REGULATED QUALIFICATION FRAMEWORK (RQF)

QUALIFICATION SPECIFICATION

- LCL Awards Level 3 Award in the Installation and Maintenance of Air Source Heat Pump Systems (non-refrigerant circuits)
- LCL Awards Level 3 Award in the Installation and Maintenance of Ground Source Heat Pump Systems (non-refrigerant circuits)
- LCL Awards Level 3 Award in the Installation and Maintenance of Heat Pump Systems (non-refrigerant circuits)

1. Objective:

These heat pump qualifications are specifically aimed at existing fossil fuel plumbing and heating engineers and giving them the necessary training to upskill their existing skills to install heat pump systems. To continue to learn, develop and practise the skills required for employment within the Building Engineering Services (BES) Renewable sector.

Learners will be able to demonstrate they know and understand the requirements for installing heat pump systems, know the different operational characteristics of each type of heat pump, namely air, ground and exhaust air heat pumps, their components, the principles of heat pump selection, system design, emitter selection, hydraulics, the preparatory work required for heat pumps installations and the requirements to install, commission and hand over heat pump systems. The learner will know the health and safety risks and regulations and standards relating to the installation, testing, and commissioning of heat pump systems.

The objective of this qualification is for learners to demonstrate they are competent in accordance with legislation, regulations, and industry standards.

The target groups for the qualification are those learners who are;

1 Confirming occupational competence and or obtaining a licence to practice
2 Preparing for further learning or training and/or developing knowledge and or skills in a subject area who are existing workers in the occupation seeking to extend their range of work

NOTE: *Whilst the qualification is designed for sealed refrigerant systems and precludes the knowledge and competence requirements to break, make and fill split refrigerant circuits which would be covered by separate Refrigerant Handling Qualifications, the knowledge and understanding criteria are still relevant and this qualification could be undertaken by operatives wishing to install splits systems so long as they are also separately qualified in the handling of refrigerants as described in the EU F-GAS regulation and the Fluorinated Greenhouse Gases Regulations.*

2. Qualification Framework:

This qualification comprises of 3 routes. Unit LCL-R3035 is a mandatory core unit, and at least one of the other units (LCL-R3036 and/or LCL-R3037) must be undertaken to gain the qualification.

Unit Title	Unit Reference Number	Type of Unit	Level	Credit Rating
Core unit in Heat Pump Technology (Non-Refrigerant Circuit)	LCL-R3035	Knowledge	3	2
Air Source unit in Heat Pump Technology (Non-Refrigerant Circuit)	LCL-R3036	Knowledge and Practical	3	1
Ground Source unit in Heat Pump Technology (Non-Refrigerant Circuit)	LCL-R3037	Knowledge and Practical	3	1

Qualification Structure:

- **LCL Awards Level 3 Award in the Installation and Maintenance of Air Source Heat Pump Systems (non-refrigerant circuits)** *(IMASHPS_H21)*
  - **QAN** – 603/7790/2
  - **QW** - C00/4532/0
  - The Guided Learning Hours (GLH) are 20 hours
  - The Total Qualification Time (TQT) is 30 hours
  - The total credit required to achieve the qualification is 3

- **LCL Awards Level 3 Award in the Installation and Maintenance of Ground Source Heat Pump Systems (non-refrigerant circuits)** *(IMGSHPS_H21)*
  - **QAN** – 603/7791/4
  - **QW** - C00/4532/1
  - The Guided Learning Hours (GLH) are 20 hours
  - The Total Qualification Time (TQT) is 30 hours
  - The total credit required to achieve the qualification is 3

- **LCL Awards Level 3 Award in the Installation and Maintenance of Heat Pump Systems (non-refrigerant circuits)** *(IMHPS_H21)*
  - **QAN** – 603/7792/6
  - **QW** - C00/4532/2
  - The Guided Learning Hours (GLH) are 30 hours
  - The Total Qualification Time (TQT) is 40 hours
  - The total credit required to achieve the qualification is 4

3. Unit Grading Structure:

The learner is required to successfully achieve a pass in the core unit along with the relevant technology (Air / Ground / Combined) for the relevant qualification to be awarded.

