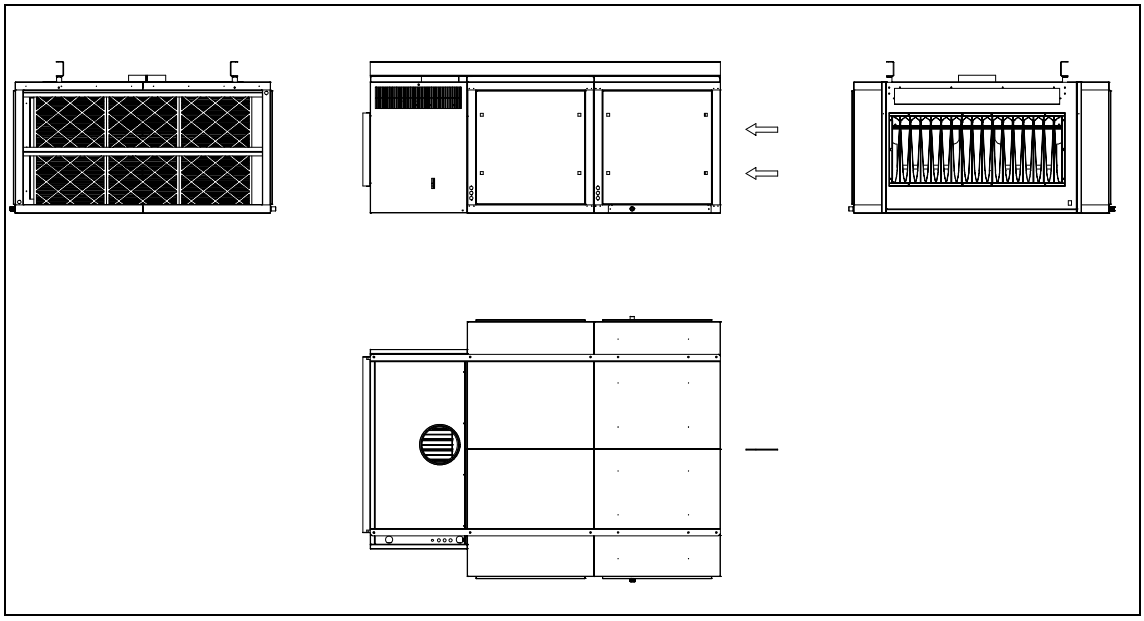
Reznor

0109X1EGGBEN

GAS FIRED AIR HEATERS
TYPE EURO-X 1000 E/G

Centrifugal Fanned Forced Convection Appliances with
automatic ignition burner controls for use as :
Type B11 Open flued appliances

This document applies to EURO-X appliances with:
Fast Response Ignition



These appliances meet the following EC Directives:

Dir. CE 90/396/EEC	GAD
Dir. CE 89/336/EEC	EMC
Dir. CE 89/392/EEC	MD
Dir. CE 73/ 23/EEC	LVD

Please read this document carefully before commencing the installation and leave it with the user or attached to the appliance or gas service meter after installation.

Subject to modifications

Reznor U.K. Limited – Park Farm Road – Folkestone – Kent – tel 01303-259141 – fax 01303-850002

Thomas&Betts

INDEX

N.B. If optional equipment is supplied with this appliance please refer to the additional instructions supplied with the option.

SECTION 1 GENERAL

1.1 Before installation, check that 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.

1.2 After unpacking the appliance, leave it fastened to the wooden pallet until it has been suspended or until just before base mounting.

1.3 Please read this document before commencing installation.

1.4 These instructions are only valid for the country of use indicated on the appliance i.e.: GB - IE. If these symbols are not shown, it is necessary to obtain appropriate technical instructions, which will provide information concerning the necessary modification of the appliance for the conditions of use in the country concerned. Such instructions may be obtained upon request from your supplier.

1.5 Check that the local distribution conditions of electricity supply, type of gas and pressure, and adjustment of the appliance are compatible.

1.6 When installed in Great Britain the total installation must comply with the requirements and recommendations of British Standard BS 6230 1991. "Installation of Gas Fired Forced Convection Air Heaters for Commercial and Industrial Space Heating".
The Installation must also be in accordance with the relevant requirements of "The Gas Safety (Installation and Use regulations) and (Amendment Regulations 1990)" and The "Building" and "Electrical Regulations" (in GB the IEE Regulations).
The requirements of the "Local Building Standards Office", the premise "Insurance" undertaking and the"Fire Office" must also be observed.

1.7 Unauthorised modification of this appliance or departure from use in the manner for which it was intended by the manufacturer or installation in a manner contrary to these instructions, may constitute a hazard and jeopardise all warranties. Deviations should only be carried out after formal consent has been obtained from the manufacturer.

1.8 Ensure the environment in which the air heater will be installed will not create a hazard i.e. where excessive (volatile) dust, flammable or corrosive substances and/or vapours and combustible materials may be present.

1.9 These appliances have been tested, and set according to the data plate before leaving the factory.

SECTION 2. TECHNICAL DATA & DIMENSIONS

Table 1. APPLIANCE DATA

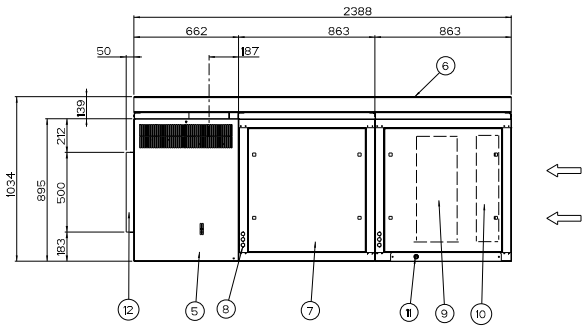
			Type EURO-X 1095E/G
Gas category 'Cat.'			II_{2H3+}
Air supply and flue type			B11
Heat input (Hs) 'Qn'		kW	118,7
Heat input (Hi) 'Qn'		kW	107,0
High heat output		kW	93,2
Number of jets			16
Main jet size	natural gas	Dia mm	2,6
	propane/butane	Dia mm	1,40
Ignition burner jet size	natural gas	Type	7223
	propane/butane	type	4210
Gas supply pressure 'P' [1]	natural gas	mbar	**(GB)** =17,5 **(IE)** = 20,0
	propane	mbar	37,0
	butane	mbar	28,0
Burner pressure	natural gas	mbar	6,0
Gas consumption	natural gas [2]	m^3/h	11,33
	butane G30	kg/h	8,66
	propane G31	kg/h	8.48
Gas service connection (not supply line size)			Rc :
Electrical service (protection class IP 20)			230/240V 1 N ~ 50 Hz
Weight net		kg	450
Weight shipping		± kg	470
EURO-X 1000 E/G STANDARD AIR FLOW - FREE BLOWING – 60Pa STATIC PRESSURE			
Temperature rise ΔT (± 1)		K	21/28
Air volume @ 15 °C (70kW cooling / 55kW cooling)		m^3/h	13.320/10.000
Mounting height [3]		m	3 à 4
Throw (terminal V_o to 0,5 m/s) [4]		#m	46
Sound pressure level L_P [5] (70/55kW cooling)		dB(A)	68/65
Fan motor rating (70/55 kW cooling)		kW	4 / 2.2
Total electric rating [6] (70/55 kW cooling)		kW	4.25 / 2.45

1 Maximum gas pressure at inlet to appliance = 50,0 mbar
2 Natural gas G 20, calorific heating value 10,48 kWh/m^3 on Hs @ 15 °C & 1013 mbar
Propane G 31, calorific heating value 14,0 kWh/kg. Butane G 30, calorific heating value 13,7 kWh/kg
3 To underside of air heater
4 Isothermic condition (20°C), Louvres zero deflection
5 At distance of 5.0 m, Q = 2, A = 160 2m^2, louvres zero deflection, isothermic condition,

For all air flow duties and performance consult sales bulletin Document reference: FAN00049503

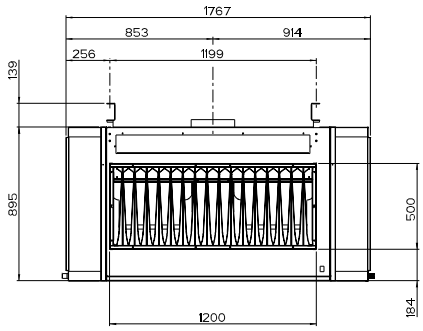
Figure 1. **DIMENSIONS**

Left hand side (controls side)

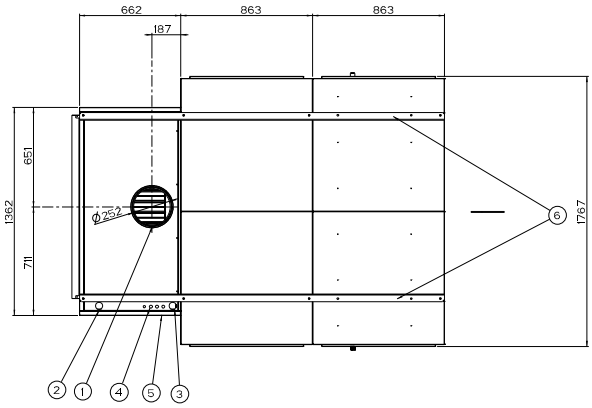


5	SERVICE PANEL
6	HANGING SUPPORT
7	BLOWER CABINET
8	ELECTRIC CONNECTIONS
9	COOLING COIL
10	FILTER RACK
11	DRAIN PAN OUTLET
12	DUCT SPIGOT

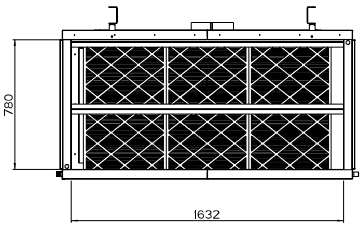
Front view



Top plan



Rear view



Legend

1. Flue socket
2. Gas connection Thermoelectric
3. Gas connection FRI
4. Electrical and Controls connections
5. Service and User access panels
6. Suspension points

Table 2. : DIMENSIONS REFERENCE FIGURE 1 (mm)

EURO-X 1095 E/G	
A1 Width of appliance	Flue internal dia (mm)
C1 Width overall base frame	G1 Width of suspension points centres
D1 Width of inlet air duct spigot OA	K1 Width of warm air outlet duct spigot OA
E Flue centres	W Centre of flue to cabinet divider panel

SECTION 3. INSTALLING

3.1 The EURO-X 1000 E/G air heater may be installed in a suspended manner using the suspension points provided in the base frame of the appliance. These air heaters may be base mounted. Ensure that the air heater is secured to any base mounting arrangement. Ensure that the structural elements of the building are adequate to carry the weight of the appliance and its ancillary components i.e. the flue system. If suspended the appliance should remain rigid so as not to impose a strain on the services connected to the appliance.

