GENERAL GUIDES

Direct Air Supply Guidance

Firepower

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1. Introduction

Many stoves can have some or all of the air they need for combustion supplied via a direct air duct. This can reduce cold draughts in the room because the stove would otherwise be drawing this air from the room and that air would need to be replaced by a flow of air from outside.

These stoves usually have a direct air spigot on the back or sides to which a duct can be connected. The size of this spigot is typically 80 or 100 mm for smaller stoves, up to 125 or 150 mm for larger ones.

2. Type of duct

We recommend using a metal circular duct, and for anything over a 2m run we recommend using a smooth rigid duct because it has a far lower resistance to the flow of air than a flexible duct. If you are using a flexible duct then use as short a section as possible.

Minimum diameter, lengths, bends

The diameter of the direct air spigot on the stove should be taken as the absolute minimum size for the diameter of the connecting duct. If the spigot is 80mm then you need to upsize that to 100mm.

i. Using round rigid air duct

You can use up to a 4m straight length with no bends before upsizing.

Above that and you must increase the size of the duct:

- Upsize by 25mm diameter for every additional 4m of straight length above 4m.
- Upsize by 25mm diameter for every two 90 degree bends.
- Upsize by 25mm diameter for every four 45 degree bends.

So if you were using a smooth air duct with a straight length of 5m and four 90 degree bends then you would upsize the direct air duct diameter by 75mm (3 x 25mm).

ii. Using flexible air duct

The air resistance of a flexible duct is greater than a rigid duct and so should be upsized as follows.

- Upsize by 25mm diameter if the straight length is over 2m (to a maximum of 4m).
- Upsize by 25mm diameter for every 90 degree bend.
- Upsize by 25mm diameter for every two 45 degree bends.

If the straight run is over 4m long, OR you will have more than two 90 degree bends, or more than four 45 degree bends, then do not use flexible air duct, use rigid duct.

Avoid sharp 90 degree bends, use more gradual, swept bends.

Whatever type of duct you use 90 degree bends should be avoided - they have a greater resistance to the flow of air. Use shallow 45 degree swept bends wherever possible.

3. Weather grille / termination

An outside cover is usually used to keep rain and insects out from the duct. This grille should not restrict the flow of air through the duct so will often need to be upsized in order to achieve that.

i. Termination height

Where the duct comes through the outside wall of the house it should finish at least 300mm above the ground level. In the winter the air at ground level can be exceptionally cold and so the stove and chimney will work better if the end of the duct is raised up above this level.

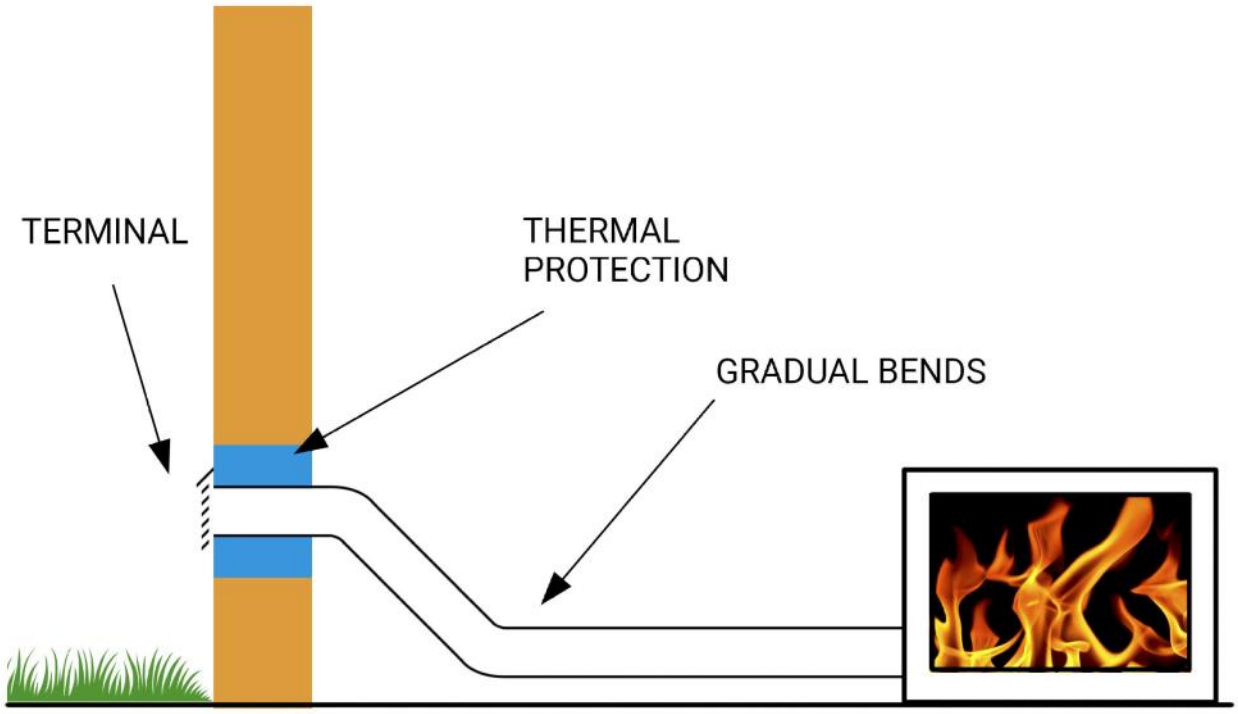
This also has the effect of raising the end of the duct up and away from, for example, vegetation and snow. It is important that the end of the duct does not become blocked so pay attention to that when positioning it, and make sure that you check that it is free from obstructions, that the actual termination is clear of blockages like spider's webs, nesting birds or animals for example. Do this, at a minimum, at the start of the heating season, and ideally check during the heating season.