4. Unit Specification:

LCL-R3035: Core unit in Heat Pump Technology (Non-Refrigerant Circuit)
Assessment method: WQMC

Learning Outcome 01 The learner will know what a heat pump is, the principle of the vapour compression system and system components.
The learner will demonstrate knowledge of:

1.01 The purpose and operational characteristics of the following components:

- evaporator
- low pressure switch
- compressor
- high pressure switch
- condenser
- dryer/receiver
- expansion valve
- expansion valve phial
- refrigerant four-way valve
- evaporator fan coil
- fan
- heat transfer fluid pump

1.02 How the vapour compression refrigerant circuit within a heat pump unit operates.

Learning Outcome 2. The learner will know the different operational characteristics of each type of heat pump unit and system arrangement.
The learner will demonstrate knowledge of:

2.01 The different type of heat pump within their categories and recognise their individual heat source:

- Air Source heat pump
  - Monobloc, fixed speed, inverter driven
  - Split
  - Air to air
- Ground source heat pump
  - Fixed speed, inverter driven
  - Closed loop
  - Open loop
- Exhaust air heat pump
  - Fixed speed, inverter driven
  - Heating and hot water
  - Hot water only
  - Air to air

2.02 The requirements of the current fluorinated greenhouse gases regulations in relation to:

- The competence of personnel installing heat pumps where the refrigerant circuit has been assembled and tested by the product manufacturer

- The competence of personnel installing and charging split air source heat pumps where the refrigerant circuit is to be assembled and tested in the location where the heat pump is to be installed and operated
- The competence of personnel undertaking leakage checking on heat pump refrigerant circuits
- The competence of personnel undertaking servicing of a split air source heat pumps
- The competence of personnel undertaking recovery of fluorinated greenhouse gases from heat pump refrigerant circuits
- Flammability of certain refrigerants

Learning Outcome 3. The learner will know the fundamental principles of heat pump efficiency and design selection that are common for heat pumps.
The learner will demonstrate knowledge of:

3.01 The meaning of the term 'Coefficient of Performance'.
3.02 The relationship between Coefficient of Performance and the:
- heat pump input temperature
- heat pump emitter temperature.

3.03 The effect that ambient temperature can have on:
- coefficient of performance
- heat pump output.

3.04 The meaning of the term 'Seasonal Coefficient of Performance'.
3.05 The factors that can affect the Seasonal Coefficient of Performance.
3.06 The understanding of a products ErP label and product Fiche
3.07 The meaning of the term 'System Efficiency'.
3.08 The factors that can affect the 'System Efficiency'.
3.09 The understanding of a products package label
3.10 Why is achieving minimum heat loss from the building is particularly important when designing a heat pump system.
3.11 The factors that need to be considered when selecting a heat pump in relation to:
- heat load based on a heat loss calculation based on worst case outside temperature
- flow temperature
- hot water requirements

3.12 Identify suitable electrical supply in relation to:
- District Network Operator (DNO) connection
- isolation switches
- fuse rating

3.13 The effect that oversizing of a heat pump has on:
- system performance/efficiency
- heat pump operation.

3.14 The effect that under-sizing of a heat pump has on:
- system performance/efficiency
- heat pump operation.

3.15 The meaning of the terms:
- monovalent system
- bivalent system
- hybrid system.

3.16 How to use manufacturer's data to select heat pump units:
- output charts
- other data.

3.17 The meaning of the term 'bivalent points' in relation to heat pump output charts.
3.18 How 'bivalent points' are used to determine auxiliary heat requirements.

3.19 How heat pump output capacity is affected by:
- heat pump input temperature
- heat pump output temperature.

3.20 The typical mean water temperature recommended when designing a hydraulic emitter circuit that incorporates:
- standard panel radiators.
- underfloor heating
- fan assisted convector heaters
- fan coils

3.21 The typical annual operating hours for a heat pump that is being used for:
- heating only
- heating and domestic hot water.

3.22 How heat pump annual operating hours may vary in relation to the:
- type of building
- geographical location of the installation.

