

**THE RADON COUNCIL'S
GUIDANCE NOTES**

ISSUE 0205



ELECTRICAL SAFETY

and

PART P

Electrical Safety – and Part P

The Radon Council requires that electrical installation work in relation to radon reduction systems meets all applicable safety requirements and welcomes every initiative that improves safety.

Brief explanations of the radon reduction methods are listed below followed by a list of the applicable requirements and recommendations pertaining to electrical safety. The Council's understanding of the specific implications of the new Part P of the Building Regulations is included.

Basic methods of radon reduction

The objective of all radon reduction schemes is to reduce radon levels within a building so that levels of exposure to occupants is reduced. It is not possible to remove radon entirely.

New Buildings: As radon enters a building from the ground on which it is built, it follows therefore that the most effective means of reduction is to prevent it entering in the first place. This can be achieved by placing a radon barrier over the entire footprint of the building, prior to construction. Providing the barrier is gas tight and is not perforated very low indoor levels can be achieved, even in areas known to have high levels of radon.

Existing Buildings: The majority of the housing stock in the UK consists of existing buildings, many of which are older and built using traditional methods. It has been necessary to design suitable systems for radon reduction, once a building has been found to have high levels. Available methods of radon reduction include mechanical ventilation. Three methods of radon reduction using mechanical ventilation have proved to be effective and are described below:-

1) Sump with extract fan

A sump is excavated under the property and an extract fan exhausts gases to the outside air.

This is the most effective method, so far devised, for reducing high levels of radon. The sump is constructed either by vertical internal coring or external horizontal coring into the sub-slab space beneath the damp proof course membrane. The sump is connected via ducting to an in-line fan that sucks out soil gases and exhausts them to atmosphere. The extract fan is mounted either inside the building or, in most cases, externally on an outside wall giving reduced noise and easier access.

- Advantages: Effective at high and very high radon levels.
- Disadvantages: The installation is frequently not effective for timber (suspended) floors.
- The installation is clearly visible in the case of the external fan arrangement.

2) Positive pressurisation

Air from the attic space is blown downwards into the building.

A building has an inherent negative pressurisation because warm air rises and the method of positive pressurization partly overcomes this natural airflow. Positive pressurization is achieved by fitting a purpose built fan system in the attic space. The fan blows air downwards into the property through a ceiling diffuser, usually above a stairwell. Such systems were initially used for reducing condensation but have subsequently been found to be effective at reducing levels of radon. For reasons of reducing draughts and noise the fan operates at low speed and power level, hence it is only suitable in “air tight” properties with relatively low radon levels.

- Advantages: Easy and unobtrusive installation, condensation reduction.
- Disadvantages: Only effective in certain properties and at fairly low radon levels. Opening the windows and doors, in summer for example, reduces the effectiveness of the system.

3) Dilution

Radon levels in properties with suspended timber floors can be reduced by increasing the air-flow beneath the floor. Increased air flow is achieved by the use of an in-line fan forcing air from one side of the building and exhausting via airbricks on the other.

- Advantages: The fan can be mounted beneath the floor and be unobtrusive.
- Disadvantages: Not always successful and fan noise can be a problem.

Ensuring the electrical installation meets the applicable requirements

Contractors appearing on the Radon Council's list undertaking electrical installation work for a radon reduction system:

- must be competent to perform the work safely and prevent danger and injury,
- must comply with the requirements of BS 7671: *Requirements for Electrical Installations*, the national standard for electrical safety. Contractors should follow related information such as guidance published by the IEE,
- must comply with the requirements of Part P of the Building Regulations, and
- should follow the additional recommendations listed below applicable to fan-operated radon reduction systems, where appropriate.

Competent to perform the work safely and prevent danger and injury

Contractors must be competent. Contractors must have sufficient technical knowledge or experience. Technical knowledge or experience is normally considered to include an adequate knowledge of electricity, adequate experience of electrical work, adequate understanding of the system to be worked on and practical experience of that work, understanding of the hazards that may arise and the precautions which need to be taken and the ability to recognize at all times whether it is safe for work to continue.

BS 7671 and the IEE's Guidance Material

All electrical design, installation and inspection, testing, and verification must meet the requirements placed by BS 7671. It must not be forgotten that the requirements of BS 7671 include inspection and testing of the work performed. The user of the installation must be provided with a suitable certificate. Guidance on the application of BS 7671 is provided by the Institution of Electrical Engineers in a series of Guidance Notes.

Part P

It is not necessary to give prior notification of proposals to carry out electrical installation work in a dwelling to the appropriate building control body under the following circumstances:

- The proposed installation work is undertaken by a person who can be either a firm or an individual who is a competent person registered with an electrical self-certification scheme authorised by the Secretary of State, or

- The proposed electrical installation work is non-notifiable and does not include the provision of a new circuit.

A radon reduction system supplied by an additional point in a lighting circuit or by the addition of a fused spur to an existing ring or radial circuit would not be notifiable providing the installation work is not in a kitchen or a special location such as a location containing a bath tub or shower basin. Refer to Approved Document P for full details.