3.2 Ensure that sufficient space around the air heater is maintained for servicing and that the appliance is not sited where it may suffer from damage by, e.g. fork lift trucks.

3.3 Adequate clearance from combustible materials must be maintained between the appliance and its flue system.

3.4 A minimum distance of 300 mm must be allowed at the front of the appliance between any surface that will obstruct the free passage flue products spillage from the down draught diverter slot which is located directly above the warm air outlet from the air heater.

3.5 The appliance must be installed in a level plain both laterally and horizontally.

3.6 EURO-X E/G air heaters are open flued natural draught appliances, it is therefore, important that they are installed in a draught free zone i.e. away from doors etc. Consideration must be given to the effects that any power extraction might have on the buildings natural pressure condition. The appliance flue will act as a pressure relief in the event that a negative pressure exists within the space where the air heater is installed.

Figure 2 INSTALLATION CLEARANCES

Top clearance 150 mm is from combustibles and applies to flue also see table 3

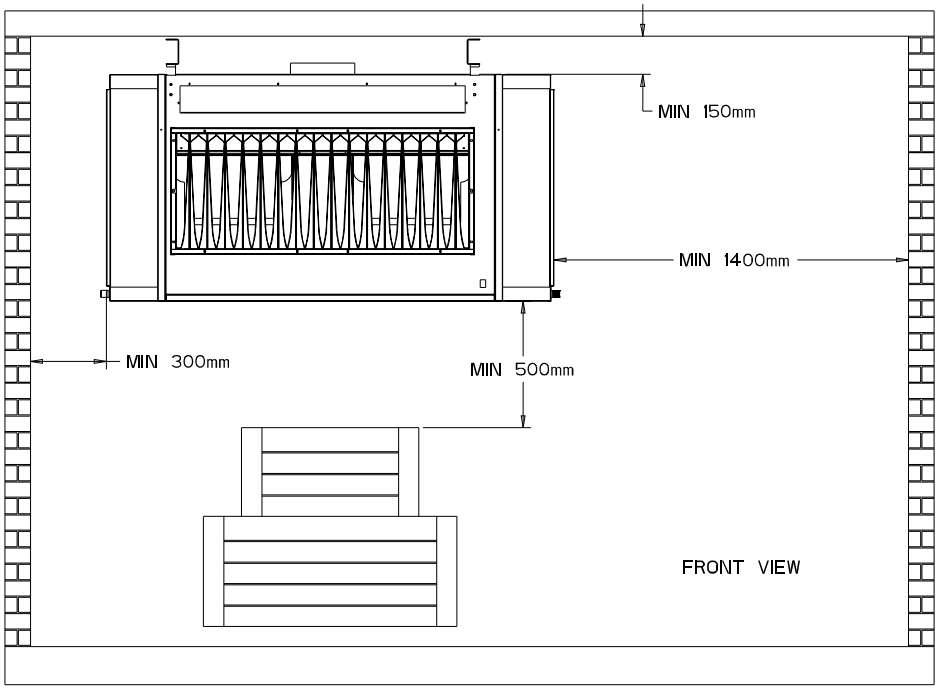


Table 3 : DIMENSIONS REFERENCE FIGURE 2

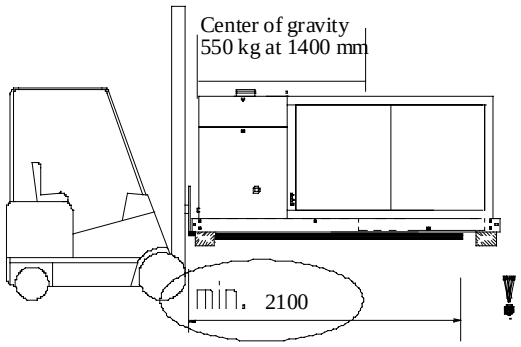
L minimum	1400
L1 Opposite side	300

3.7 When transporting the appliance after it has been unpacked i.e. For lifting etc. Note the restrictions and recommendations indicated in figure 3.

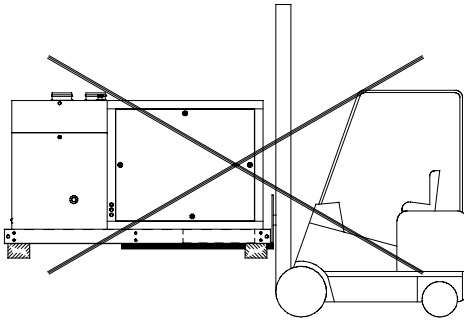
3.8 The base frame contains an internal support member which acts as a lifting fulcrum point to prevent damage to the underside of the appliance by lifting forks.

Figure 3. Appliance handling criteria

NOTE: Reznor model type EURO-T 2000 shown. Same criteria applies for EURO-X 1000 E/G

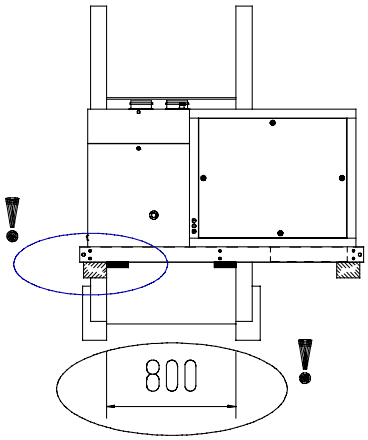


Minimum fork length requirement

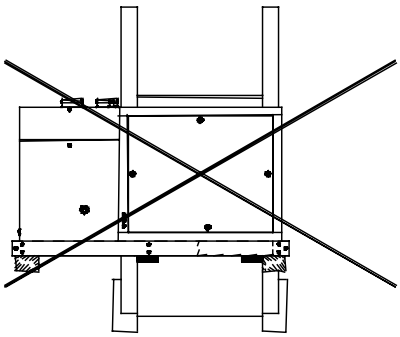


Never truck from air handler end

Minimum fork width for balance



Never truck from air handler end



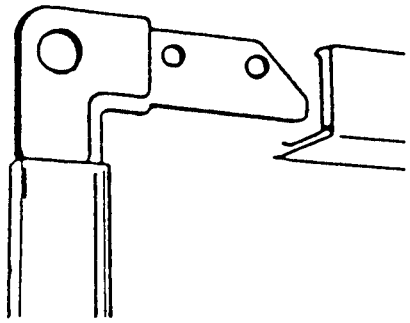
3.9 **DUCT CONNECTIONS**

The Euro-X 1000 E/G series air heaters are designed to be used in conjunction with intake and or discharge ducting. A positive seal should be made between any ducting and the air heater. A flexible connection is desirable to eliminate transmission of noise and to take account of thermal expansion. Figure 4 illustrates a method of connection between the appliance and the duct using

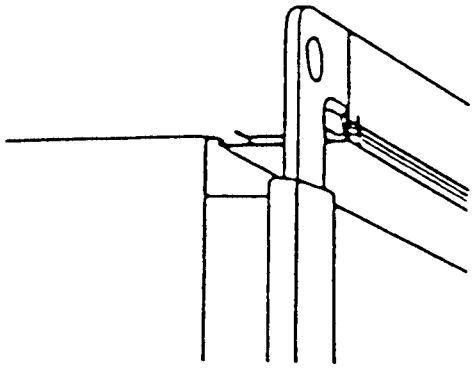
3.10 Consideration should be given to the application of duct fittings directly connected to the appliance. Air inlet and outlet elbows, transitions etc. should be designed to ensure an unrestricted and turbulent free air flow. This requirement is to ensure that an even air temperature is maintained when leaving the appliance thus eliminating heat exchanger "hot-spots" and nuisance shut-down of the burner due to over heating.

