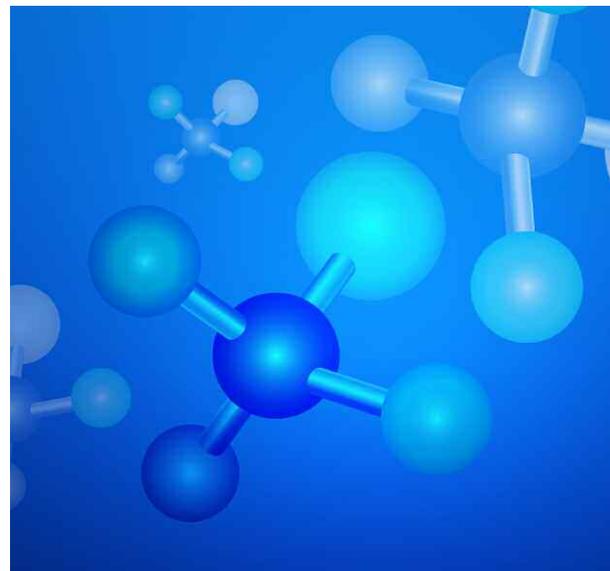


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Mitsubishi Electric Guide to F-Gas Regulation



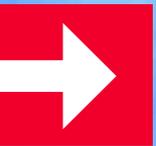
Information Guide

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Air Conditioning | Heating
Ventilation | Controls





Mitsubishi Electric Guide to F-Gas Regulation



This is an independent guide produced by Mitsubishi Electric to enhance the knowledge of its customers and provide a view of the key issues facing our industry today.

This guide accompanies a series of seminars, all of which are CPD certified.

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F-Gases: ‘The beginning of the end’

In March 2014, the European Parliament passed by an overwhelming majority, a piece of legislation that will bring significant changes to the air conditioning industry.

The new F-Gas Regulation is a landmark ruling that will have a far-reaching impact on how contractors and end users operate and maintain their systems.

From 1 January, 2015, when the new regulation comes into effect, the phase-down of HFCs, and bans on use of the refrigerants in certain sectors of new equipment, will commence. Indeed, just after the legislation was passed, European Climate Commissioner Connie Hedegaard tweeted: “**I welcome the ‘beginning of the end’ for super-warming greenhouse gases.**”

Prohibitions on the sale of a number of products used in building services and refrigeration include areas that directly impact on air conditioning and other areas of refrigeration too:

- Centralised refrigeration systems for commercial use with a capacity of 40 kW or more that use F-Gases with a GWP (Global Warming Potential) of 150 or more, from 1 January 2022
- Movable room air-conditioning appliances that contain HFCs with GWP of 150 or more from 1 January 2020
- Single split air-conditioning systems containing less than 3 kg of F gases with a GWP of 750 or more from 1 January 2025
- Domestic refrigerators and freezers containing HFCs with a GWP of 150 or higher from 1 January 2015, as follows
- Refrigerators and freezers for commercial use containing HFCs with a GWP of 2500 or higher from 1 January 2020 and those containing HFCs with a GWP of 150 or more from 1 January 2022
- Stationary refrigeration equipment running on HFCs with a GWP of 2500 or more from 1 January 2020
- Foams that contain HFCs with a GWP of 150 or more; extruded polystyrene from 1 January 2020, and other foams from 1 January 2023
- Technical aerosols that contain HFCs with a GWP of 150 or more from 1 January 2018

