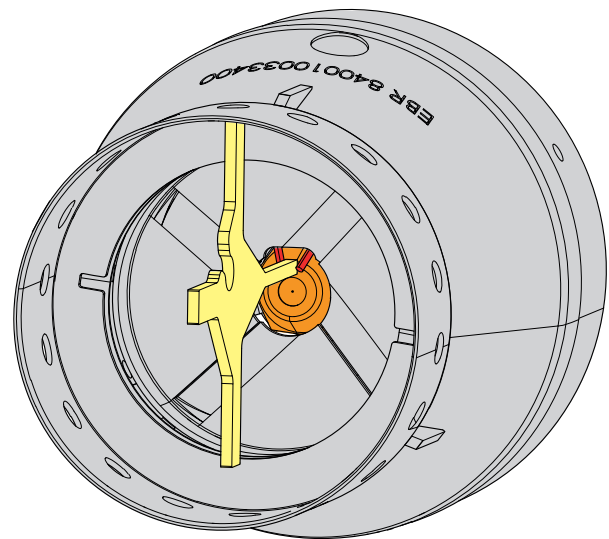
To check the position of the combustion head:

- check the distance between the combustion head (1) and the nozzle (2) as illustrated in the figure.  
- if the position is not correct (use the template supplied with the burner), move the nozzle line forwards or backwards by turning the adjustment screw number 9, Fig. 2 on page 10 (clockwise rotation: advance of the nozzle line, counterclockwise rotation: backward movement of the nozzle line)

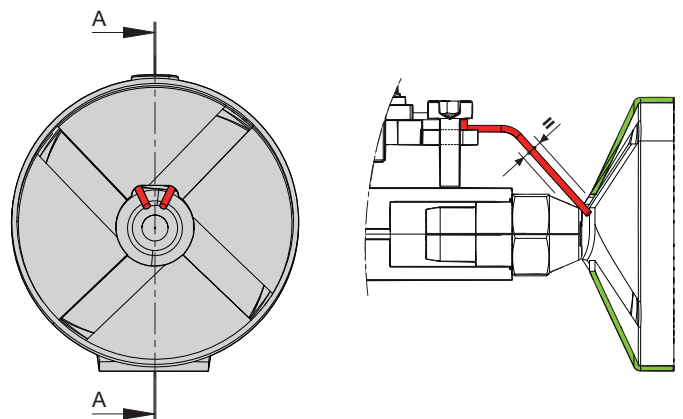


### 10.10 CHECKING THE POSITION OF THE ELECTRODES

- Check the distance between the ends of the electrodes (2 mm)



Check the position of the electrodes making sure they are centered as shown in "Fig. 46".

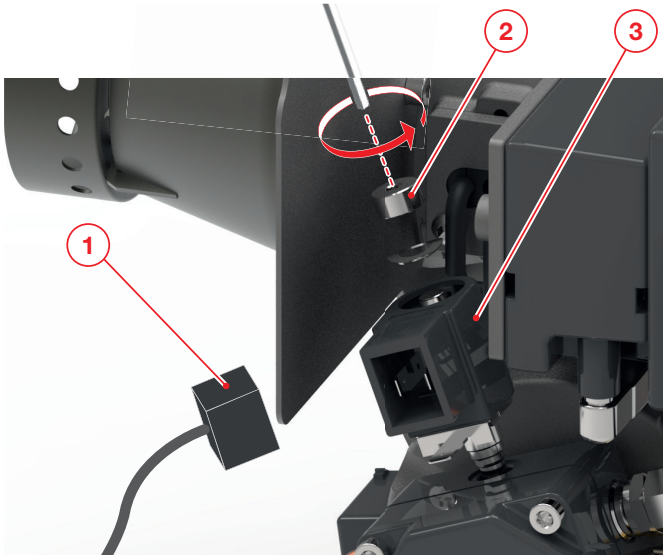


A-A 1:1

## 10.11 COIL REPLACEMENT

The pump coil is designed and manufactured to withstand temperatures up to 85 ° C. In the event of faults or breakdowns, replace the coil following the following procedure:

- remove the connector (1)
- remove the nut (2) using the wrench provided
- slide the spool (3) to remove it and replace it

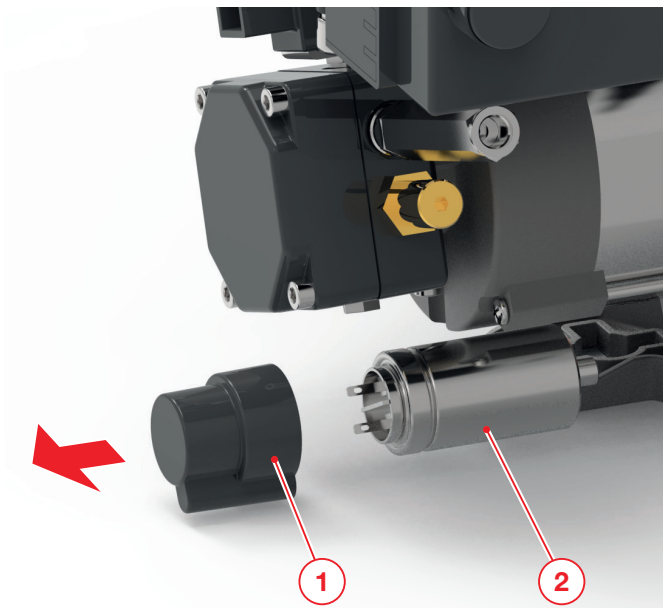


- put the components back in place, performing the above procedure in reverse.