Figure 4. **Recommended procedure and method for connection of ductwork and transitions to the air heaters using a typical proprietary flange system.**

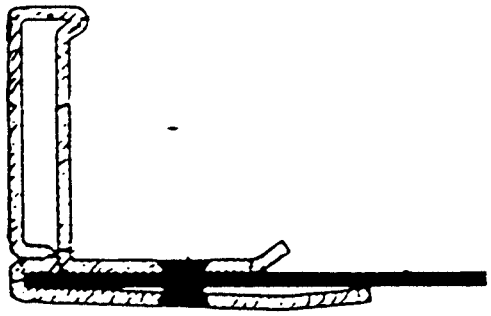
4.1 Corner jointing framework



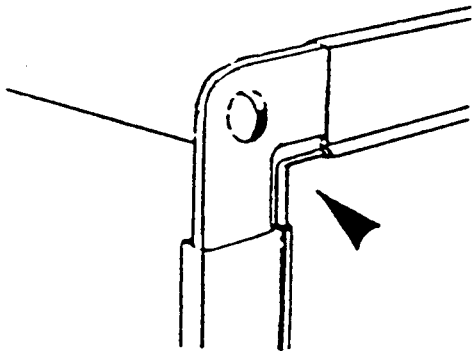
4.2 Cleating between sections to be joined



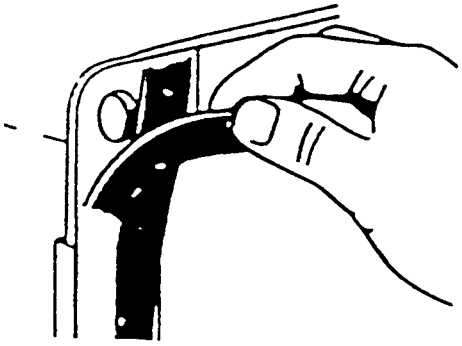
4.3 Fastening through all members



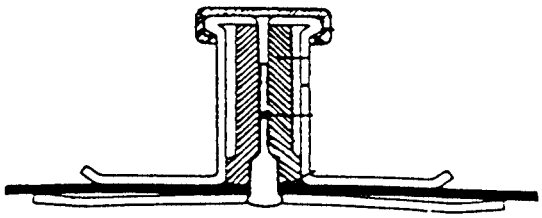
4.4 Checking alignment and joint worthiness



4.5 Applying gasket seals to prevent air leakage



4.6 Sectional view of completed joint



Legend

4.1 Cut and assemble flange into frame to suit opening

4.2 Check dimensions and position on duct spigot

4.3 Ensuring flange is mated correctly before fastening

4.4 Checking location after positioning

4.5 Applying sealing gasket

4.6 Sectional view of completed joint

SECTION 4 AIR SUPPLY for COMBUSTION & VENTILATION

4.1 It is essential that sufficient fresh air is provided for combustion and room ventilation. Most traditional building constructions have a natural air change rate of at least 0.5/h. Where it is known that the air change rate is at least 0.5/h and where the volume of the heated space is greater than 4.7m³; per kW of total rated heat input, additional ventilation is not required.

4.2 **Table 4**.
Building volume limits for Reznor EURO-X Air Heaters based upon 4.7m³ per kW of rated heat input for one air heater only.

EURO-X Model	Heat Input kW	Room Volume m³
1095	118.70	558

If the minima volumes stated above exist together with appropriate similar allowances for other fuel fired plant that may be installed in the same space or zone, then additional ventilation is not required.

4.3 Where it is known that the air change rate is less than 0.5/h or where the building volume is less than 4.7m³ per kW of heat input, ventilation grilles must be provided at low level i.e. below the level of the appliance flue connection. In cases where doubt exists over the air change rate ventilation should be provided.
The total minimum free area shall not be less than 270 cm² plus 2.25 cm² per kW in excess of 60 kW rated heat input.

4.4 **Table 5. Air Supply Requirement for Combustion & Ventilation.**

EURO-X Model		Heat input kW	Low level cm²
95 kW	1095	118.70	410

Note :
Ventilation grilles must be installed so that air is drawn directly from outdoors. In the event that communication from the space where the heater is installed to outdoors is via another room then the route to outdoors must be ducted through the communication area.

Grilles should be sited where they cannot easily be blocked or flooded. Notices should be provided advising about the need to keep air supply grilles unobstructed.

4.5 Normally EURO-X 1000 E/G air heaters, which are used in the free blowing mode i.e. without discharge air ducting, are installed within the room to be heated. If it is necessary to install the air heater in a separate room and blow the air into an adjoining room, return air should be ducted to the appliance.

EURO-X E/G air heaters may be used for fresh air and/or return air as combined heating/ventilation appliances.

SECTION 5 FLUE SYSTEM

5.1 EURO-X air heaters must be connected to a flue system venting the products of combustion directly to outdoors.

Flue systems must be installed in accordance with the rules in force taking into account the location of flue termination relative to the construction elements of the building, i.e. windows, roof levels, etc., and in accordance with statutory requirements.

5.2 The products of combustion may reach a temperature of 230°C.

Reznor recommend that appliances are connected to individual flues sized in accordance with the diameter appropriate to the appliance flue connection socket.
Flues must be terminated with an approved terminal fitting.

5.3 A minimum length of 2.0 m is required to ensure a good flue draught condition.

5.4 Where it is necessary to flue more than one appliance into a common flue then the flue should be sized in accordance with the following formula:

$$D_1 = \sqrt{D_2^2 + 0.5D_3^2}$$

Where:
D_1 = new flue size required
D_2 = diameter of largest flue
D_3 = diameter of additional flue

Never connect an additional flue to a main stack at a 90° angle an inclined 8 piece must be used.

5.5 It is not recommended to install the flue directly into the appliance flue socket but to use a stopped tee piece following a bend off of the air heater. This practice prevents ingress of water into the appliance and affords the facility to connect to a drain to evacuate water and condensation should this occur. Figure 5 shows the method recommended.

5.6 If it is necessary to include horizontal runs of flue within the system, then the horizontal section of flue should be installed with a positive rise away from the appliance of at least 1° or 17 mm per metre run until the vertical section.
A vertical rise from the appliance to the terminal point of 2.0. X the horizontal length must be maintained as indicated in figure 6.

5.7 The use of twin wall flue should be considered if condensation in the flue system is a possibility.

NOTE: FIGURES 5 & 6 DEPICT EURO-X 1000 S AIR HEATERS SAME FLUE DATA APPLIES FOR E/G MODELS

Figure 5. RECOMMENDED FLUE CONNECTION

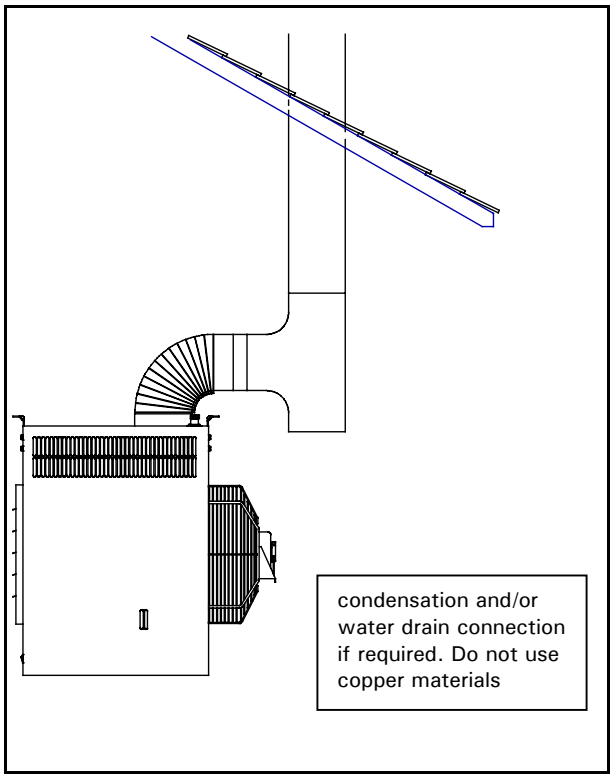
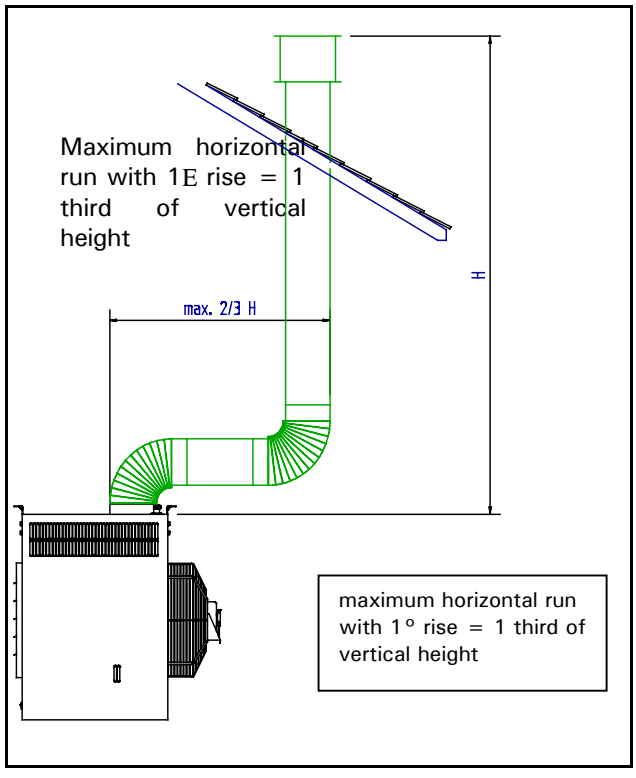


Figure 6. HORIZONTAL FLUE CRITERIA



SECTION 6 GAS & COOLING CONNECTIONS

6.1 Connection to a gas service may only be carried by suitably qualified persons. The gas installation must comply with the rules in force using materials appropriate for gas service installations.

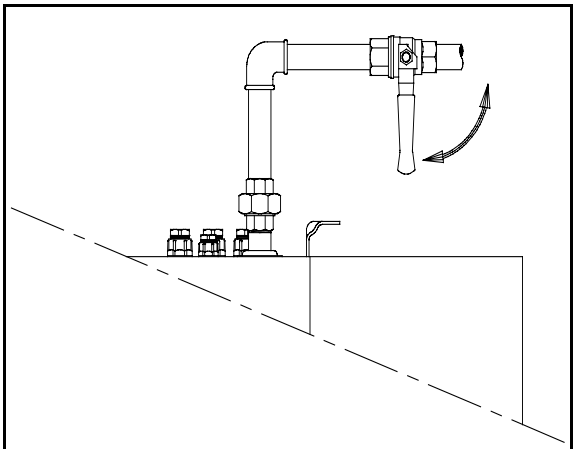
6.2 Check that the gas category is in accordance with the data described on the air heater.