Learning Outcome 4. The learner will know the fundamental principles of domestic hot water cylinder selection and system design that are common for heat pumps.
The learner will demonstrate knowledge of:

4.01 The different type of heat pump hot water cylinders:
- heat pump, hot water packaged unit
- coiled indirect cylinder
- tank in tank cylinder
- thermal store
- solar cylinder

4.02 The volume of hot water cylinder required for the building.
4.03 The output required from heat pump to heat the hot water cylinder.
4.04 The correct selection of hot water cylinder for the heat pump.
4.05 The correct zone valve selection for heat pump and hot water cylinder.
4.06 The requirements for secondary hot water circulation.
4.07 The safe system design in relation to regulations for:
- legionella protection
- hot water temperature protection and prevention of scalding.

Learning Outcome 5. The learner will know the fundamental principles of hydraulic system design that are common for heat pumps.
The learner will demonstrate knowledge of:

5.01 The suitability of the following types of hydraulic heating system emitter for heat pump systems:
- standard panel radiators.
- underfloor heating
- fan assisted convector heaters
- combined systems (radiators, underfloor heating)
- multiple zones

5.02 How to identify heat pump hydraulic flow rate requirements and circulation pump selection.
5.03 How to identify heat pump pipe size requirements in relation to designed flow temperature.
5.04 Why a buffer vessel maybe required in the system design.
5.05 How to size a buffer vessel in the system design.
5.06 The correct piping alternatives for buffer vessels in the system design.

Learning Outcome 6. The learner will know the fundamental principles of heat pump controls.
The learner will demonstrate knowledge of:

6.01 The common control systems for heat pump units in relation to:

- weather compensation
- indoor and outdoor sensors
- heat curves
- scheduling
- optimisation
- accessories
- internet connections and Apps

Learning Outcome 7. The learner will know how to plan and prepare for the installation of heat pumps.
The learner will demonstrate knowledge of:

7.01 The common requirements of pre-installation checks for heat pump unit installations connected to hydraulic emitters circuits in relation to:

- verification that the heat output capacity of the heat pump unit is matched to the required proportional contribution of the total building heat load
- the availability and condition of a suitable electrical input service
- verify the correct fuse rating for heat pump
- adequate provision for the siting of key internal system components
- the suitability of the building structure in relation to the proposed installation.
- DNO notification
- Building Regulation and assignment of rights

7.02 Undertake pre-installation checks for a heat pump installation to include checks relating to:

- authorisation for the work to proceed
- client/end user requirements
- statutory regulations and/or industry recognised procedures
- manufacturers requirements
- the availability of appropriate access to all required work areas
- the availability and collation of all relevant information
- verification that the heat pump rating is suitable for the emitter circuit load (heating and/or heating and hot water)
- verification of the suitability of the proposed location of the heat pump unit
- verification that the emitter circuit design or existing installation is compatible with the proposed heat pump installation.
- verification that the buffer tank size (where relevant) is appropriate

Learning Outcome 8. The learner will know the requirements to install and test heat pump systems (non-refrigerant circuits).
The learner will demonstrate knowledge of:

8.01 The requirements for moving and handling heat pump units to avoid damage to the unit.
8.02 The requirements to avoid undue noise and/or vibration transmission from the heat pump unit to the building structure during the operation of the heat pump.
8.03 The requirements where heat transfer fluid circuit pipework passes through the external building fabric in relation to:

- provision for movement
- protection against freezing

- prevention of water ingress

8.04 The charging and flushing requirements for hydraulic system in relation to:

- correct filling and venting
- purging of air and installation debris
- addition of antifreeze protection and suitable cleansers and or inhibitors.
- checking for leaks
- check filters for debris

8.05 The hydraulic test requirements.

Learning Outcome 9. The learner will understand the requirements to commission heat pump system installations (non-refrigerant circuits).
The learner will demonstrate knowledge of:

9.01 The conditions that are required to implement commissioning activities for heat pump systems.
9.02 The commissioning requirements for heat pump systems in relation to:

- setting of mechanical controls
- setting of electrical controls and temperature sensors
- functional tests
- hydraulic balancing
- checking flow rates.
- checking the designed delta T
- checking start and stop temperatures

Learning Outcome 10. The learner will understand the requirements to handover heat pump system installations.
The learner will demonstrate knowledge of:

10.01 The pre-handover checks that need to be carried out for a heat pump system installation.
10.02 The industry handover procedures for a heat pump system installation in relation to the:

- provision of completed commissioning sheet
- provision of diagrammatic information
- provision of verbal information/demonstration relating to system operation and use.

