

Heat pumps and the F Gas Regulations

This bulletin provides guidance for those involved in the installation, commissioning, service, maintenance, leak checking or decommissioning of heat pump systems containing or designed to contain F gases. It will help clarify what actions are necessary to comply with legal obligations under the F Gas Regulations.



A split type domestic air to water HP is classed as pre-charged as the entire refrigerant charge is contained in the outdoor section. However the system still needs to be installed on site with refrigerant pipes between indoor and outdoor units to complete the refrigerant pipework circuit. This work comes within scope of the F Gas Regulations.

If the system is a “monoblock” type and the installing operative is simply placing a unit on site ready to be connected to the electrical supply and the flow and return heating water pipes the installation work would not come within scope of the Regulations.

However, all service, maintenance and decommissioning activity on either type of system must be carried out in accordance with the F Gas Regulations.

1. Which regulations apply to heat pumps

Heat pumps are defined as heating devices that use a refrigeration system to extract energy from a waste heat source and deliver useful heat.

Many organisations use heat pump systems containing HFC refrigerants such as R410A, R134a or R407C which are also known as “F gases”. F gases are global warming gases which if allowed to leak to atmosphere will damage the environment.



Where such refrigerants are contained, added to or removed from the system, the company carrying out the installation, service or maintenance work must ensure that it meets certain legal requirements. Many of these requirements are also obligations for the operator or owner of the equipment.

The regulations that apply are the F Gas Regulation (EC Regulation 842/2006) and the GB Fluorinated Greenhouse Gases Regulations 2009 (Statutory Instrument No 261) which specify penalties for non compliance.

The regulations are designed to improve containment of refrigerant—ie to prevent emissions due to refrigerant leakage.

2. Potential sources of F Gas emissions



During installation - Poor jointing of pipework, components or insufficient care during charging of systems can lead to leakage.

During plant maintenance - If a component needs to be replaced it may be necessary to remove some or all of the refrigerant from the system. Removed refrigerant must be recovered and contained. It is illegal to vent refrigerant to atmosphere.

Emissions at end of plant life - Waste refrigerant must be recovered during decommissioning, using recovery equipment, recovery cylinders and appropriately certified personnel. Waste refrigerant is

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classified as Hazardous Waste and must be returned for recycling or destruction.

3. Some critical dates

From 4th July 2007 - Regular leak testing and record keeping for F gas systems containing 3 kg or more (6kg if hermetically sealed and labelled as such) required. Refrigerant recovery and use of appropriately certified personnel for all systems mandatory.

From 4th July 2009 - Interim or full company and personnel certification required for those employing personnel working on HP equipment that contains or is designed to contain F gases (including sole traders).

By 4th July 2011 - Full company certification will be required for those employing personnel working on HP equipment that contains or is designed to contain F gases. Interim personal certificates will no longer be valid—all personnel carrying out relevant work must hold a valid F Gas Certificate.

A. During Installation or commissioning of heat pump systems

Obligation	Who is legally responsible?	Which systems ?	Find out more
Take steps to prevent F gas leakage and repair detected leakage as soon as possible.	The operator	All systems	F Gas Support Guide RAC3 Section 4.1 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf RAC6 Section 1 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac6.pdf
Use only certified personnel/ companies	The operator and the employer	All systems	RAC3 Section 4.6 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf RAC5 Section 7 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac5.pdf
Further obligations for companies taking delivery of containers of F gas.	The operator and the employer	All systems	RAC5 Section 8 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac5.pdf
Label new equipment and provide information & instruction manuals.	The equipment manufacturer or those building equipment on site.	All systems	RAC6 Section 6 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac6.pdf

B. Carrying out leak checks

Obligation	Who is legally responsible?	Which systems?	Find out more
Regularly check for leakage and keep certain records about refrigeration plant that uses F gases (a set timetable for frequency of inspections is available)	The operator	Only those containing more than 3kg of F Gases (6kg if hermetic and labelled as such)	RAC3 Section 4.2 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf RAC3 Section 4.4 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf RAC6 Page 4 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac6.pdf
Use only certified personnel/ companies to carry out relevant work	The operator and the employer	All systems	RAC3 Section 4.6 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf RAC5 Section 7 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac5.pdf



