SFG20

BESA BUILDING ENGINEERING SERVICES ASSOCIATION PUBLICATIONS

Maintenance Task Schedules

Indoor Climate Systems (UK) Limited – Printed: 19/12/2022

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SFG20

1 Introduction

This document has been prepared by **AMS Ltd** to assist in the specific planned maintenance for carrying out service tasks, tendering, service level re-modelling and auditing. The safety of persons working with plant and equipment and the environment it is situated within is a fundamental part of good maintenance practice and should be taken into account at all times.

2 SFG20 Overarching Introduction

It is EXTREMELY IMPORTANT that you have read and understood the SFG20 Overarching Introduction which is the first schedule included in this Book of Standards and provides essential guidance concerning:

- Statutory Compliance
- Safety
- Points to Consider during Maintenance Works
- Maintenance of Systems
- Proprietary Equipment
- Records
- Efficiency and Emissions
- Specialist Technical Services

3 Modelling (as shown at the top of each schedule page)

All intervals of service and inspection are expressed as D (Day) W (Week) M (Month) i.e. 1D, 1W, 3M, 6M, and 12M.

Colour-Coded Criticality Key		
	Statutory/Legal	To ensure legal compliance
	Mandatory	Business Critical (To ensure sector/organisation compliance)

Unit of Measure Key	
Nr	Number
System	System
m^2	Metre Squared
Not Specified	Not Specified
Metre	Metre

Skill Set Key							
AA	Not-specified	AD	Appointed Person	AE	Authorising Engineer	AF	Authorising Engineer (Fire)
AG	Authorising Engineer (Lifts)	AH	Authorised Person (HV)	AL	Authorised Person (LV)	AN	Authorised Person (Lifts)
AP	Accountable Person	APD	Authorised Person (Decontamination)	BL	Building Trade	CC	Chartered Civil Engineer
CE	Controls Engineer	CF	Competent Person (Fire)	CH	Competent Person (HV)	CL	Competent Person (LV)
CM	Competent Person (Lifts)	CO	Contractor	CP	Competent Person	CPV	Competent Person (Ventilation)
DH	Duty Holder	DP	Designated Person	DQ	Designated Persons (Lifts)	E	Electrical
EA	Energy Assessor	EE	Examining Engineer	FC	Facilities Coordinator	FDI	Fire Door Inspector
FM	Facilities Manager	FN	Facilities Operative	FSA	Fire Safety Adviser	FSM	Fire Safety Manager
GM	Grounds Maintenance	GNS	Gas Network/Specialist	GS	Gas Safe	HET	HETAS Certified Engineer
HO	Horticulturist	IC	Infection Control Officer	ID	Internal Trades Person	IE	Internal Trades Person - Electrically Aware
IF	Internal Trades Person - Mechanically Aware	IG	Internal Technician - Electrically Aware	IH	Internal Technician - Electrically Qualified	II	Internal Technician - Mechanically Aware
LME	LEV Maintenance Engineer	LO	Locksmith	LS	Lift Steward	M	Mechanical
ME	M&E	MM	Management	MN	Manager	MS	Multi-skilled
OP	Operator	PA	Plant Attendant	PN	Painter	PO	Prison Officer
POP	Pool Operator	PP	Plumber	PTE	Petroleum Technician (Electrical)	PTM	Petroleum Technician (Mechanical)
RE	Refrigeration Engineer	RP	Responsible Person	SP	Specialist	TE	Technician
U	User						

SFG20

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Type	Category	NRM Code(s)	Schedule Ref	Schedule Version	Schedule Title
SFG20	Overarching Introduction		00-01	9	Overarching Introduction
SFG20	Boilers/Heat Generators / HVAC	5.5.1.1.13 / 5.5.1.1.8 / 5.6.4.1.1.1	05-31	9	Air to Water Heat Pump

Summary Information
Asset Profile including Service Timings

SFG20
Core

00-01 Overarching Introduction

Date: 04 Nov 2020
Version: 9
Unit of Measure: Not specified

Introduction

It is IMPORTANT that this SFG20 Overarching Introduction is read and understood by all concerned and where appropriate, the additional Specialist Technical Services Introductions in Annex A (after section 7.2 below). These include section 8 for Catering and section 9 for Hospitals and Healthcare Premises.

1 Standard Maintenance Specification

1.1 This Specification was originally intended for maintenance contractors and organisations to provide a standard to evaluate and audit adequate maintenance works. The Specification is now used as a standard both for tendering and for carrying out the work. Organisations going out for tender also use the Specification as an integral part of the tender specification and process to ensure comparable tenders have been received and evaluated.

1.2 This Specification is used extensively by government bodies, Local Authorities and other organisations as the minimum maintenance requirements for the building engineering services plant and equipment in their estates. The specification is applicable to commercial and residential properties, including residential care homes.

1.3 This Specification is produced under various service equipment headings, each covering the major elements in Building and Public Health Services and includes reference to the frequency of checks and statutory requirements.

1.4 This Specification has been produced as a **generic guide** to maintain building services equipment and is used to match tasks to assets. However, it should be remembered that the user must consider all elements to be maintained rather than the headline item. As an example, if an air handling unit (AHU) is to be maintained, the tasks associated with an air handling unit: motors; controls; dampers; heat exchangers etc. must all be selected in order that all elements of the AHU are adequately maintained.

1.5 It is important to tailor the maintenance to the individual site. Sites and Buildings can vary in complexity and importance. The user must therefore understand what is required on the site/building and this is reflected in the maintenance and frequencies. As an example, the frequency of maintenance visits to the air conditioning system serving a commercial bank data centre, may be significantly different to the maintenance frequency of an air conditioning unit in an unoccupied office. The task in SFG20 will have the same frequencies as it is a generic guide. The user must therefore adjust the frequency to suit their requirements.

