INSTALLATION/COMMISSIONING/SERVICE/USER MANUAL

ZEPHR (UHO) OIL FIRED UNIT HEATER

The Zephr range meets the following European directives:

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

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

Contents

1. General

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- Low Voltage Directive (2014/35/EU)
- Electromagnetic Compatibility Directive: (2014/30/EU)
- Regulation (EU) 2016/2281

The Zephr UH is designed for operation with either certified Gas Oil Oil to BS2869 Class A2 or D (35 sec Oil) and Kerosene to BS2869 Class C2 (28 sec Oil).

Zephr UH must be installed in accordance with BS5410 Part 2, BS799 Part3 & part 5 and BS5440 and any relevant requirements of local and national building codes in force.

A fire valve and oil filter must be fitted to the Zephr UH, these will be supplied loose.

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1.1 Introduction

These instructions refer to appliances designed to operate in the UK and Ireland. Appliances designed for other countries can be provided upon 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 Oil distribution systems, nature of Gas Oil and pressure, and adjustment of the appliance are compatible.

Zephr UHO 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.

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.

1.2 General Health and Safety

Symbols used in this document.

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 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.

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 Oil control that has been immersed in water.

Gas Oil-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 oil supply fail to shut off, shut off the manual oil 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.

1.2.1 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 Oil category on the appliance data label does not match the country of installation or the country codes and Gas Oil 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 Oil or oil pipework installation is carried out in accordance with all current legislation, Codes of Practice and recommendations.

1.3 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.

1.4 Factory Test

All heaters produced 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.

1.5 Construction

The construction of a Zephr UH will consist of double skin panels all around and build from a pentapost frame.

1.6 Burner and Fuel

The Zephr UHO Unit heater will be fitted with a Pressure Jet Oil Burner.

1.7 Burner Type

Zephr UHO uses three main manufacturers for Oil Fired Unit

Reillo, Weishaupt, Elco & Nu-way which are available for high/low (modulating can be supplied on request).

1.8 Applications

The Zephr UHO 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.

2. Technical 2.1 Technical Data

ZEPHR UHO HEATER INFORMATION								
Model	**Units**	**30**	**45**	**60**	**90**	**120**	**150**	**200**
HEAT OUTPUT	kW	30	45	60	90	120	150	200
HEAT INPUT	kW	31.8	47.7	63.6	95.4	127.2	159	212
LOW FIRE OUTPUT	kW	15	22.5	30	45	60	75	100
Nox EMISSIONS	ppm	67	71	73	79	55	67	80
AIFLOW	m3/sec	0.86	1.28	1.71	2.57	3.43	4.28	5.71
TEMPERTURE RISE	Degree c	29	29	29	29	29	29	29
FLUE DIMETER	mm	130	130	130	130	130	130	150
ELECTRICAL SUPPLY				230 volts 50Hz				
NOISE LEVELS	db(A)	52	51	54	59	59	65	66
WEIGHT	kg	92	119	138	169	197	219	265

Riello Gulliver Technical information (ZEPHR UH) - 35 sec Oil - Diesel

				Low Fire Settings		High Fire Settings	
Model	**Burner Type**	**Heat Input (kW)**	**Nozzle**	**Pump Pressure**	**Fuel Flow Rate (kg/hr)**	**Pump Pressure2**	**Fuel Flow Rate (kg/hr)2**
UH 30	RG1RKD	31.8	0.65 x 80S	9	1.34	14	2.68
UH 45	RG2D	47.7	1.00 x 60S	9	2.01	15	4.02
UH 60	RG2D	63.6	1.25 x 60S	9	2.68	14	5.36
UH 90	RG3D	112.5	2.0 x 60S	9	4.74	14	9.49
UH 120	RG3D	127.2	2.75 x 60S	9	5.36	12	10.73
UH 150	RG3D	159	3.00 x 60S	9	6.70	15	13.41
UH 200	RG5D	212	2.5 & 2.0 x 60S	13	8.94	13	17.88

Net CV (HI = 42.69 Mj/kg)