6.3 An adequate gas supply sized to provide the dynamic pressure for the volume required by the air heater(s) is essential to maintain the nominal heat input.

6.4 A 90° action gas service tap and, to facilitate servicing, a disconnect union fitting must be provided adjacent to the appliance, see figure 7.

6.5 Ensure that a gas service includes a filter and has been tested and purged in accordance with prescribed practice prior to commissioning and taking the air heater into service.

Fig. 7 GAS CONNECTION DETAIL



Note : Gas tap must be fitted to fall closed.

WARNING: NEVER use a FLAME to test for GAS SOUNDNESS !!!

6.6 The EURO-X 1000 E/G unit is delivered without the cooling coil but is ready to receive a coil of 70kW or 55kW with the following limitations :

- Overall height of the coil (including frame) may not exceed 794mm (see figure 7.1)
  Note
  The drip pass does not include a dispositive to allow condensate water to evacuate. If the coil is not mounted on feet allowing this, extra dispositions have to be taken to mount the coil on this kind of feet for condensate water evacuation and the available coil height must be decreased by the raise obtained by this condensate water evacuation utility.
- Overall width of the coil (including connection tubes & frame) may not exceed 1705mm (see figure 7.2).
- Overall depth of the coil (including connection tubes & frame) may not exceed 450mm (see figure 7.1).
- Frame width & height :
  The frame of the coil (in which the coil elements are fitted) needs to have the correct dimensions to allow the fixation of the coil on both support plates (see fig. 7.3). This figure indicates that the frame must allow fixation at a distance of 1504mm between both ends and at a height distance of 748mm. The height of fixation is given relatively to the outside edges of the cabinet just as the widths.
  The widths from left edge or right edge on this figure must be interpreted as maximal allowable width of any parts exceeding the fixation points in terms of width.

6.7 **Cooling coil installation (figure 7.4)**

The EURO-X 1000 E/G series air heater are delivered with the necessary structure and fixation holes to mount a cooling coil in the cabinet. The unit is delivered with a horizontal drip pan with two condense outlets (7) (one on each side of the unit) of which one of both has to be sealed. An overall view is given in figure 7.4.
The coil (2) has to be placed into the drip pan (1) and then can be slided into the unit.
For mounting and dismounting operations, first the side panel (6) has to be removed and then the small bottom notch (5). Once this is prepared, the drip pan (1) can be slided in or out of the unit.
When the coil is positioned in the unit, it has to be connected to both supporting plates (3/4). This connection is made by screwing the supporting plates on to the coil frame.
Once the coil is positioned and fixed, holes have to be drilled in one of the fixed cabinet panels for the cooling connections.
There is enough place in the cabinet to allow multiple possible configurations e.g. connections on opposite side panel, connections in bottom panel or connections in top panel.

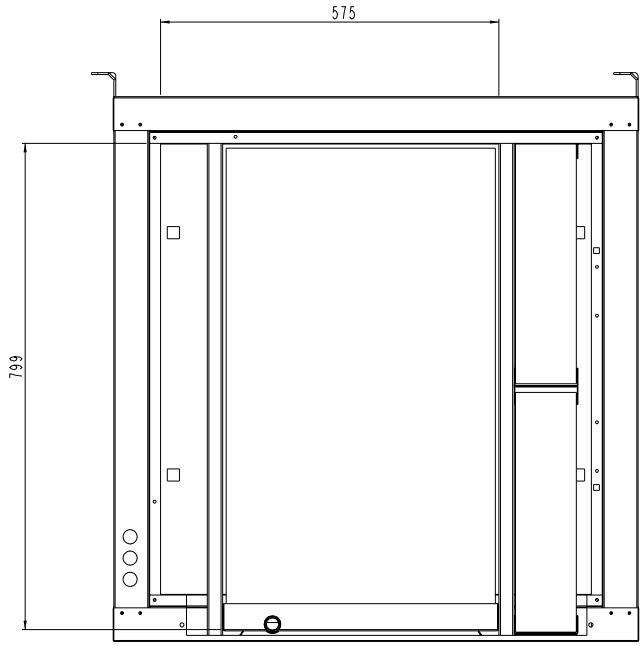


Figure 7.1 : Max. dimension cooling coil 794x450mm

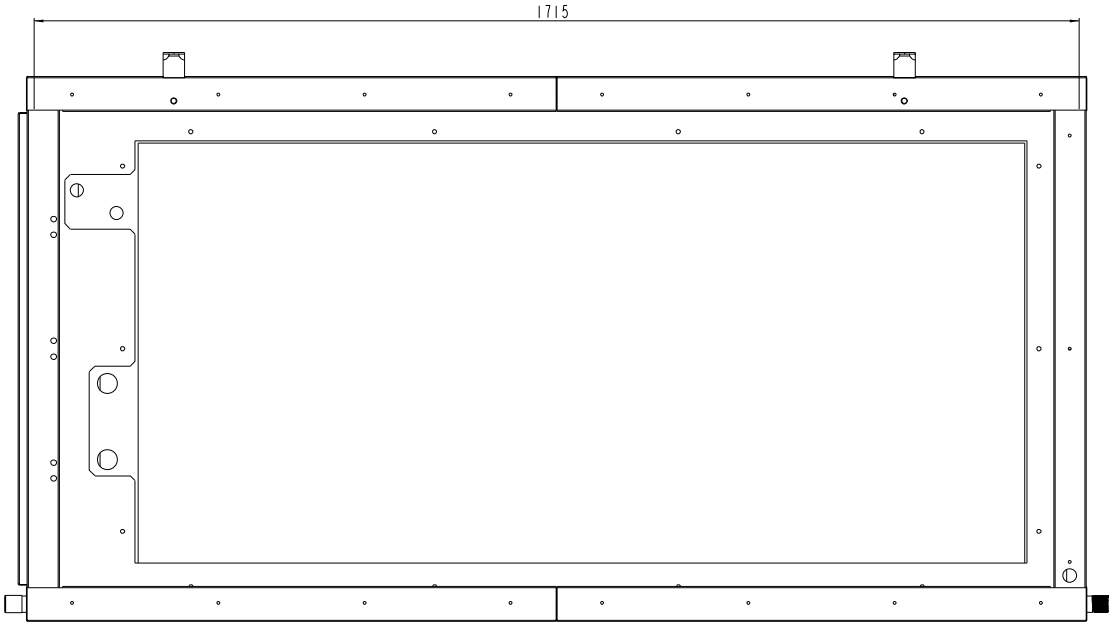


Figure 7.2 : Max. dimension cooling coil 1705mm

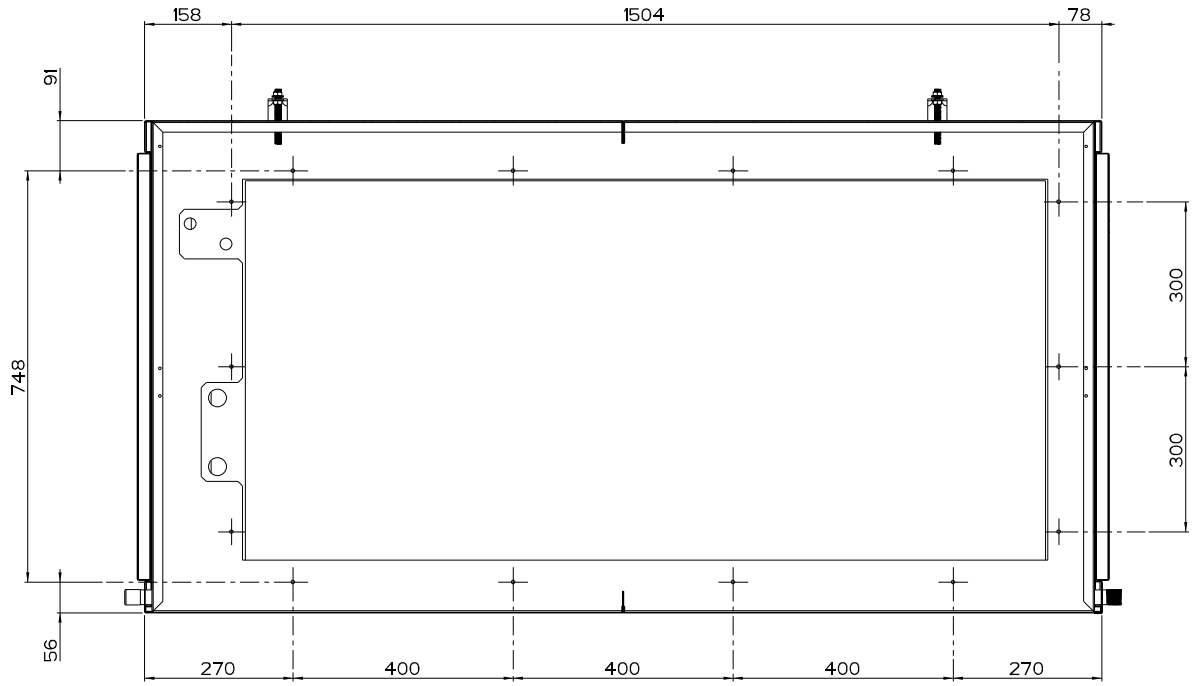


Figure 7.3 : Position of holes

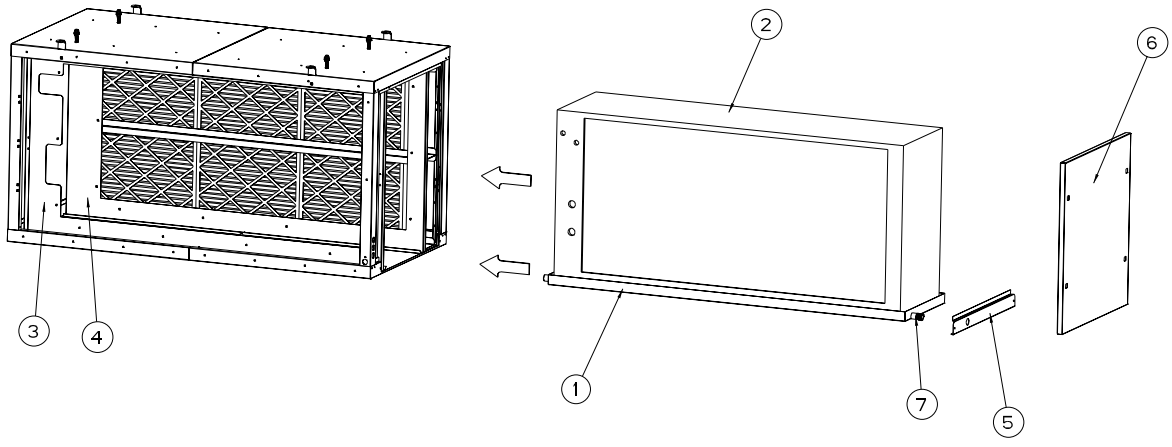


Figure 7.4 : Placing cooling coil

Legend :

