Clean Air Systems Ltd



"The Clean Air Solution"

Basic Do's & Don'ts for All Hand Fired Wood Heaters

Do: Train only 2 people to operate this heater and warn others not to touch it.

Do: Keep this heater clean both inside and out.

Do: Always keep an area 2m around this heater clean.

Do: Check power supply is on.

Do: Fill the heater with mixed fuel types. (Solid timber - shavings - chipboard - m.d.f.). Start with a small fire and build steadily up to the maximum level

Do: Inspect the brickwork and blower tube in the heater fire box every day. (These items are not under warranty)

NEVER: Burn plastic-polythene-polystyrene-rubber-laminate

NEVER: Keep/use volatile products near this heater i.e. petrol-oil-paint thinner etc.

Do Not: Fill above indicated line.

Do Not: Put large pieces of board material in to burn, always cut them down in size.

Do Not: Run this heater with the door open.

Do Not: Keep opening the fire door to look inside, it lowers the temperature and makes smoke.

Do Not: Light this heater if a firebrick or tile has fallen out.

Do Not: Forget to service it regularly (3 month intervals).

Do Not: Forget to check that there are no remaining embers before leaving the premises.

WARNING - SOME PARTS OF THIS HEATER CAN BECOME EXTREMELY HOT!!

The Life of this heater is now in your hands!!!!!

CLEAN AIR SYSTEM LTD

WOOD WASTE COMBUSTION HEATERS - HAND FIRED
CAS 200, CAS 400 & CAS 600

CONSTRUCTION INFORMATION

The full range of CAS heaters are completely manufactured in our own factory in England. They have a full ceramic lining retained with stainless steel clips giving full protection up to 1,500°c. The firebox walls are lined with firebricks and the base has a 25mm thick steel removable ash grate. The flue gases then flow from the combustion chamber through a twin pass secondary heat exchanger before entering the flue. This arrangement ensures that the maximum amount of heat is extracted from the waste being burnt. All major body panels are fully insulated.
Combustion air is supplied by a small fan and is distributed evenly over the entire length of the combustion chamber by a heavy steel tube giving a complete balanced combustion zone.
An air thermostat starts and stops a blower fan. This blows air around the firebox - through the heat exchanger then out of the heater register.
Each heater is supplied with air distribution registers of the swivel louvered type. These can be rotated and the vanes adjusted to ensure the optimum direction of hot air flow. Alternatively the heaters can be fitted with a plenum box enabling direct connection to a summer dump diverter and a distribution ductwork system

A single electrical control panel has been fitted; this allows an afterburner to be retro fitted, if required on any model. This panel contains: Neon Power on Indicator - Isolator switch - Fuses - Overload control - Afterburner timer & Din rail for easy electrical connection.
Oil or Gas afterburners can be retro fitted if required when burning other fuel types or in very smoke sensitive areas.

AFTERBURNER

The afterburner on the back of the unit (when fitted) is designed to burn off the volatile gases produced on stoking. The flame path when commissioning the burners should be 300mm. The output of the burners should be set at 50,000 BTU, maintenance is most important, it is necessary once a month to disconnect the burner from the afterburner box to clean the probes, jets etc. An approved Corgi person should only carry this out. The afterburner is wired via a time control and door activated switch on the loading door. Every time the door is opened an electric impulse is sent to the door switch on the timer, which is preset to switch power to the burner, then the burner will switch off automatically. Occasionally, check the door control switch to ensure the ball type electric micro switch is activating correctly. Every time the door is opened and closed, the timer recycles.

ALWAYS TURN OFF THE POWER AND GAS SUPPLY BEFORE A SERVICE AND ALWAYS EMPLOY A SPECIALIST SERVICE ENGINEER.

CALL OUR SERVICE TEAM.

INSTALLATION

Consult your local Authority regarding any planning permission that may be required for height and position of the flue or regarding any byelaws for the installation of all boilers or furnaces. This rule applies to any unit you may chose. Please contact us if you require any additional information or advice.