Riello Gulliver Technical information (ZEPHR UH) - 28 sec Oil - Kerosene

				Low Fire Settings		High Fire Settings	
Model	**Burner Type**	**Heat Input (kW)**	**Nozzle**	**Pump Pressure**	**Fuel Flow Rate (kg/hr)**	**Pump Pressure2**	**Fuel Flow Rate (kg/hr)2**
UH 30	RG1RKD	31.8	0.75 x 80S	7	1.22	10	2.45
UH 45	RG2D	47.7	1.25 x 60S	7	1.83	10	3.67
UH 60	RG2D	63.6	1.50 x 60S	7	2.45	10	4.89
UH 90	RG3D	112.5	2.50 x 60S	7	4.33	10	8.65
UH 120	RG3D	127.2	3.00 x 60S	7	4.89	10	9.78
UH 150	RG3D	159	3.75 x 60S	7	6.12	10	12.23
UH 200	RG5D	212	2.5 & 2.0 x 60S	10	8.15	10	16.31

Net CV (HI = 47.00 Mj/kg)

3. Installation

3.1 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 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 Oil 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.

3.2 General requirements

WARNING Unauthorised modifications to the appliance, or departure from the manufacturers guidance on intended use, on recommended practices may constitute a hazard.
thereby constitute a hazard All heaters must be earthed.

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.

3.2.1 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.

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

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 & oil supplies

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 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 contact.

3.3 Installers Responsibilities

- To install the heater, as well as the Gas Oil and electrical supplies, in accordance with applicable specifications and codes. Warmatic recommends the install- er 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.

3.4 Heater installation

Before installation, check that the local distribution conditions, nature of Gas Oil 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.

3.3.1 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

Hanging the heater

Do not locate the heater where it may be exposed to water or where the ambient temperature exceeds 40°C.

Ensure that the structural elements, which will be used to suspend or support the appliance, are adequate to carry the weight of the appliance and its ancillary components i.e. the flue system. Unit weights are given in the technical data section previously.

Sufficient space must be provided around the heater for servicing and clearances for safety.

Ensure that the unit heater is installed in a level plane.

Always provide a minimum clearance of 600mm at an open-air intake (inlet side) Suspend the heater only from the threaded nut retainers or with a suspension kit provided by the manufacturer.

Do not suspend the heater from the heater cabinet panels.

Do not add additional weight to the suspended heater.

The minimum safe mounting height is 2.5 metres.

The unit heater is delivered on a pallet; leave the unit on the pallet until you are ready to hang it. If the bottom of the unit is not protected or supported prior to installation, damage can occur.

The heater is supplied with four point suspension. All points must be used. Two threaded nut retainers are

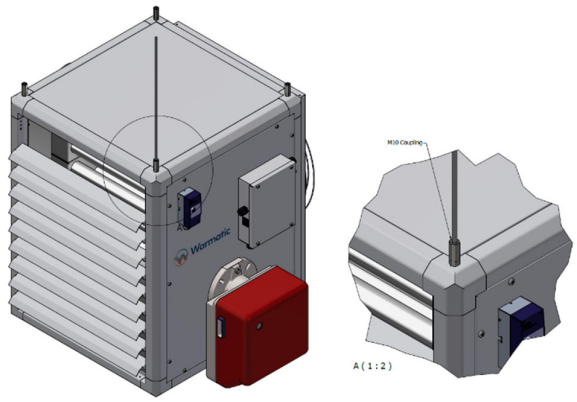
provided on each side of the top of the heater. See Figure 1 for hanger rod size.

Be sure that the threaded hanger rods are locked to the heater as illustrated in Figure 1.

Recommended maximum hanger rod length is 1.8m. Where longer drops are required, ensure that restraints are fitted to prevent excess lateral movement and supports are adequately sized.

A wall mounting bracket kit is available to offer mounting alternatives. Please contact the manufacturer / distributor for details.

Figure 1 Suspending the heater with rods from the threaded nut retainers.



To correctly install the heater, bear in mind that the heaters should:

Note:

- 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 are such that it can prevent vibrations from reaching underneath.
- Respect the clearance distances to allow for a correct flow of air and normal cleaning and maintenance operations.
- 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 exit point.
- 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 environments.
- In negative pressure environments.
- Outdoors, if not provided with protection against bad weather conditions.

When installing the heater, minimum clearance is re- quired 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 (see Table 2), 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 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^{O}C.

WARNING No air heater shall be installed where there is a foreseeable risk of flammable particles, Gas Oiles, vapours, or corrosion inducing Gas Oiles 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 2 must be considered.

Airflow
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.

3.3.2 Air distribution
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.

4. 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 The heater has a JUMO Limit Stat, the maximum setting 100°c, the limit stat must be set 20°c above normal running temperature.