1.6 Similarly, the ‘Service Timings’ displayed against each frequency are also generic. Please note that Service Timings are estimated so could vary dependent on the size, age and/or location of the equipment/building. Consequently, the timings provided within the SFG20 task schedules may require customising according to individual circumstances. This also applies where it has not been possible to estimate and allocate a Service Timing to a particular task.

2 Statutory Compliance Guidance

2.1 There are many Statutory Instruments, Regulations and Approved Codes of Practice that apply to the work undertaken within the service and maintenance industry. It should be noted that no piece of legislation stands alone as they all interact with each other. They stipulate minimum standards for safe working but also have absolute requirements in respect to particular areas of the legislation. All persons involved with the operation and maintenance works must ensure that the associated regulations are fully understood.

2.2 SFG20 has been produced to provide Engineers, Building Owners, Building Managers, Landlords, Managing Agents, Tenants and Consultants with a maintenance specification covering the majority of equipment found in a typical commercial or residential building.

2.3 This Specification represents the maintenance practice in general terms. It is anticipated that this standard will be used by maintenance engineers carrying out the maintenance but also by managers as a means of checking that the work has been carried out and that they conform to the tender requirements. It is also envisaged that Building Owners and Managers will start using the Specification to identify the maintenance works required on their individual buildings.

2.4 Where, in the opinion of the Building Engineering Services Association (BESA), a task would assist the user of the specification to discharge their legal duties under a Statutory Instrument, Regulation or an Approved Code of Practice the task has been designated and

colour coded RED. It should also be noted that the Specification deals with maintenance tasks only. Tasks to ensure plant is operated safely have not been included in this current version of the Specification.

2.5 This Specification is provided as generic guidance to Engineers and Management. While the specification identifies tasks that will assist the user to discharge their legal responsibilities, the user of the Specification will still need to assess each individual building to ensure equipment not currently listed in SFG20 is maintained and any statutory operational tasks are undertaken.

2.6 The relevant Legislation has been included at the end of each task which has been deemed to be RED - this is not an exhaustive list and before carrying out any tasks within SFG20, the correct statutory requirements must always be checked and applied.

2.7 On appointment of a new maintenance organisation a special inspection of any existing system that would be considered a building safety system should be commissioned, including the records in order to produce a plan for effective maintenance of the system. Areas of non-conformity should be documented and identified to the responsible person.

3 Safety

3.1 The safety of persons working with plant and equipment should be taken into account at all times as well as the environment in which it is situated. This a fundamental part of good maintenance practice.

3.2 Prior to carrying out tasks within SFG20, 'Risk Assessments' must be produced and where it is identified 'Method Statements' for safe working must also be produced. Due to the nature of some tasks the activity may require a 'Permit to Work' as well as a 'Method Statement'. This will ensure a safe system of working will be adopted prior to work commencing.

3.3 There are a number of different types of tasks that require specific training and registration with a designated registered body. Any enterprise or person working to SFG20 must ensure they are competent to do so and that they have the correct accreditation and/or registration appertaining to the works being undertaken - appropriate to the country or region where the work is being carried out.

3.4 All maintenance tasks within SFG20 are the series of tasks required to carry out maintenance of a piece of equipment. All statutory requirements and safety practices must be adhered to in respect to the method of completing the task and the requirements of the specific Acts, Regulations, Standards and Guidance Notes currently in force and applicable to the country or region where the work is being carried out.

3.5 Points to Consider during Maintenance Works - please note this is not an exhaustive list:

(a) Asbestos - Check for asbestos-containing material prior to dismantling any equipment; if any asbestos is found or suspected STOP WORK and close off the area. In accordance with safe working practice, have a sample of the suspected material certified as safe before any works can re-start; if asbestos is identified, take actions in accordance with the current and applicable Asbestos Regulations.

(b) Carbon Monoxide (CO) - Undetected CO is poisonous, life threatening and also causes energy waste. Flames should be bluish in colour and burn in a stable manner. Correct combustion entails the adequate mixing of the fuel with air to ensure that the fuel is completely burnt without producing excessive smoke or diluting the combustion gases with excess air both of which cause energy wastage. With all fossil fuels, insufficient air produces carbon monoxide, a safety and health hazard, as undetected CO is poisonous and could be fatal. NB: Where a living accommodation exists within or as part of a commercial estate or in domestic premises, the installation of a CO detector that complies with BS EN 50291 and BS EN 50292 should be considered.

(c) Ceiling Voids - Some maintenance tasks will involve working in voids above suspended ceilings. Schedule SFG 88-54 contains recommendations on safely accessing ceiling voids to avoid damage or injury.

(d) Confined Spaces - A 'Risk Assessment' and 'Method Statement' must be undertaken in accordance with the Confined Spaces Regulations before entering any confined space such as a hopper, flue chamber or boiler to ensure that there is adequate ventilation and an absence of any fumes or flue gases. Great care must be taken when entering brick or concrete drainage pits because of the possible presence of harmful gases. They must be vented to ensure the chamber cannot be pressurised over 0.1 bar g. (1.5 psig). Where entry into confined spaces is necessary, compliance is required with Guidance note L101 - Safe work in confined spaces approved code of practice, regulations and guidance and INDG 258 - Work in confined spaces. Staff training must be up to date including the possibility of using breathing apparatus in some areas.

(e) COSHH - The Building's Health and Safety file will normally define any such likely or known hazards in accordance with COSHH Regulations and contractors have a duty to satisfy themselves that hazards are known and accounted for. Specific risk assessments should be carried out and particular method statements provided to deal with hazardous contamination. NB: Other personnel on site

(Cleaners, Ground Maintenance etc.) may also be using COSHH materials on the same site.

