INSTALLATION/COMMISSIONING/SERVICE/USER MANUAL

ZEPHR INDIRECT FIRED CABINET HEATER

Machinery Directive (2006/42/EC)
Low Voltage Directive (2014/35/EU) Electromagnetic Compatibility Directive: (2014/30/EU)
Regulation (EU) 2016/2281
Gas Appliance Regulations (EU) 2016/426

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Please read this document carefully before commencing installation, commissioning and/or servicing. Leave it with the end user/site agent to be placed in their premises technical file after installation.

WARNING
Improper installation, adjustment, alteration, service, or maintenance can cause property damage, injury or death. All work must be carried out by appropriately qualified persons.
The manufacturer does not take any responsibility in the event of non-observance of the regulations concerning the connection of the apparatus
causing a dangerous operation possibly resulting in damage to the apparatus and/or environment in which the unit is installed.

Version 3.0 – January 2024

Heater Models	Description
WMIG(**)	Horizontal cabinet heater for ducted or AHU applications suitable for natural gas.
WMIVG(**)	Vertical Cabinet heater for ducted or AHU applications suitable for natural gas.
WMIG(**)DF burner.	Free standing ducted cabinet heater with force draught gas
WMIG(**)F	Horizontal ducted cabinet heater with force draught gas burner.
WMIG(**)DD burner.	Downward discharge cabinet heater with force draught gas

** (L) – Replaces G for LPG Fired unit

(O) – Replace G for Oil Fired Units

Reference

W – Warmatic	D - Ducted
M – Heat Module	F – With Fan
I – Indirect	DD – Downward Discharge
G – Natural Gas	R – Riello Burner
V – Vertical	BT – Burner Tech Burner
W – Weishaupt Burner	EL – Elco Burne

DESCRIPTION

Section 1: Introduction

The instructions refer to appliances designed to operate in the UK and Ireland.

Appliances designed for other countries can be provided on request.

This appliance must be installed in accordance with the local and national codes in force and used only in a sufficiently ventilated space, as specified in these instructions.

Before installation, check that the local gas distribution systems, nature of gas and pressure, and adjustment of the appliance are compatible.

Zephr is the latest generation of heat module, combining innovative design with proven heat exchanger technology to provide a high efficiency cost effective and durable range.

The heaters are CE and UKCA certified to EN17082 for use in non-domestic installations.

Gas and oil-fired options are available. Gas fired cabinet heaters are suitable for use with natural gas (G20), LPG (G31).

Oil fired cabinet heaters are suitable for use with Class D gas oil (35 sec), being supplied complete with a loose fire valve and oil filter.

The type of fuel, the input rate and the electrical supply requirement is shown on the heater rating plate. Check the rating plate to determine if the heater is appropriate for the intended installation.

This installation manual is shipped with the unit. Verify that the literature is correct for the model being installed. If the manual is incorrect for the heater, contact the supplier before beginning installation. The instructions in this manual apply only to the models listed.

Installation should be carried out by a suitably qualified installer in accordance with these instructions and the current rules and regulations in force. The installer is responsible for the safe installation of the heater.

Indirect Fired

The term 'Indirect Fired' indicates that the products of combustion are kept isolated from the main supply air stream. The burner fires into a combustion chamber, the resultant products of combustion are directed into a heat exchanger and from there to an external flue, which discharges into the atmosphere.

Factory Test

All heaters produced by Warmatic Ltd will be subjected to various tests before they are dispatched. Each heater is individual so the data will differ between each unit. The relevant data can be found on the data plate attached to the heater.

The construction of a Zephr will consist of double skin panels all around,.

External units will be fully water proof; the burner compartment will be adequately ventilated via two combustion air grills situated high & low.

Burner and Fuel

The Zephr cabinet heater will be fitted with either a Force Induced Natural Gas & LPG Burners or Pressure Jet Oil Burner.

Burner Type

Warmatic use four main manufacturers for Natural gas and LPG burners.

Reillo, Weishaupt, Elco & Burner Tech which are available for high/low or fully modulating appliances.

Oil Burners are available for high/low & Modulating control.

Applications

The Zephr unit can be made to suit the customers requirements and used for all types of applications, commercial, industrial & Process applications.

Some common uses:

- Inline duct work
- Air Handling unit Application
- High Temperature application
- Drying
- Comfort Heating.

Section 2

General Health and Safety

WARNING

Warning is used when failure to heed or implement the instruction(s) can lead to not only component damage, but also to a hazardous situation being created where there is a risk of personal injury.

CAUTION

Caution is used when failure to follow or implement the instruction(s) can lead to premature failure or damage to the heater or its component parts

GAS LEAK EMERGENCY

If you can smell gas from or near the heater:

- Do not try to light any appliance
- Do not smoke or light matches
- Do not turn electrical switches on or off
- Open doors and windows, to air the room
- Close the fuel control to the device
- if you still smell gas turn off the supply at the meter
- Raise the alarm and evacuate all personnel to a safe place
- Promptly Call your Gas Emergency number

Enter your gas emergency number below:

- Do not store or use petrol or other flammable vapours and liquids in the vicinity of the appliance.
- In case of persisting problems, contact your distributor Improper installation, adjustment, alteration, service, or maintenance can cause property damage, injury, or death.

Read the installation, operation, and maintenance instructions thoroughly before installing or servicing this equipment.

Do not use this appliance if any part has been immersed in water. Immediately call a qualified service technician to inspect the appliance and replace any gas control that has been immersed in water.

Gas-fired appliances are not designed for use in hazardous atmospheres containing flammable vapours or combustible dust, in atmospheres containing chlorinated or halogenated hydrocarbons or in applications with airborne silicone substances.

Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the appliance before shutting off the electrical supply.

This appliance is not intended for use by persons (including children) with reduced sensory or mental capabilities or lack of experience and knowledge unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

Carry out a risk assessment for the task to be carried out and ensure the correct use of any Personal Protective Equipment.

This manual should be kept in a safe place for future reference.

HEALTH AND SAFETY

Before using this appliance:

• Carefully read these instructions and follow the processes explained by the manufacturer. These instructions are only valid for appliances designed to operate in Europe.

• Check that the voltage indicated on the type plate corresponds to the mains supply voltage. If the country code and gas category on the appliance data label does not match the country of installation or the country codes and gas categories as shown in this instruction manual, it will be necessary to contact the distributor or manufacturer to provide the necessary information for the modification of the appliance to the conditions of use for the country of installation

• Ensure that the heater has been securely fastened in its final mounting position.

• Installing, commissioning, testing, programming, and maintenance of these products must only be carried out by suitably qualified and trained technicians and in full compliance with all applicable regulations and current best practices.

• Check if the appliance as described on the packaging label is in accordance with the correct type and model as specified on the data plate and complies with your customer order.

• Check that the temperature ranges given and those of the location match. The appliance must be powered with a voltage corresponding to the value shown on the rating plate.

• These units must be installed in accordance with the rules in force and local regulations / legislation as appropriate plus all local building codes.

• Installers should satisfy themselves that the gas or oil pipework installation is carried out in accordance with all current legislation, Codes of Practice and recommendations.

Location/Positioning

WARNING

The oil variant of the heaters must be installed in accordance with the current OFTEC regulations for oil fired products.

Under no circumstances should any item be placed on or above any part of the heater, whether it is being used or not.

All basic criteria must be satisfied prior to commencing the installation and commissioning process.

The heater must be positioned and installed to comply with all relevant standards and guidelines.

And should also meet the local and national fire regulations and insurance criteria, this is critical if the heater is to be installed within a special risk area (e.g. being; within close proximity to

where petrol engine vehicles are stored or parked, where cellulose spraying takes place, where woodworking machinery is being operated, etc,).

CAUTION

The heater must not be installed within an area with unsuitable conditions, e.g. where the atmosphere is highly corrosive, has a high degree of salinity, or where high wind velocities may affect burner operation.

Suitable protection should be provided for the appliance when it is located in a position where it may be susceptible to external mechanical damage; for example, fork lift trucks, overhead cranes etc.

Indirect heaters must not be located in hazardous areas, however, it is permissible for the heater to supply air to such areas.

The heater must not be installed within an environment where there is a high concentration of chlorides, fluorides, salts, or other aggressive or volatile chemicals/ compounds. Nor should the heater be positioned where the burner could be adversely affected by high winds or draughts.

The location chosen for the heater must allow for the fitting of an effective flue system.