The heater must be run at full output until the temperature reaches maximum, turn the limit stat down until the overheat trips and stops the burner running, if the overheat trips at 70°c then the limit stat will be set to 90°c.

The overheat limit stat must be check at the time of commissioning for its operation.

The overheat device is a crucial component of the safe operation of the heater, this device must not be by-pass electrically or altered in anyway.

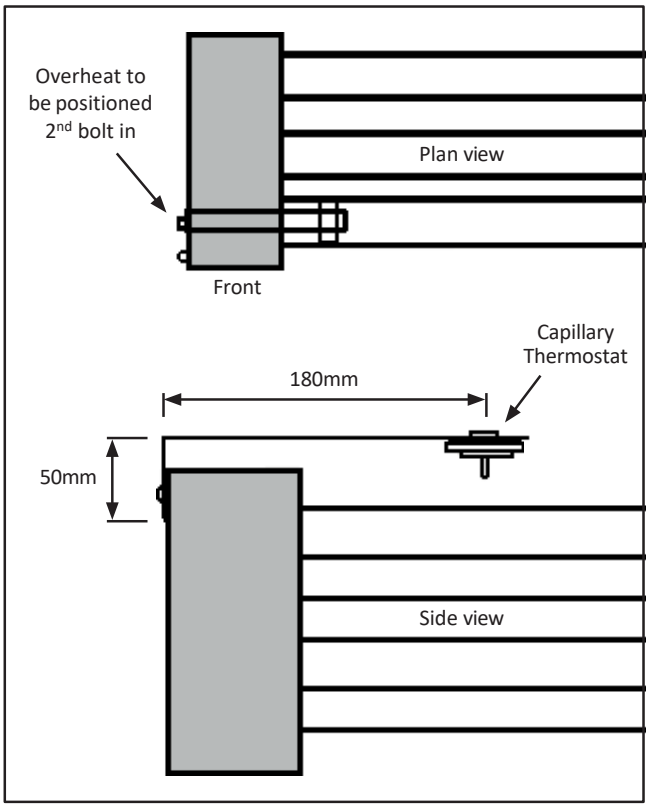
This may cause heat exchanger damage as a result.

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

Fig. 2 Overheat device Limit device

Fig 2, remove the plastic cap with a screw driver and lift the white lever under the cap).

Fig. 3 Overheat position



Under no circumstances should the capillary thermostat differ from information in Fig.3, unless instructed by Warmatic technical department.

4.1 Supply Fan Control.

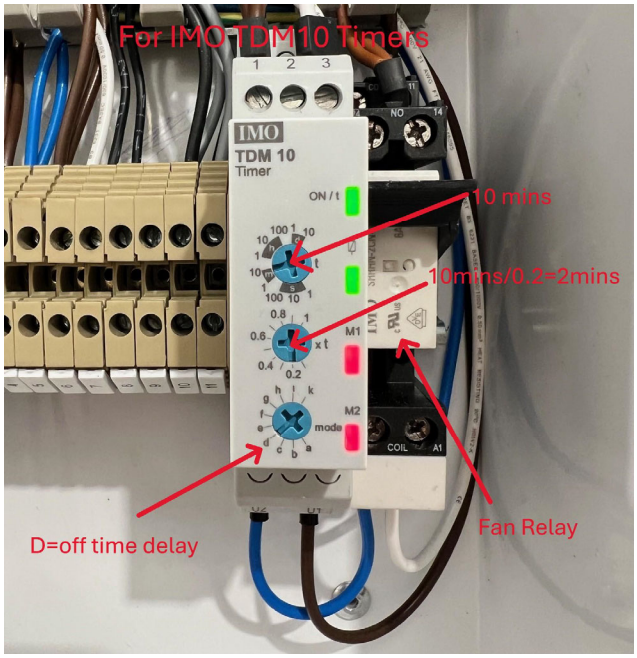
The supply fan(s) are control via a relay and multi-functional timer.

The multi-functional time, triggers when the burner enable is requested, once the set point in the room is reached the burner dis-enables and the multi-function delay timer keeps the fans operating to a define time, this time must not be set lower than 3 mins.

Various multi-functional timers are used in the production of this appliance, the IMO timer shown in figure 4 shows the mode is set to (d), where as the mode setting on the Europa Timer is set to (e) for the same function.