(f) Electrical Equipment - All electrical equipment should be capable of local isolation in accordance with the regulations of the Institution of Engineering and Technology (IET) – Regulations for Electrical Installation (IET Wiring Regulations Current Edition), BS 7671, and as detailed in IET guidance note No 2, Isolation and switching. All electrical equipment should be safely isolated, and where necessary locked off, before any maintenance work is undertaken, especially where the equipment is remote to the isolation point. There are also stringent requirements and guidance in the Electricity at Work Regulations, and of particular importance is Regulation 12 – "Means of cutting off the supply and for isolation". In this Regulation, isolation means the disconnection and separation of the electrical equipment from every source of electrical energy in such a way that this disconnection and separation is secure. The word 'secure' is specifically mentioned in the Electricity at Work Regulations and requires the means of isolation to be such that it is not likely to fail, become loose, etc. by the action of vibration, mechanical shock or knocks, or be accidentally or inadvertently operated. Padlocking is a widely used means, with clear labelling and warning notices.

(g) Permits to Work - Depending on the Establishment, a Permit to Work system may be in operation. The Authorised Person should be approached for the issue of the permit before the commencement of any maintenance or remedial works. The permit system may require the maintenance Engineer to undertake additional training to satisfy the Establishment's requirements for Competent Person roles.

(h) Personal Protective Equipment (PPE) - The appropriate PPE will be detailed in the 'Method Statement' and it is important to ensure that all necessary PPE is worn at all times during any maintenance works. All PPE must be selected by a competent person as suitable for the purpose and must fit the individual operative properly (Health & Safety (PPE) Regulations).

(i) Reports and Worksheets - Reports should be signed by the servicing engineer and the client/responsible person/client's representative. Premature failure of the plant will result if a satisfactory service is not carried out. Depending on the nature/urgency of the fault and the type of premises the report may be verbal.

(j) Waste – Ensure that any waste as a result of maintenance works is correctly disposed of. This will include ensuring that any necessary storage requirements are met (e.g. fluorescent tube coffins). It should also be noted that some used panel and bag filters could be classed as hazardous waste and Waste Disposal Licensing Regulations may apply.

4 Maintenance of Systems

4.1 This specification is presented in a checklist format describing specific maintenance activities applied to generic types of plant. The responsible agent, either as a contractor or Building Owner/Manager is responsible for maintaining the entire system, not just groups of components.

4.2 Regarding the maintenance activity in respect of a system, care should be taken to ensure that maintenance tasks are carried out by suitably qualified and experienced staff capable of exercising professional standards of judgement and discretion in relation to individual systems. The specification is a statement of typical standards and further reference to manufacturer's guidance should be sought to supplement the specification.

4.3 It should also be noted that the Specification is not intended to replace the manufacturer's guidance but rather supplement it. For the avoidance of doubt, the manufacturer's guidance will always take precedence over the Specification. This is especially relevant where plant and equipment is still in its warranty period.

4.4 Condition Based Maintenance (CBM) is a maintenance strategy/method that monitors the condition of an asset to indicate what elements of maintenance need to be carried out. Usually, CBM dictates that maintenance is performed when indicators show signs of decreasing performance or upcoming failure. Where CBM is applied to an asset, this needs to be considered as part of the overall risk assessment when designing or amending a maintenance plan and, where appropriate, the responsible person should customise the related task schedules within SFG20.

5 Proprietary Equipment

5.1 SFG20 represents the maintenance practice in general terms. For specific items of plant it is essential that the maintenance engineer should be familiar with the equipment manufacturer's maintenance manual and comply with the instructions contained therein. It is anticipated that this standard will be used not only by maintenance engineers carrying out the maintenance but also by managers, landlords, owners and tenants as a means of checking that the work has been carried out correctly.

6 Records

6.1 It is essential that a manual should be kept on site which should record the clearly defined responsibilities of:

(a) Operators
(b) Plant Attendants
(c) Supervisors
(d) Other responsible persons, as deemed applicable.

6.2 A list detailing the equipment and its normal settings, its location and operating and maintenance manuals relating to specific plant and control equipment needs to be available. Records should also be kept of all events and changes related to the equipment, the various settings of controls and valve positions. In addition, the manual should also contain the contact details of the relevant person to provide an emergency response to the building.

7 Efficiency and Emissions

7.1 European Directives and UK law require, carbon emissions from the combustion process to be controlled in order to achieve low fuel consumption and assist in the reduction of carbon footprint, thus leading to greater overall efficiency.

7.2 Nitrogen oxides (NOx) are also produced during combustion. When oxides of nitrogen combine with water in the upper atmosphere, acidic compounds are formed which then lead to acid rain formation, which can cause damage to plants, aquatic life and buildings. Low NOx boilers are available to counter this effect and to comply with European Directives and UK law, the aim of which is to reduce the permitted NO2 emissions from new fossil fuel heat generators to 180mg/Nm3 (normal cubic metres).

ANNEX A: SPECIALIST TECHNICAL SERVICES

In conjunction with and assistance from recognised bodies, BESA Publications Ltd have incorporated various Specialist Services within SFG20. Additional information for each specialist area has been included below. Please ensure you read and understand any applicable Specialist Introduction together with the SFG20 Introduction in sections 1 to 7 above.

8 CATERING - written in conjunction with the Foodservice Equipment Association (FEA).

8.1 The purpose of the 'Catering' schedules is to provide operators, manufacturers, service companies and facilities managers with an industry recognised structured approach to managing commercial kitchen equipment of all types and in all situations. Recognition is given to the fact that foodservice operations vary significantly in terms of: the food and beverage offered; the consumer requirements; the volume of food served; site and environmental conditions and the operating times and periods.

8.2 The schedules have been designed to provide a full service schedule for equipment based on 6-monthly service intervals. Additional visits may be required on key equipment or heavily used water-fed items.

8.3 It must be recognised that equipment-servicing schedules will be affected by such things as:

(a) the equipment specification, use and suitability in relation to the tasks required;
(b) the age of the equipment;
(c) the type of equipment;
(d) hours of operation;
(e) its use of gas, water and electricity;
(f) staff use of equipment and cleaning regimes;
(g) volume of meals prepared using the equipment;
(h) how well the equipment has been looked after;
(i) gas appliances are serviced in accordance to gas safety guidance at least once every 12 months (refer to manufacturer's instructions);
(j) suitable service plan (planned preventative maintenance) program in place and operation.