① Drip pan
② Cooling coil
③ Filling & supporting plate, blower side
④ Filling & supporting plate, filter side
⑤ Bottom notch
Side panel
⑦ Condensate outlet

SECTION 7 ELECTRICAL CONNECTION

7.1 The Electrical installation may only be carried out by suitably qualified persons observing the rules in force.

7.2 Check that the electrical specification is in accordance with the specified data on the air heater. A unique appliance wiring diagram is supplied as a separate document attached to this one, plus an additional copy is attached to the air heater.

7.3 These appliances **must** be earthed.

7.4 A separate lockable electrical isolator for each heater must be provided adjacent to the appliance, viewable from the service access panel. The isolator must have a contact separation of at least 3.0 mm on all poles.

7.5 Ancillary controls are required to provide timed heat cycles, room comfort temperature level, frost protection, override air circulation etc. These are not included with the appliance and should be ordered separately.

7.6 Ensure when planning the external appliance control circuitry, that power will be supplied at all times to the air heater, even when it is control switched in the 'heat-off' mode. This is necessary to ensure that the fan can operate independent of the heating control.

Therefore, **Never** incorporate automatic controls that electrically isolate the appliance.

NOTE: EURO-X 1000 E/G AIR HEATERS ARE SUPPLIED WITH EXTERNAL CONTROL CIRCUITS BRIDGES. THE AIR HEATER/S WILL OPERATE CONTINUOUSLY UNLESS THESE ARE REMOVED AND TIME AND TEMPERATURE CONTROLS SUB-STITUTED FOR THEM

7.7 The centrifugal blowers fitted to Euro-X E/G series air heaters are of the forward curved type therefore, the speed setting for the static pressure imposed by the air distribution system will govern the motor loading.
All Euro-X E/G air heaters leave the factory with a fixed drive set

Table 6 Maximum motor load ratings

Motor rating	kW	2.2	4
Phase	~	3	3
Voltage	V	400	400
Load rating	A	5.20	8.80

SECTION 8 COMMISSIONING, LIGHTING AND OPERATION

COMMISSIONING

8.1 Normally Reznor Euro-X air heaters do not require commissioning. Final testing after production ensures that: i**f installation has been carried out strictly in accordance with this document**, the appliance is ready to be taken into service.

8.2 Checks to ensure;
- earth continuity
- resistance to earth
- phase supply to correct terminals
- current rating and fuse value
- correct supply gas pressure
- correct burner gas pressure
- satisfactory & smooth ignition
- flue system is evacuating the products of combustion to outdoor atmosphere.must be made.

8.3 In addition to the above requirements, check to ensure that the fan performance and motor load factors are correct for the application and in accordance with the appliance data plate.

8.4 **EURO-X 1000 E/G Air heaters are standard fitted with Fast Response Ignition system (FRI)**

8.4.1 Ensure that the air discharge louvers are set to an open position;

8.4.2 Switch **ON** the electricity supply to the air heater;

8.4.3 Turn **ON** the gas supply to the air heater;

8.4.4 These appliances employ the FRI burner ignition principle. When the external controls call for heat, a separate ignition burner which is lit at the dictates of an external control i.e. time swich is signalling a heating ON period building occupancy mode The ignition burner once lit following a full sequence stat-up remains alight throughout the heating on period so that the main burner will be lit immediately the temperature sensor (thermostat) calls for heat.

8.4.5 If the ignition burner has not lit within 15 seconds, the electronic flame relay will switch off and lockout will occur. This will cause the signal lamp to glow within the reset push-button on the appliance and/or on a remote control if fitted). After 10 seconds the reset button on the appliance or the remote control can be activated in order to reset and restart the appliance.

8.4.6 Flame failure protection is by the ionisation principle i.e. the ability of a suitable flame to pass an electrical current between the igniter and the earthed ignition burner assembly.
The fast response burner models employ a 'Honeywell' model S4560 fully automatic electronic burner control. Ignition of a separate ignition burner is via a high voltage intermittent spark generated within the control module. Flame sensing is via the ionisation principle whereby a current is passed through a flame to earth on the applicance. The quality of the flame dictates the level of current achieved thus the burner control prescribed level of $\geq$ 1,0μA must be met. This ensures safety and monitors flame failure. The flame current can be measured by connecting an ammeter in series between terminals 13 & the flame rod wire terminal on the burner control.

8.5 **Two stage burners**
Setting and adjustment

8.5.1 This feature is an option for the EURO-X 1000 E/G series.
The type of gas control fitted is the "Honeywell" VR 4601P/B or VR 4601A/B either are fitted with a two-stage pressure governor model V4336A. Regulation is possible for the pressure range 3 - 20 mbar for natural gas and 4 - 37 mbar for propane/butane gas. The appliances are fitted with a relay to ensure that during burner start-up the initial firing rate is 100% to ensure good burner cross-lighting.

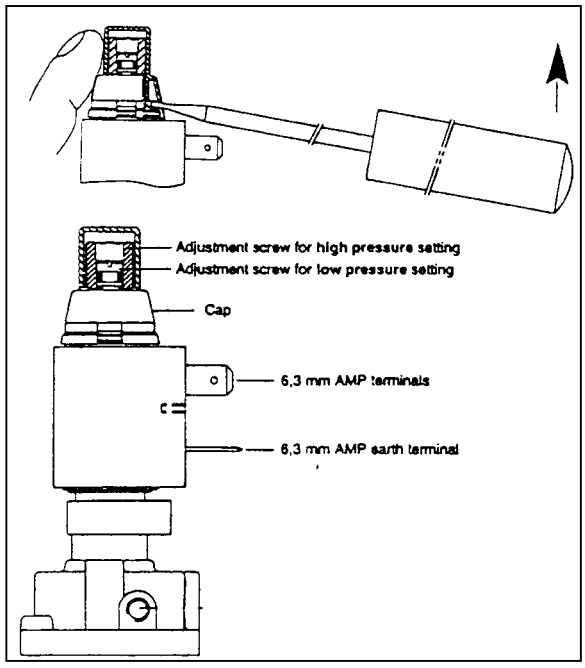
8.5.2 Setting. (refer to figure 8)
N.B. Allow time for pressure to stabilise before and during making adjustments.
- Lever off the plastic cover cap
- Maximum high rate setting **must** be adjusted first after which the minimum low rate setting can be adjusted. Any adjustment of the maximum setting influences the minimum setting.
- Do not adjust maximum or minimum settings above or below the pressures stated on the air heater data plate or table 6.

To adjust:
Connect a manometer to the appliance burner test point.

Adjusting maximum pressure setting

1. Energise high/low regulator, set gas control in operation and wait until an outlet pressure is recorded on pressure gauge.
2. Using an 6 mm hexagon wrench or 10mm screwdriver to turn adjustment screw for **maximum** pressure setting clockwise to increase and counter-clockwise to decrease pressure until desired maximum pressure is obtained.
3. Check maximum pressure setting several times.

Figure 8 : two stage pressure adjustment



Adjusting minimum pressure setting

1. Disconnect electrical connection of high/low regulator.
2. Set gas control in operation and wait until an outlet pressure is recorded on pressure gauge.
3. If minimum pressure setting needs adjustment then use a 3.5 mm screwdriver to turn adjustment screw for **minimum** pressure setting, clockwise to increase or counter-clockwise to decrease pressure, until desired minimum pressure setting is obtained.
4. Reconnect high/low regulator in circuit.
5. Check **maximum** pressure setting, re-adjust if necessary and check minimum pressure again
6. Replace cover cap.

8.6 **How the EURO-X 1000 E/G air heater works**

EURO-X 1000 E/G heaters fitted operate fully automatically when switched **ON** and the remote controls have been set to call for heat.

Simultaneously to being switched **ON** an electrical circuit is made to a thermal fan control switch to operate a heater within the switch.

This plus the heat of the burner causes the switch contacts close. When hot, at approximately 45°C, the air circulation fan will switch on and warm air will be discharged until the burner is switched off.

Note :
- The fan will run on after the burner has switched off to cool the heat exchanger.
- During periods of extreme cold operating i.e. morning start up, the fan may switch on and off for short periods due to the rapid cooling of the thermal fan switch. This will cease as the ambient temperature around the air heater rises.

In the event of overheating for any reason, thermally activated, fail safe overheat controls operate to protect the air heater. The first control LC1 switches off the burner and upon cooling will automatically reset.

NOTE: Two LC controls (LC1 + LC2) are fitted to EURO-X 1000 E/J 95 as 2 fans are used.

The second control, LC3, which switches at a higher temperature will if activated switch off the main burner, thus causing controlled lock-out. Following this manual intervention is necessary to restart the air heater by resetting an automatic burner control after the air heater has cooled and the LC3 control on automatic ignition models can be itself reset, this may take a few minutes dependent upon the ambient temperature.