## 10.12 CAPACITOR REPLACEMENT

Proceed as follows to replace the capacitor:

- disconnect the electrical connection from the capacitor (1)
- remove the capacitor (2) and replace it



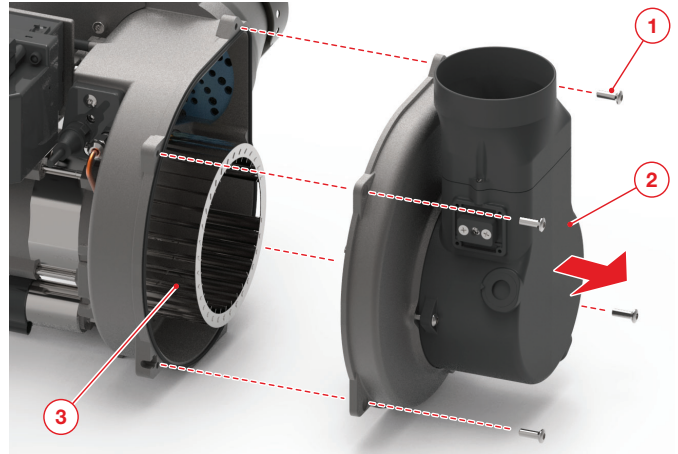
- put the components back in place, performing the above procedure in reverse

## 10.13 MAINTENANCE OF YOUR BOILER

Check that there is no dust inside the fan wheel, as this could reduce the combustion performance. Carry out maintenance operations, avoiding damaging the fan. Check the correct position of the fan wheel inside the burner housing.

Follow the steps below

- loosen the screws (1) and remove the air intake pipe (2)
- clean the fan (3) and the inside of the air intake duct with a brush
- if necessary, disassemble and reassemble the fan.



## ALL MODELS

### Photocell

The photocell is a quick adjustment in the body of the burner. Take it out carefully to clean it.

Air intake

Unscrew the two screws and remove the air intake box from the burner.

Inspect and clean if necessary.

### Burner fan

With the air intake box removed, remove the four screws securing the fan box cover (R / H side of the burner) and remove the cover.

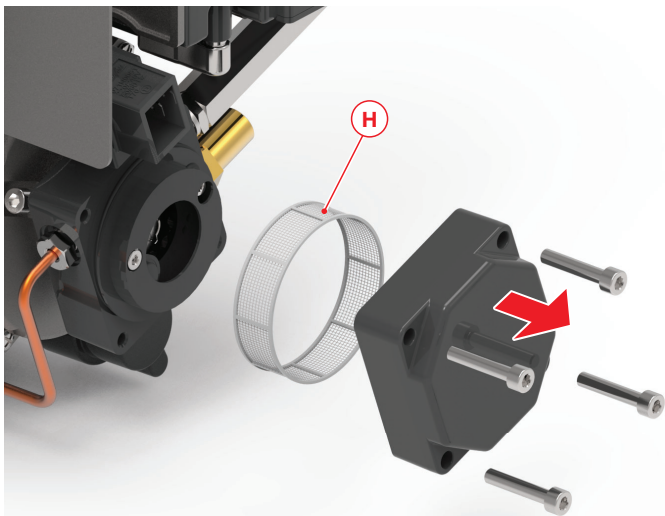
Inspect the fan and housing and clean them if necessary. Refit the cover.

### Pump filter

Reassemble in reverse order.

## 11.14 CLEANING THE PUMP FILTER

To be able to clean the filter (H), the pump cover must be removed. Check the pump cover gasket and replace it if necessary.



**To ensure safe and efficient operation of the boiler, it is important to carry out a new commissioning procedure, in particular with the combustion controls (% of CO<sub>2</sub>, smoke temperature and Smoke test) after the maintenance of the boiler. Refer to the commissioning instructions in chapter 10.**