8.4 As a result the service schedules should be used in conjunction with the above parameters to define the optimum approach in each situation. For some equipment an annual service may be sufficient although this should be the minimum requirement. Equipment subjected to heavy use is likely to require the full schedule outlined in the documents.

8.5 Manufacturers' service recommendations should be followed and used in conjunction with these schedules.

8.6 Electrical testing is undertaken as part of the standard servicing schedule and documented on the scope of works ensuring safety

compliance. PAT testing, if appropriate, should be treated as an additional requirement and contracted exercise and it should be noted that the PAT test only covers the electrical security and not the mechanical operational aspect. This element of the schedules should be treated as indicative that the essential requirements of product safety and test are met in relation to the equipment and mandatory requirements associated with safe operation and maintenance.

8.7 The effective maintenance of equipment is an essential requirement in order to ensure the:

(a) safety of staff;
(b) effective and safe operation of equipment;
(c) longevity of the equipment;
(d) energy efficiency of the equipment throughout its lifecycle;
(e) duty of care;
(f) compliance to respective regulatory requirements.

8.8 It has been demonstrated that well maintained equipment will have a longer serviceable life and that it will provide optimum resource efficiency.

8.9 These schedules will comprise an effective planned preventive maintenance strategy and will be updated to ensure relevance and compliance with current standards.

8.10 Some items of catering equipment have a central monitoring system fitted to pick up 'hours run', temperatures, pressure and alarm information etc. These systems should be checked when undertaking the servicing to ensure that they communicate with the monitoring station and the individual piece of equipment.

9 HOSPITALS AND HEALTHCARE PREMISES - in association with the Institute of Healthcare Engineering and Estate Management (IHEEM)

9.1 This Introduction for Hospitals and Healthcare premises is an overview only and does not replace the Health Technical Memorandum 00: Policies and principles of healthcare engineering.

9.2 The purpose of the HTM Aligned specialist set of task maintenance schedules is to create a sector-recognised structured approach for Hospitals and Healthcare premises which should not be considered as replacements for any Health Technical Memorandum (HTM) or Scottish Health Technical Memorandum (SHTM). SFG20 has interpreted the HealthTechnical Memorandum requirements by combining them with the SFG20 core elements, current statutory requirements and recognised Codes of Practice.

9.3 Scope and Application

9.3.1 General principles, key policies and factors common to all engineering services within a healthcare organisation. Key issues include:

(a) compliance with policy and relevant legislation;
(b) professional support and operational policy;
(c) design and installation;
(d) maintenance;
(e) training and competence requirements.

9.3.2 Patients and staff have a right to expect that engineering systems and equipment will be designed, installed, operated and maintained to standards that will enable them to function efficiently, reliably and safely. Compliance with the guidance in the applicable HTMs and these task schedules will help to meet these goals.

9.3.3 Healthcare providers have a duty under the Health and Safety at Work Act etc. to ensure that appropriate engineering governance arrangements are in place and are managed effectively. HTMs provide best practice engineering standards and policy to enable management of this duty of care.

9.3.4 The special nature of healthcare premises and dependency of patients on the provision of effective and efficient engineering services (in most cases 24 hours a day, seven days a week) requires that engineering staff and systems must be resilient in order to maintain the continuity of health services and ensure the ongoing safety of patients, visitors and staff.

9.4 Engineering Governance

9.4.1 Engineering governance is concerned with how an organisation directs, manages and monitors its engineering activities to ensure compliance with statutory and legislative requirements while ensuring that the safety of patients, visitors and staff is not compromised.

9.4.2 To help achieve this, healthcare organisations need to ensure that sound policies are approved by the board of directors. These should:

(a) ensure safe processes, working practices and risk management strategies are in place to safeguard all their stakeholders and assets in order to prevent and reduce harm or loss; and
(b) be backed up with adequate resources and suitably qualified, competent and trained staff.

9.4.3 Responsibility and, more specifically, the duty of care within a healthcare organisation are vested in the board of directors and its supporting structure.

9.5 Reviews

9.5.1 Management should conduct regular reviews of the effectiveness of the healthcare organisation's engineering structure and systems. The review should cover all controls, including strategic, operational, safety and engineering risk management.

9.6 Operational Policy

9.6.1 Healthcare organisations have a duty of care to patients, visitors and staff to ensure a safe and appropriate environment for healthcare. This requirement is identified in a wide range of legislation and common law.

9.6.2 Healthcare organisations should ensure that where facilities are provided under a PFI (Private Finance Initiative) arrangement, a clear understanding exists on the role and duties carried out by each party.

9.6.3 The HTM series should enable an organisation to be aware of the issues relevant to a particular service and support any operational policy that has to be prepared. This will be guided by factors such as the consequences of failure and the risks involved in their maintenance and management. Where services are covered by HTMs, the guidance therein should be followed to prepare operational policies. For other services, relevant guidance published by the HSE, regulating bodies, professional institutions or trade bodies should be followed.

9.6.4 Where the operation of engineering services is vital to the continued functioning of the healthcare premises, operation and maintenance may require special consideration; therefore, improving resilience within the critical engineering systems should be considered.

9.7 Maintenance

9.7.1 HTMs decree a maintenance policy/asset management strategy should be in place which ensures that equipment is regularly inspected and maintained. This policy/strategy should outline the importance of the role and the benefits of maintaining buildings and equipment at optimum performance levels in order to support healthcare activities.

9.7.2 Records of service reports and attendance dates (both scheduled and achieved) should always be available.

9.8 Maintenance Planning

9.8.1 Irrespective of the scale of operation, maintenance programmes are essential to ensure that all the critical engineering service equipment is checked, inspected, tested, repaired or replaced at the appropriate time. This makes sound economic sense, as it enhances the operational lifespan of the equipment and maximises the potential for its availability for use.