The location must also allow for adequate clearance for the air supply, return air circulation, gas supply and electrical

supply, whilst also providing good and

safe working access. The heater must be installed on a flat and level surface made from non-combustible material, which is sufficiently robust to withstand the weight of the heater and any ancillary equipment.

General requirements

WARNING

Unauthorised modifications to the appliance, or departure from the manufacturers guidance on intended use, on recommended practices may constitute a hazard.

To ignore the warning and caution notices, and advice from the manufacturer on installation, commissioning, servicing, or use, will jeopardise any applicable

warranty.

Moreover, such a situation could also compromise the safe and efficient running of the appliance itself, and thereby constitute a hazard

All heaters must be earthed.

The installation of the appliance must meet all the relevant European, national, and local criteria

Prior to installation the following points should be considered;

• The position of the heater for the optimum efficient distribution and circulation of warm air.

• The position of the heater relative to the route of the flue.

• The position of the heater relative to the supply of fuel

• The position of the heater relative to the electrical services, and if appropriate, any additional controls.

• The position of the heater relative to the supply of fresh combustion air.

• The height if applicable at which the heater is to be mounted and potential stratification /circulation problems.

• The position of the heater relative to service and maintenance requirements. The appliance is designed to work in a maximum ambient temperature of 40°c.

The Air Heaters are designed for mounting directly on the floor and do not need any fixing.

Electrical supply

CAUTION

Ensure the supply is in accordance with the manufacturer's recommendations and is as stated on the appliance data plate.

The main electrical supply must not be switched off or disconnected as a method for stopping the heater, the exception to this is in an emergency, or during servicing, where the heat exchanger has been given sufficient cooling time to prevent damage from occurring. Claims for damage will not be considered if they resulted from incorrect wiring or incorrect use of the heater

Wiring external to the heater must be installed in accordance with any local, national, and European regulations.

The means of connection to the main electrical supply must allow for complete electrical isolation of the heater,

furthermore, in the case of a unit wired for a three-phase supply, the supply should only be used to serve the heater itself and no other plant or equipment.

The position of the isolation switch must be such that it is adjacent to the heater and easily accessible at all times. In addition, the isolator itself must have a contact separation of not less than 3mm.

The Control fuse ratings are detailed on the appliance data plate.

WARNING

Ensure that the electric and gas or oil supplies are turned off before any electrical work is carried out on the heater.

Ensure that wiring cannot make contact with any surfaces liable to be subject to high temperatures or where the insulation of the wiring could be impaired as a result of such con

Section 3:

Installers Responsibilities

- To install the heater, as well as the gas and electrical supplies, in accordance with applicable specifications and codes. Warmatic recommends the installer contact a local Building Inspector, Fire Officer or Insurance Company for guidance.
- To use the information given in the manual together with the local and national codes to perform the installation.
- To install the heater in accordance with the Clearances to Combustibles of this heater.
- To plan for the installation of supports, flues and air intakes.
- To provide access to burners for servicing.
- To provide the owner with a copy of this installation, commissioning, operation and service manual.
- To never use heater as support for ladder.
- To ensure that there is sufficient ventilation in the area to comply with the requirements of all relevant local and national codes.

Ignoring the warning and caution notices and the advice from the manufacturer on installation, commissioning, servicing, or use, will jeopardise any applicable warranty. This could also compromise the safe and efficient running of the appliance itself and thereby constitute a hazard.

Section 4: Technical Information Zephr

Table 1

Model	Heat Output kW	Flue Spigot Nominal Ø mm	Flue Size Ø mm	Weights External Heater (Kg)	Weights Internal Heater (Kg)
30	30	134	130	175	166
45	45	134	130	307	292
60	60	134	130	307	292
90	90	134	130	307	292
120	120	134	130	346	328
150	150	134	130	346	328
180	180	204	200	520	484
210	210	254	250	520	484
250	250	254	250	520	484
300	300	254	250	520	484
350	350	254	250	520	484
450	450	304	300	1704	1464
600	600	304	300	1704	1464
700	700	304	300	1704	1464
800	800	354	350	1704	1464
900	900	406	400	1850	1602
1000	1000	406	400	1850	1602

Technical Data	30	45	60	90	120	150	180	210	260	300	350	450	600
Nominal Heat Output (kW)	30	45	60	90	120	150	180	210	260	300	350	450	600
Heat Input (kW)	32	48	64	96	128	160	193	225	278	321	374	481	642
Temperature Rise (°C)	33	41	41	41	41	41	41	41	39	41	41	41	41
Thermal Efficiencies (Nett CV) %					MIN 93.5%								
Nox Seasonal (mg/kW)	59.3	58.2	62.3	65.3	62.1	65.9	61	63.5	65.3	66.2	61	65.2	60.2
Gas fired													
Gas Consumption Nat Gas (G20) (m3/hr)	3.00	4.50	6.00	9.00	11.99	14.99	17.99	20.99	25.99	29.99	34.98	44.98	59.97
Gas Consumption Nat Gas (G31) (m3/hr)	1.24	1.86	2.48	3.72	4.96	6.20	7.44	8.67	10.74	12.39	14.46	18.59	24.79
Minimum Dynamic Inlet Pressure Nat Gas (G20)	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Minimum Dynamic Inlet Pressure LPG (G31)	37	37	37	37	37	37	37	37	37	37	37	37	37
Gas Connection (Rc)	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"	11/4"	11/4"	11/4"	11/2"	11/2"	11/2"	11/2"
Oil Fired													
Oil Consumption (35 sec)	2.96	4.44	5.91	8.87	11.83	14.79	17.74	20.70	25.63	29.57	34.50	44.36	59.14
Oil Connection Rc	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	1/2"
Air Handling Data													
Airflow m3/hr	2700	3276	4392	6552	8712	10944	13104	15264	19656	21816	25452	32724	43596
Airflow m3/sec	0.75	0.91	1.22	1.82	2.42	3.04	3.64	4.24	5.46	6.06	7.07	9.09	12.11
Number of Nozzles	0	4	4	4	4	4	4	4	4	4	4	8	8
Nozzle Throw (m)	24	26	26	29	32	38	44	46	47	48	48	48	51
External Static Pressure (Ducted) (Pa)	250	250	250	250	250	250	250	250	250	250	250	250	250
Fan (kW)	0.65	0.65	0.8	1.2	2.5	2.5	3	3.5	4	7.5	11	11	15
Full Load Current (A)	1.2	1.2	2.3	3.9	4.1	4.5	4.8	5.5	6	11.5	21.5	21.5	28
General Data													
Electrical Supply (V)	415v	415v	415v	415v	415v	415v	415v	415v	415v	415v	415v	415v	415v
Nominal Flue Diameter (mm)	100	130	130	130	150	150	200	200	200	250	250	300	300
Noise Level @ 5m db(A)	58	58	62	72	72	75	76	77	78	79	79	76	79
Net Weight (kg)	259	338	343	354	385	458	497	543	574	598	986	1430	1512

Gross CV = 10.7 kw/m3 Nett CV = 9.64 kW/m Section 4: General Technical Table 2 - Zephr

Each appliance has been range rated: burner pressures can be found on data plate and the burner pressure once commissioned must be entered in the actual burner pressure setting

Section 5: Heater Installation

Before installation, check that the local distribution conditions, nature of gas pressure and adjustment of the appliance are compatible.

The air heater must be installed in accordance with the rules in force and the relevant requirements of any fire regulations or insurance company's requirements appertaining to the area in which the heater is located, particularly where special risks are involved, such as areas where petrol vehicles are housed, where cellulose spraying is carried out, in wood working departments etc.

Clearances and Positioning:

The following clearances for installation and servicing must be observed.

To the front Equal to the depth of the heater.

To the rear 1.0m

To at least one side 1.0m

Above the heater 1.0m

Clearances see fig.1

Clearances

A minimum of 500mm upstream and downstream must be allowed for, due to the radiant heat. Filters must be fireproof, if fitted and a motor shield is required over the main supply fan motor if directly in front of the heater.

To properly install the heater, bear in mind that the heaters

should:

• The heater must be installed on a level non-combustible surface capable of supporting the weight of the heater and any ancillary equipment.;

• Be supported over the entire perimeter of the lower base;

• Be placed on a surface whose deflection and strength is such that it can prevent vibrations from reaching underneath;

• Respect the clearance distances in order to allow for a correct flow of air and normal cleaning and maintenance

operations;

• The unit must be easily and safely accessible without the need for special equipment (ladders, mobile platforms, etc.).