# 11 FAULT FINDING

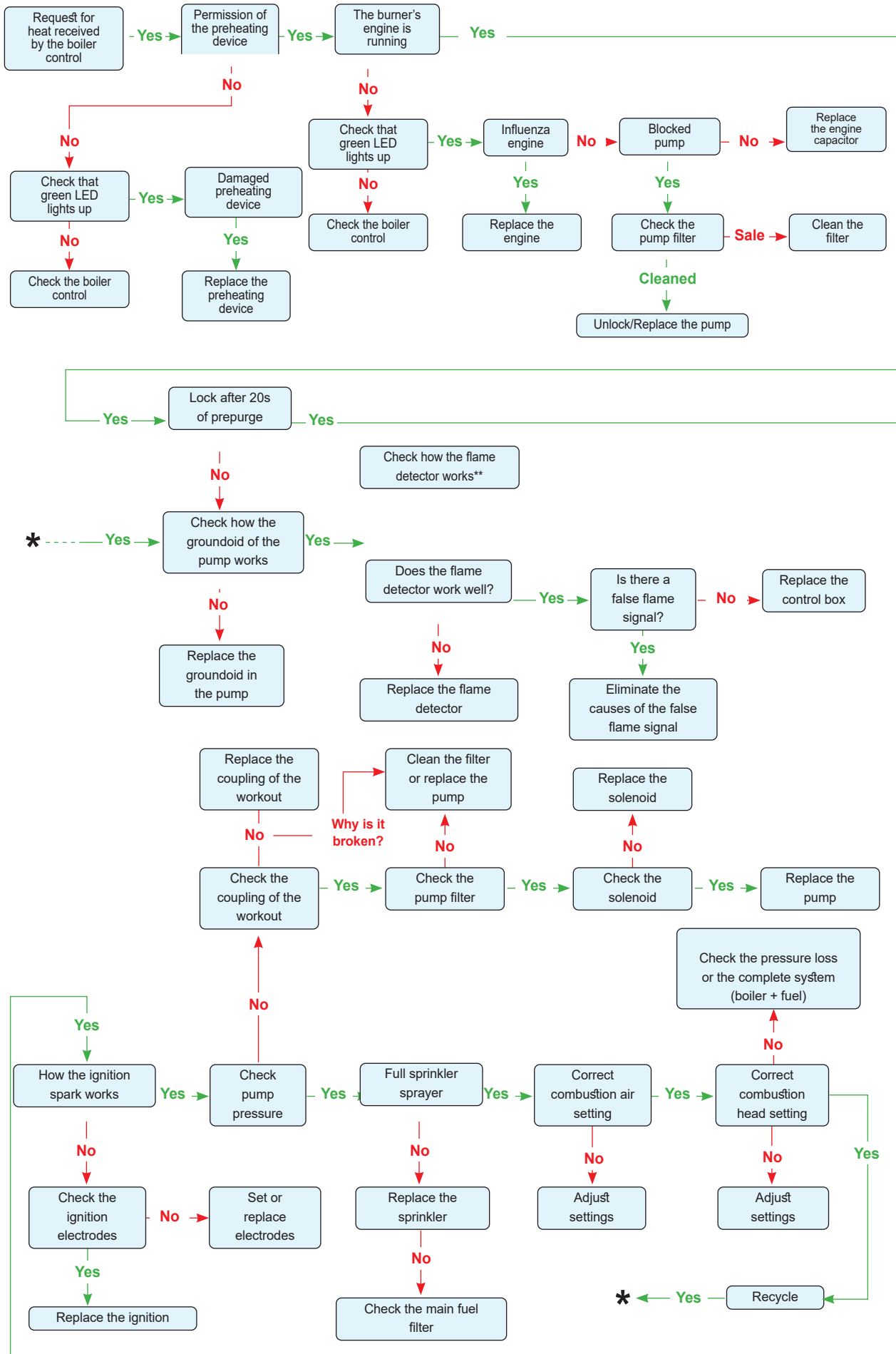
## 11.1 TROUBLESHOOTING - DIAGNOSTIC

Always cut off the electrical supply to the boiler before working on the boiler

**Figure 12-1:** Boiler diagnosis

Failure type	Actions
<b>The boiler cannot start:</b>	
1 No oil supply.	<ul style="list-style-type: none"> <li>-Make sure that a sufficient quantity of fuel oil is available and that the fuel supply valve is open.</li> <li>Check the condition of the oil filter, clean it if necessary.</li> <li>-Make sure that the oil supply arrives at the burner and bleed the oil pump.</li> </ul>
2 No power supply.	<ul style="list-style-type: none"> <li>-Make sure that the electrical supply to the boiler is properly activated (switch on ON) and that all thermostatic controls (heating + DHW) are in demand.</li> <li>-Make sure the overheat thermostat has not triggered, reset it if necessary.</li> <li>-Check that the 230V network is present at the burner terminal block.</li> <li>- Otherwise, check the boiler and the overheating safety thermostat.</li> </ul>
3 The burner does not start - oil and electricity are present.	<ul style="list-style-type: none"> <li>-Press the reset button on the burner control unit, if it is lit.</li> <li>-Refer to the Riello burner fault detection tables.</li> </ul>
4 The burner ignites but goes directly into burner safety mode (burner button lit red)	<ul style="list-style-type: none"> <li>-If the flame is unstable, check the combustion settings.</li> <li>-Refer to the burner fault detection tables.</li> </ul>
<b>The boiler works but</b>	
5 Visible smoke from the flue or high smoke-test.	<ul style="list-style-type: none"> <li>- Insufficient air supply: check the setting of the air damper and the condition of the fan.</li> <li>-Check that the air intake openings in the boiler door are clear, see chapter 9.1</li> <li>-Check the size and type of nozzle.</li> <li>-The oil pressure may be too high - check and adjust.</li> </ul>
6 Unstable burner	<ul style="list-style-type: none"> <li>- Insufficient air supply: check the setting of the air damper and the condition of the fan.</li> <li>-Check that the ventilation openings in the boiler door are clear, see chapter 9.1</li> <li>Check the size and type of nozzle.</li> </ul>