POSITIONING

The position of the heater is essential to give the maximum performance of these heaters.

IMPORTANT POINTS TO CONSIDER

1. The heater must stand on a completely level non - combustible base capable of supporting its full weight.
2. Distribution of heat is best if the heater is positioned centrally within an area, alternatively, it will need to be installed an area so a ducting system can be installed.
3. The position of the heater must allow for the fitting of a flue, the top outlet of which must be one metre clear of the highest point of the building or any obstruction within a 7m radius.
4. If you require the heater to work as an incinerator during the summer months a position must be chosen that will allow a duct to be taken horizontally through an outside wall or vertically through the roof.
5. Should the heater be positioned adjacent to any walls, etc. a minimum of 600mm must be allowed for access and removal of panels for servicing.
6. If the heater is to be installed in a boiler house it must be fire and weatherproof and must conform to building regulations, also adequate return air must be re-circulated back to the heater to ensure maximum efficiency.

Flues:

The flue must satisfy all building, fire and heating regulations and be capable of withstanding temperatures of 1,000°c.
We recommend a stainless steel flue with a 1mm thickness for warm air applications.
A straight vertical flue is in all cases the most efficient, if however it bends; never use more than two elbows, the angle of which must not be greater than 45°.

Ducting:

The heaters are suitable for connection to ducting systems, careful design of each system is important to ensure maximum efficiency. Consult our project engineers.

Electrics: All heaters are pre-wired and factory tested.

Model 200: single phase + Earth (0.6kw)

Model 400: single phase + Earth (0.75kw)

Model 600: 3- phase and Neutral + Earth (2.2kw)

BEFORE COMISSIONING

Note: Ensure the fan is running in the correct direction. If you have to correct this, change any two phases connected to the isolator (3PH).

Thermostat:

Each heater is fitted with a thermostat that controls the main centrifugal blower fan it is normally set to switch on at 120°c and switched of at 80°c. The factory settings are adjustable.

Combustion fan:
The combustion fan is provided with a fused neon indicator.

Afterburner:
When fitted the afterburner is fully wired into the all in one control panel and provided with a fused switch and neon indicator light.