• Maintain the safety distances from flammable material;

• Be placed close to a flue;

• Be able to be connected to the fuel source;

• Be close to an electrical socket;

• Allow for easy maintenance and inspections;

• Be fitted with the ventilation openings required by the relevant regulations.

Do Not Install the Unit:

• In places where there are aggressive atmospheres;

• In tight spaces where the sound level of the heater can be increased by reflections or echoes;

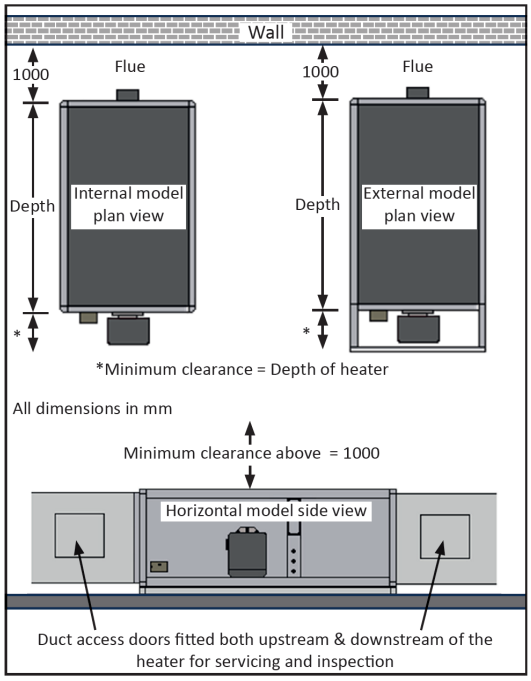
• In corners where leaves could accumulate or where other objects could clog the air passage and reduce the heater efficiency;

• In pressurised places;

• In de-pressurised places;

• Outdoors, if not provided with protection against bad weather conditions.

Fig 1



When installing the heater, minimum clearance is required around the heater.

If the heater is to be fitted at a height, then the structure of the gantry must be capable of the heaters weight (which can be found in section 4, table 1), also a safe working platform and access must be allowed for; to enable easy and safe working access.

Note: The front of the heater is the side on which the burner is fastened.

When designing a system, allowance must be made so equipment can be serviced after installation and for the fitting of any spares, which may be required. The Zephr is designed to be installed nozzle head or in ductwork.

The appliance is designed to work in a maximum ambient temperature of 40°c.

The Air Heaters are mounted direct on the floor and do not need any fixing. The base on which the heater is positioned should not be less than 150mm (6 inches) thick and must be constructed of non-combustible material. Any combustible material adjacent to the heater and the flue system must be placed or shielded as to ensure that its temperature does not exceed 65°C.

WARNING!

No air heater shall be installed where there is a foreseeable risk of flammable particles, gases, vapours, or corrosion inducing gases or vapours being drawn into either the heated air stream or the air for combustion. In such cases installation may only proceed if the air to be heated and the air for combustion are ducted to the heater from an uncontaminated source, preferably outside the building.

If this heater is to be suspended, then weight in table 1 in section 4 must be considered.

Section 6: Air Supply

Ductwork

All delivery and return air ducts, including air filters, jointing and any insulation or lining must be constructed entirely of materials, which will not contribute to a fire, are of adequate strength and dimensionally stable for the maximum internal and external temperatures to which they are to be exposed during commissioning and normal operation. In the selection of materials, account must be taken of the working environment and the air temperatures which will result when the overheat limit thermostat is being commissioned. Where inter-joint spaces are used as duct routes, they should be suitably lined with fire-resisting material.

A full and unobstructed return air path to the air heater must be provided.

If the air heater is to be installed in a plant room, the return air and warm air discharge arrangements must be such as to avoid interference with the operation of the flue by the air circulation fan. The return air intake and the warm air outlet(s) should therefore be fully ducted, in the plant room, to and from the heater, respectively. The openings in the structure of the plant room through which the ducting passes must be fire stopped.

In addition, where there is a risk of combustible material being placed close to the warm air outlets, suitable barrier rails should be provided to prevent any combustible material being within 900mm (3 ft) of the outlets.

Air flow

It is essential that the correct amount of air is provided through the heater and should be evenly distributed when entering the heater. All pressure calculations/resistances for air are ambient with the Heater in the 'off' position.

Adjustable by pass plates

Zephr models fitted into larger cabinets for internal or external use should be fitted with adjustable air balancing plates or a simple restriction damper. If the work is not going to be carried out by Warmatic Ltd then we recommend that the installer ensures that it can be altered to give guaranteed minimum equal air over the combustion chamber/heat exchanger (see minimum and maximum air flow volumes in section 4 table 1).

Air distribution installation

It is essential that the correct amount of air is provided through the heater and should be evenly distributed when entering the heater.

All pressure calculations/resistances for air are ambient with the Heater in the 'off' position.

The materials selected must be of low heat capacity, and it is preferable that all warm air ductwork is thermally insulated.

Where ducting may be subject to deterioration from exposure to moisture or high humidity, material selection and insulation are prime considerations. Joints and seams must be airtight and fastened securely and designed to remain so, even when operating at high temperatures.

Adequate support must be designed into the layout of the ductwork to ensure that the integrity of the seams and joints is maintained. The support must be independent and separate from the heater and the ducting, to allow for free movement during expansion and contraction.

Where ducting passes through walls or partitions sufficient clearance must be left, irrespective of any fire stop requirement, to allow for expansion and contraction. Failure to adhere to these latter two points can result in the generation and transmission of excess noise.

Where ducting is installed in concrete flooring a permanent membrane must be used to isolate the ducting from the corrosive effect of the alkaline salts within the concrete.

Care should be taken to ensure that soft insulation material does not become compressed and thereby lose its insulation effectiveness.

Section 7: Overheat Protection Device

Overheat protection is fitted in case the air flow falls below the minimum necessary for safe operation of the heater, which may be caused by failure of the supply fan motor or belt failure, dirty filters or inlet damper failure. If the air flow falls too low, the high limit will trip out and will require manually resetting. If this happens on a regular basis it must be investigated by a competent registered engineer as this could cause serious damage to the heater.

WARNING!

If the heater has a Honeywell combined thermostat installed, then the jumper link must be removed from the replacement thermostat.

Heat exchanger damage may be the result.

Failure to follow these instructions can result in death, injury, property damage or product damage.

Overheat stat Fig 2 & 3

Overheat Position Fig 4

Fig 2. Jumo Over Heat

To reset the Jumo overheat the right hand side stat shown in Fig 2, remove the plastic cap with a screw driver and lift the white lever shown below in Fig 3

Fig 3

Fig 4

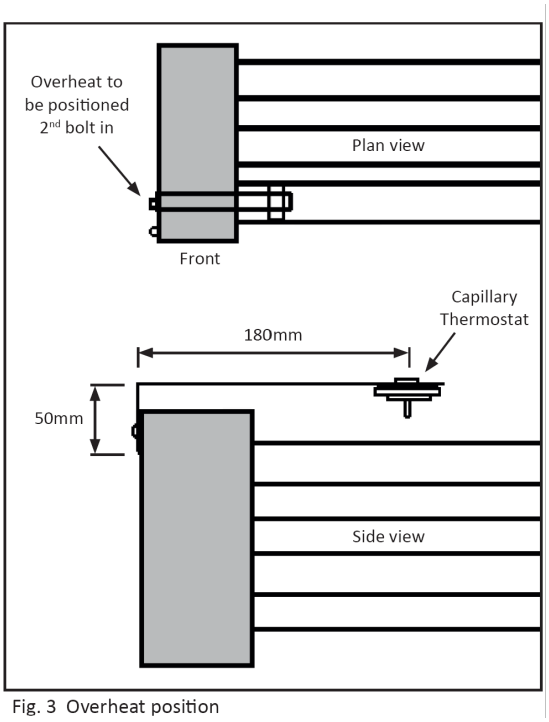


Fig. 3 Overheat position

Ensure that the fan and limit settings are as follows:-

Fan On 35°c

Fan Off 25 °c

Limit 20 °c above normal running temperature no greater than 100 °c

Section 8: Flue System

The flue system must be made to the following specifications:

a) Mechanically robust.

b) Resistant to internal and external corrosion.

c) Non-combustible and durable under the conditions to which they are to be subjected.

d) Stainless steel flue is recommended.

e) Dinak flue is recommended

Design

When designing a flue system for the appliance the designer must consider the following points.

a) The flue gases exiting the appliance can be as great as 250 °c and as low as 60 °c on modulating burners.

b) Prevention of condensation within the flue and the management of drainage from the flue; for example, the use of twin wall flue will minimise the condensation.

c) Flue must be a type acceptable to current standards.

d) Facilities should be made for the disconnection of the flue from the heater to aid servicing and inspection.

e) This appliance does not require a draught diverter.

f) It's a requirement to fit a 90° Tee condensate piece is connected directly onto the heater spigot, from this point the flue must then rise vertically with no horizontal runs of flue pipe or 90° bends. If there is an unavoidable obstruction, then the use of 45° bends will be permitted. **(Please contact Warmatic if more than two 45° bends are used).**

g) The flue should terminate in a freely exposed position and must be situated as to prevent the products of combustion entering the building via any opening.

h) A Flue terminal must be fitted.

i) The flue installation must be designed to the latest gas regulations and any local environmental standards.

j) Where a flue passes through a combustible roof, ceiling or floor, the flue pipe should be surrounded with a metal sleeve, the size of which should be sufficient to provide a space not less than 25mm between the flue pipe and the sleeve when positioned.