7. Smoke and puffs at start-up	<ul style="list-style-type: none"> <li>-Check the condition of the chimney flue, make sure it is not blocked and that it is high enough to give the required draft.</li> <li>-Check that there is a sufficient air supply near the burner and that a kitchen CMV (or wc or laundry, or bathroom) does not suck the fumes from the burner.</li> </ul>
8 Slow flame to stabilize at start-up.	<ul style="list-style-type: none"> <li>- Insufficient air supply: check the setting of the air damper and the condition of the fan.</li> <li>-Check that the ventilation openings in the boiler door are clear, see chapter 9.1</li> <li>Check the size and type of nozzle.</li> <li>-The oil pressure may be too high - check and adjust.</li> <li>Insufficient draft - Clean the heat exchanger of the boiler and check the state of the boiler room</li> </ul>
9 Boiler temperature too low	<ul style="list-style-type: none"> <li>-Size undersized and / or low oil pressure.</li> <li>-Check the condition of the boiler heat exchanger and clean it if necessary.</li> <li>-Check the boiler aquastat.</li> <li>-Check the combustion parameters.</li> <li>-Check the condition of the oil filter.</li> </ul>
10 Boiler operating until the overheating safety thermostat is triggered	<ul style="list-style-type: none"> <li>-Faulty boiler aquastat.</li> <li>-No circulation, check the circulation pump. --- Check the air supply.</li> </ul>
11 Fuel oil odors	<ul style="list-style-type: none"> <li>-Check all the oil supply piping connections, re-seal if necessary.</li> </ul>
12 The combustion fumes give off a strong odor.	<ul style="list-style-type: none"> <li>-Check that the boiler cleaning door and its gasket are correctly fitted.</li> <li>-Check that the burner is correctly mounted on the flange.</li> <li>-Check that the smoke stack is correctly fitted in the boiler smoke outlet connection.</li> <li>-Check that the condensate outlet pipe and the siphon are working properly.</li> </ul>

