



Wood Fuelled Blown Air Drier

Setup and
Installation guide

Guides you through
planning & installing
Edition 1c

Design Concept

Our system example utilises a standard 20ft ISO container and, with minimum modifications, it can turn it into an efficient log drying machine. Almost any closed structure can be used. Existing buildings, larger container or containers attached to each other.

Simply by attaching a wood fuelled blown air heater to the side of the container, which can blow heated air to temperatures upto 95C, drying split logs quickly and efficiently.

The Zero Wood Heater on board ventilation fans pushes air around the heat exchanger where it picks up heat and expels it from the top exit ducts.

- Total loss.

We have many customers who simply connect a Zero Wood Heater to a drying chamber and push the heat straight through and out the other side to atmosphere via flaps or doors, this blows the logs dry but is very inefficient.

- Recirculation system.

The heated air is allowed to recirculate. The heated air is blown into the drying chamber circulated then returned to the Zero Wood Heater creating a circuit. When the humidity hits a pre-set setting a vented flap closes dumping the humidity.

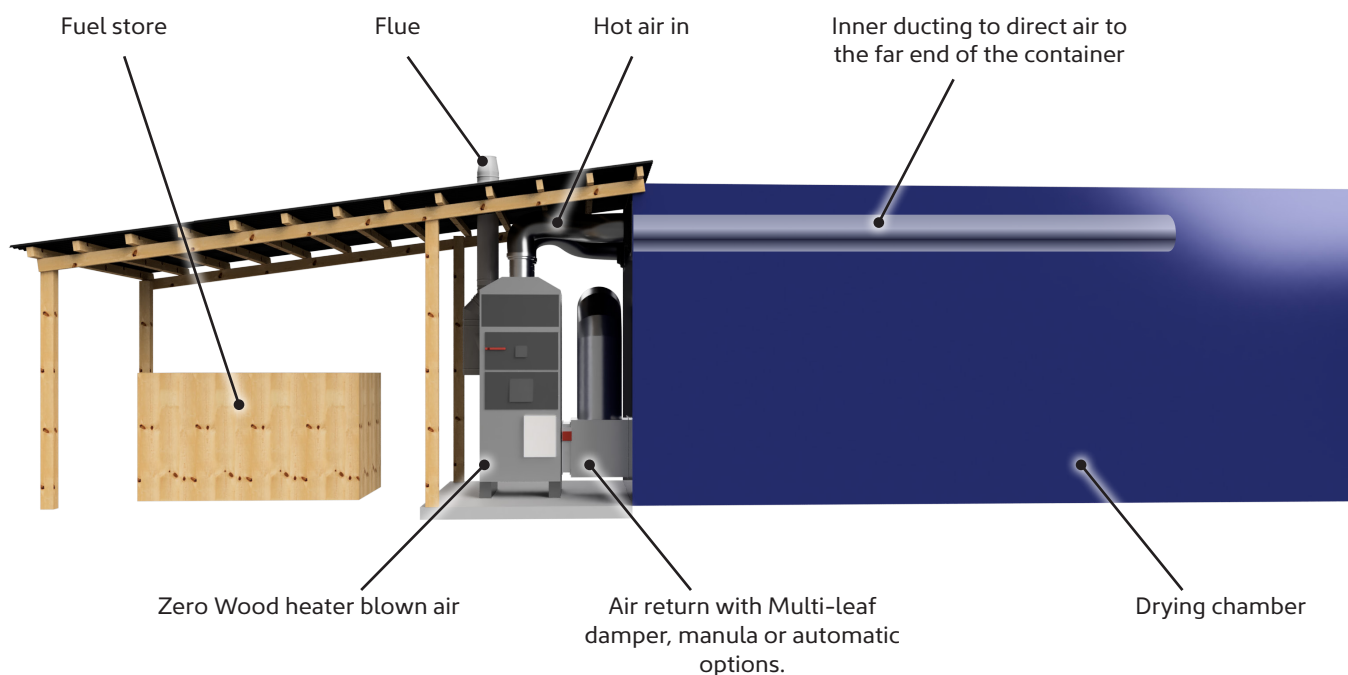
There are two main types of recirculation system;

Manual version.

Using a manual lever the circulated air can be passed back through the heater or expelled to atmosphere depending on the users choice.