8.7 Upon completion of the commissioning, ensure the user or a responsible person is aware of;
   a. How to operate air heater;
   b. The need for maintenance and servicing;

Important
Ensure that these instructions and the user's instructions are made available for the user and/or left in a safe place, i.e. attached to the gas service meter.

Table 7. EURO-X 1000 E/G Models High/Low burner gas pressures and low rate consumption values

EURO-X 1000 E/G				1095
BURNER PRESSURE	Pressure @ 100%	Natural G 20	mbar	6.0
		Butane G 30	mbar	30.0
		Propane G 31	mbar	35.0
	Pressure @ 50%	Natural G 20	mbar	1.5
		Butane G 30	mbar	7.5
		Propane G 31	mbar	8.8
Gas consumption @ 50% [1] Reference 15° C, 1013 mbar		Natural G 20	m^3/h	5.67
		Butane G 30	kg/h	4.21
		Propane G 31	kg/h	4.13

Note:
Burner pressures for Butane/Propane gasses are approximate based on regulated supply pressure.

1 Natural gas G 20 calorific value 10.48 kWh/m^3 @ 15° C & 1013 mbar
Butane gas G 30 calorific value 13.70 kg/h
Propane gas G 31 calorific value 14.0 kg/h

Low fire rate must not be reduced below the values stated above for 50% rating.

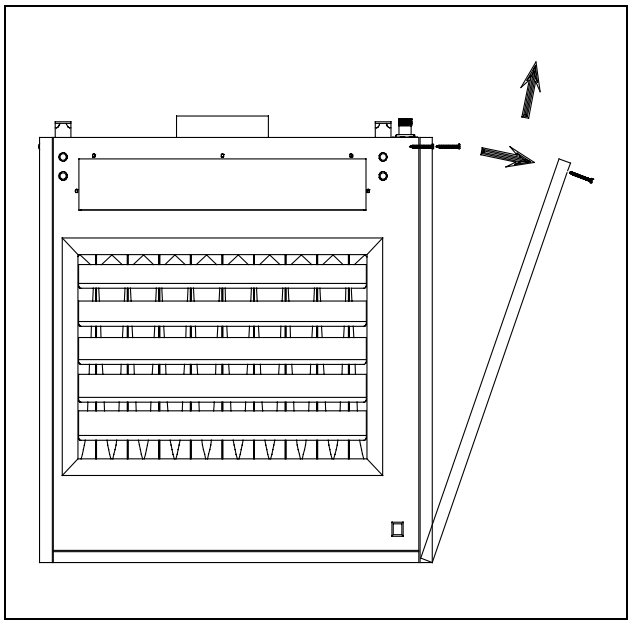
SECTION 9 SERVICING INTRUCTIONS

9.1 **CAUTION:**
Inadvertent substitution or replacement of components similar to those specified or replacement in a manner contrary to the method herein described could constitute a hazard.
Servicing work my only be carried out by appropriately qualified persons.

9.2 **Attention:**
Before starting to service the air heater turn **OFF** the main gas supply to the heater at the service tap provided. Switch **OFF** the main electricity supply to the heater after the air circulation fan has stopped.

9.3 EURO-X 1000 E/G air heaters require maintenance and service at least once a year. More frequent servicing may be required dependent upon the environmental circumstances where the air heater(s) are installed. Advise the user of recommended service frequency after your findings during this service. Regular inspection is recommended initially, especially in dirty areas, to assess the servicing requirement frequency. Refer to the illustrations provided fig 13 for component and visual instruction as a guide to carrying out service work.
Items that require inspection during servicing are as described below.

FIGURE 9. BURNER ACCESS PANEL REMOVAL



9.4 **General:**
Generally clean all accessible surfaces including the outside of the heat exchanger accessible after removal of the louvre frame and fan assembly.

Heater casing:
Check for damage that could be detrimental to the correct fitting of panels and affect the correct working or noise level. Check that all assembly screws are fastened, replace missing screws. Check that all panels are fixed in place upon completion of service and that motors, fans and guards are fixed securely.

9.5 **Heat exchanger:**
To be checked when carrying out burner and flue section work. Inspect heat exchanger where visible inside by use of an inspection lamp and mirror and outside when burner, air circulation fan and louvre frame have been removed.
Look for signs of severe corrosion, splits and perforations that would indicate a failure. If upon inspection it is found that the heat exchanger is excessively dirty or blocked with e.g. soot, it will be necessary to remove the front portion of the draught diverter to aid cleaning. This can be carried out referring to fig. 11.

1. Remove the screws securing the front of the down draught diverter Key 1 and the side screws
2. The portion of the down draught diverter may then be withdrawn through the front slot by lifting and pulling outwards.
3. To replace reverse above procedure

Remove any deposits with a flexible flue brush. Remove loosened deposits with a vacuum cleaner. IF HEAT EXCHANGER IS FOUND TO BE PERFORATED ADVISE USER NOT TO OPERATE HEATER UNTIL A REPLACEMENT HAS BEEN FITTED.

9.6 **Burner:**
The orifice of a gas injector is machined to precision limits, do not clean with a hard sharp object that could damage or enlarge the size. Remove burner tray carefully see below. Check main burner rails for soundness. Clean thoroughly taking particular care to ensure that burner ports are free from lint and dust.
Check gas injectors for cleanliness and that thread joints are gas tight. If necessary clean with acetone. Do not over-tighten.

9.7 **Burner tray removal:**

Refer to figs. 12

1 Disconnect gas supply at the unions below the inlet gas service tap and adjoining the gas control valve.
2 Disconnect the wires leading to the gas valve at the valve terminal end.
3 Disconnect high tension wire at the burner relay.
4 Disconnect pilot gasline at the gas valve.
5. Unscrew qty. 2 burner tray fixing screws.
6 Withdraw the burner assembly by pulling from its runners until it is released.
7 To reassemble reverse procedure 1 thru. 5.

9.8 **Note:**

Appliances for use on propane or butane gas have an aeration shutter fitted to the burner inlet air venturi (see fig. 'gas conversion'). This device may also be fitted to natural gas appliances which have been converted. The shutter is set and sealed by a multi- functional sealing plate marked LPG + NG. Ensure it is correctly reset after any burner service work is carried out.

9.9 To renew or service the gas valves :

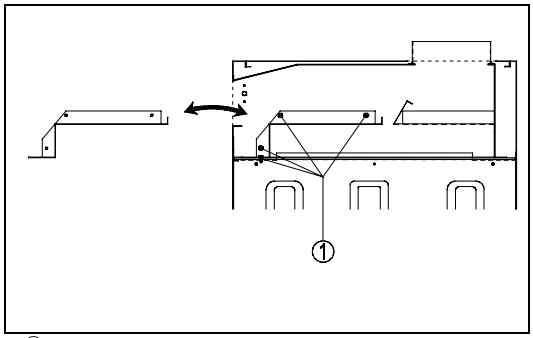
Remove burner rack assembly as described 9.7 above. To dismantle valve from manifold, take care when using spanners not to damage valve bodies which are constructed from soft die cast aluminium.
It is necessary to remove the burner manifold from the burner ribbon tray assembly to unscrew the gas valve.

9.10 **Electrical:**

Check all visible wiring for damage, check terminal security.
When removing for service or renewal any electrical component follow a logical sequence to ensure that replacement will be

correct. Mark wiring to ensure before disconnection to ensure that circuits are re-connected correctly.

FIG. 10 :DRAUGHT DIVERTER REMOVAL



①. Draught diverter securing screws left and right hand side.

9.11 **Flue system:**

Check that flue is in good condition adequately supported and that the flue and supports are free from corrosion and that the flue is unobstructed. Test for a positive up-draught when re-commissioning the appliance by using smoke introduced into the draught hood slot at the front of the air heater.
On flue systems fitted with a Reznor Euroventer refer to the separate instructions supplied with the Euroventer.

9.12 **Fan assembly:**

When it is necessary to remove the fan blade from the motor it should be noted that the securing screw is fitted using a thread sealing compound. local heat may be required to soften the compound so that the screw may be loosened.

9.13 After any service work has been carried out re-commission the air heater following the steps outlined in clauses 8.2 and 8.3 of this document.

9.14 After any service work has been carried out re-commission the air heater following the steps outlined in clauses 8.2 and 8.3 of this document.