9.8.2 It is important that maintenance is planned so that any plant or equipment is out of service for as little time as possible. There may be some reluctance on the part of users to accept the intrusion of PM. By forward planning and some minor adjustment to timing, these difficulties may be minimised; however, failure to carry out the maintenance should not be considered an option as it will compromise safety and reliability.

9.9 Training and Competence

9.9.1 All personnel employed in the design, operation and maintenance of engineering services, including maintenance personnel and

operators, should receive adequate, documented training. Personnel should not commence their duties until this training has been completed, competency has been validated and detailed operating instructions have been provided.

Legislation, Regulations and Guidance
http://www.england.nhs.uk/publication/building-engineering-in-the-health-sector-htm-00/ HTM 00: Policies and Principles of Healthcare Engineering

05-31 Air to Water Heat Pump

Date: 17 Aug 2021
Version: 9
Unit of Measure: Nr

COVID 19 -
Ventilation 3

*See end of document for definitions

Summary	
Frequencies	**Tasks**
6M (Months) 90 mins	6 7 8 9 10 11 12 13 14 15 16 17
12M (Months) 20 mins	18
5Y (Years) 120 mins	19
0U (Unspecified)	1 2 3 4 5
Annual Timing	**224 mins**

Introduction

This document specifies the requirements for the periodic maintenance of air to water heat pumps. It should be read in conjunction with all current statutory requirements and regulations. All maintenance should be in accordance with the manufacturer's or supplier's recommendations. Any accompanying method statements and risk assessments should be read and understood before starting work.

It is against the law to work with F-Gas if you do not have the correct qualifications. To work on stationary refrigeration and air conditioning systems including heat pumps you must have the following qualifications:

1 Category 1 certificate to carry out installation, servicing, repairing, maintenance or recovery of refrigerant from all sizes of system.
2 Category 2 certificate to carry out installation, servicing, repairing, maintenance or recovery of refrigerant from systems containing F-Gas equivalent to less than 5 tonnes of CO_2.
3 Category 3 certificate to recover refrigerant from systems that contain less than 3 kg of F-Gas.
4 Category 4 certificate to check equipment for leaks if you do not break into the refrigeration circuit.

To comply with current regulations, equipment containing an F-Gas above a certain threshold must be checked for leaks at specific intervals. This applies to the following categories of equipment:

1 Stationary refrigeration equipment.
2 Stationary air-conditioning equipment.
3 Stationary heat pumps.
4 Moveable room air-conditioning appliances.
5 Refrigeration units in refrigerated trucks and trailers.

For both stationary equipment and refrigeration units of refrigerated trucks and trailers, the checks must be performed by certified contractors.

Leak checks are required for systems containing fluorinated greenhouse gases in quantities of 5 tonnes of CO_2 equivalent or more. Hermetically sealed equipment containing less than 10 tonnes of CO_2 equivalent of fluorinated greenhouse gases are exempted from regular leak checks, providing that the equipment is labelled as such.

Leak checks may be carried out using the 'indirect' method where reliable information is available - this involves comparing actual performance with design criteria and visually inspecting for leaks. In cases where the system is underperforming and a leak is suspected, the 'direct' method should be used - this involves breaking into the refrigeration circuits and checking the system components to identify faults. Where a leak is identified, there is a legal requirement for it to be repaired without undue delay (note that it is an offence to charge or top up the refrigerant charge against a known leak). A follow up check must be carried out within one month of the repair being done.

The thresholds for fluorinated greenhouse gases are expressed in tonnes of CO_2 equivalent. To calculate the tonnes of CO_2 equivalent for the refrigerant in your system, multiply the kilogram weight of the gas by its global warming potential (GWP) using the figures from the UK Government guidance document on fluorinated gases (refer to the Legislation, Regulations and Guidance table at the end of this schedule for a link to this document). The frequency of leak checks can then be determined from this table:

Fluorinated greenhouse gases	**Frequency of leak checks without leakage detection system**	**Frequency of leak checks with leakage detection system**
5 tonnes CO_2 equivalent	12 months	12 months
50 tonnes CO_2 equivalent	6 months	12 months
500 tonnes CO_2 equivalent	Leakage detection system is mandatory	6 months

Warning: Do not use R32 refrigerant as a replacement in R410A systems. Recharging an R410A system with R32 could cause equipment damage, safety hazards and non-compliance with safety standards.

Please refer to the overarching introduction (SFG 00-01) to make sure you are of the correct skill level as indicated within the task schedule to carry out the described works. Ensure you have read and understood the manufacturer's recommendations, carried out risk assessment(s) on each item of plant to identify the correct frequency of maintenance, identified all safety procedures that need to be applied and recorded in order to carry out the work in a safe and reliable manner.

If this asset (item of equipment / system) is within the warranty or guarantee period, it is essential that you maintain it in full accordance with the specific manufacturer's or installer's maintenance requirements. If you are in any doubt about the maintenance requirements or the warranty or guarantee period please contact the manufacturer, installer or their representative to seek clarity.

Notes:
It is prohibited to use virgin fluorinated greenhouse gases with a GWP (global warming potential) of 2500 or more to service or maintain refrigeration equipment with a charge of 40 tonnes CO_2 equivalent or more. There is no restriction on the servicing or long-term use of these systems.

All classes of refrigerant fall within the scope of the dangerous substances and explosive atmospheres regulations. This means that for all refrigeration, air conditioning and heat pump installations a risk assessment must be undertaken to cover any work relating to the refrigerant being used. This risk assessment must be produced in accordance with current regulations, codes of practice, and industry guidance documents.

Air conditioning systems with an effective rated output of more than 12 kW must be inspected by an accredited Energy Assessor at regular intervals not exceeding five years.