Note! Flue connection sizes can be found in section 4 table 1

Flue arrangement

The Zephr heaters are designed as a Type B23 forced draught heater were the combustion air is taken from the room space the heater is installed in and requires only a flue pipe exhausting to outdoors. All products of combustion must be flued to outdoor atmosphere.

The heaters are designed to operate safely and efficiently with either a horizontal or vertical flue system when installed according to the specific requirements and instructions.

If the heater is replacing an existing heater, be sure that the flue is of the correct size and that the existing flue is in good condition. A correctly sized flue system is required for safe operation of the heater. For testing, the flue pipe should include a sealable test point. Ideally the test point

should be at least 450mm away from the air heater flue connection socket. However if a concentric flue is attached directly to the connection sockets then the combustion should be tested through the flue outlet collar via a drilled test point which must be securely plugged on completion.

Follow the flue pipe manufacturer's installation instructions for making joints, including connections to the air heater, for passing through a building element and for support requirements.

Gasket sealed single wall seamless stainless-steel flue pipes are required. All joints must be sealed to prevent the products of combustion from leaking into the building.

The products of combustion from the unit heater must be flued to the outside of the building. A properly sized flue system is required for safe operation of the unit heater.

An improperly sized flue system can cause unsafe conditions and/or create condensation.

Failure to provide proper flueing arrangements could result in death, serious injury and/or damage to property.

It is important to ensure that there is an adequate air supply at all times for both combustion and heating requirements. Modern buildings involve greater use of insulation, improved vapour barriers and weather proofing.

These practices mean that buildings are sealed much tighter than in the past.

Proper combustion air supply for a power vented Type B installation requires ventilation of the heated space. Natural infiltration of air may not be adequate. Use of exhaust fans aggravates this situation. It is important to ensure that there is adequate combustion air supply at all times. Reliance on doors and windows is not permitted.

Always ensure that an adequate inlet for fresh air for combustion is provided sized to suit the total installation of any combustion apparatus.

The flue MUST be installed in accordance with national and local regulations.

Single wall flue pipe exposed to cold air or run through unheated areas should be insulated. Where condensation is unavoidable, provision must be made for the condensation to flow freely to a point to which it can be released, i.e. a drain or gully.

The condensation drain from the flue must be constructed from non-corrodible material not less than 20 mm diameter. Copper or copper based alloys must not be used for condensate drains.

Vertical flue runs greater than 3m long will require a condensate drain fitting between the flue outlet of the heater and the vertical flue pipe. Alternatively, insulated flue pipe should be considered.

Horizontal flue up to 150kW runs should be installed with a slight gradient of approximately 5° towards the terminal. Due consideration should be given to the possibility of condensation from the flue freezing on any footpaths that pass below the terminal.

It is important to ensure that there is an adequate air supply at all times for both combustion and heating requirements.

Ensure that the air combustion inlet opening at the appliance cannot be obstructed.

An approved flue terminal must be installed to provide an extraction effect under virtually all wind conditions. The free area of outlet

openings should be at least twice the nominal area of the flue. Outlet openings should be provided preferably all round, or at least on opposite sides

It is important for the terminal of an individual open flue system to be located so that it is not likely to be subjected to wind pressures which could restrict or reverse flow of combustion products through the flue.

The ideal position is above the highest point on the roof. It is essential that the terminal is positioned outside the building so that it is freely exposed to any wind and is not shielded by any roof structure or object to such a degree that they create undesirable pressure regions around the terminal.

The table below details the minimum flue heights for internally and externally mounted units.

The maximum flue height is 25m; if this is to be exceeded please contact the manufacturer / distributor.

When these units are installed, air for combustion is taken from the space in which it is installed. Do not restrict the combustion air intake.

Ensure that an adequate clean air supply for combustion and ventilation is provided within the building in accordance with the relevant rules and regulations in force.

Flue terminal

A flue terminal (must be approved) needs to provide an extraction effect under virtually all wind conditions, the free area of outlet openings should be at least twice the nominal area of the flue. Outlet openings should be provided preferably all round, or at least on opposite sides.

It is important for the terminal of an individual open flue system to be located so that it is not likely to be subjected to wind pressures which could restrict or reverse flow of combustion products through the flue.

The ideal position is above the highest point on the roof. It is essential that the terminal is positioned outside the building so that it is freely exposed to any wind and is not shielded by any roof structure or object to such a degree that they create undesirable pressure regions around the terminal.

single wall flue and internal twin wall flue to EN1856-1:2009-06, flues can be purchase from Warmatic or any Flue specialists

RECOMMENDED LOCATIONS OF ROOF TERMINALS:

<table>
<tr><td colspan="2" rowspan="3">Type of roof</td><td colspan="3">Location not within 1.5m of a vertical surface* on the roof</td><td>Location within 1.5m of a vertical surface* of a structure on the roof</td></tr>
<tr><td colspan="2">Internal route</td><td rowspan="2">External route</td><td>Internal route

External route</td></tr>
<tr><td>On ridge</td><td>Not on ridge</td><td></td></tr>
<tr><td rowspan="2">Pitched</td><td>Pitch exceeding 45°</td><td rowspan="2">At or above roof level (see figure 4)</td><td>1m above flue/ roof intersection (see figure 3)</td><td>See figure 3</td><td rowspan="4">The base of the terminal to be 600mm above the level of the top of the structure (see figures 2, 5, 9 and 11)</td></tr>
<tr><td>Pitch not exceeding 45°</td><td>600mm above flue/roof intersection (see figure 4)</td><td rowspan="3">The base of the terminal to be 600mm above the level of the adjacent roof edge (see figures 1, 6 and 10)</td></tr>
<tr><td>Flat</td><td>With parapet</td><td>Not applicable</td><td>600mm above flue roof intersection (see figure 6)+</td></tr>
<tr><td></td><td>Without parapet</td><td>250mm above flue/roof intersection (see figure 10)</td></tr>
</table>

*For example: a chimney stack dormer window; tank room; lift motor room; parapet, etc.

+When the flue outlet is at a horizontal distance greater than 10 times the height of the parapet or structure, the terminal outlet height need be only 250mm above the roof.

Gas Installation/connection

The installation must be purged and tested for soundness prior to commissioning.

Always ensure that appropriate personal protective equipment is used.

The minimum inlet gas pressure should be 20mbar for natural gas.

A competent and/or qualified engineer is required to either install a new gas meter to the service pipe or to check that the existing meter is adequate to deal with the rate of gas supply required.

Installation pipes should be fitted in accordance with national standards so that the supply pressure, as stated in the technical data section will be achieved.

It is the responsibility of the competent engineer to ensure that other relevant standards and codes of practice are complied with in the country of installation. Pipes of smaller size than the heater inlet gas connection must not be used. The complete installation must be tested for soundness as described in the country of installation. Support gas piping with pipe hangers, metal strapping, or other suitable material.

Service pipework must terminate at an approved isolating valve and be adjacent to the position of the heater. The connection to the heater can be made by way of either an approved flexible coupling, or rigid connection. Threaded connections must comply with ISO288/1 of ISO 7/1, further information concerning the accepted practice in European countries is detailed in EN 1020. The diameter of the pipework from the isolating valve to the burner connection must not be less than the diameter of the burner connection inlet.

As far as gas burners are concerned, we suggest placing a leak detector near them, which will operate an electro valve that will stop the gas supply in case of any accidental leakage.

The gas supply line should be installed by a qualified person, in compliance with all the relevant Laws, Regulations and Rules. Refer to the designer of the system.