FIG. 11 : FRI IGNITION BURNER

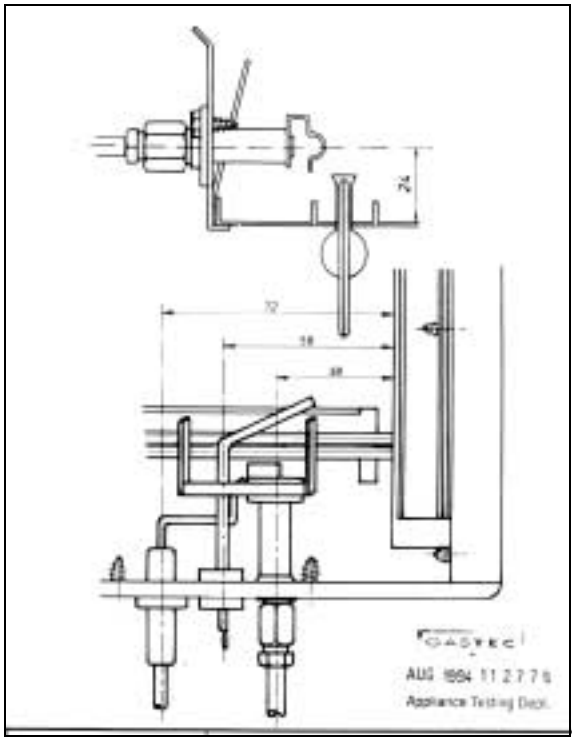
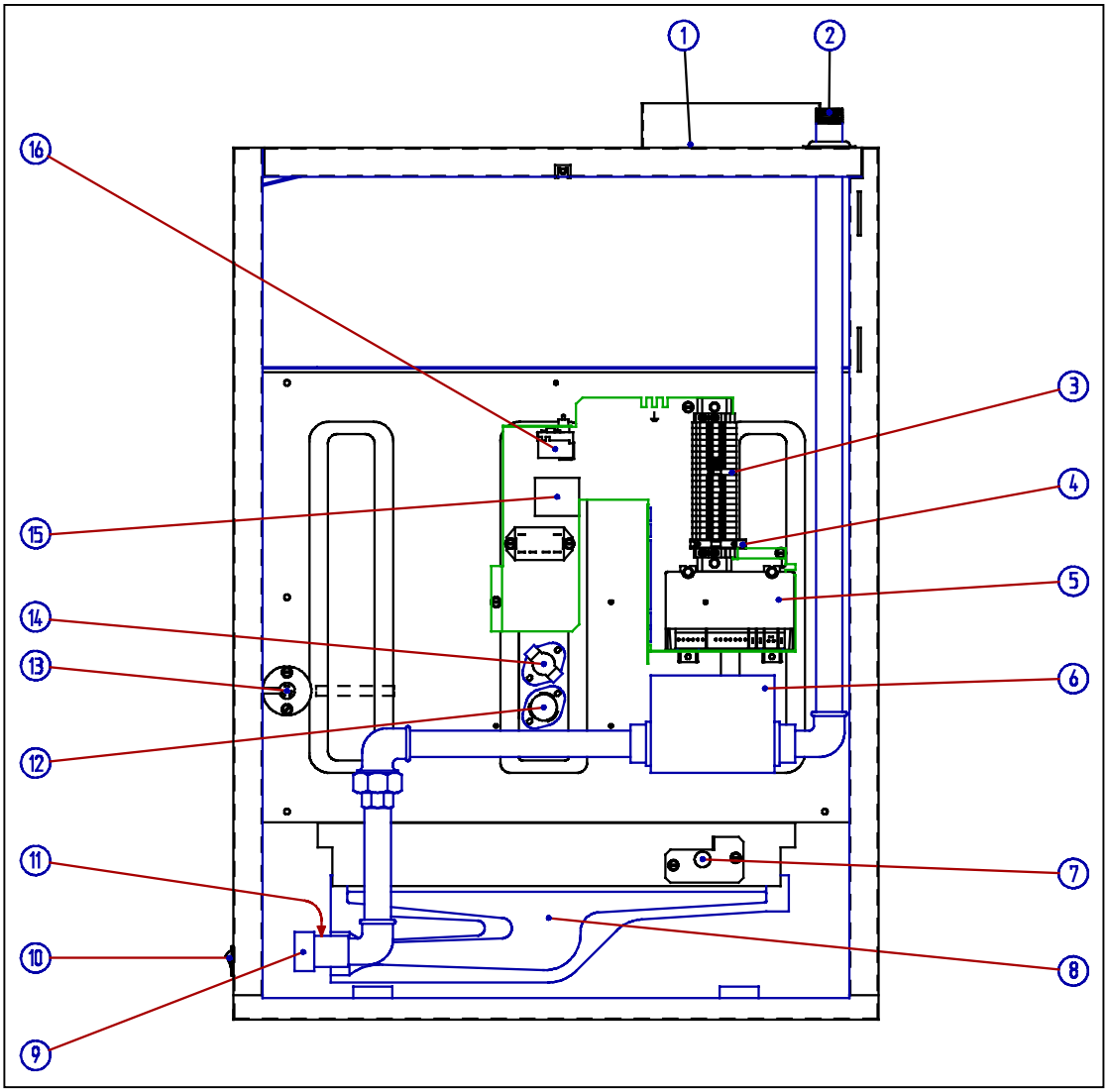


FIGURE 12 COMPONENT PARTS LOCATION FRI IGNITION BURNER CONTROLS



Legend

1. Flue socket
2. Gas inlet connection
3. Main wiring terminals
4. Controls fuse
5. Automatic electronic burner control
6. Gas valve
7. Ignition burner
8. Burner ribbon
9. Burner manifold
10. Burner fail indicator
11. Burner gas pressure test point
12. Thermal fan control
13. Thermal overheat control LC3 capillary
14. Thermal over heat (limit) control LC1 plus LC2 on model E/G 1095
15. Not applicable for GB & IE
16. Thermal overheat control LC3

SECTION 10 SPARE PARTS LIST

10.1 GAS SECTION

DESCRIPTION		PART NUMBER	MFGS.REF.	APPLICATION
Gas valve		03 25136	H'well VR4601AB	1095
Gas valve		03 35136	H'well VR4601PB	2 stage
Gas jet	Main burner	07 25801 024	Dia 2,4 mm	1095 NG
Gas jet	Main burner	07 25801 026	Dia 2,6 mm	1095 NG
Gas jet	Main burner	07 25801 140	Dia 1,40 mm	1095 LPG

CODES: NG = Natural gas G20 LPG = Butane gas G30 or Propane gas G31

10.2 ELECTRICAL SECTION

DESCRIPTION	PART NUMBER	MFGS.REF.	APPLICATION
Thermal fan control	03 25166	TOD29T12 (250V)	All
Thermal over-heat control LC1 & * LC2	03 24970	TOD60T11 51,5 EC	* ALL
Ignition burner nat. gas	05 25164	BASO	ALL
Ignition burner inject. nat	07 25824 023	BASO 7223	1095 NG
Ignition burner inject. prop	07 25824 010	BASO 4210	1095 LPG
Thermal over-heat control LC3	03 24959	Imit 96 °C 5417LS1	All
Burner relay FRI	03 25318	H'well S4560LS	All
Fuse	06 00157 125 mA	125 mA Rating	All
Wiring harness burner control	06 41631 HGC	-	All
Wiring harness. 2 stage burner control	06 41621	-	All
Terminal rail	06 41635	Entrelec	All

10.3 AIR HANDLING SECTION

DESCRIPTION	PART NUMBER	MFGS. REF.	APPLICATION
Centrifugal blower	02 25756 01	BPC 381-381	1095
Fan motors	2,2 / 4 kW		

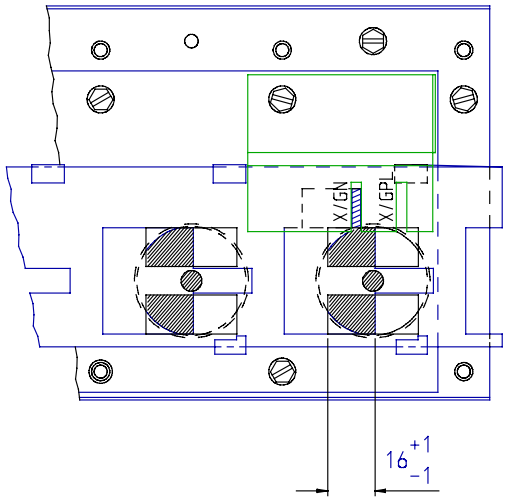
SECTION 11 GAS CONVERSION

11.1 Reznor EURO-X 1000 E/G air heaters are designed to operate on natural, propane or butane gas and will be supplied fitted for the gas type ordered.
In the event of site conversion to a different gas type it is be necessary to convert the gas burner and burner controls.
To carry out the conversion refer to section 9 of this document which explains how to remove and replace the burner assembly.

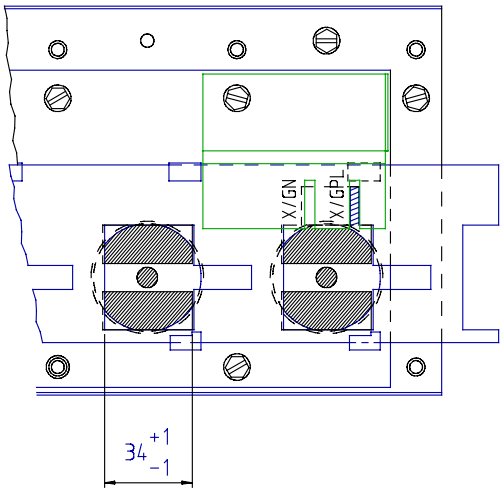
11.2 The following changes must be made:
a. Change the main burner jets to the size as given in 10.1;
b. Change the ignition burner jet as given in 10.1;
c. Set burner primary air shutter as appropriate referring to figure 13;
d. Adjust gas governor;
Natural gas to setting pressure as per data plate supplied;
LPG gases to maximum pressure setting adjuster screwed in to stop. Seal governor after setting.
For LPG gases a governor blank off plate may be used, remove governor and fix plate;
e. Affix new data plate and gas type over-sticker

11.3 Upon completion of conversion re-commission the air heater in accordance with section 8 of this document.

Figure 13. **GAS CONVERSION DATA**



Air shutter setting Natural gas



Air shutter setting Propane/Butane gas

SECTION 12 FAULT FINDING

BURNER IGNITION CONTROL MODELS

12.1 **Burner does not light:**

- Thermostat set too low;
- Controls fuse has blown;
- If fitted Euroventer not operating;
- Burner relay in lock-out or faulty;
- Faulty thermal over heat (limit) control;
- Thermal over heat control LC3 in lock-out mode;
- Faulty burner igniter;
- Insufficient ionisation flame current : should be > 1µA;
- Incorrect wiring or bad earth connection.