Learning Outcome 11. The learner will know the requirements for the handover of a heat pump installation (non-refrigerant circuits).
The learner will demonstrate knowledge of:

11.01 The relevant checks to ensure that the system is ready for handover and compliant with manufacturer's guidance, the system design/specification, client's requirements, regulatory requirements and/or industry recognised requirements.
11.02 Explain and demonstrate to the end user the operation and use of the system using manufacturer's guidance and industry agreed handover procedures.
11.03 Explain to the end user any aspects of the system that varies from the agreed specifications and requirements.
11.04 Obtain acceptance by the end user of the system according to the industry agreed handover procedures.
11.05 All relevant handover documentation is correctly completed and recorded in the appropriate information systems and passed to the end user in accordance with manufacturer's guidance and industry recognised procedures.

Learning Outcome 12. The learner will know the requirements for routine service and maintenance of a heat pump system installation (non-refrigerant circuits).
The learner will demonstrate knowledge of:

12.01 Which documentation needs to be available to enable routine service and maintenance work on heat pump system installations.
12.02 A typical routine service and maintenance requirements for a heat pump installation in relation to:
- visual inspection requirements
- cleaning of components
- checking of system water content
- functional tests.

12.03 The industry requirements for the recording and reporting of routine service and maintenance work on heat pump system installations.
12.04 The action(s) to take in the event of a failure or suspected failure of the refrigerant circuit and/or a suspected refrigerant circuit defect.

Learning Outcome 13. The learner will undertake fault diagnosis work on a heat pump system installation. *The learner will demonstrate knowledge of:*

13.01 The cause of a minimum of **FOUR** separate faults from the following list.
- heat pump low pressure trip/alarm activated by a collector circuit malfunction
- heat pump high pressure trip/alarm activated by an emitter circuit malfunction
- poor or no collector circuit performance
- insufficient heat output to emitter circuit
- domestic hot water heat up is satisfactory but space heating is not operating
- system noise and/or vibration.

13.02 The relevant person(s) fault rectification procedures for the faults identified.

LCL-R3036: Air Source unit in Heat Pump Technology (Non-Refrigerant Circuit)
Assessment method: WQMC + OP

Learning Outcome 1. The learner will know the preparatory work required for the installation of an air source heat pump.
The learner will demonstrate knowledge of:

1.01 The factors that need to be considered when positioning an air source heat pump in relation to:
- operating noise and proximity to habitable rooms and neighbouring properties.
- planning considerations and permitted development
- ensuring adequate airflow and clearances

1.02 The factors that need to be considered when wall or floor mounting an air source heat pump.
1.03 The requirement for moving and handling air source heat pumps units to avoid damage and personal injury.
1.04 The options to deal with the condensate produced from normal and defrost cycle operation of an air source heat pump.

Learning Outcome 2. The learner will know the common requirements for the installation of an air source heat pump connected to hydraulic emitter circuits.
The learner will demonstrate knowledge of:

2.01 The installation requirements where flow and return pipework passes through the external building fabric in relation to:

- provision for movement
- prevention of water ingress

2.02 If a buffer vessel is required in the system design and correctly sized.
2.03 The heat pump hydraulic flow rate requirements and circulation pump selection.
2.04 The installation requirements for suitable insulation of external pipework in relation to:

- thermal loss
- protection against freezing
- UV protection
- animal protection

Learning Outcome 3. The learner will install heat pump units (non-refrigeration units).
The learner will be able to:

3.01 Install a heat pump in accordance with manufacturer's guidance, regulatory requirements and industry recognised procedures, to include as a minimum the connection of the heat pump unit to the hydraulic emitter circuit.
**Learners should only undertake this activity on one occasion only (xRef 3037.3.01)*

Learning Outcome 4. The learner will test and commission an air source heat pump system (non-refrigerant circuits).
The learner will be able to:

4.01 Prepare an air source heat pump system for testing and commissioning to include checks/actions to confirm:

- compliance with the system design and specification
- compliance with system/component manufacturer requirements
- the suitability of electrical supply circuit arrangements
- correct flushing the system of installation debris
- correct filling and venting the hydraulic circuits
- protection of the system against freezing.