Oil Installation/connection

Warning

Prolonged exposure and contact with gas oil can result in the natural oils being removed from the skin, sensitisation can result in dermatitis.

Always ensure that the appropriate personal protective equipment is used.

Fuel supply

Warning

Galvanised or plastic pipe work and fittings must not be used. (See BS 5410 Part 1)

The constraints of the application will, to a large extent, determine whether it is preferable to use a single pipe gravity feed system, or whether a two pipe pumped system is more appropriate. Where more than one appliance is to share a common supply it will be necessary to use a pressurised ring main system.

All pipe work must be constructed and installed so that it does not permit the ingress of air. The construction, size, and position of the oil storage tank must take account of the current regulations, as well as suiting the requirements of the installation.

CAUTION

On pumped systems always check that the pump is correctly set up prior to operation.
Ensure that valves are open allowing a free flow of oil through the system.

In order to promote trouble free operating it is necessary that the oil within the storage tank and oil line does not fall below the cold filter plugging point (cfpp), in the UK and with class D fuel (also referred to as gas oil). The critical temperature is -4°C for this summer grade.

The cfpp critical temperature for the winter grade is -12°C. If summer grade fuel is stored for winter use in areas prone to severe frosts and low temperatures it will be necessary to insulate or even heat the supply tank and pipe work.

Note: The fuel supplier should be contacted prior to installation so that any requirements concerning delivery, transport, storage and use can be addressed before work commences.

The inlet pump pressure must not exceed a maximum of 0.4 bar, this is because beyond this point gas is liberated from the oil.

Storage tank

An externally painted steel storage tank to BS 799 part 5 or a medium density polyethylene oil tank OFTEC certified to OFS T-100 may be used. Local, national, European and fire regulations must also be complied with and must include:

• A fuel level gauge (not made from glass) a vent pipe with a diameter greater than that of the filler and featuring a weatherproof termination.

• A sludge valve.

• An outlet valve situated at the opposite end of the tank to the sludge valve.

• A filler pipe connection situated at the opposite end to the outlet valve.

The size of the storage tank must take account of the estimated consumption and any quantity price breaks offered by the oil supplier. It is preferable to install the tank outside, however, if this is not practicable and the tank must be installed indoors advice must be sought about its positioning, especially so far as fire regulations are concerned.

If a separate fire-resistant chamber cannot be provided for indoor installations, a catchment pit with a capacity 10% greater than that of the storage tank must be provided storage tanks can if necessary be sited on a roof, but this is subject to special regulations as well as local authority approval and compliance with fire regulations, reference to BS 5410 part 2 & part 1 is strongly suggested.
It is advisable to leave the tank unpainted on the inside, but to paint the outside with a proprietary grade of anti-corrosive paint.

WARNING

A galvanised or open topped tank is strictly not allowed. All oil storage tanks require a bond.

The Control of Pollution Regulation (Oil Storage) 2001 should be consulted prior to installation.

Single pipe system (gravity feed)
For installations where the oil tank is 200mm or more above the level of the fuel pump the principle of gravity feed may be used. The draw off point for the supply to the burner must not be positioned any lower than 100mm above the bottom of the tank.

Where a return valve is fitted this must be tamper proof to prevent inadvertent operation.

CAUTION
If the valve is closed when the pump is running the oil pressure can be increased sufficiently to cause damage to the seals within the pump.

The return oil should be discharged (preferably) through an elbow onto a tank plate situated within the tank, this should be positioned so as not to introduce air or air bubbles into the draw off pipe.

Two pipe system
This is used where the oil storage tank is lower than the pump.

Access for the fuel feed to the burner should be via a suitable tapping made in the top of the tank, and the fuel feed pipe should extend to not less than 100mm above the bottom of the tank. A none return valve with a metal to metal seat should be fitted, especially if the return pipe work is terminated at a level above the draw off tube. The non- return valve must be removable for service and maintenance purposes, and the return pipe from the pump must therefore be extended down into the tank to the same level as the suction pipe.

The presence of a tamper proof isolating valve fitted within the return pipe is only required if there is a risk that oil will siphon out of the tank if the return pipe is disconnected at the pump during maintenance or servicing and if the non return valve has been omitted.

Figure 5 . Pressurised oil feed system
Pressurised ring main system

This system is used to supply a number of units from a common storage tank.

A booster pump is used to provide the pressure to push the oil around the ring main and back to the tank.

Pressure reducing valves should be fitted on the delivery pipe to each heater to ensure that the pressure at the burner pump is less than 6 psi.

The internal by-pass plug must be removed from the burner pump when used in a pressurised ring main application.

Pipework and fittings
Galvanised or plastic pipe work and fittings must not be used. (See BS 5410 Part 1)

All joints must be sealed properly, if necessary, using PTFE tape or other approved sealing media.

The pipe work must be effectively sealed so as to prevent the ingress of air. The fire check valve must be operated by way of a fusible link positioned so that it is above the burner.

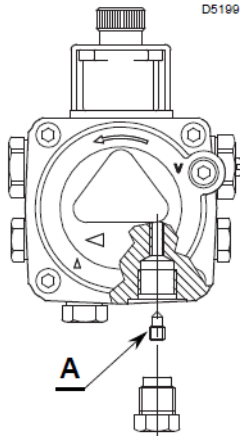
1. Gate valve
2. In-line filter
3. Pump
4. Relief valve
5. Pressure gauge
6. Pressure reducing valve
7. Return to tank

The pump suction should not exceed a maximum of 4 metres. Beyond this limit gas is released from the oil. Oil lines must be completely airtight.

The return line should terminate within the oil tank at the same level as the suction line; in this case a non-return valve is not required.

The return line should terminate within the oil tank at the same level as the suction line; in this case a non-return valve is not required. Should, however, the return line terminate over the fuel level, a non-return valve is essential. This solution, however, is less safe than the previous one, due to the possibility of leakage in the valve.

Priming the pump: start the burner and await priming. Should lock-out prior to arrival of the fuel, wait at least 20 seconds before repeating the operation



Section 10 Condensate drains

On models where larger turndowns are required, there will be a 1" BSP condensation drain, which must have a trap fitted and then pipe/drain accordingly (by others). The condensate pipe work must not be installed below 1" BSP. See fig 6

Do not use plastic condensate pipe and connections as the temperature of the condensate may be high at the outlet to the drain.

Check local and national regulations regarding the discharge of condensate.

Electrical installation/ connection

WARNING

Always isolate from the mains electrical supply before commencing work on the heater.

The electrical installation may only be carried out by an appropriately qualified person in accordance with the current Rules and Regulations in force.

This appliance must be earthed. All wiring must be in accordance with current IEE Regulations and all local regulation that apply.

Zephr heaters are available for 415V 50Hz 3PH & 240v 50Hz 1PH supplies as standard.

The electrical supply must be as specified and suitable for the heater, and must be run within conduit to a point adjacent to the heater, and be terminated to provide an isolation point that will prevent remote or inadvertent activation.

Cables, conduit, and fittings that are used to make the connection between the isolator and the heater must conform to the appropriate local and national regulations. All heaters are supplied fused and prewired; all must be earthed.

The electric and controls terminations are located on the front of the Heater housed in an interface panel. All heaters are compatible for interfacing with building management systems and 0-10V DC is required as standard on Modulating heaters.

Check that the air heater is well earthed and that an earth leakage test is carried out.

Final connections for any additional external controls must be completed on site, and must be carried out according to local and national regulations. Separate user information is provided for the burner, and forms part of the product information pack which accompanies every heater when despatched.

Always ensure that the appropriate personal protective equipment is used.

Ensure that all cables and installers wiring are appropriately fixed and that they do not touch the flue or combustion collector box. The electric panel is pre-installed with burner, control and safety thermostat of the FAN-LIMIT device connected.

Electrical connection should be carried out in the following order:-

1. General power supply;
2. Connections to the blown burner;
3. Connections to the various external safety systems (fire dampers, fire protection, etc.).