4. Reverse air flow / downdraught

It is helpful to be aware that in exceptional and rare circumstances wind can blow down the chimney which can result in hot air being blown the wrong way down the air duct.

The air duct used should be made of durable metal. Hard plastic duct should only be used within a cast floor slab where it is unlikely to become hot enough to melt and bend.

Combustible materials should be protected from the duct with a suitable type of insulation. Rockwool for example.Pay attention to where the duct penetrates the external wall of the house and also be aware of any cladding materials that might come into contact with the duct.

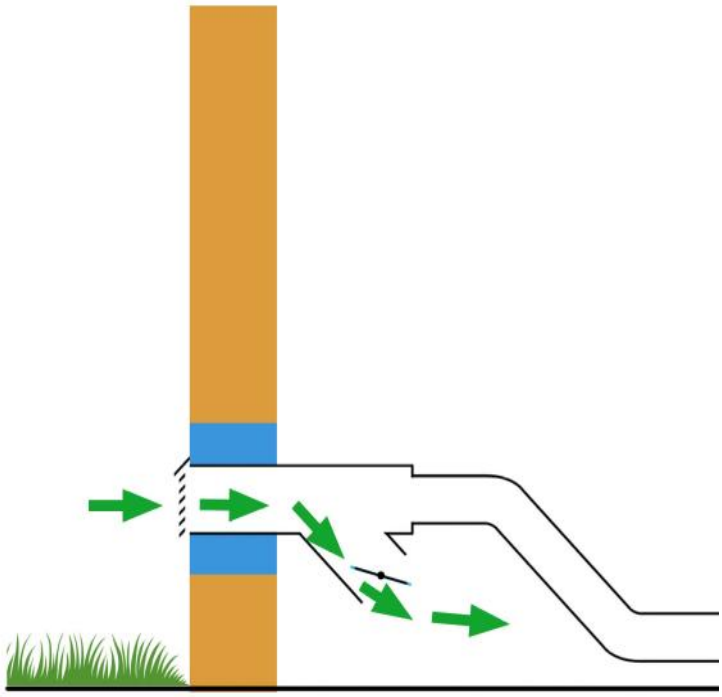


i. Air when refuelling

A stove needs relatively little air when it is burning with the door shut, but when the door is opened air rushes up the chimney. That air has to come from somewhere and so an open air route is needed so that the same volume of air going up the chimney can also get into the room. This air can generally not be supplied via the direct air duct, and so, especially for well-sealed homes with low air permeability, another solution is often required. That may take the form of a permanently open vent to the room, recommended sizes of which are shown in Building Regulations Document J, or an AirSmart device may be used.

AirSmart devices use a door sensor on the stove to open a vent to the room only when the door of the stove is opened, and in the case of a powercut. This vent increases the volume of air that can flow into the room, and then automatically seals shut when the door of the stove is shut.

The AirSmart vent may be installed separately to the direct air duct or combined with it. If it is combined with it then a Y-junction should be used with the AirSmart vent incorporated as pictured below. It should be placed as close as possible to where the duct penetrates the wall of the house, no further than 2m from the outside end of the duct, and before any bends.



5. Minimum size of air ducting for AirSmart Controllers

The size of the duct between when an AirSmart controller system is being used should have a minimum size as follows, AND be no smaller than the diameter of the AirSmart vent:

- 0-7 kW minimum size 100 mm
- 7-15 kW minimum size 125 mm
- 15 kW+ minimum size 150 mm

If in doubt pick the largest size possible to provide the least resistance to the flow of air.

Airflow from the AirSmart vent through to the room should be free, easy and unobstructed. It should be accessible so it can be regularly checked, and the path of the air through to the room should be designed in such a way that it is not easily blocked - for example by cushions or items in a cupboard.

6. Verification and Testing

A standard smoke spillage and smoke draw test should be carried out as part of the installation. If a direct air duct is fitted at a later date to the main installation then these tests should be repeated.

If the intention is to not fit a permanent air vent to the room then the system should be tested to verify that it functions as required using the procedure described in HETAS Technical note TN0020. This is the case even when an AirSmart system is used.

This test method also provides a useful way to verify that the air supply to the room is sufficient when the door of the stove is opened for refuelling under many circumstances. This is especially important in well-sealed homes, whether that is a new build home, or an older property that has been extensively retrofitted/upgraded.