Automatic Control (Zero Pro Kiln Control)

The air is ducted in a closed circuit back to the heater, all the while it is monitored for moisture content and when it reaches a given saturation point the air is redirected to expell outside of the drying chamber. The heater draws fresh air from outside, until the sensor closes the vent when the sensors read a low enough humidity and the air is circulated in a closed loop until it again reaches saturation point and the process starts again. This process drives moisture off the logs and periodically dumping it outside is an energy saving tool. The system also includes an overheat sensor so if the drying chamber or heater system gets too hot the system dumps heat until within safe or required levels.



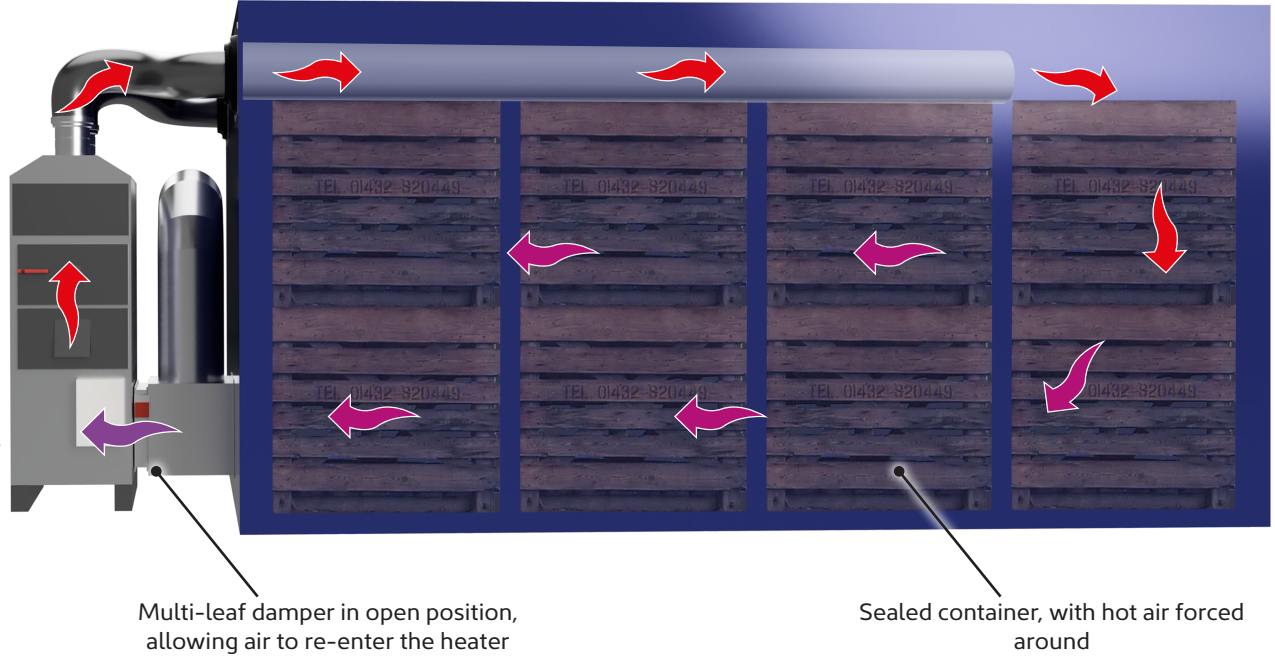
Example recirculate system using a container