## 11.2 BURNER DIAGNOSIS -CUENOD MAX 4 OR MAX 8

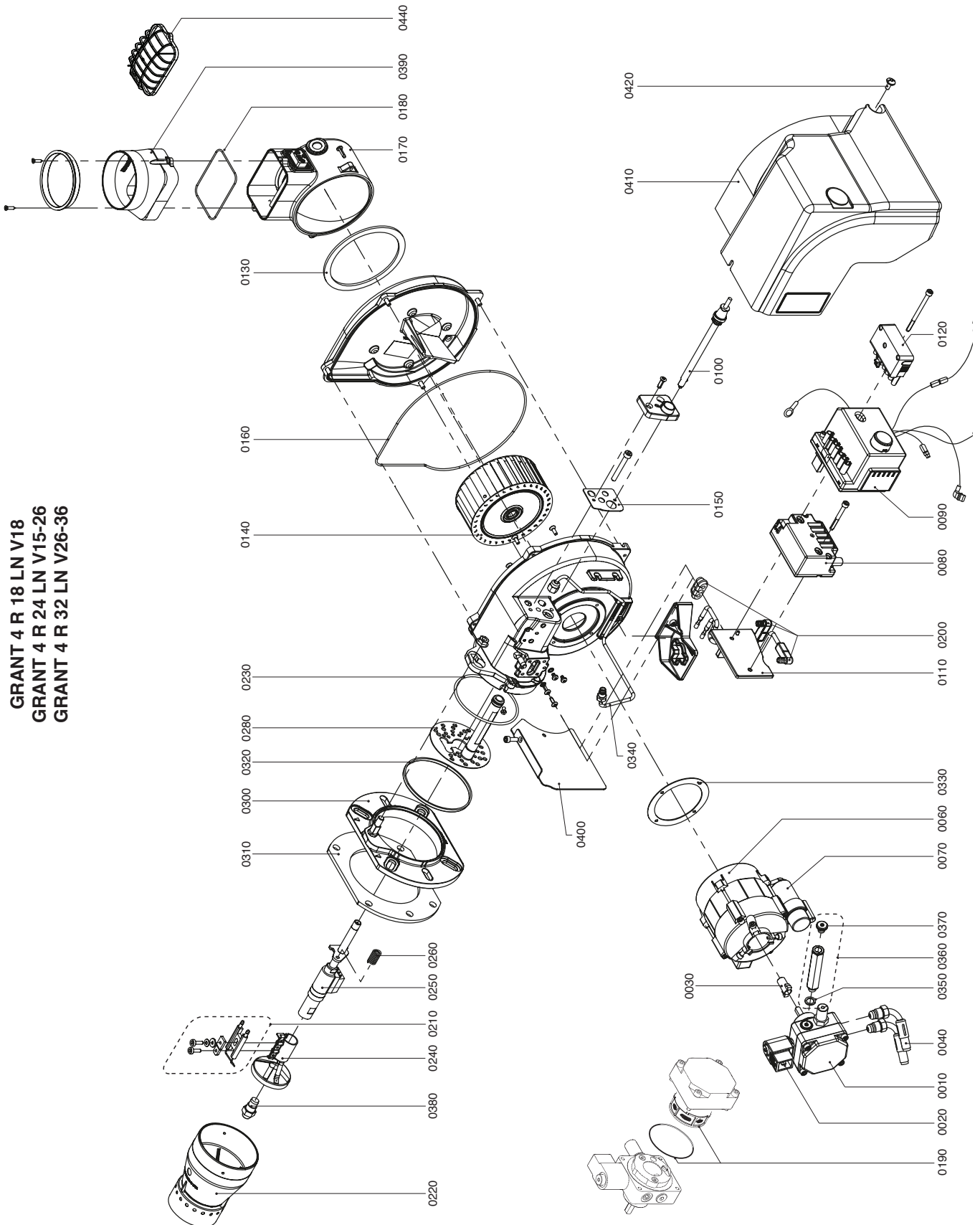


# 12 BURNER AND BOILER SPAREPARTS

## 12.1 CUENOD BURNERS (18KW, 24KW AND 32KW MODELS)

This chapter section gives exploded views of the Cuenod burners in Grant Vortex boilers and lists of parts associated with them.

GRANT 4 R 18 LN V18  
GRANT 4 R 24 LN V15-26  
GRANT 4 R 32 LN V26-36

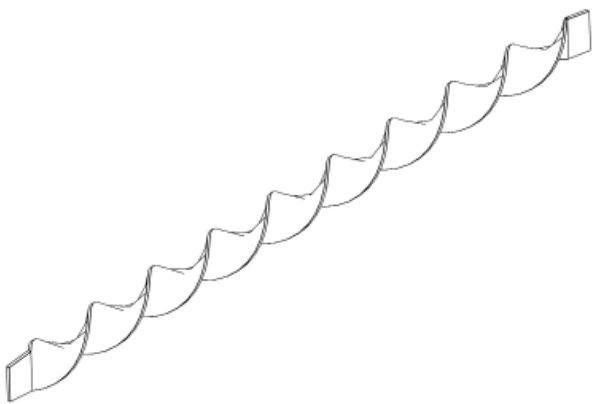


<b>NB</b>	<b>Description</b>	<b>GRANT 4 R 18 LN V18</b>	<b>GRANT 4 R 24 LN V15-26</b>	<b>GRANT 4 R 32 LN V26-36</b>
0010	FUEL PUMP	65327692	65327692	65327692
0020	SEPENTINE	65327693	65327693	65327693
0030	CONNECTION	65327694	65327694	65327694
0040	A FLEXIBLE PIPE	65327696	65327696	65327696
0060	MOTOR + CAPACITOR	65327697	65327697	65327697
0070	CAPACITOR	65327698	65327698	65327698
0080	IGNITION TRANSFORMER	65327699	65327699	65327699
0090	CONTROL BOX WITH CABLES	65327700	65327700	65327700
0100	PHOTORESISTANCE	65327702	65327702	65327702
0110	SUPPORT	65327703	65327703	65327703
0120	7-PIN PLUG	65327706	65327706	65327706
0130	JOINT	65327707	65327707	65327707
0140	FAN	65327709	65327709	65327709
0150	FLAT JOINT	65327712	65327712	65327712
0160	AIR INTAKE CAP SEAL	65327715	65327715	65327715
0170	AIR INTAKE CAP	65327716	65327716	65327716
0180	O-RING	65327718	65327718	65327718
0190	FILTER + SEAL SET	65327719	65327719	65327719
0200	IGNITION CABLE	65327729	65327729	65327729
0210	ELECTRODES	65327723	65327723	65327723
0220	SMOKE DUCT	65327724	65327724	65327724
0230	O-RING OF THE SMOKE DUCT	65327721	65327721	65327721
0240	DEFLECTOR	65327730	65327730	65327730
0250	JET HOLDER	65327731	65327731	65327731
0260	SPRING	65327733	65327733	65327733
0280	AIR DISTRIBUTOR	65327734	65327734	65327734
0300	FLANGE	65327738	65327738	65327738
0310	FLANGE GASKET	65327737	65327737	65327737
0320	O-RING	65327736	65327736	65327736
0330	ENGINE GASKET	65327735	65327735	65327735
0340	PIPE	65327726	65327726	65327726
0350	JOINT	65327725	65327725	65327725
0360	EXTENSION FOR PRESSURE TAKING	65327722	65327722	65327722
0370	THREADED PLUG	65327720	65327720	65327720
0380	JET	65327711	65327711	65327711
0390	NEW AIR INTAKE	65327710	65327710	65327710
0400	HOOD SUPPORT	65327708	65327708	65327708
0410	HOOD	65327705	65327705	65327705
0420	HOOD SCREW GROUP	65327704	65327704	65327704