When maintaining a radon reduction system, the following work would not be notifiable:

- replacement of a defective fan, a damaged accessory or control switch
- replacement of a damaged cable on condition that the cable has the same current-carrying capacity, follows the same route and does not serve more than one sub-circuit through a distribution board.

Additional recommendations applicable to fan-operated radon reduction systems

The fan of a fan-operated radon reduction system should be supplied by a permanent connection to the fixed wiring of the installation. A fan must not be connected via a 13 A plug and socket arrangement or other removable means.

The supply for a fan-operated radon reduction system should be supplied by one of the following:

- An independent circuit at the dwelling's main distribution board, in which case no other electrical equipment should be connected to the circuit and RCD protection should not be provided, unless necessary for reasons of electrical safety. Note that provision of a new circuit is notifiable under Part P as explained above.
- A separate electrically-protected regularly-used local lighting or ring or radial final circuit.

The use of moulded, non-conductive fan assemblies is recommended.

Prior to making an alteration or addition to an electrical installation

No addition or alteration, temporary or permanent, can be made to an existing electrical installation unless it has been ascertained that the rating and condition of any existing equipment is adequate for the altered circumstances and that the earthing and bonding arrangements are adequate (Regulation 130-07-01 of BS 7671 refers).

In the case of a fan-operated radon reduction system, the additional load of the fan placed on an existing circuit will not be large. The installer must ascertain that the rating and condition of the existing circuit is adequate, that the protective device for the existing circuit is suitable and will provide protection for the modified circuit, and any other relevant safety provisions are satisfactory.

The installer is also required to check that the installation's earthing and bonding arrangements are adequate. The presence and adequacy of a means of earthing for the installation must be checked as must the main equipotential bonding arrangements. If work were to be performed in a bathroom or shower room, supplementary bonding arrangements in that special location would need to be verified and the work would be notifiable under Part P.

Loft mounted positive pressurisation system

The fan should be wired into the existing lighting circuit. A local double pole isolating switch should be provided to permit isolation of the supply so that the fan can be replaced or maintained as necessary without the need to switch off the lighting circuit. Alternatively, such maintenance could be performed by isolating the entire installation at the main switch in the consumer unit.

Sump and similar ventilation systems using a fan mounted inside the building

Providing the protective device for the existing circuit is suitable and provides protection for the modified circuit and other relevant safety provisions are satisfactory, the fan should be supplied from an existing ring or radial final circuit via a fused spur. Isolation at the consumer unit would permit fan replacement or maintenance as necessary.

Sump and similar ventilation systems using a fan mounted outside the building

The external fan selected should be in a dust protected, splash proof housing to IP54 or better. The fan should be mounted on an external wall and due consideration should be taken of external influences such as the possibility of mechanical damage or the ingress of water, for example due to leaking rainwater gutters and downpipes. External wiring should be minimized. Electrical connection should be made within the building to an existing local ring final or radial circuit via a fused spur. Isolation at the consumer unit would permit fan replacement or maintenance as necessary.

In the Radon Council's view, if the above guidance is followed the work will not be notifiable under Part P of the Building Regulations. If, however, the connection is made in the kitchen or to an isolator fixed to the outside of the house, then the work becomes notifiable.

If installers are in any doubt as to whether or not electrical work is notifiable, they should contact their local authority Building Control Department for advice.

Inspection, testing and certification

It must be verified that every alteration or addition to an electrical installation complies with the requirements of BS 7671 (Regulation 721-01-02 of that Standard refers). Inspection and testing must be performed (Chapter 71 refers). Inspection includes checking that installed electrical equipment is suitable, correctly installed, not damaged so as to impair safety and that the detailed requirements of BS 7671 have been met (Refer to Regulation 712-01-03). Requirements for testing are detailed in Regulation 713 and should include, as a minimum, tests of continuity, insulation, polarity and earth fault loop impedance.

The electrical installer must issue either an Electrical Installation Certificate or Domestic Electrical Installation Certificate if the work involves a new circuit or a Minor Works certificate provided that the alteration or addition to the installation is minor and does not include the provision of a new circuit. A Minor Works certificate could be issued for the addition of a fused spur to an existing ring or radial final circuit or for the addition of a point to an existing lighting circuit.

User instructions

It is important that appropriate documentation and instructions are given to the user of the installation. Such instructions should include:

- An explanation of radon gas and its effects
- The need to keep the fan operational
- Routine checks that should be made
- Contact numbers

New developments

The Radon Council will be introducing an additional section in its publication 'The Radon Manual' and in its training courses and examinations to assist contractors in demonstrating competence to perform electrical installation work in accordance with the requirements placed by BS 7671.

These Guidance Notes have been produced jointly with the Institution of Electrical Engineers (IEE) and The Radon Council. This version includes all of the text and modifications supplied by the Office of the Deputy Prime Minister (ODPM) to whom a copy was sent originally.

The Radon Council acknowledges with thanks the assistance given in the preparation of this document by the IEE and ODPM.

For further information see:

www.odpm.gov.uk/electricalsafety

www.iee.org

www.radonhotline.org

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