How recirculation works

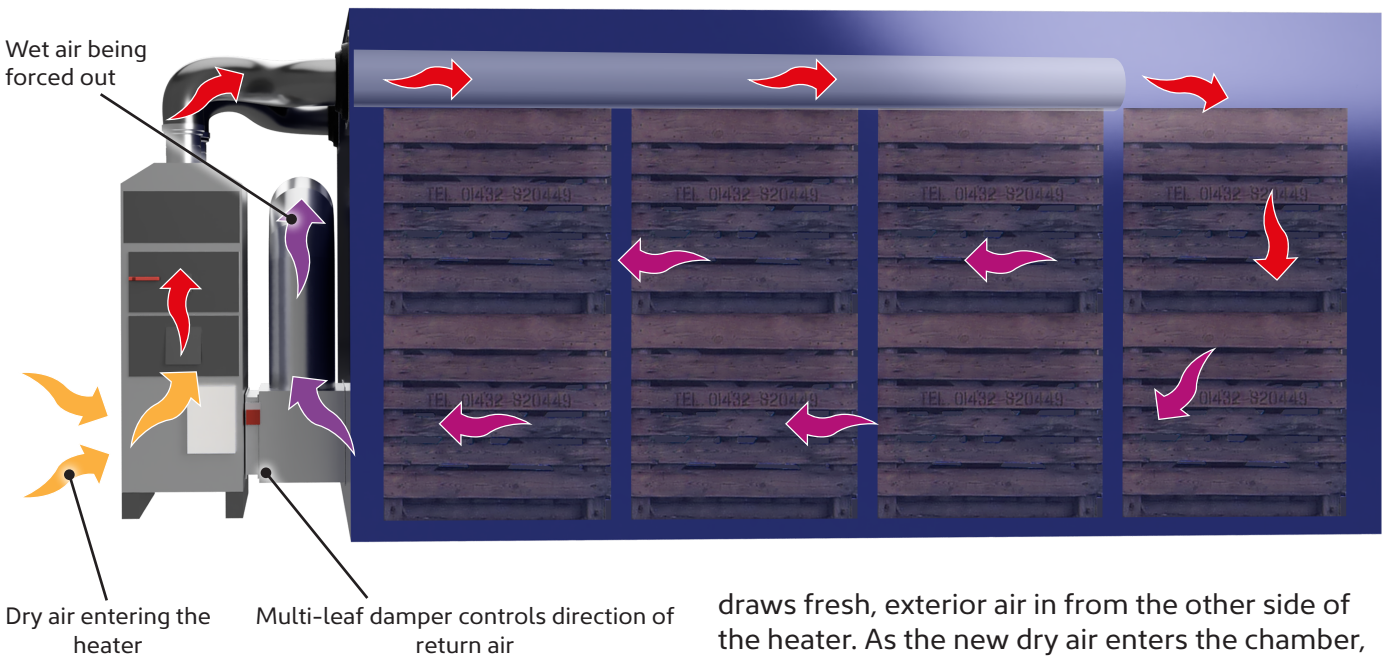
When the heater is turned on and ignited the large circulation fan at the bottom automatically switches on when the chamber exceeds 42c. The fan sucks air in from the drying chamber, heats it and blows it out

at the top back into the drying chamber, because the air is been forced into the chamber and the only exit for the pressurised air is the exit at the bottom, the air is forced back into the heater. The circuit repeatedly reheats the air, raising the temperature driving off moisture from the contents.

Re-circulating Cycle



Dumping Moisture Cycle



As the moisture is drawn off, the humidity of the circulating air is measured. When it reaches a set-point the by-pass flap closes and the saturated air is expelled to the outside. As the heater can no longer draw air from inside the chamber, it now

draws fresh, exterior air in from the other side of the heater. As the new dry air enters the chamber, it lowers the humidity and the slatted vent will automatically open sealing the system and starting the drying process again. This automatic, wet air dumping cycle only happens when it is required, raising the efficiency of the process.

Guide drying chamber with a 20ft container

Model F55 with single phase connection.

