

Exhaust Design



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Exhaust Design

The following section is for your guidance in establishing a design to suit your Exhaust duct design requirements.

Oven exhaust design should be carried out by a qualified, engineering consultant with knowledge of local authority requirements. The following information is supplied as a guide only.

Whichever exhaust system is to be used it is a primary consideration to allow access to the complete system that will allow regular cleaning and service to the whole exhaust system.

In the case of solid fuel (wood burning) ovens, this is critical consideration as there may be build up of creosote and ash which can become a fire hazard.

All Phoenix Ovens utilize a proprietary exhaust design which under normal operation runs cooler than more conventional oven systems, This eliminates the need for water sprays and additional “make up air”).

Additionally, Phoenix Ovens are fitted with a mesh filter at the entry to the exhaust transition. This can be easily accessed by kitchen personal for regular cleaning. The performance of the filter is monitored by the interlock system.

Flue Material

Check your local authority requirements. (Generally min 0.9mm Galv. steel or min 0.55mm S/S). Seams should be triple folded or fully welded.

Also available and highly recommended are a variety of specialised proprietary flue systems including stainless steel twin and triple skinned products. *(Your local mechanical contractor should advise you of available systems)*

Phoenix Ovens advise to use best available material and ensure it is installed correctly to comply with local codes. (for construction, mounting, joining and clearances to combustible materials).

Recommended Flue size

300mm square or equivalent cross-sectional area in round or rectangular section. This can vary depending on fan capacity etc. Engineering principals should be adhered to. Some jurisdictions will specify exhaust velocity which will require different calculations to obtain correct sizing.

Nominal airflow required.

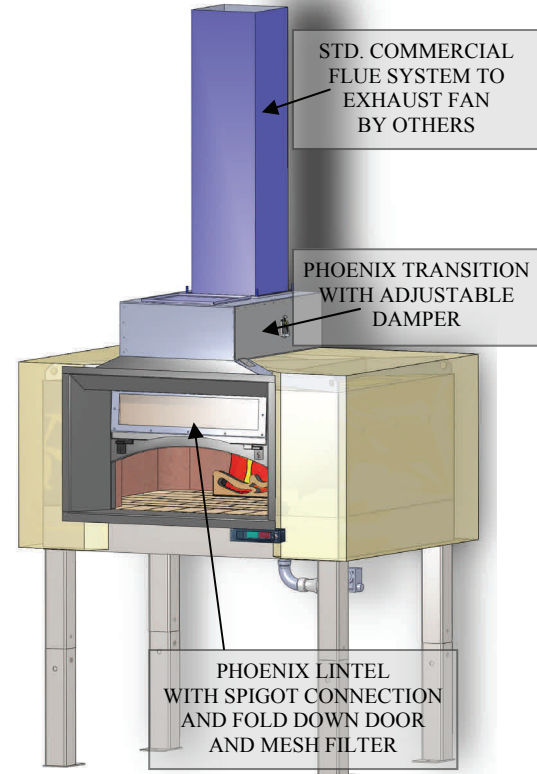
150Pa Static Pressure (available at oven transition)

Maximum total flue airflow - 700 litres / second for a single opening.

Maximum total flue airflow - 1000 litres / second for multi-door ovens.

The oven flue can be connected to any exhaust system with a much higher flow rate by controlling the suction utilising a damper.

Connection to common or community systems should be carefully planned so that solid fuel exhaust is not common with grease duct. Local authority approval should be obtained.



The following methods are to be used ONLY as a guide.

There are typically three (3) methods of exhaust ductwork for a Phoenix Oven. These methods are using:

1. Directly connected power flue using dedicated flue and exhaust fan.
2. Directly connected power flue using existing flue and exhaust fan (common or communal share system.)
3. Canopy method - Oven exhaust and spillage is captured by conventional overhead kitchen canopy system.

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Direct Connection Flue Systems.

Method 1 – Use of dedicated Exhaust Fan (power flue).

Dedicated oven system.

For ovens that will be using solid/wood fuel, we recommend the use of a dedicated flue for the oven connecting to a dedicated fan.

Fan Selection: Should be made by the exhaust design team to supply correct specification to the system, accounting for size, length, height etc. (Biflacted air cooling vents are recommended on most designs.)