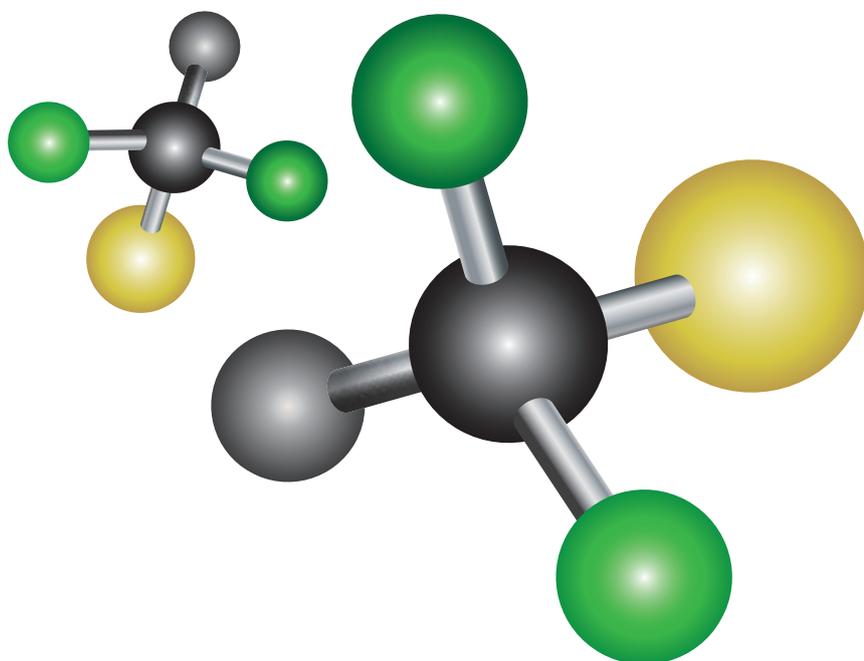
The long-term aim of these measures is to reach the figure of an 80 per cent reduction in the use of HFCs by 2030.

The legal basis

This is not the first move to reduce the use of ozone – depleting gases in air conditioning equipment, but this most recent round of legislation allows Member States to apply the F-Gas rules to support national HFC and greenhouse gas reduction targets.

This means that Member States can maintain or introduce **“more stringent protective measures”** than those imposed by the regulation, and they do not have to seek approval from the Commission to do so.

Therefore we could see some countries going beyond the requirements of these rules, which is a situation that will need to be monitored over time.





The major changes introduced from January 2015

1. Leakage detection

When a leak of F-Gases is detected, it is an obligation to have it repaired without undue delay. The 2006 Regulation limited this obligation to “technical feasibility” and “(lack of) disproportionate costs”. No such mitigating circumstances will be accounted for as of 1 January 2015. The legislation does not, however, specify time frames that offer a clear guide as to when a ‘delay’ becomes an ‘undue delay’.

The Air Conditioning and Refrigeration European Association (AREA), has produced a helpful guide to the likely impacts of the new F-Gas Regulations. It states that ‘undue delay’ is a legal concept that ensures the consideration of proportionality. This means that in the case of a severe leak, of a lot of refrigerant, immediate action may be required regardless of cost. A smaller leak might be repaired in the course of routine maintenance. AREA advises that the benchmark for deciding what might be required would be the behaviour of a ‘diligent’ operator.

This is a very important legal point to consider, and for any air conditioning or system owner will be of importance when devising any leak response strategy.

The obligations for checking equipment will continue to apply to stationary refrigeration equipment, stationary air-conditioning equipment and heat pumps, with exemptions for hermetically sealed equipment containing less than 10 tonnes of CO₂ - eq. of fluorinated greenhouse gases. These obligations fall squarely on the shoulders of users and contractors and have implications for training and competency, which we will come to later.

It is also specified both operatives of companies must take precautionary measures to prevent leakages.

2. From kg weight to CO₂ equivalent

Previously, as specified by the 2006 regulation, checks were required on equipment using more than 3kg of refrigerant. These expressions of weight did not take into account the global warming potential (GWP) of the refrigerant and have been replaced by the CO₂ equivalent in tonnes (CO₂ - eq.). Therefore the charge limit from which leak checks apply will depend on the GWP of refrigerant contained in the equipment.

CO ₂ - equivalent (R410A)	Weight in kg
5 tonnes CO ₂ - eq.	2.39kg
10 tonnes CO ₂ - eq.	4.78kg
50 tonnes CO ₂ - eq.	23.95kg
500 tonnes CO ₂ - eq.	239.46kg

This is a significant step that has an impact on a number of commonly-used refrigerants, including the popular R410A. The weights for R410a in kilogrammes compare to CO₂ - eq. as follows:

This means that R410A systems with a 24kg weight of refrigerant will fall into the 50 tonnes CO₂ - eq. bracket. So if such a system does not have fixed leak detection installed, it will have to be checked every six months. If the leak detection is installed the checks must be once a year.

Conversely, AREA highlights other examples that will fall outside the regular check requirements as a result in this change of measurement: Equipment working with R134a (minimum charge increases from 3 to 3.5 kg) and with R32 (minimum charge increases from 3 to 7.41 kg).