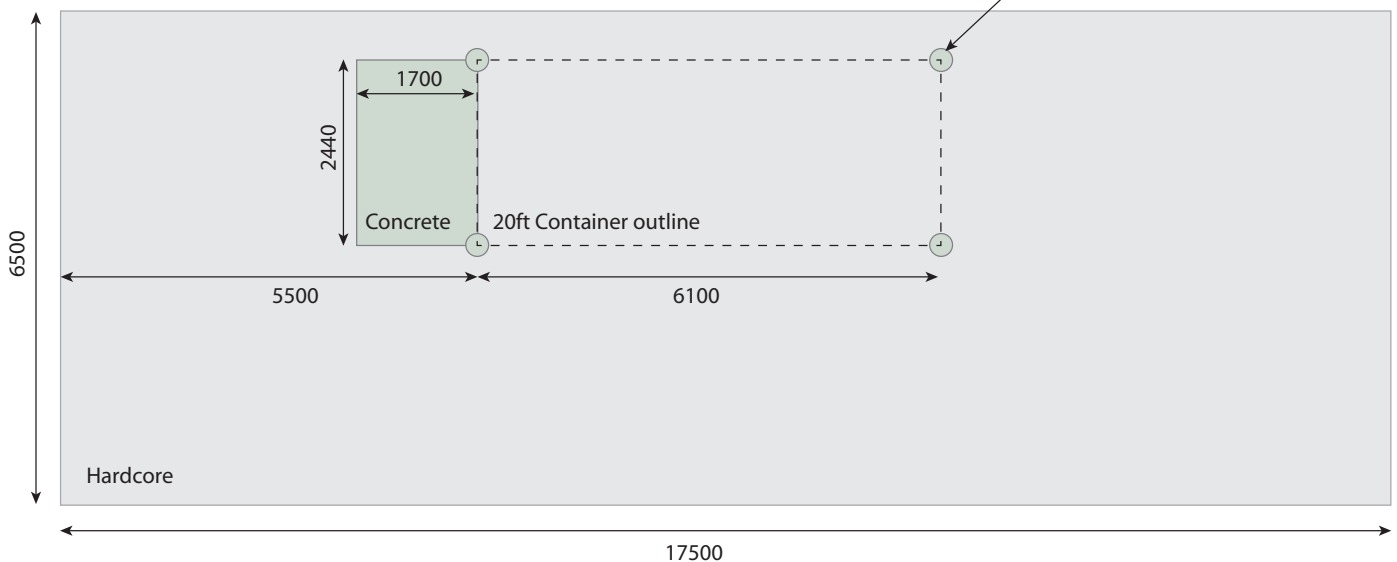
Step 1 Ground Works

We recommend the minimum size to stand your setup on is an area of hard core or existing hard standing of 17.5 x 6.5 metres. Within this area you will need to construct four footings at the corners of the container's position, these should be 300mm in diameter and 400mm deep. Also a small concrete pad (1500 x 2440 x 100mm) at the closed end of the container to stand the heater on. See diagram.

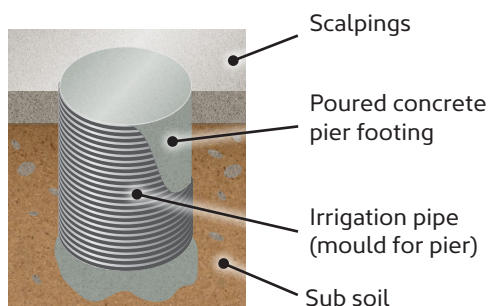
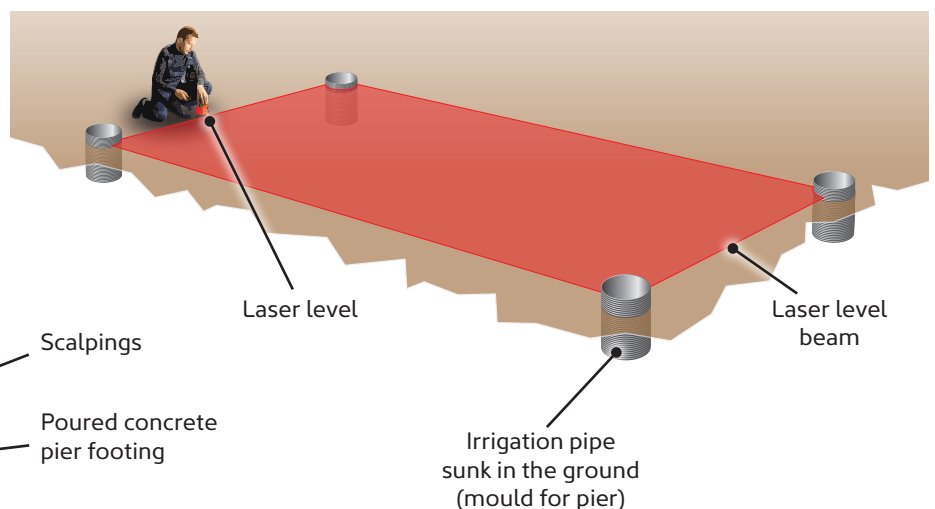
You will also need a 230v power supply to power to the fans on the blower and the sensors.



300mm diameter concrete footings
400mm deep at each corner of the container



The concrete piers for each corner of the container can be easily constructed by setting 300mm diameter drainage pipe 400mm into the ground. Trim the tops to the desired height/level using a laser level and then pour concrete to the top of the pipe.