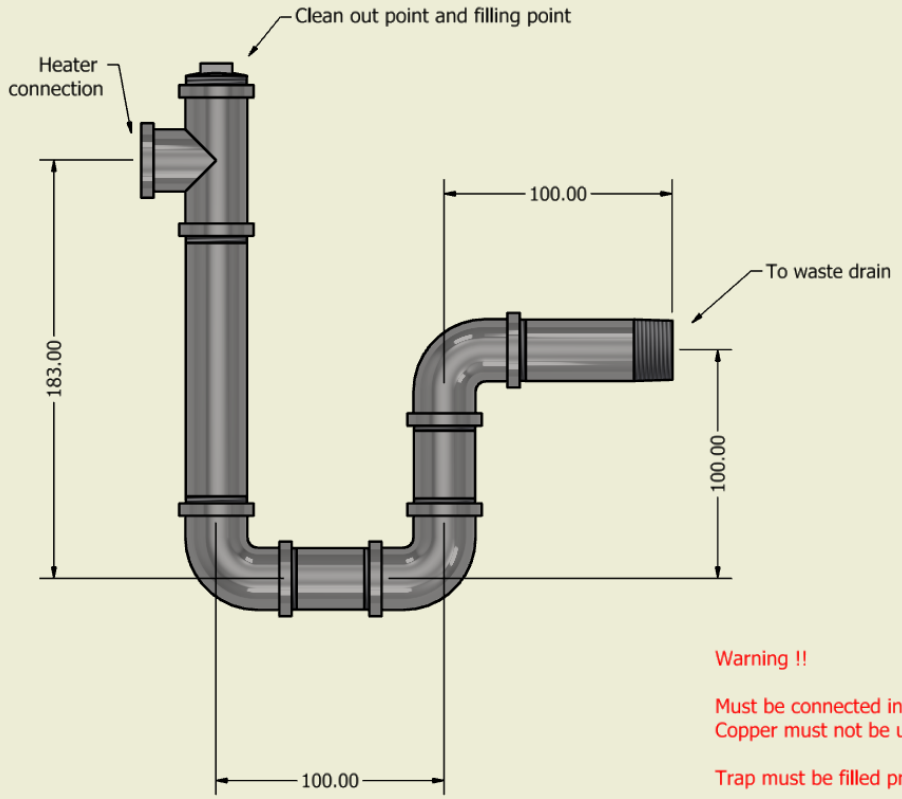
Please note the following:-

• Electrical connections must only be carried out by qualified engineers

• If confused, please contact manufacturer for further clarification.

• Install upstream of the unit a differential magneto thermal circuit breaker suitably sized according to the regulations in force.

• Always connect the earthing system, taking care to leave the earth wire slightly longer than the other wires, in the event that the wires are accidentally pulled, the latter is the last one to be removed.



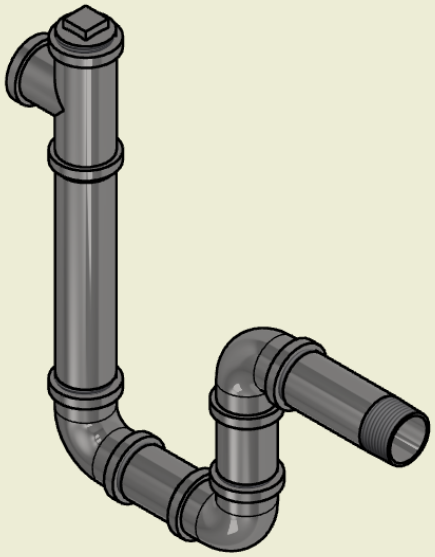
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	ISO 49 Tee B1 3/4	Stainless Tees B1
2	144.780 mm		Stainless Pipe
3	63.500 mm		Stainless Pipe
4	3	DIN EN 10242 Elbow A1 3/4	Stainless Elbow
5	63.500 mm		Stainless Pipe
6	81.280 mm		Stainless Pipe
7	1	DIN EN 10242 Plain Plug T8 3/4	Stainless Plug

Warning !!

Must be connected in stainless or Galv - Copper must not be used!

Trap must be filled prior to operation

Plastic can be used after trapping only



JOB Nbr:	CUSTOMER: SUPERCELL & ZEPHR		Part Nbr: CONDENSATE TRAP		Drawing Nbr: 23651
warmatic EFFICIENT CLIMATE SOLUTIONS	Material Type:	DRAWN BY: sb	CREATION DATE: 02/04/2023	Description: **CONDENSATE TRAP**	Revision: 1
	Material Thickness:	MFG APPROVED BY:	MFG CHECKED DATE:		
	Material Grade:	Scale:	Units:		Format: A3
	Material Area: N/A	QUANTITES:			
	Material Weight: N/A	Warmatic Limited,2D Vaughan Court, Middlesbrough, TS6 7BJ Tel 01642 989950			

• Get a qualified engineer to check that the section of the cables and the electrical systems are suitable for the maximum power absorbed by the unit indicated on the information plate.

• Respect polarity in the connection of the power supply (phase - neutral). In any case, make sure that the direction of rotation of the fans is correct.

• The unit must be connected to an efficient earthing system.

Section 9: Ventilation Requirements

Where the heater is to be installed in a plant room, the heater requires the plant room housing to have permanent air vents communicating directly with the outside air, at a high level and at a low level.

Where communication with the outside air is possible only by means of high level air vents, ducting down to floor level for the lower vent(s) should be used. Air vents should have negligible resistance and must not be sited in any position where they are likely to be easily blocked or flooded, or in any position adjacent to an extraction system, which is carrying flammable vapour.

Grilles or louvers should be designed so that high velocity air streams do not occur within the plant room.

The ventilation should be installed to in accordance with local and national codes.

Ventilation Requirements:

The space in which the heater is situated must be adequately ventilated, see below for the minimum ventilation area at low and high levels.

Low Level: after 60kw.	540cm² plus 4.5cm² per kW
High Level: after 60kw	270cm² plus 2.25cm² per kW

Section 11: Gas Piping

All Gas Pipework to the appliance should be installed in accordance with current regulations, local and national codes and must be connected with an acceptable gas isolation valve and union, so that the burner maybe removed to aid servicing and inspection of the burner.

Size and Connection

The following considerations are to be considered:

a) Pipe work smaller than the inlet gas connection should not be used.

b) The gas supply pipe is adequately sized to carry correct volume of gas from the gas meter to the heater(s).

c) The heat input and gas flow rates for each heater can be found in section 4 table 1 to aid in the design of gas supply pipe work.

d) All gas pipe work and electrical connections must be adequately supported and must not support any of the heaters weight or rely on the strength of the burner gas pipe work.

e) Unless the heater is suspended or movement is apparent, the Zephr must be connected with medium, heavy or copper pipe; otherwise the use of an approved flexible connection between the isolating valve and the heater can be used. We recommend that the flexi hose is one size bigger than the heater connection to reduce any pressure loss.

The minimum inlet gas pressure for natural gas should be 20 mbar.

Please note: We require a minimum of 17.5mbar at the inlet when running and a maximum of 75mbar, if this is exceeded then a governor must be fitted.

Important: The complete installation must be purged and tested for gas soundness in accordance with local, national codes and a registered engineer.

Section 12: Heater Controls

The heater can be used with most Building Management Systems.

2:1 Turndown Burner:

. Burner 7 pin plug/socket terminal connections:

1. 240v & N supply
2. T1 & T 2 is the enable, T1 & T2 must break when up to temperature, all interlocks to be wired in series with T1 & T2. (The burner must be interlocked with the supply fan).
3. Terminal S3-240v burner lockout indication if required.
4. Terminal B4-240v burner lockout indication if required.

Burner 3 pin plug/socket terminal connections:

1. L-10v dc modulating signal connection
2. N-0v dc modulating signal connection

Please supply 15 minutes supply fan over run on burner shutdown

If you require any further information or you have any special requirements please do not hesitate to contact our Technical Department.

For ON/OFF Control Only, Omit 3 Pin Burner Plug

4:1 Turndown Burner:
Burner 7 pin plug/socket terminal connections:

1. 240v & N supply
2. T1 & T 2 is the enable, T1 & T2 must break when up to temperature, all interlocks to be wired in series with T1 & T2. (The burner must be interlocked with the supply fan).
3. Terminal S3-240v burner lockout indication if required.
4. Terminal B4-240v burner lockout indication if required.

Burner 3 pin plug/socket terminal connections:

5. L-10v dc modulating signal connection
6. N-0v dc modulating signal connection

Please supply 15 minutes supply fan over run on burner shutdown.

If you require any further information or you have any special requirements, please do not hesitate to contact our Technical Department.

WARNING!
Electrical Shock Hazard

Use extreme caution while working on this appliance.
Failure to follow these instructions can result in death or electric shock.
Only competent engineer should carry out work on this appliance.

Section 13 - Commissioning

Commissioning MUST be carried out by a competent Gas Safe registered engineer.

This section must be read in conjunction with the commissioning instructions given in the burner manual.