Various multi-functional timers are supplied, these are set during the production and testing of the appliance.

Fig.4 Timer example and setting for IMO type



5. Flue System

The flue system must be made to the following specifications:

1. Mechanically robust.
2. Resistant to internal and external corrosion.
3. Non-combustible and durable under the conditions to which they are to be subjected.
4. Stainless steel flue is recommended.
5. Dinak flue is recommended

5.1 Design

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

1. The flue Gas Oiles exiting the appliance can be as great as 250^{O}C and as low as 60^{O}C on modulating burners.
2. 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.
3. Flue must be a type acceptable to current standards.
4. Facilities should be made for the disconnection of the flue from the heater to aid servicing and inspection.
5. This appliance does not require a draught diverter.
6. It is a requirement to fit a 90^{O} 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^{O} bends. If there is an unavoidable obstruction, then the use of 45^{O} bends will be permitted. (Please contact Warmatic if more than two 45^{O} bends are used).
7. 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.

8. A Flue terminal must be fitted.
9. The flue installation must be designed to the latest Gas Oil regulations and any local environmental standards.
10. 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 table 1

5.2 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.

Gas Oilket sealed single wall seamless stainless steel flue pipes are required. All joints must be sealed to prevent 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 tee c/w drain fitting between the flue outlet of the heater and the vertical flue pipe. Alternatively, insulated flue pipe should be considered.

WARNING 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 flue 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.

Horizontal flue up to 150kW (max run is 3m plus one 90^{O} elbow - condense tee is not required) runs should be installed with a slight gradient of approximately 5^{O} 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.

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 the 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 flue specialists.

6. Gas Oil Installation

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 Oil pressure should be 20mbar for natural Gas Oil.

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

Type of Roof		Location not within 1.5m of a vertical surface* on the roof		Location within 1.5m of a vertical surface* of a structure on the roof
		On Ridge	Not on Ridge	
Pitched	Pitch exceeding 45°	At or above roof level	1m Above flue/roof intersection	The base of the terminal to be 600mm above the level of the top of the structure.
	Pitch not exceeding 45°		600mm Above flue/roof intersection	
Flat	With parapet	Not applicable	600mm Above flue/roof intersection+	
	Without parapet		250mm Above flue/roof intersection	

Table 3 Recommended flue roof terminal locations

* 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.

WARNING 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.

5.3 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.

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 Oil connection must not be used. The complete installation must be tested for soundness as described in the country of installation. Sup- port as 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 EN1020. 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 Oil burners are concerned, we suggest placing
a leak detector near them, which will operate an electro valve that will stop the Gas Oil supply in case of any accidental leakage.

The Gas Oil supply line should be installed by a qualified per- son, in compliance with all the relevant Laws, Regulations and Rules. Refer to the designer of the system.

8. Oil Installation/connection

WARNING Prolonged exposure and contact with Gas Oil 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.

8.1 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 pipework 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 oil). The critical temperature is -4^{O}C for this summer grade.

The cfpp critical temperature for the winter grade is 12^{O}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 Oil is liberated from the oil.

8.2 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 suggest- ed. 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.

8.3 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.

8.4 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 pipework 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.

8.5 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.

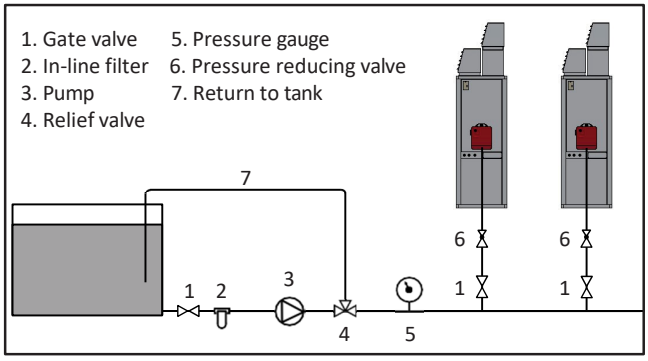


Fig. 4 Pressurised oil feed system

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.

CAUTION The internal by-pass plug must be removed from the burner pump when used in a pressurised ring main application and Single piped system

8.6 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 pipework 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.

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

The return line should terminate within the il 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-re- turn 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

WARNING - A fire valve fire protection device and filter must be fitted to the appliance.