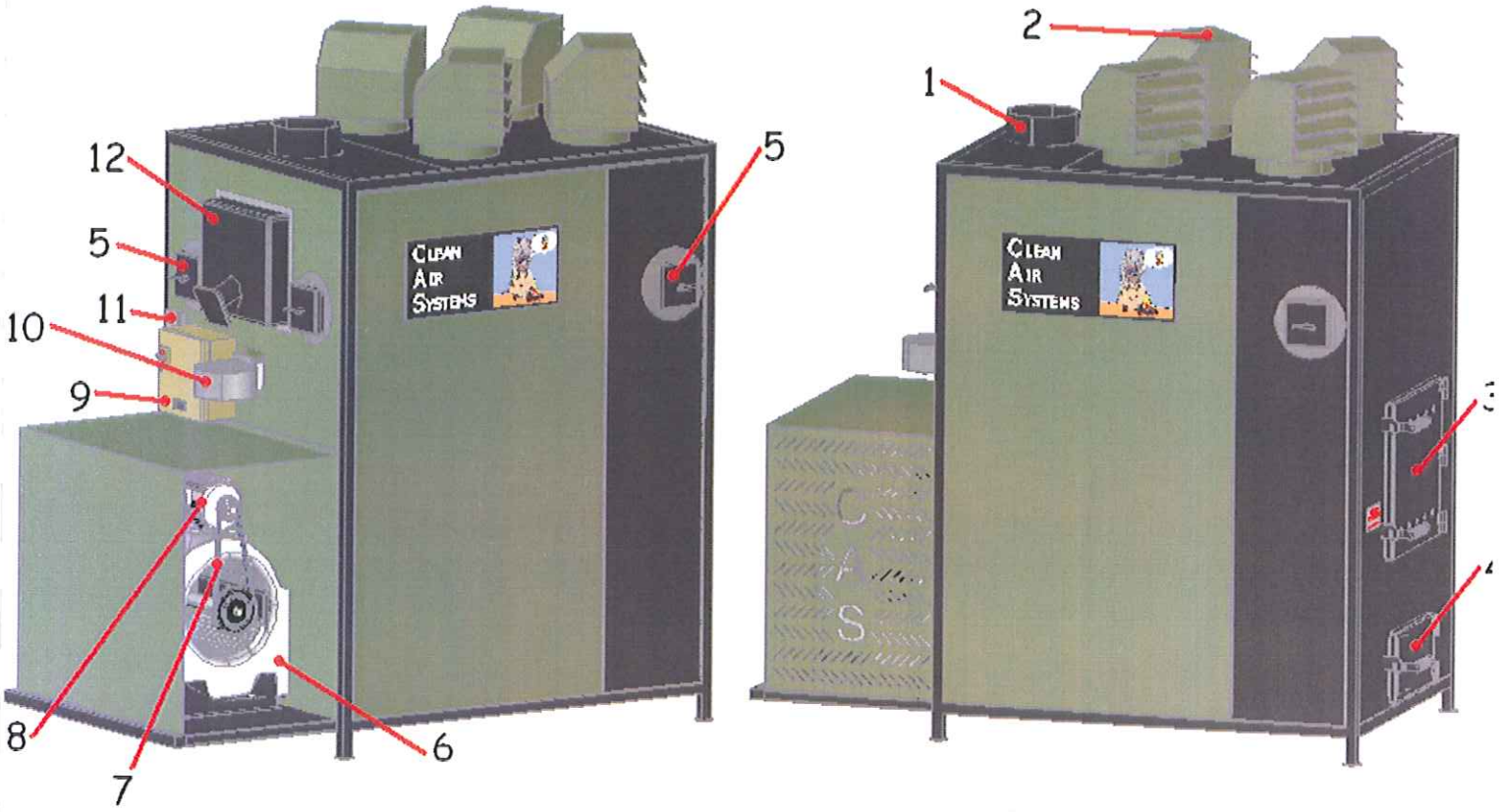
NOTE: The afterburner will be permanently on when the heater is in use to enable the burner fan to run continuously, this helps to prevent deposits forming which will eventually cause the burner to malfunction or fail.

In all cases where Oil or Gas afterburners are fitted, we will include commissioning by the afterburner specialist.

IMPORTANT NOTE: it is essential that the electrical power is connected to the heater before they are fired up and checked prior to lighting every day.

NEVER RUN A HEATER WITH THE POWER TURNED OFF OR RE-STOKE DURING A POWER SUPPLY FAILURE AS DAMAGE COULD RESULT

CAS 600



1. Flue Outlet
2. Heat Directional Registers (alternative Duct heads if required)
3. Loading Door
4. Ash Door
5. Access Cleaning Doors
6. Double Inlet centrifugal blower fan
7. Drive Belts
8. Fan Motor
9. All in One control Panel
10. Combustion Fan
11. Thermostat

After Burner Box (Suits oil, Gas afterburner if required)

WARNING SOME PARTS OF THE HEATER CAN BE EXTREMELY HOT

Assure that you fully understand the manufacturer's instructions manual and have received sufficient training in the use of this machine and the particular safety precautions to be observed.

Persons under the age of 18 years should not operate this machine except under supervision during a course of training.

Before setting a fire and operating this machine ensure that: -

- Loose clothing is either removed or fastened and jewellery removed.
- Suitable protective equipment is available, e.g. goggles, ear defenders and dust masks.
- The working area is well lit, clean and unobstructed.
- The area is free from highly combustible products, e.g. petrol, paint thinners & adhesives.
- That the proper fuel is being used.
- The electric power is switched on (see red indicator light)
- Unit is cleaned out and has been serviced and checked over to instructions

Before any maintenance and cleaning

- **Assure all power sources are isolated before any maintenance work commences**
- Assure all moving parts of the machine are stationary.
- Heater is cold before any work commences
- Unit is cleaned out and has been serviced and checked over to instructions
- Report immediately to a person in authority any machine malfunction or operator hazard. **DO NOT** attempt to repair the machine unless competent to do so.