## 12.2 LIST2 OF BOILER PARTS

**Table 13-5:** Grant vortex boilerhouse combi boiler spare parts list

Description	Grant product code
Nuts and washers (for cleaning door) EFBS14	EFBS14
Complete deflector kit (baffles) - 18 and 24 VBS96	VBS96
Complete deflector kit (baffles) - 32 VBS97	VBS97
Turbulators for deflector - 360 mm (unit) - 18, 24 and 32	VBS05SS
Access for combustion door - 18 and 24 VBS92	VBS92
Access for combustion door - 32 VBS69	VBS69
VBS02 condensate trap	VBS02
VBS109 condensate hose	VBS109



**Figure 13-7:** Turbulator for deflector (baffle) (VBS05SS)

# 13 EC DECLARATION OF CONFORMITY

We declare that the range of Grant ECO and VORTEX Utility (boiler house) oil-fired boilers fitted with Cuenod MAX 4 or MAX 8 burners conforming to standard EN 267: 1999 meets the requirements of the following European directives:

2006/95 / EC Complies with the safety objectives of the European low voltage directive and its amended amendments

2004/108 / EC directives modified Complies with the safety requirements of the European directive electromagnetic compatibility

92/42 / EC Complies with the requirements of the European boiler efficiency directive

2009/12 / EU Complies with the ECO design label of ERP (Energy Related Products) 813/2013

2010/30 / EU Complies with ERP (Energy Related Products) labeling 813/2013

## **In EU countries**

The following information is provided to enable regulatory compliance with the identified European Union (EU) directives and any changes to these directives when using electrical or electronic equipment in EU countries.

### **Disposal of electrical and electronic equipment**

European Union (EU) Directive 2002/96 / EC on waste electrical and electronic equipment (WEEE).

Do not throw electrical or electronic equipment into landfills. In the EU, it is the responsibility of each recipient to ensure that discarded electrical or electronic materials are collected and recycled in accordance with the requirements of EU environmental law.

### **Disposal of excess packaging**

Directive 94/62 / EC of the European Parliament and of the Council Packaging and packaging waste

Do not dispose of excess packaging in landfills. In the EU, it is the responsibility of each recipient to ensure that packaging materials are collected and recycled in accordance with the requirements of EU environmental law.

## **In non-EU countries**

In non-EU countries, dispose of electrical and electronic equipment and all excess packaging in accordance with national and regional regulations.

Complies with the EC directive on low voltage electromagnetic compatibility and energy efficiency of boilers.

# 14 HEALTH INFORMATION AND SECURITY

## 14.1 INSULATION MATERIALS

### Material types:

Ceramic fiber panels, mineral wool.

### The description:

Rigid panel, tiles, sleeves, joints, ropes.

### Known hazards:

May cause temporary irritation or rash. High dust levels can irritate the eyes and upper respiratory tract.

### Precautions:

Avoid unnecessary or rough handling, or hard abrasion of the panels. Normal handling and use of the material should not produce high concentrations of dust.

Avoid inhalation and contact with skin and eyes.

Always follow good hygienic practices after handling.

### Protection:

Use disposable gloves, mask and goggles.

### First aid:

Eyes

If irritation occurs, wash eyes with large amounts of water.

If symptoms persist, seek immediate medical attention.

Skin

If irritation occurs, wash skin with running water before washing with soap and water.

Inhalation

Get out into the fresh air, drink water to clear your throat and blow your nose to remove dust and fibers.

Ingestion

To drink a lot of water.

The lighter fractions remove the protective fat naturally present on the skin, leaving it dry, susceptible to cracking and more susceptible to damage from cuts, abrasions and irritating chemicals. Rashes most often on the arms, but also on any part of the body in contact with fuel oil or contaminated clothing.

Contact with fuel oil can cause dermatitis.

### Precautions:

Avoid skin contact with fuel oil or with clothing contaminated with fuel oil as much as possible.

The use of a lanolin-based protective cream is recommended, in conjunction with regular washing with soap and rinsing with water to ensure that all of the fuel is removed from the skin.

Take care to prevent clothing, especially underwear, from being contaminated with fuel oil.

Do not put rags or tools soaked in fuel oil in the pockets, especially the pants pockets.

Seek first aid treatment at once for even a minor injury.

Do not inhale the vapors of different types of heating oil

## 14.2 SEALANT AND ADHESIVE

### Material types:

Silicone elastomer.

### The description:

Sealant and adhesive.

### Known hazards:

Eye irritation.

### Precautions:

Avoid inhalation of vapors, contact with eyes and prolonged or repeated contact with skin.

Always follow good hygienic practices after handling.

### Protection:

Use eye protection. Rubber or plastic gloves should be worn in case of repeated contact and a mask should be worn when working in confined spaces.

### First aid:

The eyes

Flush eyes with water for 15 minutes. Notify the emergency services and seek immediate medical attention.

Skin

Wipe and wash with soap and water.

Inhalation

Get in the fresh air as soon as possible.

## 14.3 FUEL OILS

### Known hazards:

The effect of fuel oil on the skin varies depending on the duration of exposure and the type of fuel oil.

# 15 GUARANTEE

You are now the proud owner of a Grant Vortex Boilerhouse Combi boiler from Grant Engineering (Ireland) ULC which has been designed to give years of reliable, trouble free operation.