9. Electrical installation/ connection

WARNING Always isolate from the mains electrical supply before commencing work on this appliance

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 supplied for use on 415V 50Hz 3PH & 240v 50Hz 1PH supplies as standard. Single phase is available on some models upon request.

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 nation- al 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.

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-in- stalled with burner, control and safety thermostat of the Fan control 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.). and 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.
- 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.

10. Ventilation

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 louvres 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.

10.1 Ventilation Requirements

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

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

High Level: 270cm² plus 2.25cm² per kW after 60kw

11. Heater Controls

As standard, each heater is supplied without controls although a time and temperature controller is available as an option.

Terminal 1 is the Burner & Fan enable
Terminals 7 & 8 is high stage (if fitted)

In addition to the burner, the following functions can be connected-

- Summer fan run
- Burner lock-out

Each heater can be used with most Building Management Systems.

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 carryout work on this appliance.

12. Commissioning

Commissioning MUST be carried out by a competent Gas Oil 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 legislation and IEE regulations and to this manual.

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

3. Check clearances around the heater are in accordance with those stated in section 3.4.1.

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

5. Ensure that the pipework is sized correctly and relative documents and the fuel is bled of air within the oil line, 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.

6. Ensure that the inlet oil pressure is correct as burner the burner manufacturers manual on pressurised systems

7. Make sure that all diffuser out- lets are open to give the correct air flow.

8. 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 at least 3 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.

Note:

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

IMPORTANT!

10. Ensure that the thermostat wired between terminals 1 & 2 is closed and turn the Gas Oil supply
11. 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.

12. Please refer to the burner manual for adjustment

Note:

13. The burner must run for 20 minutes before running temperatures and burner emissions checked, Typical flue Gas Oil readings are given below:-

CO_2 12.0% to 12.5%
CO Up to 50ppm (Typically, 20 ppm)
Flue stack Temperature maximum: 250°C

14. Please refer to the burner manual for adjustment
15. 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.

16. All oil test points must be replaced and checked for tightness and checked for leaks

17. com-missioning sheet provided.

The commissioning sheet should include the following:

- Model and Serial Numbers.
- Heater running temperature and overheat settings.
- Full thermal input.
- oil pressure setting (low and high fire).
- Burner damper setting and pressure switch settings.
- Exhaust Gas Oil O_2, CO_2, CO and temperature.

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

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.

13. Servicing

IMPORTANT - SERVICING MUST ONLY BE CARRIED OUT BY A COMPETENT REGISTERED ENGINEER (GAS OILSAFE) BEFORE CARRYING OUT ANY WORK ON THE UNIT SEE THAT THE ISOLATING SWITCH IS IN THE 'OFF' POSITION AND THE GAS OIL SUPPLY IS SHUT OFF.

ONLY PARTS SUPPLIED OR RECOMMENDED BY THE MANUFACTURER SHOULD BE USED.

INFORMATION IS FOR GUIDANCE OF QUALIFIED SERVICE ENGINEERS ONLY

NOTE: Heater MUST be fully serviced at least once a year and recommissioned. In dirty or dusty environments it may be necessary to increase the number of times the heater is serviced to maximise performance and efficiency from the heater.

If the flue Gas Oil 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.

13.1 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:

- The burner assembly burner Removal (With oil 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 oil valve plugs.

3. Unscrew oil union to remove oil flexi hose.

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

5. Fully service the heat exchanger in the following manner and replace burner electrodes, if required:
   - Remove the fan limit thermostat

- Remove the front outer case panel
- Remove and support the flue system
- Remove Rear panel
- Remove the heat exchanger cover plate, front and rear.
- Brush any deposits from all of the flue ways using a brush. Also brush down the heat ex- changer tubes.
- Remove any soot from the bottom of the combustion chamber with a vacuum cleaner.
- Inspect soundness of combustion chamber/ heat exchanger.
- Replace all items in reverse order.

NOTE: Fit new Gas Oil kit or seal to Gas Oil exchanger box, cleaning door where necessary.

NOTE: Service external units as per our standard internal procedures. In extreme weather conditions, always ensure any electrical connections are protected and do not allow water ingress.

13.2 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 reinstalling the electric supply.

13.3 Burner Maintenance

Refer to the Burner Supplement supplied with the heater.

13.4 Servicing Heat Exchanger

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

is important to inspect the Gas Oilket material and replace if
necessary.

It is important that the tubes should be inspected and swept out if necessary, replacing Gas Oilket 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.