OPERATING INSTRUCTIONS - CAS 200, CAS 400 & CAS 600

Have two trained personnel to operate the heater

BEFORE LIGHTING THE HEATER

Ensure that the power has been switched on to the unit (See neon light on panel).

DE-ASHING

Clean out any ash from underneath the burning grates on a daily basis.

LIGHTING THE HEATER

Light a small hot fire initially, using small off cuts, paper or cardboard, etc.
Allow the fire to become established and slowly build.
Maximum load levels are indicated on the front of each heater and should not be exceeded.

Fuel should be placed in the firebox with care as damage can be caused to the brick and tile lining of the firebox and this would not be covered by a warranty claim.

Do not open the loading door unless re-stoking.
Keeping the loading door shut will also avoid unnecessary consumption of oil or gas when an afterburner is fitted.

The fan limit is set on auto and the mains blower will switch on when there is sufficient heat to produce hot air and shut off as the heat exchanger cools down, if the unit has not been re-stoked. The manual setting overrides the thermostat and runs the blower continuously irrespective of the heat exchanger temperature and will cause a much lower air temperature to be delivered and possible smoke emissions from the chimney.

When in operation;

Care should be taken, as various parts of this heater will reach high temperatures.

IMPORTANT

Check hourly to see if the heater requires more fuel, if so, rake the fire bed out evenly and re-fill the heater to the maximum level.
If the main blower does not come on or there is a power failure SHUT DOWN HEATER AND SEEK ADVICE.
NEVER USE A FIRE EXTINGUISHER INSIDE THE FIRE BOX.
WET SAND CAN BE USED!

HOW TO TAKE CARE OF YOUR UNIT

We recommend that if possible you train two people to be responsible for stoking and the maintenance of your heater.

Never restrict the main airflow to and from the heater. If a ducting system is fitted **NEVER**, close all the vents at the same time.

Test daily that the main fan is working and the combustion fan.

When stoking the heater do not throw wood off cuts hard against the ceramic lining as it could damage the bricks. Check the lining daily.

If the heater becomes sluggish, this is an indication that it needs cleaning. Clean out the heat exchanger from inside the firebox with an industrial vacuum cleaner.

If you have any queries or require advice, please do not hesitate to contact us and our service team will help with spares and service parts.

ANNUAL MAINTENANCE

It is recommended that you have your heater fully serviced annually to achieve maximum lifespan and working efficiency.

When the heater is cold turn off the power at the isolator.

Remove large side insulated panels and brush off outside of heater exchange.
Check electrics - contactor and relays.
Check drive belts on main blower fan.
Clean out top heater exchanger.
Check inside combustion chamber, replace or re-cement bricks as necessary.

If an oil or gas afterburner is fitted, have them serviced only by a qualified afterburner engineer.

TOP HEAT EXCHANGER CLEANER

Remove the four access doors by loosening the central nut by two full turns anti-clockwise, grab the handle and push inwards, then turn the handle until it faces across the corners of the cover. Now pull the handle towards you, the cover and the handle will now come away from the heater, use the opening to view and clean the heat exchanger. Upon final inspection refit the access doors making sure that the gasket is sound and fits properly. Push and turn the handle to the horizontal, holding it while you tighten the central nut clockwise, and then make sure the door is seated and is secure.

FAULT FINDING

FAULT	CAUSE
Smoke leaking from combustion fan	Flame tube burnt through and/or fan burnt out.
Sparks & grit from warm air grilles	Heat exchange - firebox cracked or burnt through. Turn off & seek engineer's advice.
Factory power failure and heater is fully loaded	Shovel **wet sand** into fire box
Heater seems to be running but heat output low	Check how full firebox is. Check somebody has not pushed manual switch on thermostat to manual, if so reset to automatic. Wrong type of fuel
Excessive Smoke	Overloaded with fuel Afterburner not working
Bad to light or slow to get going	Flue and heat exchange needs cleaning or combustion fan is switched off.