Grant Engineering (Ireland) ULC guarantees the manufacture of the boiler including all electrical and mechanical components for a period of **twelve months from the date of installation**<sup>4</sup>, and five years on the boiler shell only, provided that the boiler has been installed in full accordance with the installation and servicing instructions issued. See main Terms and Conditions below.

## In the first instance

Contact your installer or commissioning engineer to ensure that the fault does not lie with the system components or any incorrect setting of the system controls that falls outside of the manufacturer's guarantee otherwise a service charge could result. Grant Engineering (Ireland) ULC will not be liable for any charges arising from this process.

## If a fault or defect occurs within the manufacturer's guarantee period

If your boiler should fail within the guarantee period, your installer should contact Grant Engineering (Ireland) ULC who will arrange for the repair under the terms of the guarantee, providing that the boiler has been correctly installed, commissioned, the boiler passport has been returned to Grant Engineering (Ireland) ULC within 30 days of installation and serviced by a competent person and the fault is not due to tampering, running out of oil, oil contamination, debris, system water contamination, misuse, trapped air or the failure of any external components not supplied by Grant Engineering (Ireland) ULC, e.g. fire valve, motorised valve, etc.

## If a fault covered by the manufacturer's guarantee is found

The leaking boiler must be reported and returned via the supplier/merchant. Ask your installer to contact Grant Engineering (Ireland) ULC Service Department on (057) 912 0089 who issue a return number and arrange collection from the merchants premises.

## Remember - before you contact Grant Engineering (Ireland) ULC

- Ensure the boiler has been installed, commissioned and serviced by a competent person in accordance with the installation and servicing instructions.
- Ensure there is oil to supply the burner.
- Ensure the problem is not being caused by the heating system or its controls.
- The boiler passport has been returned to Grant Engineering (Ireland) ULC within 30 days of installation.

## Free of charge repairs on the burner (For the first twelve months)

During the guarantee period no charge for parts or labour will be made provided that the boiler has been installed and commissioned correctly in accordance with the manufacturer's installation and servicing instructions, it was registered with Grant Engineering (Ireland) ULC within thirty days of installation<sup>4</sup>.

The following documents must be made available to Grant Engineering (Ireland) ULC on request:

- Proof of purchase
- Boiler passport

## Chargeable repairs

A charge may be made if the breakdown is due to any fault(s) caused by the plumbing or heating system, e.g. contamination of parts due to system contamination, sludge, scale, debris or trapped air. Refer to 'Extent of manufacturer's guarantee'.

## Extent of manufacturer's guarantee

The manufacturer's guarantee does NOT cover the following:

- If the boiler has been installed five years on the boiler shell and one year on the components.
- If the boiler has not been installed, commissioned, or serviced by a competent person in accordance with the installation and servicing instructions.
- Instances where the serial number has been removed or made illegible.
- Fault(s) due to accidental damage, tampering, unauthorised adjustment, neglect, misuse or operating the boiler contrary to the manufacturer's installation and servicing instructions.
- Damage due to external causes such as bad weather conditions (flood, storms, lightning, frost, snow, or ice), fire, explosion, accident or theft.
- Fault(s) due to incorrectly sized expansion vessel(s), incorrect vessel charge pressure or inadequate expansion on the system.
- Fault(s) caused by external electrics and external components not supplied by Grant Engineering (Ireland) ULC.
- Problems caused by lack of oil or faults with the oil storage and supply system.
- Fault(s) due to contamination of the oil storage and supply system, e.g. water or debris.
- Bleeding or removing oil storage tank contamination or blockages from oil lines.
- Problems due to the flue system being incorrectly fitted or not installed to meet installation requirements.
- Boiler servicing, de-scaling or flushing.
- Cleaning out condensate traps/discharge pipes or thawing out frozen condensate pipework.
- Checking and replenishing system pressure.
- Oil supply pipelines, electrical cables and plugs, external controls not supplied by Grant Engineering (Ireland) ULC.
- Heating system components, such as radiators, pipes, fittings, pumps and valves not supplied by Grant Engineering (Ireland) ULC.
- Instances where the oil boiler has been un-installed and re-installed in another location.
- Use of spare parts not authorised by Grant Engineering (Ireland) ULC.

- Consumable items including, but not limited to, oil nozzles, oil hoses, gaskets and seals.

### IMPORTANT

The nozzle and braided oil hose supplied with the boiler are only covered for the period up to the time of the first service (twelve months). Both **must** be changed on the first service and on every annual service thereafter.

### IMPORTANT

A suitable oil filter with a minimum 15µm filtration **must** be installed in the oil supply line.

Do not wait until the fuel supply runs out before you re-order.

Sludge in the bottom of the tank may be drawn into the fuel lines. It is recommended that the boiler is switched off when the new oil supply is delivered and that the fuel is allowed to settle for an hour before restarting the boiler.