For any type of equipment with 3kg of refrigerant or more, the new thresholds will apply from 1st January 2015.

There are some exceptions to this rule. Equipment with more than 3kg but less than 5 tonnes CO₂ - eq. of refrigerant will no longer have to be leak checked from 1 January 2015.

Equipment that contains less than 3kg but more than 5 tonnes CO₂ - eq. of refrigerant will not be subject to leakage checking requirements until 1 January 2017.

AREA has published a helpful table outlining the refrigerants that will be impacted by this change in terms of the frequency with which they must be checked.

What should contractors do?

Contractors should inform operators about potential new leak check obligations due to new weight limits applying from 1 January 2015 onwards to systems with at least 50 and 500 tonnes CO₂ equivalent.

Until 31 December 2016, contractors should inform operators about potential new leak check obligations due to new weight limits applying from 1 January 2017 onwards to systems with at least 5 tonnes CO₂ - eq.





The major changes introduced from January 2015

3. Leakage detection systems

Under the Regulation a leakage detection system is mandatory for equipment containing a minimum of 500 tonnes CO₂ - eq. of fluorinated greenhouse gases. In case of leakage, the system must be able to alert the operator or the service company.

4. Record keeping

There are three additions to the 2006 F-Gas Regulation as far as record keeping is concerned. It must now be recorded whether the quantities of installed fluorinated greenhouse gases have been recycled or reclaimed.

If so, the name and address of the recycling or reclamation facility and, if applicable, the certificate number has to be logged. If the equipment is decommissioned, the measures taken to recover and dispose of the refrigerant must now also be recorded. As well as the requirement for the operator to keep these records for five years, contractors must also do the same.

5. Training and certification

Training and certification requirements remain largely unchanged from the 2006 regulation, with decommissioning added to the list of tasks for which individuals and contractors can be certified to carry out. This also includes installation, servicing, maintenance, repair, leakage checking and recovery.



Certification programmes and training must cover the themes already included in current schemes under the previous regulation, which include:

- Applicable regulations and standards
- Emission prevention
- Recovery of fluorinated greenhouse gases
- Safe handling of equipment of the type and size covered by the certificate

And additionally, information on relevant technologies to replace or reduce the use of fluorinated greenhouse gases and their safe handling must also now be covered by training.

The new Regulation also specifies that certification can only be granted when the candidate has successfully completed an evaluation process.

In November 2014 AREA released a list of training centres around Europe equipped to deliver the appropriate training on working with low GWP refrigerants.

UK Training centres:

Cool Concerns, Tewkesbury

Eastleigh College/DCI refrigeration, Hampshire

EPTA Training Centre, Bradford

Energy Training Hub, Tipton

Business Edge, Portsmouth & Milton Keynes





The Replacements

This Regulation is going to change what we can use, and change it in ways that present challenges.

We will see a shift over the time frame outlined by the Regulations away from popular refrigerants such as R410A towards less mainstream options such as HFO-based refrigerants and low GWP HFCs plus natural alternatives such as ammonia, which brings with it issues of flammability.

In 2016 we also will introduce new R32 equipment into the UK, offering better efficiency with much lower GWP refrigerant.

AREA lists the potential replacement refrigerants as:

- R717 Ammonia

- R290-R600 Propane and Isobutane Hydrocarbons

- R744 Carbon Dioxide

- R1234yf - R1234ze HFO Hydrofluoro-olefin

- R32



Conclusion

This new Regulation has been on the horizon for the air conditioning industry ever since the 2006 F-Gas Regulation came into force. Then, HFCs were the new frontier in a shift towards environmentally friendlier refrigerants.

Nine years on, the phase-down programme and bans imposed as of 2015, confirm that HFCs are now firmly in the crosshairs of the legislators.

The refrigerants that have become commonplace will gradually be replaced by non-standard alternatives that will require industry to work together with end users to ensure the safe and competent handling of these new substances.

With the proper training and adherence to new rules, these changes can be met head on by an industry already well versed in falling into step with the march towards mending the environment.



To receive a CPD seminar on F-Gas Regulation you can call your Mitsubishi Electric Regional sales office to arrange an in-house presentation of this information.

If you would like to receive invitations to future CPD events, please email livingenvironmentalsystems@meuk.mee.com

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