OUR SERVICE TEAM IS ALWAYS AT HAND!

Call: 0808 202 1110

CLEAN AIR ACT

The fuels to be burnt are as follows: wood off-cuts; wood waste pallets, chipboard, paper-coated chipboard, cardboard, paper and cardboard briquettes.

It is necessary to apply to the Local Authority for approval to install the heaters in order to comply with sections 2 an 3 of the Clean Air Act 1968 (emission of grit and dust). The Local Authority must also be consulted over the height and position of the chimney, particularly, so that such fumes that are emitted do not become prejudicial to health and cause a nuisance.

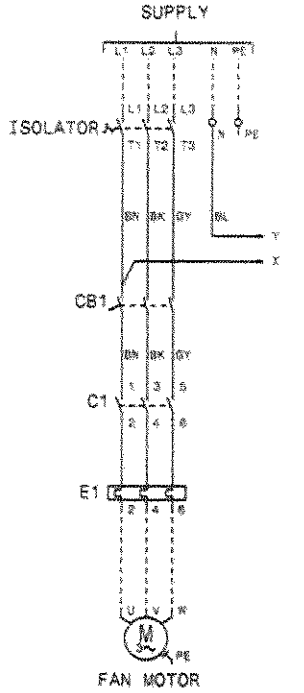
The department of industry (DEFRA) has tested the units and issued exemption from section 11.4 of the Clean Air Act 1956. This exemption allows the heaters to be operated in smoke controlled areas as long as certain conditions are abided by.

If fuel variations cause smoke problems you can retro fit the afterburner.

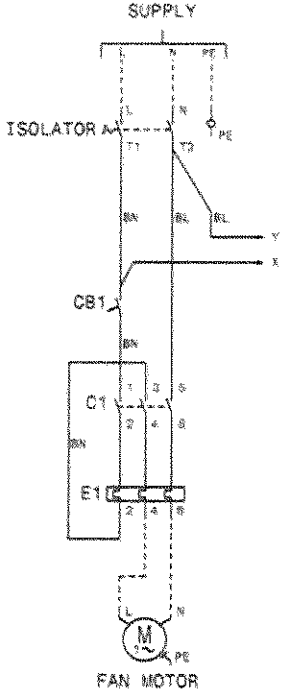
The Clean Air Act allows to some extent for breakdowns e.g. power failure etc but shut down the unit until the breakdown is corrected. Check daily that the afterburner and small combustion fan are functioning correctly.

SMOKE EMISION COULD ALSO RESULT IN YOU BEING SUBJECT TO FINES SO CHECK THE FLUE DAILY AFTER STOKING FOR DISCHARGES.