See appendix for equipment options

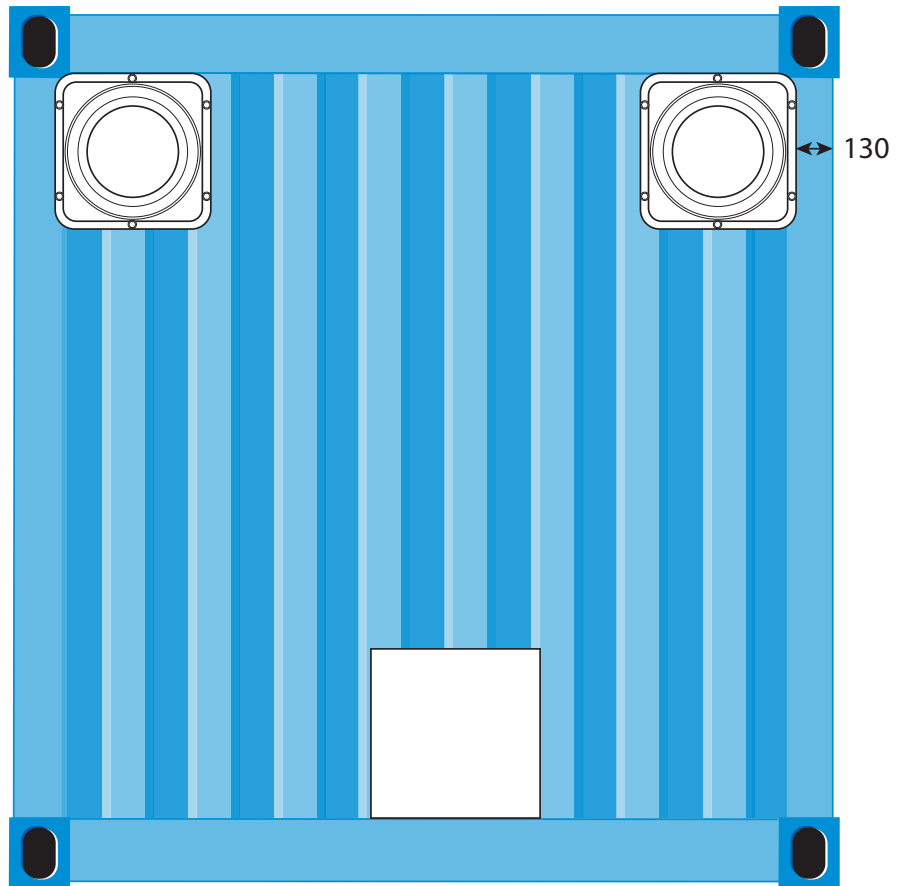
Step 2

Position container on the pads.

Board out the inside of the container using insulation panels.

Cut three holes in the rear of the container.
2 for flexible pipes
1 for return duct