12.2 **Cool air is discharged continuously at start up or during operation when burner is off?** :

- Room thermostat on : set to off;
- Ignition burner is unlit : light up;
- Thermal fan switch faulty : renew switch;
- If fitted manual override fan switch in ON mode : switch OFF;

12.3 **Air circulation fan will not run** :

- Open circuit : check;
- Thermal fan control switch faulty : renew;
- Defective fan motor capacitor : renew;
- Defective motor : renew;

12.4 **Air circulation fan runs and stops while burner remains alight** :

- Thermal fan switch heat element broken : renew switch;
- Low ambient temperature : wait, it will
- correct as temperature rises;
- Motor thermal overload switch operating : check motor current rating - renew motor if faulty;
- Thermal fan control heater element wiring incorrect : check, correct if necessary;
- Faulty thermal fan control : renew;

SECTION 13 HEALTH AND SAFETY STATEMENT

Health and Safety Information for the Installer and Commissioning-Service Engineer

Under the Consumer Protection Act 1987 and Section 6 of the Health and Safety at Work Act 1974 we hereby provide the following information on substances hazardous to health. **Product range reference: "EURO-X 1000 E/G"**

13.1 During first firing some smoking may occur, this is due to the burning off of protective/lubricating oils used during appliance production. Most of this will have been removed during the production testing process.It is a wise precaution to ensure that adequate ventilation is provided during the initial firing and throughout the commissioning period, this is particularly important if the discharge air is to blow into a confined space. This smoking does not constitute a poison hazard.

13.2 Reznor products contain no asbestos; copper is not employed in gas carrying components; solder which has a melting point below 450°C is not used; paints for corrosion protection and decoration are heat cured and contain no lead.

13.3 The above appliances meet the Electrical Safety requirements of EN60 335 Pt 1 1988.

13.4 Small quantities of adhesives and sealants used in the product are dried and cured and present no known hazard.

13.5 **Insulation and Seals**.

Material: Synthetic Ceramic Fibre with Organic binder.
Description: Tapes and Papers
Known hazards: Some people can suffer reddening and itching of the skin. Fibre entry into the eyes will cause foreign body irritation.
Inhalation will cause irritation to the respiratory tract. As with any dust pre-existing respiratory condition and lung diseases may be aggravated.

Prolonged exposure for the purposes envisaged pertaining to this Reznor product is not anticipated.

Precautions: Wear protective gloves when handling. If abrading and dust is generated suitable protective respirators must be used. People with a history of skin complaints may be susceptible to irritation.
Dust levels are only likely when the material is abraded.
In general normal handling and use for this purpose will not present discomfort. Follow good hygiene practices, wash hands before consuming food or using the toilet.

First Aid: Medical attention must be sought following eye contact or prolonged reddening of the skin.

13.6 **Thermostat.**
Material: Illuminating Kerosene.
Description: Sealed phial contains a small quantity in liquid form.
Recognition: Colourless liquid, paraffin oil/petroleum hydrocarbon odour.
Characteristics: Non-corrosive, flammable with no poisonous reference - CH poison Class 3
Precautions: Avoid handling. This product can irritate and defat the skin. Prolonged contact may cause dermatitis. Avoid breathing vapour. Avoid eye contact.Do not ingest.

First Aid: Skin. Wash thoroughly with soap and water.
Eyes. Rinse immediately with copious amounts of clean water.

Ingestion: Seek medical advice.

NOTE: If skin irritation persists seek medical advice.

13.7 **Electrolytic Capacitor**
Two types are used by random selection:

Recognition: 1.Plastic enclosure
2.Aluminium enclosure

Material: Contained liquid electrolyte

Known hazards: Electric shock possible if charged.
Precautions: Discharge to ground/earth. Do not incinerate.

First Aid: Treat for electric shock if affected.

END OF HEALTH AND SAFETY STATEMENT

SECTION 14 USER INSTRUCTIONS

NOTE: Keep a copy of this document near your air heater !

WARNING: This appliance must be earthed.

14.1 Your Reznor EURO-X 1000 E/G air heater should have been installed, commissioned and tested in accordance with these the manufacturer's written recommendations.

14.2 In the interest of safety and user satisfaction it is important that this document is read and understood. If in any doubt, consult your installer or your local gas region supplier.

14.3 It is in your interest to ensure proper service and maintenance is carried out on a regular basis by a competent service undertaking. Reznor suggests at least once every year.

14.4 In the event of difficulties in resolving any of these matters, please do not hesitate to contact the manufacturer or their official distributor.

14.5 **About your air heater :**

- EURO-X 1000 E/G air heaters are state of the art gas fired appliances and incorporate an atmospheric burner which uses air for combustion taken from the location in which the air heater is installed. Products of combustion are vented to outdoor atmosphere via a permanently connected natural draught flue. The flue system may incorporate a fan to assist evacuation of the flue gasses.

- The location of the air heater should be maintained at normal ambient pressure. Changes to the building after air heater installation should have regard to the heating installation, i.e. creation of draughts from doors, windows. Other air handlers and installation of air extraction equipment may cause equipment may cause negative pressure environments, which can, seriously affect the operation of this type of air heater.

-The space heating process using Reznor EURO-X 1000 E/J air heaters is for air to be circulated through the appliance whereby it gains heat from a heat exchanger which is discharged into the space to be heated. Dependant upon the installation configuration i.e. ducted return air or the air may be recirculated through the appliance thus an unobstructed path for the return air must be maintained. This is particularly important.

14.6 **How the air heater works :**

Gas is burned by an atmospheric burner which fires into a multiplex combined combustion/heat exchanger. The gas burner is controlled by a gas valve which is switched via external controls i.e. a room thermostat and time switch.
EURO-X 1000 E/G air heaters are equipped with an automatic ignition system;
FRI Ignition System: Which operates fully automatically at the dictates of the external time and temperature controls.

Safety against overheating is assured by the inclusion in the controls circuit of two thermal overheat controls. There is an automatic recycle control which protects against low air flows i.e. clogged air ways, fan failure ! The second control being a super overheat control which operates to switch off the ignition burner in the event of gross overheating for any reason. Two types of this control are employed for this function to suit availability, they can be identified by looking into the controls compartment of the air heater and comparing with figure 12. Manual intervention to reset the electronic burner control either on the appliance or a remote control device is necessary.
When the main burner fires and warms the heat exchanger, the heat is sensed by a thermally actuated fan control which switches on the fan when the temperature has reached approximately 45°C. At the end of a heating cycle when the burner is switched off, the air circulation fan will continue to run on until the air heater has cooled to a safe condition. Thereafter the fan will remain off until the next cycle is initiated.

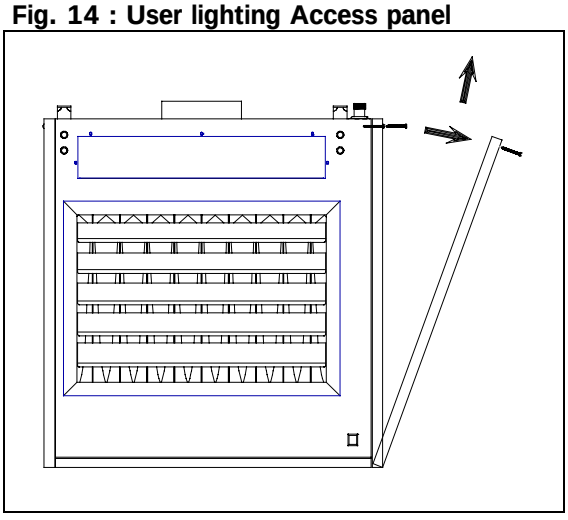
14.7 To light the air heater:

1. Turn on the gas supply to the air heater;
2. Switch on the electricity supply to the air heater;
3. Ensure that time switch (if fitted) is set to an **ON** cycle;
4. Adjust room comfort control/ thermostat to desired temperature;
5. Air heater will now light automatically when the room thermostat calls for heat.
6. If the appliance does not light:
   a) check the automatic burner control does not require resetting. An indicator light will glow on the front panel of the appliance or on a remote control where applicable. Reset by press the light button on the appliance or remote control.
   b) check if the thermal over heat control requires resetting see figure 12 key 10;

If the thermal overheat control requires resetting and doing so restarts the air heater, wait until the appliance warms up to thermal equilibrium, to ensure that the over heat control does not operate again. **If it does and the temperature surrounding the air heater is less than 30 °C then switch OFF the appliance and call for service.** If the temperature surrounding the appliance exceeds 30 °C, take appropriate action to reduce the temperature in the vicinity of the appliance.

Warning:
The externally fitted gas service tap must not be operated except in emergencies or for servicing or prolonged periods of shutdown of the air heater.

Fig. 14 : User lighting Access panel



14.8 Air circulation:

Some Reznor unit air heaters have fans connected to a remote override switch. This enables cool air to be used for circulation purposes when the air heater is not used for heating purposes e.g. in summer months.

a. Switch ON mains electricity supply to the air heater;
b. Switch ON the manual override switch on remote control panel;

14.9 Important:

In the event that the thermal overheat (limit) control LC3 has operated requiring relighting the air heater, wait close by the air heater for 15 minutes after relighting to ensure normal operation.
If the overheat control locks out again, turn **OFF** the air heater and call for service to establish the reason and rectify the fault.

14.10 Maintenance & servicing:

Maintenance and service must only be carried out by competent persons. Periods between service are dependent upon the local environment where the air heater is installed. Regular inspection is recommended initially to ascertain routine service intervals. Where local environmental circumstance change e.g. different processes being carried out in a factory, the service interval should be reconsidered. Ask your installer, service undertaking or the manufacturer about inspection and service intervals.
The service engineer is asked in section 9 of this document to advise the user of his recommended frequency for servicing after carrying out the first service.
The air heater should be serviced at least once every heating season. Ensure that any combustion air vents fitted to the building in which the air heater is installed are unblocked. Periodically check to ensure that the outer casing of the air heater is clean, excessive dust might constitute a hazard.

END OF USER INSTRUCTIONS