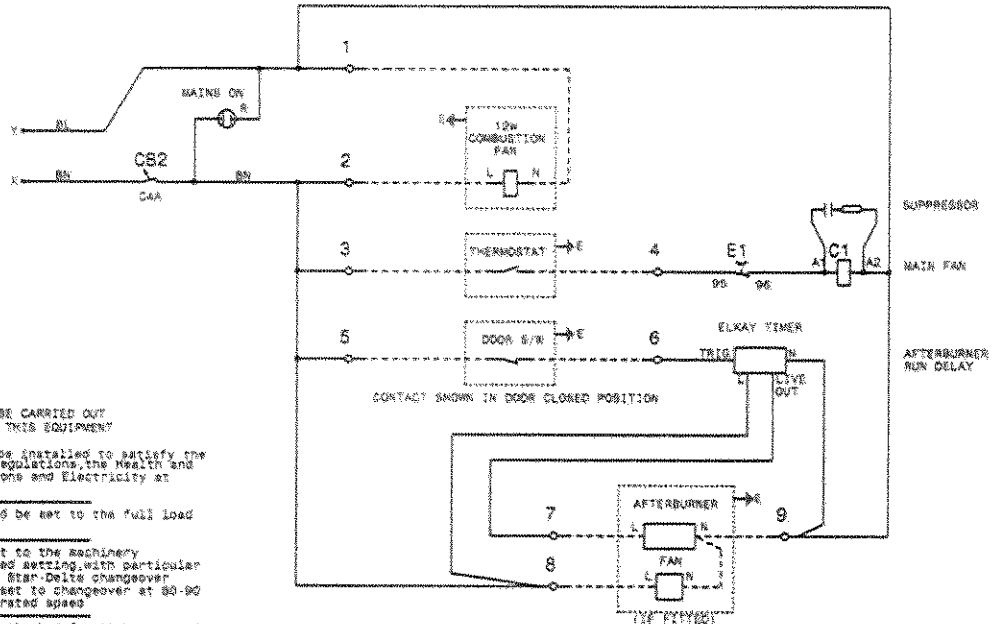
3 PHASE & NEUTRAL POWER CIRCUIT



1 PHASE POWER CIRCUIT



CONTROL CIRCUIT



INSTRUCTIONS TO BE CARRIED OUT BEFORE ENERGISING THIS EQUIPMENT

1. This controller should be installed to satisfy the current I.E.E. Wiring Regulations, the Health and Safety at Work Regulations and Electricity at Work Regulations
2. Thermal Overloads should be set to the full load current of the motor
3. All timers should be set to the machinery manufacturers recommended setting, with particular attention being paid to Star-Delta changeover delays. These should be set to changeover at 80-90 per cent of the motors rated speed
4. All terminals should be checked for tightness and re-checked as a maintainence procedure

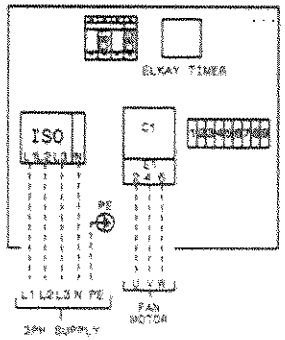
FOR INFORMATION REGARDING THE FUNCTION/OPERATION OF THIS CONTROLLER, PLEASE REFER TO THE MACHINERY MANUAL

CAS 600 2.2KW-3PH FAN MOTOR = 4.0-6.2A OVERLOAD WITH D8A MCB

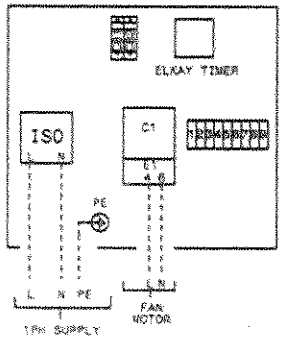
CAS 400 736W -1PH FAN MOTOR = 6.0-9.2A OVERLOAD WITH D10A MCB

CAS 200 600W -1PH FAN MOTOR = 6.0-9.2A OVERLOAD WITH D10A MCB

3PH LAYOUT



1PH LAYOUT



rev	change	date	name	note		source	substitute for	replaced with
6	MCBs FITTED	11/10/08	DT	Date	30/3/07			
5	SUPPRESSOR	8/10/08	DT	editor	DT			
4	MODEL No	1/4/08	DT	checked				