4.02 Identify the commissioning requirements for the installation in relation to:

- the system/component manufacturer(s) requirements
- system design/specification requirements
- the client/end user requirements
- statutory regulations and/or industry recognised procedures.

4.03 Commission the installation in accordance with manufacturer's guidance, design requirements, client's requirements, and statutory requirements and/or industry recognised procedures.
4.04 Complete relevant documentation to record the commissioning activities.

Learning Outcome 5. The learner will be able to undertake routine service and maintenance of an air source heat pump system (non-refrigerant circuits).
The learner will be able to:

5.01 Obtain relevant documentation required to be enable a routine service and maintenance work on air source heat pump system installations.
5.02 Undertake servicing of an air source heat pump in accordance with manufacturer's instructions.
5.03 Demonstrate knowledge of the routine servicing of relevant components of an air source heat pump installation, including checks in relation to:

- external isolation is used
- evaporator fins for any blockage

- evaporator fins are cleaned
- fan is not obstructed and moving freely
- outer casing
- condensate drain functioning and not blocked
- condition of flexible hoses
- condition and grade of pipe insulation
- signs of system water leakage
- oil leaks or deposits
- condition and security of fixing system
- anti-vibration mounts
- verify the correct fuse rating for the heat pump

5.04 Demonstrate knowledge of the routine servicing of an air source heat pump connected to hydraulic emitter circuits and controls, including checks in relation to:

- signs of system water leakage
- heating system water pressure
- heating system water content and makeup
- expansion vessel size and pressure
- pressure relief valve (PRV) operation
- system filters
- system bypass
- buffer vessel if installed
- circulation pumps
- mechanical valves
- condition and grade of pipe insulation
- control unit and alarm logs
- heating settings
- hot water settings
- indoor and outdoor sensors or thermostats

5.05 Undertake and maintenance functional tests on an air source heat pump to include:

- safe operation
- sufficient operation
- the function of system components and controls
- noise and vibration levels

5.06 Complete service and maintenance records.

LCL-R3037: Ground Source Unit in Heat Pump Technology (Non-Refrigerant Circuit)
Assessment method: WQMC + OP

Learning Outcome 1. The learner will know the fundamental design principles for ground source heat pump collector circuits, design, component sizing and installation.
The learner will demonstrate knowledge of:

1.01 The different types of ground source collectors in relation to:

- horizontal ground loop
- compact collector
- slinky collector
- vertical bore hole "Closed Loop"
- vertical bore hole "Open Loop"
- lake collector "Closed Loop"
- lake collector "Open Loop"

1.02 The principles of ground collector design in relation to:

- collector type used

- ground conditions and type
- specific heat capacity W/m² of the ground
- annual heat pump operating hours

1.03 The ground collector installation in relation to:

- collector type used
- suitable pipework materials
- below ground jointing
- protection of mechanical damage
- separation distances to avoid thermal transfer
- separation distances from other services and adjacent buildings
- type of backfill material
- achieving balanced collector circuits

1.04 The requirements where ground collector pipework passes through the external building fabric in relation to:

- provision for movement
- protection against freezing
- prevention of water ingress
- prevention of condensation

1.05 The requirements of charging and flushing of closed loop ground collector's relation to:

- purging air and installation debris
- addition antifreeze protection and suitable biocides
- checking flow rates
- state equipment needed for system charging and flushing
- pressure testing

Learning Outcome 2. The learner will know the common requirements for the installation of a ground source heat pump connected to hydraulic emitter circuits.
The learner will demonstrate knowledge of:

2.01 If a buffer vessel is required in the system design and correctly size.
2.02 The heat pump hydraulic flow rate requirements and circulation pump selection.