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C. During service and maintenance			
Obligation	Who is legally responsible?	Which systems?	Find out more
Recovery of F gases and record keeping	The operator	All systems	RAC3 Section 4.5 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf
Use of only certified personnel/companies	The operator and the employer	All systems	RAC3 Section 4.6 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf RAC5 Section 7 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac5.pdf

D. During decommissioning			
Obligation	Who is legally responsible?	Which systems?	Find out more
Recovery of F gases at end of plant life.	The operator	All systems	RAC3 Section 4.5 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf
Use only certified personnel/companies	The operator and the employer	All systems	RAC3 Section 4.6 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac3.pdf RAC5 Section 7 http://www.defra.gov.uk/environment/quality/air/fgas/documents/fgassupport-rac5.pdf

4. Key obligations

The tables above indicate who is responsible at each stage. These just give a flavour of the type of legal obligations that come with this equipment—refer to the links to the full detailed guidance notes DEFRA F-Gas Support for more information.

5. Useful definitions

Who is the “employer”?

In this guidance note the “Employer” means the company employing personnel undertaking work within scope of the F Gas Regulations. The Regulations define companies as organisations (undertaking refrigeration and air-conditioning work, be that as an in-house function or acting as contractors on behalf of other companies (this includes sole-traders).

The following definitions are taken from the relevant Regulations:

Who is the Equipment Operator?

This is defined as the natural or legal person exercising actual power over the technical functioning of the equipment and systems covered by this Regulation.

What is meant by “installation”?

Installation means joining two or more pieces of equipment or circuits containing or designed to contain fluorinated greenhouse gas refrigerant, with a view to assembling a system in the location where it will be operated, including the action by which refrigerant conductors of a system were joined together to complete a refrigerant circuit irrespective of the need to charge the system after assembly.

What is meant by “maintenance or servicing”?

Maintenance or servicing means all activities, excluding recovery and checks for leakage, that entail breaking into the circuits containing or designed to contain fluorinated greenhouse gases, in particular

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supplying the system with fluorinated greenhouse gases, removing one or more pieces of circuit or equipment, re-assembling two or more pieces of circuit or equipment, as well as repairing leakages.

What is meant by “hermetically sealed”?

A system in which all refrigerant containing parts are made tight by welding, brazing or a similar permanent connection which may include capped valves and capped service ports that allow proper repair or disposal and which have a tested leakage rate of less than 3 grams per year under a pressure of at least a quarter of the maximum allowable pressure.

6. Personnel and company certification

Personnel carrying out leak checking, gas recovery, plant installation, maintenance or servicing on HP equipment that contains or is designed to contain F gas refrigerant must have an appropriate qualification.

To take delivery of containers of F gas, for the activities described above, an organisation needs to employ appropriately certified personnel.

You must have Company Certification if employing

personnel (including sole traders) to undertake installation, maintenance or servicing of HP systems containing or designed to contain F gas.

Two F Gas Certificates are legally recognised for individuals:

- City and Guilds 2079 (parts 1 to 4)
- Construction Skills J11/12/13/14

There are various categories of qualification depending on the type of activity you are undertaking and the volume of refrigerant contained.

Note: Operatives holding C&G2078 or CITB J01 are recognised as temporarily qualified until 4th July 2011 only by which time they must have obtained one of the new F Gas qualifications.

Three company certification bodies are available:

- www.refcom.org.uk
- www.fgasregister.com (Quidos)
- www.bureauveritas.co.uk/fgas

7. A final word on energy efficiency

In many organisations HP Systems can account for a significant percentage of the total energy costs. Leaking systems are likely to consume more electricity and operate less effectively. The steps necessary for compliance with the EC F gas Regulations provide an ideal opportunity to improve the energy performance of installed HP systems and reduce operating costs for your customers.

8. Where to go for more advice

For further information on legislation and key obligations see:

www.defra.gov.uk/fgas

Or contact F-Gas Support on 0161 874 3663

What is the ACHPI?

The Air Conditioning and Heat Pump Institute (ACHPI) helps members to:

- keep up to date with news and practical tips
- broaden your knowledge of current technology
- help fill gaps in theory and fundamentals
- signpost new developments which could affect your business and track changes to legislation

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