B&J CONTROLS
UNIT 18 SLAITHWAITE IND EST
NEW STREET SLAITHWAITE HUDDERSFIELD
W. YORKSHIRE HD7 5QB
TEL: 01484 845449

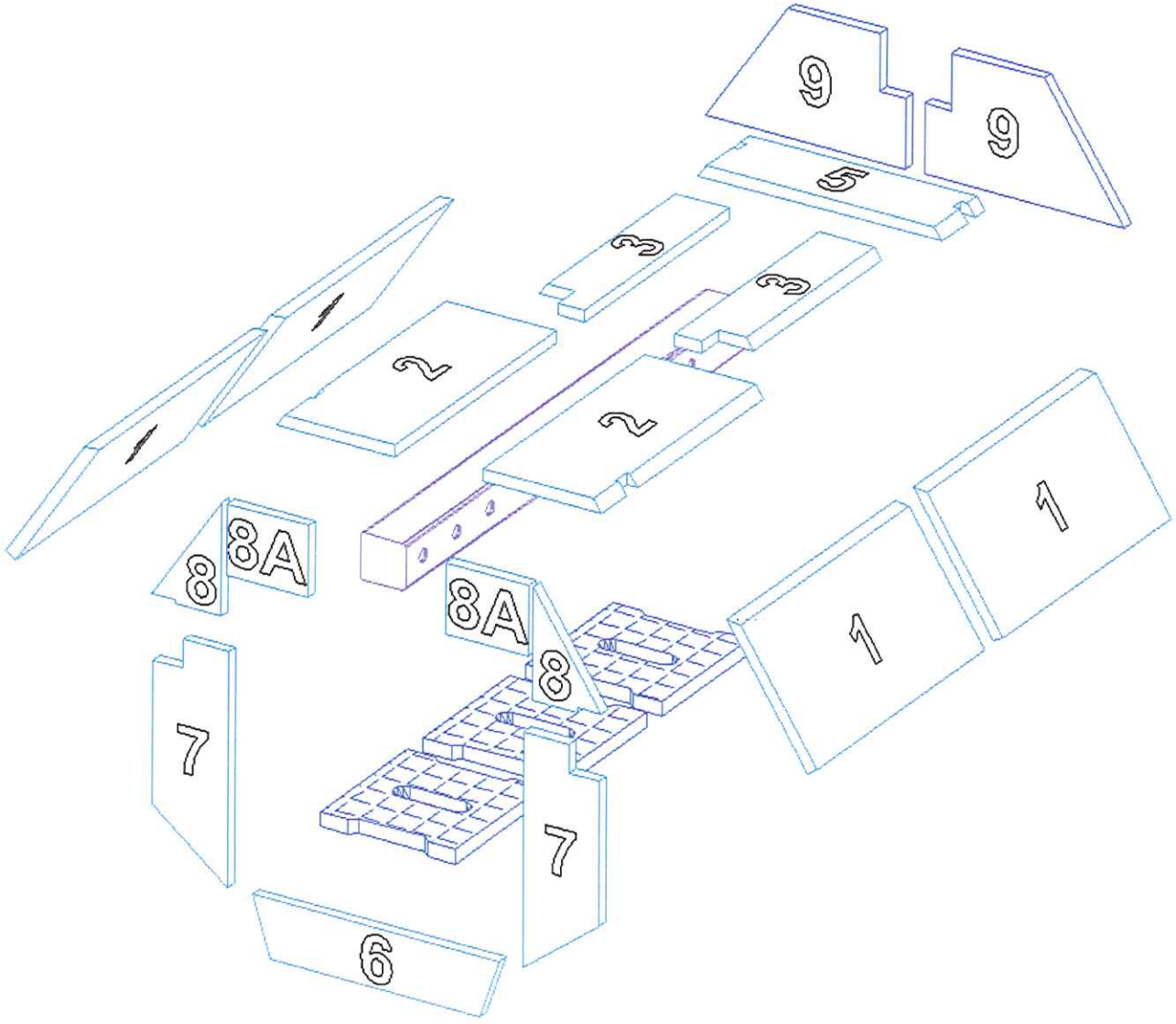
BURNER CONTROLLER

A3\1267

TILE SPARES

F.A.O .....

FROM .....



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DUST & FUME ENGINEERING • QUALITY FABRICATIONS

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Reg in England No: 4121169 VAT Reg No: 829 9766 56

ORDER N° .....

DELIVER TO:

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SIZE OF HEATER

T 150	☐	CAS 200	☐
T 300	☐	CAS 400	☐
T 500	☐	CAS 600	☐

PLEASE TICK A BOX