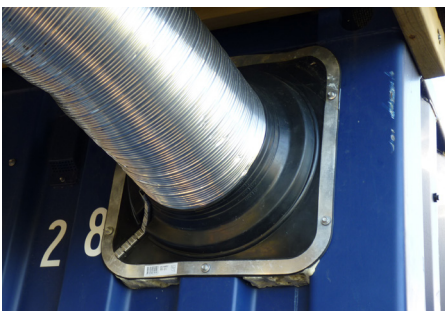
Cut holes to suit flexible ducting



Cut hole to suit return duct size

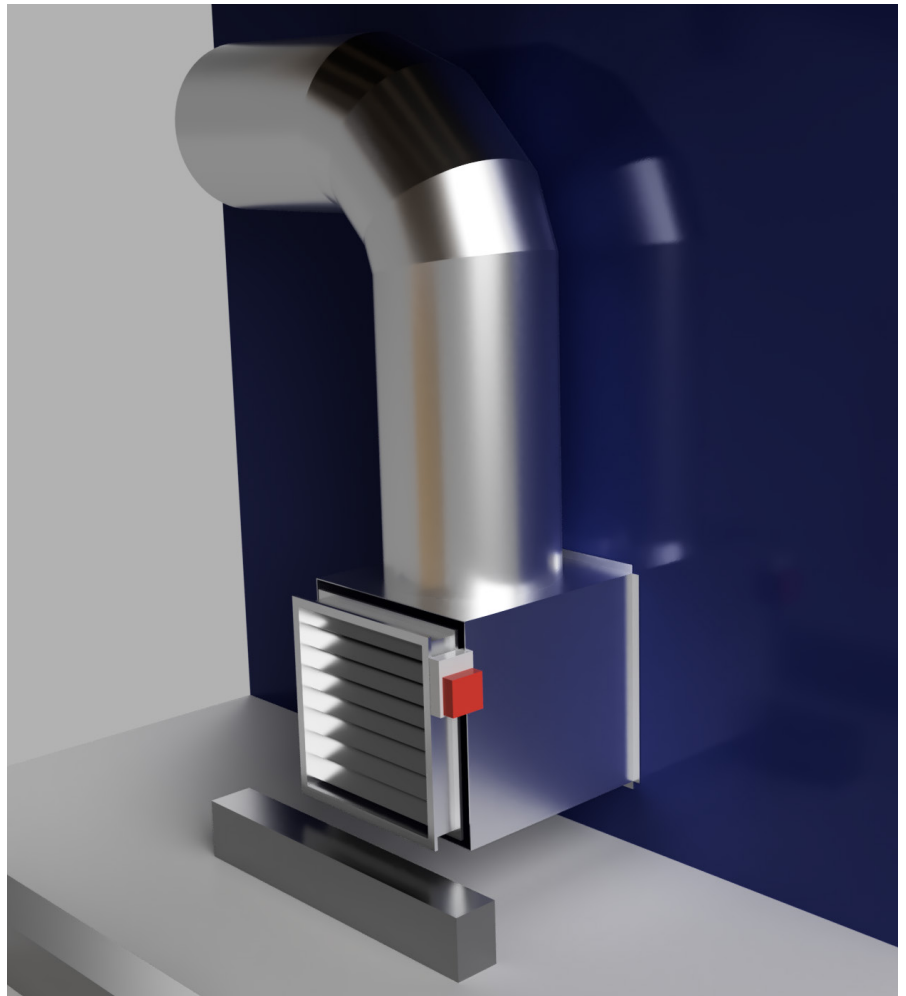
Step 3

Fit the flexible rubber flashing



Step 4

Attach the return duct and multi-leaf system to container.



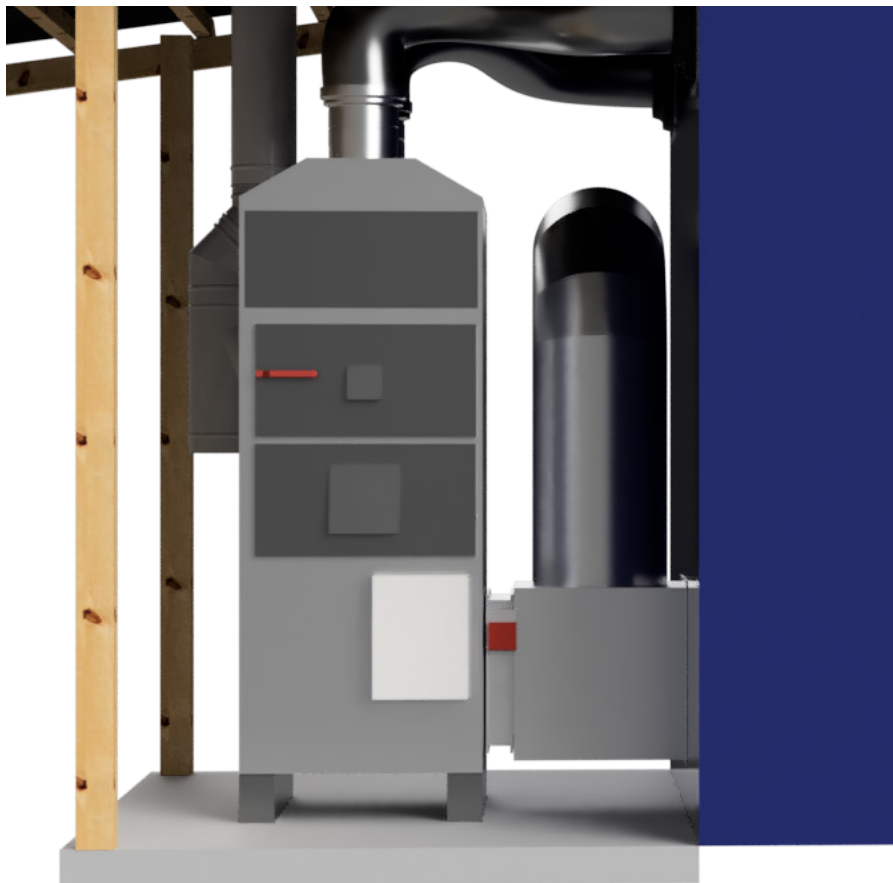
Step 5

Remove the right hand side lower grill panel from the heater.