1. Visually check the full system to see if it is in accordance with this manual and to current/GAS SAFE legislation and IEE regulations and to this manual.

2. Check combustion air is adequate in plant room or surrounding area.

3. Check contactors, electrical wiring is correct and terminated tightly and fuse ratings are correct.

4. Ensure that the gas pipework is sized correctly and relative documents for pressure testing, soundness and purging

are available. It is the responsibility of the commissioning engineer to check for soundness from the main inlet to the servicing stop tap on the inlet of the valve.

5. Ensure that the inlet gas pressure is no greater than 75mb static and no less than 17.5mb running.

6. Make sure that all dampers are set and diffuser outlets are open to give the correct air flow.

7. Check that there is an interlock with the supply fan and burner so that the burner cannot run without the supply fan e.g. air pressure switch across supply fan in series with the enable circuit between terminals 1 & 2. The supply fans MUST be set to run for 15 minutes after burner shutdown, on a shutdown condition. Terminals 1 & 2 are also used to wire thermostats and time switches in series to switch the burner on and off.

8. Terminals 6 & 7 are required for high /low operation (if fitted); when the circuit is made it is high and when it is broken it is low.

9. Ensure that the thermostat wired between terminals 1 & 2 is closed and turn the gas supply on to make the gas pressure switch and turn the commissioning stop tap off.

10. Switch the burner on. The burner should run through its cycle and after the ignition spark goes out, the burner should lockout on flame failure on the control box.

11. Before opening the commissioning stop tap ensure that the burner air damper is open. Disconnect the main valve. Leave the pilot connected. Open the commissioning tap and switch the burner on. The burner should go through its sequence and fire but stay on. At this point in time, check the start gas rate which should be no greater than 20% of the total output.

This is preset in the factory and must be checked.

12. When satisfied with the pilot pressure, switch the burner off and reconnect the main valve, turn the main gas valve on and turn the gas valve throttle to minimum. Switch the burner back on and make the high / low circuit.

Now the burner should fire and go to full fire. Set the head pressure in accordance with the rating plate. Break the circuit between terminals 6 & 7 so that the valve goes to low fire and set it in accordance with the rating plate pressure. The governor must be throttled down until it takes control of the head pressure, then be left at that setting. The main gas valve throttle can be locked in to position when the gas head pressure is set.

13. When satisfied with the gas settings, the CPI switch (if fitted) requires setting on, they are integral, which are factory set. For further information please see the burner manual.

14. Carry out full emissions check with a flue gas analyser. The parameters are to be set as specified in this manual by the adjustment of the burner air damper, which, when satisfied must be locked off securely.

Then the burner requires setting to 50% turndown, which can be done by breaking the circuit between terminals 6 & 7. Check the emissions are satisfactory once the circuit has been broken. They should be approximately 10% to 11% O2 on low fire and CO emissions should be below 100 PPM.

Note the air damper is not altered between high and low, it is set on high.

15. The high and low air pressure switch must be set after the damper has been locked off. The low air pressure switch is set by turning it up until it locks out and then moving it back 1.2mb on the pressure switch. Set the high air pressure switch to 1.2mb above the lockout pressure.

16. The low gas pressure switch will be preset in the factory to 10mb.

17. Check the strength of the flame sensing device by removing the link on the

burner, which connects the flame probe to the control box. Connect a multi-meter in series to give reading in uA. The signal strength should be a least 70uA for U.V. and 6uA on flame rectification.

18. After running the unit for a period of one hour, take a running temperature from the fan limit side of the thermostat. Set the over-heat to 20°C above the running temperature. The supply fans should be shut down once, when the burner is running to try the overheat device and the fans must be switched on as soon as the unit locks out on overheat.

19. All gas nipples must be replaced and checked for tightness and checked with leak detection fluid.

20. A leak detection test is to be carried out with leak detection fluid and an electronic leak detector on the gas train whilst the burner is running to see if there are any leaks in the burner gas train. A soundness test is to be carried our on all gas work.

21. Make a full record of combustion data on the commissioning sheet provided. The commissioning sheet should include the following:

- Model and Serial Numbers.
- Heater running temperature and overheat settings.
- Full thermal input.
- Governor pressure setting (pilot for start gas and main for full fire).
- Gas flow rates for full fire.
- Burner damper setting and pressure switch settings.
- Flame signal strength on full fire.
- Exhaust gas O2, CO2, CO and temperature.

After setting all air pressure switches and valves etc, mark the position or lock off if possible.

Typical flue gas readings are given below:-

O2 4% to 5%
CO2 9.5% to 10%
CO Up to 100ppm
Typically, 20 ppm
Flue stack temp Up to 250°C

Please Note: You must not electrically isolate the heater when in full fire, always wait until the burner stops and the supply fan over runs to dissipate the heat before electrically isolating.
For summer ventilation switch on/off switch to off and set fan switch from auto to manual.

Section 15: Servicing

INSTRUCTION FOR THE HEAT HEATER

PLEASE NOTE SERVICING MUST ONLY BE CARRIED OUT BY A COMPETENT REGISTERED ENGINEER (GAS SAFE)

BEFORE CARRYING OUT ANY WORK ON THE UNIT SEE THAT THE ISOLATING SWITCH IS IN THE 'OFF' POSITION AND THE GAS SUPPLY IS SHUT OFF.

WARMATIC ONLY RECOMMEND THE USE OF PARTS SUPPLIED OR RECOMMENDED BY OURSELVES.

INFORMATION IS FOR GUIDANCE OF QUALIFIED SERVICE ENGINEERS ONLY

Note: We recommend that the Heater is fully serviced every year and recommissioned. If the flue gas passages in the heat exchanger, the combustion chamber, or in the flue chamber are blocked, the Heater can overheat causing the unit to shut down on the overheat thermostat.

To clean the Heat exchanger:

The heat exchanger must be cleaned from the front and rear of the appliance after first removing the following items:

(a) The burner assembly

Burner Removal (With gas and electrical supply isolated):

1. Disconnect the electrical supply to the burner by removing the multi-pin plug from the socket on the Heater interface panel.

2. Disconnect gas valve plugs.

3. Unscrew gas union assembly at inlet to gas train and at entry into burner mounting flange and remove gas train assembly.

4. Remove four fixing screws holding burner to heater front and lift away burner.

5. Fully service burner and replace electrodes, if required

(a) The fan limit thermostat

(b) The front outer case panel

(c) Remove and support flue

(d) Remove Rear panel

(e) The heat exchanger cover plate, front and rear.

(f) Brush any deposits from all of the flue ways using a brush. Also brush down the heat exchanger tubes.

(g) Remove any soot from the bottom of the combustion chamber with a vacuum cleaner.

(h) Inspect soundness of combustion chamber/heat exchanger.

(i) Replace all items in reverse order.

NOTE: Fit new gasket or seal to gas exchanger box, cleaning door where necessary.

Note: Regarding External Heaters

If the heater is housed within an Air Handling Unit, there will be sufficient room to allow servicing. Servicing as per our standard internal procedures.

Please note in extreme weather conditions, always ensure any electrical connections etc are protected and do not allow water onto them.

If stand alone external heater, there will be a door, which is hinged up over to allow protection to the engineer from weather conditions; an illustration of the external heater can be found in section 5 Fig 1.

Wet Conditions

If it is found that the area in which the heater is installed has become wet/flooded, the heater must be electrically isolated immediately and an investigation to find out if any water has penetrated into the heater controls. If so, ensure they are dried out properly before re-installing the electric supply.

Burner Maintenance:

Refer to the Burner Supplement supplied with the heater.

Servicing Heat Exchanger:

Heat Exchanger of multi-tube construction with removable access clean outdoors at either end. Access plates are secured by brass nuts, sandwiching glass wool webbing type gasket material between the heat exchanger flange and the access doors. When removing the doors it is important to inspect the gasket material and replace if necessary.

It is important that the tubes should be inspected and swept out if necessary, replacing Gasket Material – the material is of glass wool webbing 25mm x 3mm thick in strip form. The method of securing it is to have strips overlapping, and to cut through both surfaces with a sharp knife to give an exact join. Self-adhesive webbing is easier to secure (available from Warmatic Limited).

Recommended intervals:

Weekly check:

Check that there are no apparent leaks.

Clean air filters if fitted, if of the washable type, or replace where necessary.

Quarterly check:

As weekly check, and also:

Check the tension of the main fan belt(s).

Check the flue for condensation.

Remove the Burner Inner Assembly – clean and replace.