### Terms of manufacturer's guarantee

- The Company shall mean Grant Engineering (Ireland) ULC.
- The boiler must be installed by a competent person and in full accordance with the relevant Codes of Practice, Regulations and Legislation in force at the time of installation.
- The boiler is guaranteed for **one year** from the date of installation<sup>3</sup> and the boiler registered with the Company within thirty days of installation. Any work undertaken must be authorised by the Company and carried out by a competent service engineer.
- This guarantee will be invalid if the boiler passport has not been returned to Grant Engineering (Ireland) ULC, if the boiler does not have an annual (every twelve month) service and it will then be limited to twelve months from the date of installation<sup>4</sup>.
- The shell (heat exchanger) of the oil boiler is covered by a **five year parts only** guarantee from the date of installation<sup>4</sup>. This is subject to the following:
  - The boiler is operated correctly, in accordance with the Installation and servicing instructions.
  - Grant Engineering (Ireland) ULC **strongly recommends** that a Grant Mag-One in-line magnetic filter/s (or equivalent<sup>5</sup>) is fitted in the heating system pipework. This should be installed and regularly serviced in accordance with the filter manufacturer's instructions. We reserve the right to ask for proof of installation – failure to provide this may result in the guarantee becoming invalid.
  - Proof is provided that the system has been flushed or chemically cleaned where appropriate (refer to BSEN 422) and that the required quantity of a suitable corrosion inhibitor added.
  - Proof of annual servicing (including the checking of any expansion vessels and pressure relief valves) must be provided if and when requested by the Company.
- This guarantee does not cover breakdowns caused by incorrect installation, neglect, misuse, accident or failure to operate the boiler in accordance with the manufacturer's installation and servicing instructions.
- The boiler is registered with the Company within thirty days of installation. Failure to do so does not affect your statutory rights<sup>1</sup>.
- The balance of the guarantee is transferable providing the installation is serviced prior to the dwelling's new owners taking up residence. Grant Engineering (Ireland) ULC must be informed of the new owner's details.
- The Company will endeavour to provide prompt service in the unlikely event of a problem occurring, but cannot be held responsible for any consequences of delay however caused.
- This guarantee applies to Grant Engineering (Ireland) ULC

- boilers purchased and installed in Ireland and Northern Ireland. Provision of in-guarantee cover elsewhere in Ireland is subject to agreement with the Company.
- All claims under this guarantee must be made to the Company prior to any work being undertaken. Invoices for call out/repair work by any third party will not be accepted unless previously authorised by the Company.
- Proof of purchase and date of installation, commissioning and service documents must be provided on request.
- If a replacement boiler is supplied under the guarantee (due to a manufacturing fault) the product guarantee continues from the installation date of the original boiler and **not** from the installation date of the replacement<sup>4</sup>.
- A Grant boiler must have a pressurised mains supply (Note: this must NOT be directly from the water mains supply as per current water regulations). Installations utilising a private water supply are not covered by the guarantee.
- Breakdown/failure due to lime scale will not be covered by this guarantee.
- The replacement of a boiler under this guarantee does not include any consequential costs, such as the removal or replacement of worktops, kitchen units, etc.
- The boiler (excluding external modules) must not be sited in a location where it may be subjected to frost.

### Hard water advice (for Combi boilers only)

If you live in a hard water area, protection against scaling must be given to the domestic hot water heat exchanger of your combination boiler.

You should fit an appropriate scale inhibitor or water softener as any breakdown caused by water scaling is not covered by the manufacturer's guarantee. Ask your installer for advice.

### Foot notes

1. Your statutory rights entitle you to a one year guarantee period only.
2. We recommend that your oil boiler is serviced every twelve months (even when the guarantee has expired) to prolong the lifespan and ensure it is operating safely and efficiently.
3. The guarantee period will commence from the date of installation, unless the installation date is more than six months from the date of purchase, in which case the guarantee period will commence six months from the date of purchase.
4. As measured by gauss. The MagOne magnetic filter has a gauss measurement of 12,000.
5. Please ensure your boiler is installed on a solid level base.

Version 1.1 – December 2019

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# 16 PRODUCT FICHE

# 17 END OF LIFE OF THE PRODUCT

## GENERAL

Grant oil boilers contain components made from a variety of materials. The majority of these materials can be recycled while the smallest cannot.

Materials that cannot be recycled should be disposed of in accordance with local regulations using appropriate collection and / or disposal services.

## DISASSEMBLY

There are few risks for those involved in dismantling this product. Please refer to the tips and follow the

Health and safety information provided in the installation and maintenance instructions supplied with the boiler.

For more information on dismantling the boiler, refer to the information provided in chapter 11 of the installation instructions supplied with the boiler.

## RECYCLING

Many materials used in Grant oil fired boilers can be recycled, these are listed in the table below:

COMPONENT	EQUIPMENT
Exterior enclosure panels	Mild steel (powder coated polyester)
Primary heat exchanger and deflectors Heat exchanger	Soft steel
secondary exchanger spirals	Stainless steel
secondary heat	Aluminum alloy
Burner body / flange	Copper
Oil burner pump	Aluminum alloy
Cuenod oil burner cover	Aluminum / steel alloy
Electrical wiring	Plastic
Thermostats	Copper / plastic
Printed circuit boards	Copper / plastic

## DISPOSITION

All materials other than those listed above must be disposed of responsibly as general waste.









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