To comply with the current pressure systems safety regulations, a vapour compression refrigeration system with an installed power greater than 25 kW must be periodically inspected in accordance with a site-specific Written Scheme of Examination (WSE).

Display Order	Tasks
1	**Formal visual inspection of electrical equipment** **Criticality:** Red **Frequency:** 0U **Skill Set:** Electrical **Action:** Before this formal visual inspection is carried out, the test operative should obtain a copy of the previous findings, if available, so that any deterioration can be assessed and advice given accordingly. The formal visual inspection shall be recorded and include the following checks: 1 The equipment is installed and operating in accordance with the manufacturer's instructions including: 1.1 Correct voltage. 1.2 Frequency. 1.3 Operating current. 1.4 Electrical protection (fuse, breaker, RCD, etc.).

1
continued

1.5 Secure terminations, etc.
2 The suitability of the equipment for the environment including:
2.1 Mechanical/heat damage.
2.2 Weather.
2.3 High/low temperatures.
2.4 Water.
2.5 Pressure.
2.6 Dirty conditions.
2.7 Corrosive conditions.
2.8 Flammable/explosive substances, etc.
3 Switching & isolation of equipment including:
3.1 Normal functional use.
3.2 Perform maintenance (lockable).
3.3 Emergency disconnection, etc.
4 Where possible, the user should be consulted if they are aware of any faults and correct operation.
5 Carry out user checks including inspect:
5.1 Equipment casing/housing - check for cracks, warping, discoloration, scorching or burns.
5.2 Flex/cable - Check for damage or splits in the cable, twisting or repairs with adhesive tape.
5.3 Accessories, including extensions and adapters - Check the plug and sockets, length of cable. Reels should be uncoiled when being used.
5.4 A valid label is attached.
5.5 Look for a 'T' or test button on RCD device. Press before use to check RCD trips and disconnects equipment. Reset after test.
5.6 Plugs, sockets, fused connection unit or similar - check for heat damage, loose or bent screws/pins, and broken and loose casings.
6 Plugs, couplers and the like (unless non-rewireable) should be opened and the connections within inspected. Fuses, if fitted, should be checked for correct rating. (See current IET code of practice.)

If equipment is found to be damaged or faulty, it should be immediately removed from use, reported, and labelled. The duty holder must be informed of any equipment failing the formal visual inspection.

Notes:

1 The scope of this inspection includes the electrical equipment and the supply cable from the point of isolation (where available) to the electrical equipment. The point of isolation is usually the demarcation boundary between the electrical equipment covered by this Schedule and the fixed wiring electrical installation.
2 The inspection should be undertaken in accordance with the current IET code of practice.
3 The findings from the inspection are to be recorded, a model form is provided within the current IET code of practice. (Specialised electrical equipment may require further tests necessitating a more detailed form.)

2

Combined inspection and testing of electrical equipment

Criticality: Red **Frequency:** 0U **Skill Set:** Electrical

Action: Before this combined inspection and testing is carried out, the test operative should obtain a copy of the previous findings, if available, so that any deterioration can be assessed and advice given accordingly.

The combined inspection and testing shall be recorded and include the following checks:

1 A preliminary visual inspection.
2 Suitable means of isolation of equipment.
3 Where necessary, identify and disconnect ancillary equipment e.g. control/comms.
4 Undertake user checks from the formal visual inspection and shown below.
5 The suitability of the equipment for the environment including:
5.1 Mechanical/heat damage.
5.2 Weather.
5.3 High/low temperatures.
5.4 Water.
5.5 Pressure.
5.6 Dirty conditions.
5.7 Corrosive conditions.

2 continued

5.8 Flammable/explosive substances, etc.

The in-service testing, to be completed, in the order shown:

1 A protective conductor continuity test on Class I equipment.
2 An insulation resistance test.
3 Where required, a protective conductor current/touch current test.
4 Where required, RCD operating time test.
5 A functional check of the equipment.

If equipment is found to be damaged or faulty, it should be immediately removed from use, reported and labelled. The duty holder must be informed of any equipment failing the combined inspection and testing.

Notes:

1 The scope of this inspection includes the electrical equipment and the supply cable from the point of isolation (where available) to the electrical equipment. The point of isolation is usually the demarcation boundary between the electrical equipment covered by this Schedule and the fixed wiring electrical installation.
2 The inspection should be undertaken in accordance with the current IET code of practice.
3 The findings from the inspection are to be recorded, a model form is provided within the current IET code of practice. (Specialised electrical equipment may require further tests necessitating a more detailed form.)

3

Leak checking

Criticality: Red **Frequency:** 0U **Skill Set:** Refrigeration Engineer

Action: To comply with current regulations, equipment containing an F-Gas above a certain threshold must be checked for leaks at specific intervals. This should be done as follows:

1 Identify the correct frequency for leak checking the system.
2 Determine whether to use a direct check or an indirect check.

Direct check

Direct leak checking involves one or more of the following:

1 Checking of circuits and components representing a risk of leakage, with gas detection devices adapted to the refrigerant in the system.
2 Application of ultraviolet (UV) detection fluid or suitable dye in the circuit.
3 Using proprietary bubble solutions/soapsuds.
4 Using oxygen free nitrogen (OFN) to pressurise the circuit after recovering the refrigerant gas.

Indirect check

Indirect leak checking involves comparing the actual system performance with the design criteria and analysing the following parameters:

1 Pressure(s).
2 Temperatures.
3 Compressor run current.
4 Liquid level checks.
5 Recharge volume where applicable.
6 Visual inspection.

Where indirect checks have proved unsatisfactory, for example where the analysis has raised a suspicion of leakage due to one or more of the parameters being out of sync with what would be expected, then the indirect checks shall be followed up with a direct check.