Annual Inspection:

Clean heat exchanger surface.

Inspect and align fan and motor pulleys. Check the tightness of the motor bolts.

Adjust fan belts for tension.

Inspect and adjust electrical connections.

Check all wiring and tube connections.

Remove the burner inner assembly – clean and replace.

Start the Heater and check CO readings, stack temperature efficiency and CO level.

Check the combustion air supply and check the smoke reading.

Overheat/Limit control:

The limit control provides protection for the heater, should the temperature rise above a safe level. If an overheat condition occurs, the limit control will shut down the burner and hold it off until the manual reset button is pressed.

NOTE: If the limit requires re-setting more than once after first re-set, then a competent engineer must be called to investigate further.

Fan setting - 35°c ON (If required)

- 25°c OFF

High Limit - 20°c above normal running temperature no greater than 100°c

Important: When integrated with building management system, the fan will be operated via their controls and all interlocks must be fitted to ensure the burner cannot start until the supply fan is running. On burner shutdown the supply fan overrun will continue running for 10 – 15 minutes to dissipate residual heat.

WARNING!

Replace faulty gas valve with genuine Warmatic replacement part; failure to do so could result in death, injury and damage to property.

Note! Check all gas pipes and joints to ensure there are no cracks or gas leaks. Any cracks in the pipe work or joint must be repaired.

Fan control (if used):

The burner should start its safety sequence and then fire up. When the heater achieves 35°c the supply fan will cut in and your heater is up and running. When the space is up to temperature the burner will stop and the supply fans will run on until the fan control reaches 25°c and then the supply fan will shut down. The heater will then switch on and off as required via the day thermostat and time clock. If your heater fails to start, check burner lockout and high limit resets as referred to in fault findings, if any further investigation is required or the heater repeatedly locks out then a Gas Safe registered engineer must be called to investigate further.

Please Note: You must not electrically isolate the heater when in full fire, always wait until the burner stops and the supply fan over runs to dissipate the heat before electrically isolating.

For summer ventilation switch on/off switch to off and set fan switch from auto to manual.

Cleaning Of Heater:

The heater can be cleaned externally using a damp cloth with a light detergent. Please note: this is on the outer panel only, away from all of the electrics. No substance can be used that will cause harm to the surface of the metal, or remove paint etc.

Please Note: You must not use water on unpainted galvanised finished surfaces.

Fan Assembly:

Inspect the fan blades to see they are not damaged and that there is no excessive building up of deposits that could give an imbalance via access panel on the side of the heater. If necessary, clean the fan blades.

The main fan bearings are permanently sealed and do not require lubrication.

Check belts for signs of wear and replace if required.

Gas control valves maintenance:

No regular maintenance is required on these devices. Please refer to section 16 for removal or replacement of parts.

WARNING!

Replace faulty gas valve with genuine Warmatic replacement part; failure to do so could result in death, injury and damage to property.

Note! Check all gas pipes and joints to ensure there are no cracks or gas leaks. Any cracks in the pipe work or joint must be repaired.

Fan control:

The burner should start its safety sequence and then fire up. When the heater achieves 35°c the supply fan will cut in and your heater is up and running. When the space is up to temperature the burner will stop and the supply fans will run on until the fan control reaches 25°c and then the supply fan will shut down. The heater will then switch on and off as required via the day thermostat and time clock. If your heater fails to start, check burner lockout and high limit resets as referred to in fault findings, if any further investigation is required or the heater repeatedly locks out

then a Gas Safe registered engineer must be called to investigate further.

Please Note: You must not electrically isolate the heater when in full fire, always wait until the burner stops and the supply fan over runs to dissipate the heat before electrically isolating.

For summer ventilation switch on/off switch to off and set fan switch from auto to manual.

Section 16: Removal and Replacement Parts

Note! Please refer also to the burner supplement supplied with this Manual.

Multi-Block gas valve

1. Isolate electric and gas.
2. Remove Din Plugs by using a terminal screwdriver to undo locking screw.
3. Undo valve flanges with 13mm spanner (up to 500 model), 17mm spanner (above 500 model). Lift out valve assembly.
4. Replace and re-assemble in reverse order, taking care that the O rings are in position.
5. Check for gas soundness and re-commission heater.

Fan and limit stat

1. Isolate electric supply.
2. Remove outer casing and disconnect wires. The wires are held in by spring terminals which will release by pushing a small screwdriver into the slot next to the wiring termination.
3. Remove fixing screws, which secure stat to front of panel, carefully withdraw stat from heater and remove casing.
4. Re-assemble in reverse order and check settings, adjust if required to fan on 35°, fan off 25°, high limit 90°.

Recommend Tools to be used.

a) Spanner 10mm, 13mm and 17mm

b) Screwdriver – Terminal, medium flat blade and philips medium

c) Stillsons – 14" and 18"

d) Allen keys – standard metric set, 1.5mm – 10mm

e) Side cutters/pliers

f) Multi-meter

g) Manometer

h) Flue – brush 3" head for exchanger tubes

Please refer to gas burner supplement supplied with this manual.

All components can be purchased from Warmatic Limited

WARNING

Only use parts recommended by Warmatic or otherwise stated in this manual.

You must first contact Warmatic if you want to use alternative parts.

Section 18: Troubleshooting

Note!
Please refer to burner supplement supplied with this manual where more specific troubleshooting will be found.

Fault	Cause	Check
Burner Lockout	Burner fault, check sector lockout occurred on controls box	Refer to burner supplement finding chart
Overheat trip	Dirty filters, low supply air	Filters, supply fan belts, damper operations
Burner held off	No enable signal	Check BMS/Controls back via T1 & T2 in heater interface panel
Main fan runs continuously	Electrical	Summer/Winter switch set to summer (Manual) Fan thermostat set to low Fault Fan/Limit stat
Main fan Fails to run	Electrical	Fan Motor faulty Fan/Limit stat faulty Contactor faulty Motor on overload

Section 19: Users Instructions

WARNING!

If you smell gas:

1. Open all windows and door.

2. DO NOT try to light any appliance.

3. DO NOT use electrical switches.

4. DO NOT use any telephone in your building.

5. Leave the building.

6. Immediately call your local gas supplier after leaving the building; follow

   the gas supplier's instructions

7. If you cannot reach your gas supplier, call the fire department

USERS INSTRUCTIONS

Once the controls have been fully installed and proved with the Heater (all interlocks proved etc), the supply air has been balanced and only when the Heater has been fully commissioned by a qualified registered engineer (Gas Safe), you are now able to use your Heater safely.

Easy Lighting and Shutting Off Instructions

Burner Start up

1. Ensure Burner and Heater On/Off Switch is on.

2. Fan switch is in auto position. If the heater is controlled via a BMS then the supply fan should be running before the burner can start.

3. Make sure the time clock and thermostats are calling for heat or that the BMS is giving enable signal to terminals 1 & 2 in our interface panel.

Burner Shut down

1.Ensure Burner and Heater On/Off Switch is off.

2.Fan switch is in auto position. The fans should run on for at least 10 min or till the fan limit is below 25°c to cool heat exchanger.

3.Make sure the time clock and thermostats are not calling for heat or that the BMS is not giving enable signal to terminals 1 & 2 in our interface panel.

WARNING!

In Emergency only! Use electrical isolator and the gas isolation valve to isolate the appliance.

Do not use electrical isolator to switch this appliance off in normal use, as the fan is required to run on to cool the heat exchanger failure to do so will cause damage to this appliance.

Simple Fault Finding

Some possible reasons for the heater not operating are:

1. Gas supply not turned ON.
2. Electrical Supply not turned ON.
3. The time and/or Thermostats may not be ON.
4. The Limit stat may have operated due to an interruption of electrical supply or fault with the distribution fan.

WARNING!

If the limit thermostats persistently operate, there is a fault which must be investigated by a qualified engineer registered with Gas Safe. This Heater should not be electrically isolated during normal operation; doing so without a fan run on for 10 min will cause serious damage to the heater.

Simple Fault Finding (burner faults)

If the burner fails to ignition for any reason, it will go to lockout. This will be indicated by the red light on the burner or digitally shown on a display screen.

Press in and release the lockout reset button; call a registered engineer if this does not rectify the problem.

Lockout should not occur during normal operation of the heater and indicates there is a fault condition which must be corrected.

WARNING!

Do not store or use petrol or other flammable vapours and liquids in the vicinity of this or any other appliance.

Some objects will catch fire or explode when placed close to the heater.

Failure to follow these instructions can result in death, injury or property damage.