Mechanical underfloor ventilation

Fans

For average sized dwellings a single fan should be adequate. The fan should have a flow rate such that it can exchange the air in the underfloor space between 3 and 10 times an hour (or an approximate power rating of 75W check with your stockist as some manufacturers are introducing lower wattage fans) and be able to run continuously throughout the year. The fan may be either axial or centrifugal. A list of companies known to supply suitable fans is available from BRE.

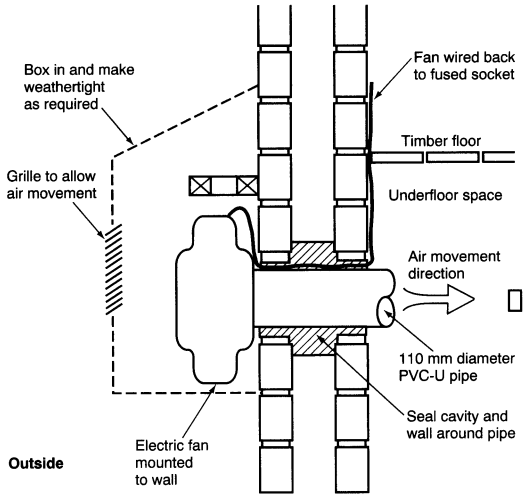
Fans can be installed to blow air into the underfloor space (supply ventilation) or suck air from it (extract ventilation). Both extract and supply ventilation have been used successfully, but it is hard to say which is best for any particular dwelling. Success depends on many factors, including soil permeabilities, floor 'leakiness', the number and position of airbricks, etc. The usual approach is to try one method, and if that does not work reverse the fan, i.e. use supply instead of extract ventilation or vice versa.

Fan wiring

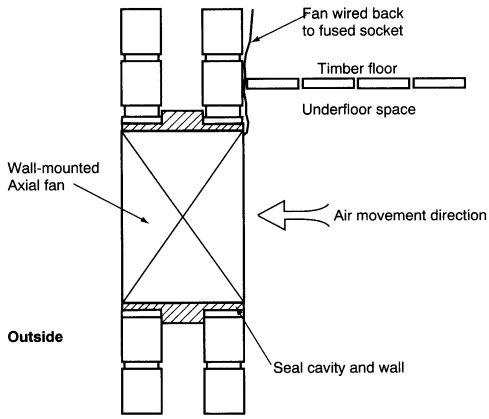
Fans should be wired in accordance with BS 7671: 2001 as amended, Requirements for Electrical Installations, the IEE Wiring Regulations.

Positioning the fan

Where a fan is to be exposed to weather it should be of a type that is suitably protected. It will need to be protected to level IP54 as classified in BS 5490.



Mechanical supply ventilation with fan mounted outside



Mechanical extract ventilation with a wall-mounted axial fan

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The fan manufacturer or supplier should be able to confirm that the chosen fan complies with this requirement. If the fan does not meet this level of protection the fan will need to be mounted within a suitable weatherproof housing.

Where a fan is fixed to a house wall, it may be connected to an existing ring circuit through a fused connection unit with a double pole switch. Where the fan is remote from the house, it must be on its own Residual Current Device RCD-protected circuit running from the consumer unit and capable of isolation by means of a double pole switch.

The fan can be mounted outside possibly in a weathertight box with a grille to protect it. But it can be mounted beneath the floor and so hidden from view, but this is likely to increase the noise levels in the rooms above. Avoid locating inlets or exhausts close to doors or windows.

To avoid noise problems position the fan away from noise-sensitive areas, such as living rooms or bedrooms. Fans located beneath floors may need to be fitted with a silencer.

Do not install an extract fan within 1.5m of an airbrick as it may simply draw outside air through the air brick instead of drawing air from the floor void.

Additional points to consider

Check whether services routed under the floor, particularly central heating or water pipes, could be put at risk from freezing and insulate vulnerable pipework. Avoid locating a fan adjacent to an open flued combustion appliance such as an open fire or boiler which draws air from the room for combustion because there is a potential risk of spillage of harmful gases. If it cannot be avoided use supply, not extract ventilation. If this is not possible seek further specialist advice.

This sheet describes using a single fan to reduce radon levels. Experience has shown that using two smaller fans one on each side of the building can also work. Being smaller they can prove easier to install, are less visually obtrusive and are quieter.

Further information

More detailed guidance is available in BRE Report BR270 *Protecting dwellings with suspended timber floors: a BRE guide to radon remedial measures in existing dwellings*, Good Building Guide 25 *Radon and Buildings* and Good Building Guide 26 *Minimising noise from domestic fan systems and fan-assisted radon mitigation systems* obtainable from BRE Bookshop, BRE Garston, Watford, WD25 9XX, telephone 01923 664262, e-mail bookshop@bre.co.uk, or visit www.BREbookshop.com

- **for further practical advice about work to reduce radon levels**
- **for a list of companies known to supply suitable fans**

Contact BRE Radon Hotline 01923 664707 www.bre.co.uk/radon

Disclaimer

It should be noted that BRE cannot guarantee that the measures described on this sheet will reduce the radon level in your home, however similar measures have regularly proven successful elsewhere in the UK.

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Other useful contacts

Defra 020 7082 8498
www.defra.gov.uk/environment/radioactivity/radon

NRPB 0800 614529 www.nrpb.org/radon

The Radon Council 01932 221212 www.radonhotline.org

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