One or more of the following situations arising from an indirect check shall constitute a presumption of leakage demanding that further direct checks be carried out:

1 A fixed leak detection system indicates a leak.
2 The equipment produces abnormal noises or vibration.
3 There is ice build up or insufficient cooling capacity.
4 Signs of corrosion, oil leaks or component damage – particularly at possible or likely leak points.
5 Indication of low charge via sight glass, level indicators or other visual aids.
6 Deviations from normal operating parameters indicated during the analysis or by readings from real time monitoring systems/software.
7 Other signs of leakage.

Where a leak is identified there is a legal requirement for it to be repaired without undue delay. Severe leakage that threatens imminent failure of performance or where the gas has a very high global warming potential (GWP) may demand immediate action, whereas a minor leak that is of a low GWP gas or is

3 continued

insufficient to cause major loss of performance may be left until a return visit under routine service visits occurs.

When the repair is carried out it must be made by personnel certified to undertake that activity. Prior to the repair a pump down and/or recovery shall be carried out as necessary. The system shall then be pressure tested using oxygen free nitrogen (OFN) under standard leak testing procedures prior to evacuation, re-charge and leakage test. A follow up check must be carried out within one month of the repair being made. In practical terms this may mean a further indirect check being conducted a short time after the system has been put back into use and normal operating conditions can be analysed.

Notes:

4

F-Gas log books

Criticality: Red **Frequency:** 0U **Skill Set:** Refrigeration Engineer

Action: Both the operator of the equipment and the company that services it must keep the following records in an F-Gas log book about any equipment that has to be checked for leaks:

1 The quantity and type of gas in the equipment when it is installed.
2 The quantity and type of gas added during any maintenance, e.g. leak repairs.
3 The name, address and certificate number if relevant of any companies that install, service or decommission the equipment.
4 The dates and results of all mandatory leak checks.
5 The measures taken to recover and dispose of gases when the equipment is disposed of, e.g. through a registered waste carrier.

If the gas used in the equipment is recycled or reclaimed, the following information must be recorded:

1 The details of the recycling or reclamation facility (name, address and certificate number if it has one).
2 The quantity of any gases recovered.

You must keep records for 5 years and make them available to government officials if they ask for them.

Notes: Equipment owners have legal responsibilities for record keeping as well as for physical leak checks. Both the owner/operator of the equipment and their service contractors have an obligation to keep copies of records for five years. Log books are not required for systems that contain less than 3 kg charge.

5

System cleaning

Criticality: Red **Frequency:** 0U **Skill Set:** Refrigeration Engineer

Action: Clean the following components as recommended by the manufacturer:

1 Air ducts (where applicable).
2 Coils.
3 Casing.
4 Fan.

System cleaning is a statutory task as specified by current regulations. The frequency for a particular installation should be determined by a site-specific risk assessment which takes into account the local environment and the criticality of the system.

Notes: Mechanical ventilation and air conditioning systems must be regularly and adequately cleaned to ensure that they are kept free from contaminants such as dust, dirt, viruses, mould, and bacteria. These can accumulate in the system and may affect the health of building occupants.

Some contaminants such as pathogenic organisms and animal debris can enter the building via external air intakes. If this is suspected it should be reported to the client and rectified without delay in accordance with (SFG 87-33).

6

Electrical isolation

Criticality: Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer

Action:

1 Isolate the electrical supply to the equipment at an appropriate stage in this procedure.
2 Check that the supply is off and that it cannot be accidentally switched on during maintenance.
3 Ensure that any remote operating systems are disabled.
4 Comply with any site-specific isolation/lock-out procedures.

Notes: Isolation of electrical equipment should be carried out in accordance with all current statutory

6 continued	requirements, regulations and local site procedures.
7	**Compressor** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** 1 Check for undue noise or vibration. 2 Check discharge and suction pressure. 3 Check superheat under full load condition. **Notes:**
8	**Condenser and evaporator fins** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** Check for damage and/or dust accumulation. Clean and comb coil fins, vacuum unit internally. **Notes:** Do not use refrigerant for cleaning tubes, use dry nitrogen or compressed air. Sterilisation may be required. Where oxygen free nitrogen is used, a risk assessment must be carried out prior to use and suitable training given.
9	**Condenser - general** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** 1 Check all nuts and bolts (including holding down bolts), setscrews, etc. for security. 2 Check any drip tray for blockage/leaks etc. 3 Remove any debris and clean. **Notes:**
10	**Evaporator and drains, drip tray and pump** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** 1 Check, flush and clean. 2 Check condensate drain is clear and clean. 3 Check operation of condensate pump (if fitted). 4 Check that drainpipe is properly attached. **Notes:** Sterilisation of drip tray and drain may be required.
11	**Compressor capacity control and unloaded start valves (if fitted)** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** Check for correct operation. Check motor current against commissioning data or nameplate. **Notes:** Compressor unload on start should reduce and increase capacity on demand.
12	**Refrigerant pipework** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** Check entire refrigerant pipework run. Ensure pipes are secure, not sagging, and are in good repair. **Notes:** All pipework joints should be brazed or welded. To prevent internal scaling use dry, oxygen free nitrogen during the jointing process. A risk assessment must be done prior to use.
13	**Water loop connections** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** Check for leaks.