Learning Outcome 3. The learner will test and commission a ground source heat pump system.
The learner will be able to:

3.01 Install a heat pump in accordance with manufacturer's guidance, regulatory requirements and industry recognised procedures, to include as a minimum the connection of the heat pump unit to the hydraulic emitter circuit.
**Learners should only undertake this activity on one occasion only (xRef R3036.3.01)*

Learning Outcome 4. The learner will test and commission a ground source heat pump system.
The learner will be able to:

4.01 Prepare a ground source heat pump system for testing and commissioning to include checks / actions to confirm:

- compliance with the system design and specification
- compliance with system / component manufacturer requirements
- the suitability of electrical supply circuit arrangements
- correct flushing the system of installation debris
- correct filling and venting the hydraulic circuits
- protection of the system against freezing

- pressure test collector circuit to ensure hydraulic soundness using appropriate test equipment in accordance with manufacturer's guidance, regulatory requirements, and industry recognised procedures

4.02 Identify the commissioning requirements for the installation in relation to:

- the system / component manufacturer(s) requirements
- system design / specification requirements
- the client / end user requirements
- statutory regulations and / or industry recognised procedures.

4.03 Commission the installation in accordance with manufacturer's guidance, design requirements, client's requirements, and statutory requirements and/or industry recognised procedures.

4.04 Complete relevant documentation to record the commissioning activities.

Learning Outcome 5. The learner will be able to undertake the routine service and maintenance of a ground source heat pump system (non-refrigerant circuits).
The learner will be able to:

5.01 Obtain relevant documentation required to be enable a routine service and maintenance work on ground source heat pump system installations.

5.02 Undertake serving of a ground source heat pump in accordance with manufacturer's instructions.

5.03 Demonstrate knowledge of the routine servicing of relevant components of a ground source heat pump ground collector circuit installation, including checks in relation to:

- check system fluid levels
- check the system pressure levels
- signs of system fluid leakage
- check anti-freeze with suitable refractometer
- check particle filter
- check pressure or filling vessel
- condition and grade of pipe insulation
- condition of casing
- pipe connections
- verify the correct fuse rating for the heat pump

5.04 Demonstrate knowledge of the routine servicing of a ground source heat pump connected to hydraulic emitter circuits and controls, including checks in relation to:

- signs of system water leakage
- heating system water pressure
- heating system water content and makeup
- expansion vessel size and pressure
- pressure relief valve (PRV) operation
- system filters
- system bypass
- buffer vessel if installed
- circulation pumps
- mechanical valves
- condition and grade of pipe insulation
- control unit and alarm logs
- heating settings
- hot water settings
- indoor and outdoor sensors or thermostats

5.05 Undertake and maintenance functional tests on a ground source heat pump to include:

- safe operation
- efficient operation
- the function of system components and controls
- noise and vibration levels

5.06 Complete service and maintenance records.

5 National Occupational Standard:

The Units used in this qualification have a direct relationship with Industry requirements and the Heat Pump Association (HPA) and are approved for use by MCS.

6 RQF Descriptor: Level 3.

Knowledge descriptor: *(the holder can)*

- *Has factual, procedural and theoretical knowledge and understanding of a subject or field of work to complete tasks and address problems that while well-defined, may be complex and non-routine.*
- *Can interpret and evaluate relevant information and ideas.*
- *Is aware of the nature of the area of study or work.*
- *Is aware of different perspectives or approaches within the area of study or work*.

Skills Descriptor *(the holder can)*

- Identify, select and use appropriate cognitive and practical skills, methods and procedures to address problems that while well defined, may be complex and non-routine.
- Use appropriate investigation to inform actions.
- Review how effective methods and actions have been.

7 Prior qualifications, knowledge, skill or understanding which the learner is required to have before taking this qualification; (Pre-requisites)

- N/SVQ Level 2/3 in Plumbing or equivalent earlier certification that provides evidence of competence;
  or
- N/SVQ Level 2/3 in Heating and Ventilating (Domestic Installation) or equivalent earlier certification that provides evidence of competence;
  or
- N/SVQ Level 2/3 in Heating and Ventilating (Industrial and Commercial Installation) or equivalent earlier certification that provides evidence of competence;
  or
- N/SVQ Level 2/3 in Oil-Fired Technical Services or equivalent earlier certification that provides evidence of competence;
  or
- N/SVQ Level 2/3 in Gas Installation and Maintenance or equivalent earlier certification that provides evidence of competence;
  or

- Heating installers with experience installing wet central heating systems, evidenced either by Gas Safe (CENWAT), OFTEC (OFT10-105E or OFT15-108W), MCS (Heat Pump or Solar Thermal Hot Water) or HETAS (H004) registration. The experience in these sectors will normally be 3 years, although where the initial assessment confirms the learner has the necessary skills, knowledge and experience which can be evidenced via RPL assessment this duration may be reduced.