13.5 Recommended intervals

13.5.1 Weekly check

- Check that there are no apparent leaks.
- Clean air filters if fitted, if of the washable type, or replace where necessary.

13.5.2 Quarterly check

As weekly check, and also:

- Check the tension of the main fan belt(s) if fitted.
- Check the flue for condensation.
- Remove the Burner Inner Assembly – clean and replace.

13.5.3 Annual Inspection

- Clean heat exchanger surface.
- Inspect and align fan and motor pulleys (if fitted)
- Check the tightness of the motor bolts.
- Adjust fan belts for tension (if fitted)

NOTE: Inspect and adjust electrical connections.

- Check all wiring and tube connections.
- Remove the burner inner assembly – clean and

Note: replace.

- Start the Heater and check CO readings, stack temperature efficiency and CO level.
- Check the combustion air supply and check the smoke reading.

13.6 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.
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 to 15 minutes to dissipate residual heat.

13.7 Fan control (if used)

The burner should start it's safety sequence and then fire up. When the heater achieves 35°C the supply fan will cut in and the heater is up and running. When the space is up to temperature the burner will stop and the sup- ply fan(s) will run on until the fan control reaches 25°C, 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 the 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 Oil Safe registered engineer must be called to investigate further.

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.

13.8 Cleaning the heater
The heater can be cleaned externally using a damp cloth with a light detergent **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.

NOTE: Water must not be used on unpainted galvanised finished surfaces.

13.9 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 (if fitted) for signs of wear and replace if required.

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

WARNING Replace faulty Oil valve with genuine manufacturer recommended replacement parts; failure to do so could result in death, injury and damage to property.

NOTE: Check all oil pipes and joints to ensure there are no cracks or oil leaks. Any cracks in the pipe work or joint must be repaired.

Removal and Replacement Parts

NOTE: Please refer also to the burner supplement supplied with this Manual.

13.11 Multi-Block Gas Oil valve

1. Isolate electric and Gas Oil.
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 Oil soundness and recommission heater.

13.12 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 high limit 100°.

13.13 Recommend Tools to be used.

- Spanner 10mm, 13mm and 17mm
- Screwdriver – Terminal, medium flat blade and Philips medium
- Allen keys – standard metric set, 1.5mm – 10mm
- Side cutters/pliers
- Multi-meter
- Oil Pressure Guage
- Flue brush 3" head for exchanger tubes. Please refer to Gas Oil burner supplement supplied with this manual.

14. 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 locout occured on control box	Refer to burner supplement fault finding chart
Overheat trip	Dirty filters. Low supply air	Filters Fan belts (if fitted) Damper operation
Burner held off	No control signal	Check on/off voltage is present from control device. Is a 0 - 10V signal present
Main fan runs continuously	Electrical	Summer/winter switch set to summer (manual) Fan thermostat set to low Faulty fan/limit stat
Main fan fails to run	Electrical	Fan motor faulty Fan/limit stat faulty Motor on overload

15. User 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 engineer), you are now able to use your Heater safely.

Easy Lighting and Shutting Off Instructions

Burner Start up

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

- Ensure Burner and Heater On/Off Switch is off.
- Fan switch is in auto position. The fans should run on for at least 3 min is below 25ºc to cool heat exchanger.
- 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 Oil 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:
- oil supply not turned ON.
- Is there oil in the tank
- Electrical Supply not turned ON.
- The time and/or Thermostats may not be ON.
- 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. After discussion with Warmatic.

This Heater should not be electrically isolated during normal operation; doing so without a fan run on for 3 min will cause serious damage to the heater.

Simple Fault Finding (burner faults)