13 continued	**Notes:**
14	**Electrical wiring and terminals** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** Check integrity. **Notes:**
15	**Return to service** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** 1 Place on heating cycle. 2 Isolate from water loop. 3 Check high-pressure safety device stops refrigeration compressor. 4 Follow by opening water loop connection and resetting high-pressure cut out. 5 On completion of maintenance, the contractor shall run the system and take and record operational readings in order that the operational efficiency of the system can be established. **Notes:**
16	**Controls** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** Return to standard settings. **Notes:**
17	**External cleaning** **Criticality:** Not Specified **Frequency:** 6M **Skill Set:** Refrigeration Engineer **Action:** 1 Clean surfaces of compressor and components of condensing unit particularly fan impeller and motor casing. 2 Check and clean surfaces of unit casing. 3 Check for corrosion, repair and treat as found necessary. 4 Note defects and report to client. **Notes:** Remove any dirt or rubbish from vicinity of plant.
18	**Automatic leak detection system (if installed)** **Criticality:** Red **Frequency:** 12M **Skill Set:** Refrigeration Engineer **Action:** Test the automatic leak detection system in accordance with the manufacturer's instructions. **Notes:**
19	**Thorough examination for systems with more than 25 kW total power** **Criticality:** Red **Frequency:** 5Y **Skill Set:** Competent Person **Action:** Systems with a total installed power greater than 25 kW must undergo a periodic thorough examination in accordance with a site-specific Written Scheme of Examination (WSE). The examination may include (but is not limited to) the following: 1 Visual external examination for evidence of damage or deterioration to pressure vessels, pipework and protective devices. 2 Visual external examination for evidence that the system is being correctly maintained. 3 A review of maintenance logs and verification that a suitable maintenance regime is in place. 4 Functional testing of protective devices to confirm that they function correctly. These devices may include (but are not limited to) the following: 4.1 High-pressure trips. 4.2 Low-pressure trips. 4.3 Safety relief valves (including those fitted to low-pressure circuit). 4.4 Bursting discs.

19 continued	4.5 Fusible plugs. 5 The WSE may also specify the periodic replacement or overhaul of protective devices such as pressure relief valves, and the recalibration of pressure/temperature indicators associated with these devices. 6 A report should be issued on completion of the thorough examination which may include (but is not limited to) the following: 6.1 Details of the components examined, their condition and the examination results. 6.2 Recommendations for any repairs, modifications, or changes that are required to ensure safe and effective operation. 6.3 A review of the WSE to verify that it is still appropriate for the installation, taking into account the age and condition of the equipment. **Notes:** In some installations the WSE may specify a different frequency for the thorough examination. In all cases the site-specific WSE must take precedence over the generic guidance in SFG20.

Legislation, Regulations and Guidance
http://shop.bsigroup.com/ProductDetail?pid=000000000030342613 BS 7671:2018+A1:2020. Requirements for Electrical Installations. IET Wiring Regulations.
http://www.legislation.gov.uk/nisr/2011/239/contents/made Controls on Ozone-Depleting Substances Regulations (Northern Ireland) 2011
http://www.legislation.gov.uk/uksi/2002/2776/contents/made Dangerous Substances & Explosive Atmospheres Regulation (DSEAR) 2002
http://www.legislation.gov.uk/nisr/2003/152/contents/made Dangerous Substances and Explosive Atmospheres Regulations (Northern Ireland) 2003
http://www.feta.co.uk/publications/feta-publications FETA - Guidance on Risk Assessments for compliance with Dangerous Substances and Explosive Atmospheres Regulations (DSEAR)
http://www.legislation.gov.uk/eur/2014/517/contents F-Gas Regulation No. 517/2014 on fluorinated gases
http://www.legislation.gov.uk/uksi/2018/98/contents/made Fluorinated Greenhouse Gases (Amendment) Regulations 2018
http://www.legislation.gov.uk/all?title=The%20fluorinated Fluorinated Greenhouse Gases Regulations (Northern Ireland) 2015 and 2018 Amendments
http://shop.theiet.org/code-of-practice-for-in-service-inspection-and-testing-of-electrical-equipment-5th-edition IET Code of Practice for in-service inspection and testing of electrical equipment
http://www.hse.gov.uk/pubns/books/l138.htm L138 - Dangerous Substances and Explosive Atmospheres Regulations 2002. Approved Code of Practice and guidance
http://www.hse.gov.uk/pubns/books/l24.htm L24 Workplace health, safety and welfare. Workplace (Health, Safety and Welfare) Regulations 1992. Approved Code of Practice and guidance
http://www.legislation.gov.uk/uksi/2015/168/contents/made Ozone-Depleting Substances Regulations 2015
http://www.legislation.gov.uk/uksi/2002/1267/contents/made Pressure Equipment Regulations 1999 and 2002 amendment
http://www.legislation.gov.uk/nisr/2004/222/made Pressure Systems Safety Regulations (Northern Ireland) 2004
http://www.legislation.gov.uk/uksi/2000/128/contents/made Pressure Systems Safety Regulations 2000
http://www.safed.co.uk/technical-guides/pressure-equipment/ PSG17 Refrigeration Systems – Guidelines for Users and Competent Persons
http://www.refcom.org.uk/resources/downloads/f-gas-downloads/ REFCOM Technical Guidance documents

http://www.gov.uk/guidance/fluorinated-gases-f-gases UK Government Guidance on Fluorinated gases (F gases)
http://www.legislation.gov.uk/nisr/1993/37/contents/made Workplace (Health, Safety and Welfare) Regulations (Northern Ireland) 1993
http://www.legislation.gov.uk/uksi/1992/3004/contents/made Workplace (Health, Safety and Welfare) Regulations 1992 (WHSWR)

Flags and Definitions	
 COVID 19 - Ventilation 3	SFG20 have created a schedule providing Ventilation Systems and Equipment general guidelines in relation to COVID - 19 to follow during this epidemic. It provides links to various documents concerning COVID - 19 and the subjects covered are: • General Ventilation Guidelines to follow during this epidemic • Room level circulation: fan coil, split and induction units • Filters • Questions raised in relation to what special measures should be taken at this time when dealing with maintenance tasks • Indoor Air Quality The information is specific to the schedule this flag has been allocated to. When you access the COVID schedules you will be able to download them in pdf format for printing and you can also select them to add them to a pdf booklet you wish to download and of course add them to your Service Models, if applicable. **COV01 Intro** **COV09 Vent 3**

SFG20

Asset Profile

Service Timings are displayed in minutes in brackets

Type	Code	Title	Skill Set	UoM	Annual Timing	6M	12M	5Y	0U
SFG20	05-31	Air to Water Heat Pump	E / RE / CP	Nr	224 mins	90m	20m	120m	

Total Annual Timing: 224 mins