  The above pre-requisites are not required where this Qualification is being delivered as part of a recognised training course in any of the above.

In addition, if not included in the above current certification in relation to:

- WRAS Water Regulations/Water Byelaws or equivalent

8 Qualifications or Units which a learner must have completed prior to registration on this qualification and any optional routes.

None

9 Other requirements which a learner must have satisfied before the learner will be assessed or before the qualification will be awarded.

None

10 The design and delivery of the examination associated with these units are based on the following documents;

- Manufacturer's Installation and Commissioning Instructions
- Building Regulations Approved Document Part L
- Water Regulations
- BS 7671 IET Wiring Regulations
- MIS 3005(I/D) Heat Pump Systems
- MDG 007 Heat Pump Reference and Information Tools published by MCS

11 The criteria against which learners' level of attainment will be measured:

The Learning Outcomes and Assessment Criteria against which learners' level of attainment will be measured are detailed in Section 4 of this specification.

12 Planned exemptions: None

13 Specimen assessment materials: None available

14 Specified levels of attainment:

Learners must pass all the mandatory units for the qualification to be awarded.

15 Other information:

This Qualification would enable registration with MCS for work under the scope of MIS 3005-I (The Heat Pump Standard - Installation). Learners wishing to design installations (MIS3005-D (The Heat Pump Standard - Design)) would need to undertake further training (in addition to this qualification) such as the Level 3 award in Low Temperature Heating and

Hot water Systems in Dwellings. Where learners apply for MCS registration for the installation only of heat pumps (MIS3005-I) they will be required to demonstrate (in accordance with the CPS requirements) that they have a contract in place with a qualified design engineer.

This qualification, for the purpose of membership to or membership retention to the Microgeneration Certification Scheme (MCS), a competent person's scheme, a professional institute or trade association may require that this qualification is retaken within a 5 year period from the date of certificate issue. Further information regarding membership requirements can be obtained from the relevant organisation.

SSAs: 5.2 Construction

Review Date: 31/08/2024

Assessment and Examination Terminology

AC – *Approved Centre; an examination conducted either at the approved centre or a location approved by the centre, using staff approved by the centre to conduct the examination.*

CBSR – Closed Book Short Response; Short response written questions will be set by the awarding organisation and administered and marked locally at the approved centre by approved markers. Learners will be prohibited from using industry normative or informative documents.

CE – Customer Evidence; evidence provided by a customer in the form of a written witness statement confirming a competent performance by the learner. That evidence may also be provided by an employing supervisor or manager of the learner. Witness statements that relate to a technical competence will only be accepted from a person technically competent in that particular activity to provide the statement.

IK – *Inferred Knowledge; inferred knowledge is assessed as part of a performance assessment by a centre approved assessor. To deem the learner as having sufficient knowledge the learner must satisfactorily pass the performance assessment.*

LE – *Learner Evidence; learner generated evidence is for example documented recordings of readings, calculations or the production of a risk assessment or other procedural document.*

MCQ – Multiple Choice Question; set by the awarding organisation and administered and marked locally or electronically. Learners will be able to answer multi-choice questions using reference to appropriate industry normative or informative sources.

MRQ – Multiple Response Question; set by the awarding organisation and administered and marked locally or electronically. Learners will be able to answer multiple-response questions using reference to appropriate industry normative or informative sources.

O/L – Online: a secure web-based assessment system (XAMS)

OP – *Observed Performance; the assessment of a learner's performance by an approved assessor either in the learner's work place or at the approved centre or a location approved by the centre.*

OQ – *Oral Questions; oral questions may be asked by an assessor as part of a performance assessment or knowledge examination to confirm the understanding of the criteria by the learner*.

PA – *Performance Assessment; a performance assessment conducted either in the learner's work place or at the approved centre or a location approved by the centre.*

RWE – *Realistic Work Environment; an area at the approved centre or a location approved by the centre which replicates and has the features of a Work Place. The learner must not be permitted to be familiar with the simulated environment prior to undertaking assessment*.

WP – *Work Place; is the naturally occurring environment in which the learner works, typically that would be in a customer's premise where work is being paid for by the customer*.