Step 6

Place the heater up against the return ducting. Depending on model and position of concrete base the Zero heater might need raising on spacers to align with flap assembly.



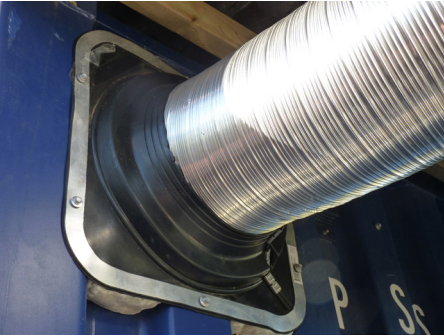
Step 7

Attach the adapters to the top air outlets on top of the heater, ready to attach the flexible pipes. In all cases the flexible duct must be at least one size larger than the outlets



Step 8

Attach the flexible duct to the top adapter on the heater and push the other end through the rubber flashings into the container..



Step 9

Suspend the long rigid pipes in the container with threaded bar and fittings from the roof ensuring there is enough space below to stack your log boxes. Attach the pipe to the flexible pipe with the adaptors.



Step 10

Attach chimney to heater. We don't recommend cowls as this restricts chimney flow. However rain coming down the chimney will damage chimney fan. Always fit a tee or rain catch section with rain trap.



Step 11

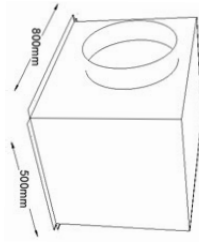
Add Flue brackets to suspend it from the roof.



Ducting Equipment options

Return Duct

Return air connection duct from drying chamber to right hand side bottom of heater.



SIZES

F55
800MM wide., 500MM tall, 500mm deep.
Flange connection to Muliti leaf Flap
Open back 760mm wide x 460 tall

90 deg Bend



F55 = 400mm

Non return damper



F55 = 400mm

Semi Rigid Flexible Ducting



F55 = 250mm

Spiral Tube



F55 - 250mm

Multi-leaf Volume Control damper.
Manual or Automatic operation



F 55 = 800mm x 400mm

Female - female Couplers



F55 = 2 x 400mm & 2 x 200mm

Male - Male Couplers



F55 = 4 x 250mm

Reducer



F55 = 250mm-200mm

Chamber sealing flashing



F55 = 250mm-

Controller options



Starter - Manual only

This system simply allows the user to manually alter the dump action of the moisture ridden air.

The multi leaf recirculation flap includes a manual lever which changes the amount of recirculation or dump.



Pro - Controller

Our Pro system measures the moisture temperature in the drying chamber and vents it to the atmosphere when a given temperature or humidity is reached.

Pro controller includes touch screen for mounting by hot air heater PT1000 temperature sensor to monitor hot air flow. Humidity and temperature sensor for drying chamber. for access and control the user can directly access via the touch screen or via the within the CMI APP.



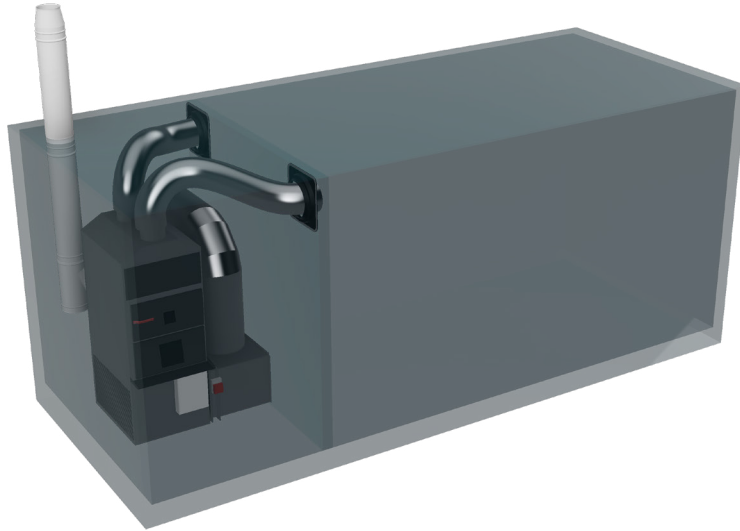
Premium - Controller

Our Premium system. Bespoke controller with additional actions such as additional air dumps, internal fan control and much more.