Method 2 – Use of Existing System

In some instances it is possible to connect the oven exhaust to an established kitchen exhaust duct. These are generally available in kitchens that have canopy systems in place for other appliances. Ovens connected to "communal systems should be "Gas Only" fired. Solid fuel burning ovens should not be connected to communal flue systems.

Professional advice should be sought to ascertain the compatibility of the existing system to accept the additional load of the oven system inclusion.

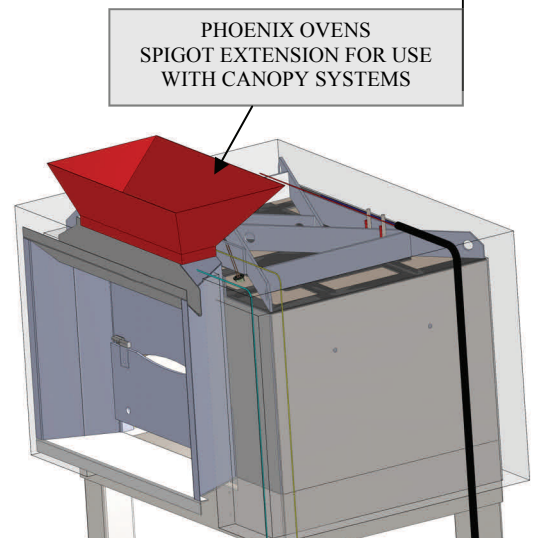
It should also be acceptable to local certifying engineers.

Canopy Method

By using std. Kitchen canopy equipment, this type of oven will perform perfectly and the exhaust system will be safe and familiar to most contractors. The only negative of this method is that designers are often not able to include the overhead fixture into the specific architecture.

As with the direct connection systems, it is not appropriate to mix exhaust from wood/solid fuel ovens with other systems (ie greaseduct). Dedicated system from canopy to exhaust fan is recommended.

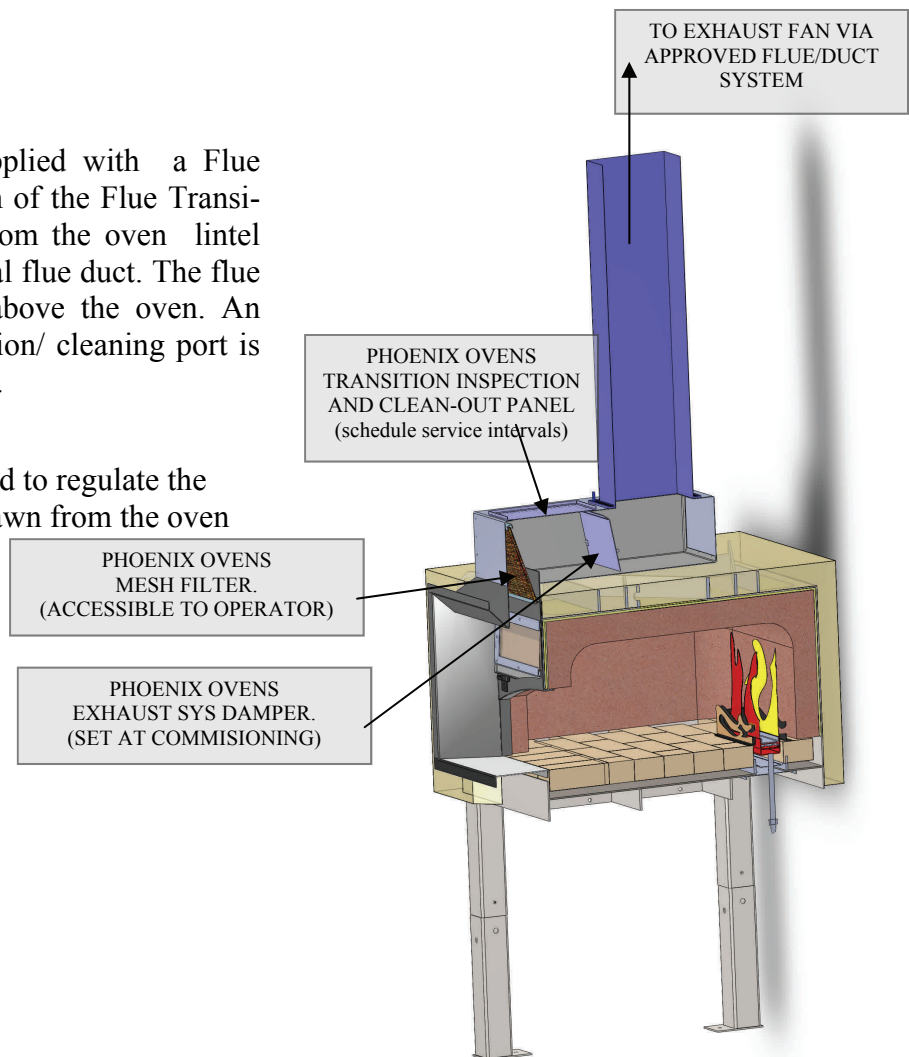
Phoenix Ovens can supply a special spigot for the oven lintel to enhance a canopy operation. There is no transition or filter required. The interlock system is still appropriate for use with canopy systems.