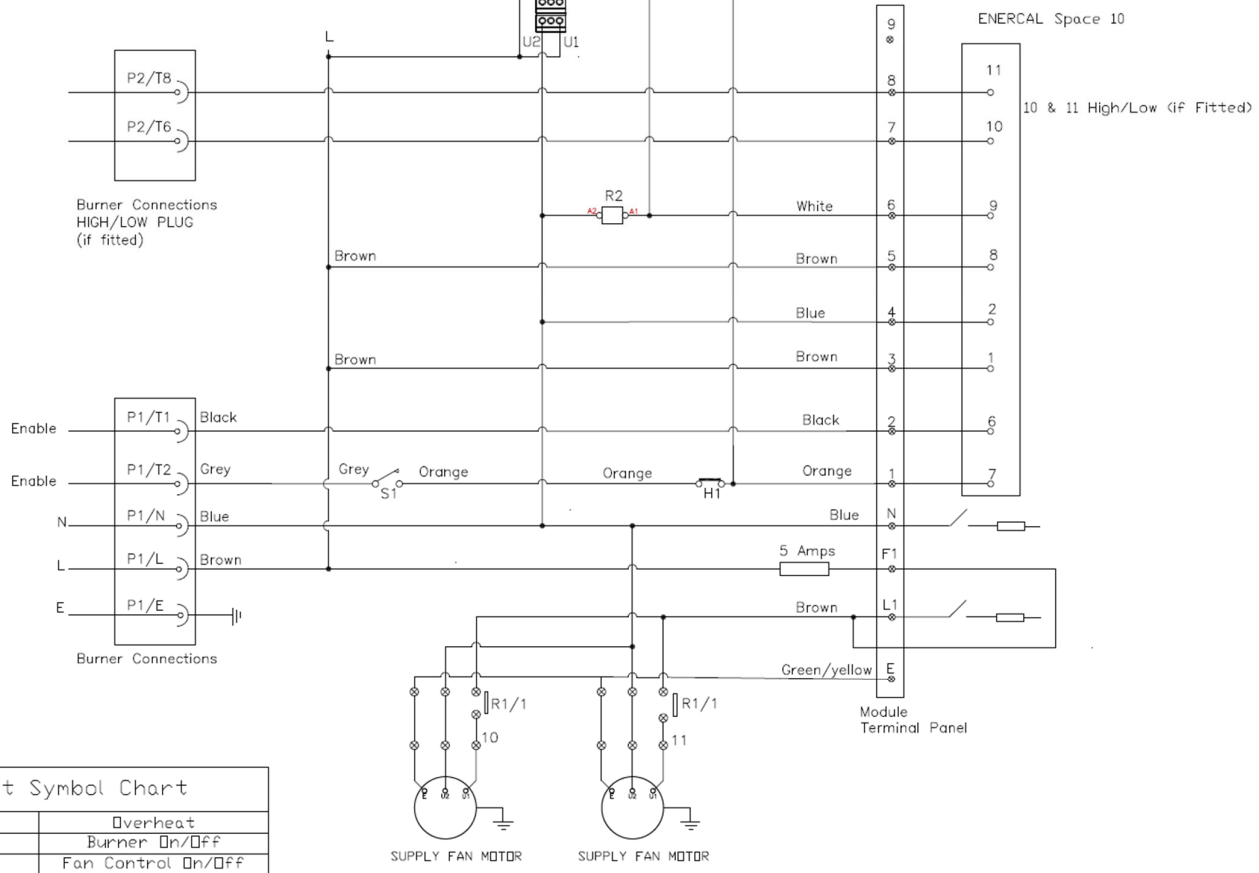
If the burner fails to ignition for any reason, it will go to lockout. This will be indicated by the red light on the burner or digitally shown on a display screen.
Press in and release the lockout reset button; call a qualified engineer if this does not rectify the problem. Lockout should not occur 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.

	The meaning of the symbol on the material, its accessory or packaging indicates that this product shall not be treated as regular waste. Please, dispose of this equipment at your applicable collection point for the recycling of electrical and electronic equipment waste. In the European Union and Other European countries which there are separate collection systems for used electrical and electronic product. By ensuring the correct disposal of this product, you will help prevent potentially hazardous to the environment and to human health, which could otherwise be caused by unsuitable waste handling of this product. The recycling of materials will help conserve natural resources. Please do not therefore dispose of your old electrical and electronic equipment with your regular waste.



Component Symbol Chart	
H1	Overheat
E1	Burner On/Off
FC1	Fan Control On/Off
V1	Remote Fan Control
CC1	Fan Contactor
S1	ON/OFF Switch
H/L	High Fire

Wiring diagram for oil heaters with enercal controller

REV	DESCRIPTION	DRAWN	DATE
2	ENERCAL space 10 connections	sb	28/11/23

Warmatic

PROJECT.
ZEPHR UH0

TITLE.
GENERIC WIRING

CLIENT.

PROJECT	DRAWN BY	DATE	SCALE
N/A	S.BYRNE	30-1-12	n/a

DRAWING NO.
ZEPHR_UH_-OIL-H/L_90_1

REVISION
R1

Notes

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