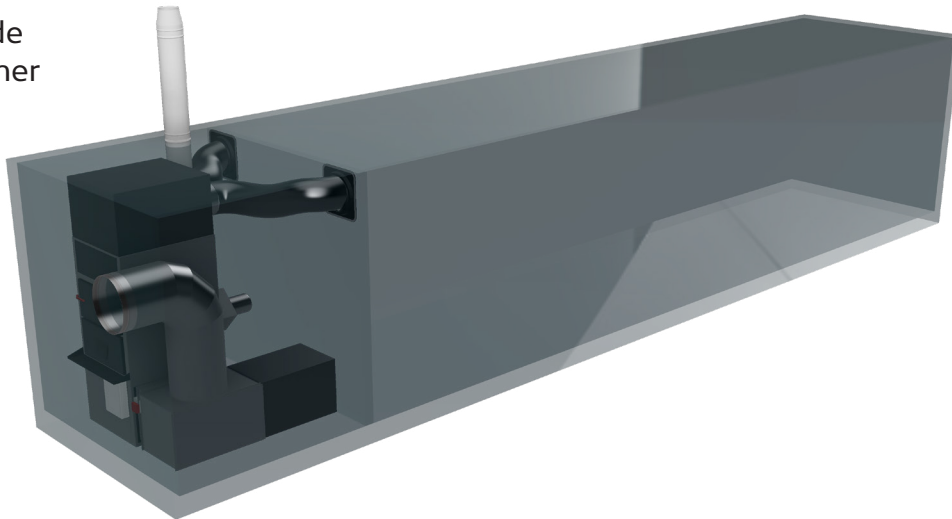
Premier controller will include all of the Pro controller plus options of Additional outputs for additional control. 7" touch screens. Email notification of events. Internal fans in drying chamber. Additional dump or recirculation valves.

Examples of drying chamber

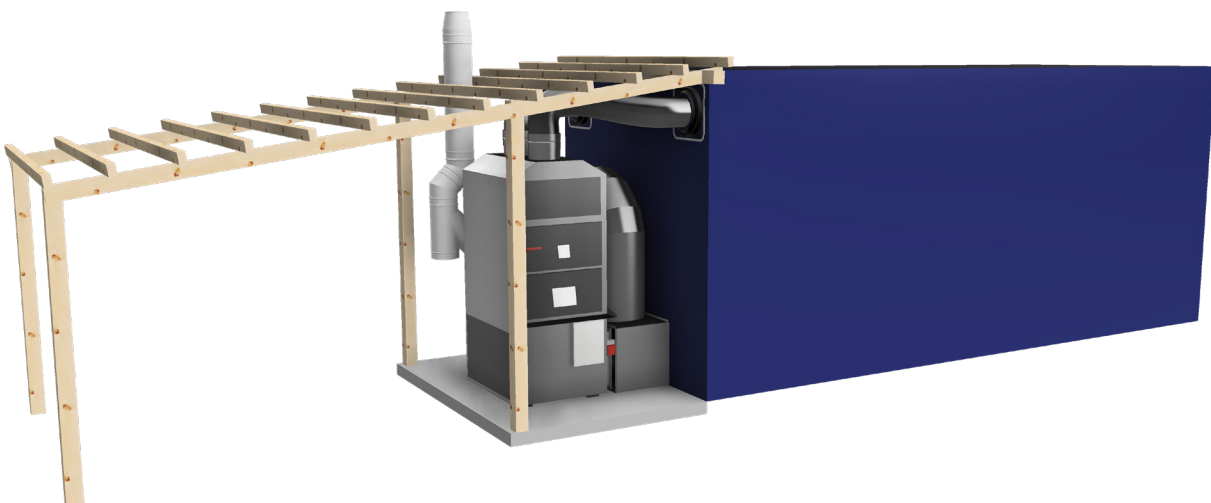
F55 fitted inside container



F120 fitted inside high top container



F55 fitted outside small container





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