Flue Transition

Most Phoenix Ovens are supplied with a Flue Transition. The main function of the Flue Transition is to form a transition from the oven lintel spigot to a standard commercial flue duct. The flue connection point is directly above the oven. An integrated damper and inspection/ cleaning port is included in the transition piece.

The System Damper is designed to regulate the amount of air allowed to be drawn from the oven to achieve a correct operational balance.



Interlock System -

Phoenix Ovens: Gas System Safety Interlock.

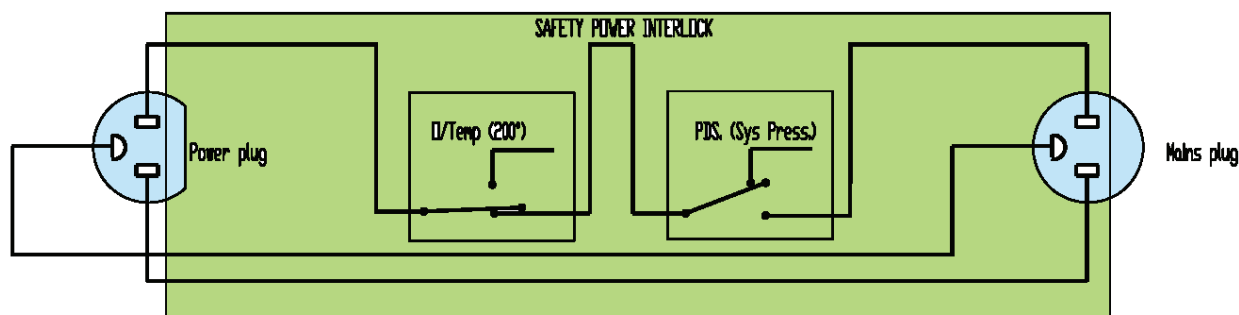
The Phoenix gas system is compliant with all required CE gas directives (EN 60335-1). For additional safety, Phoenix Ovens are fitted with a Power Interlock device that monitors:

1. The temperature of the exhaust gas entering the flue system.
As this is normally quite cool at $<100^{\circ}\text{C}$ if there is a problem with the system (flue, particle filter or over firing) the temperature in this area will quickly rise and the interlock device will cut the electrical power to the gas control system. This will cause a non-volatile lock out situation where the gas will not re-light until the controls are manually reset. (turned on). The interlock device will automatically reset when the temperature situation is controlled.
2. The pressure difference (PD) inside the supplied exhaust transition.
This insures the fan extraction system is operating at all time that the gas system is active. If the fan fails or PD drops below 60Pa. the interlock will cut the electrical power to the gas control system. This will cause a non-volatile lock out situation where the gas will not re-light until the controls are manually reset. (turned on). The interlock device will automatically reset when the exhaust flue situation is rectified.

The interlock device is a stand alone module that connects to the mains power by std power supply lead and to the Phoenix Ovens control module by special cables supplied.

This interlock device meets the additional requirements of many national and local authorities.

The interlock module also contains the 230-12V transformer that powers the internal spot light for the oven. This makes the connections to the oven very safe by keeping all 230-240V wires and plugs below the oven and the only power connection above the oven is the 12V spotlight. (High voltage connections above an oven can be very dangerous to service personal and are prone to damage from hot components).



When the interlock device is proved (Exhaust is ON and Temperature SAFE) electrical power is supplied to the control module and there will be lights at the LED display panel on the controller.
If power is interrupted, Exhaust failure or over-temperature, No lights will appear on the LED display.
When the system returns to “Normal” (flue operation and temperature correct) the LED light will turn ON.
The oven can be re=started by pressing the “ON/OFF” button on the control panel.