

REGULATED QUALIFICATION FRAMEWORK (RQF)

QUALIFICATION SPECIFICATION

➤ LCL Awards Level 3 Award in Low Temperature Heating and Hot Water Systems in Dwellings

1. Objective:

The objective of this qualification is for learners to be upskilled to the concept of low temperature heating systems, it will allow them to demonstrate their knowledge and understand the need and requirements for installing low temperature heating and hot water systems in Dwellings.

This qualification has been written by LCL Awards in conjunction with the Chartered Institute of Plumbing and Heating Engineers (CIPHE).

The qualification allows learners to continue to learn, develop and practise the skills required for employment within the Building Engineering Services (BES) Renewable sector.

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

- a. Preparing for employment, new entrants to the occupation
- b. Updating occupational competence, continuous professional development and/or obtaining a licence to practice
- c. 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

2. Qualification Framework:

The qualification comprises of 1 mandatory Units;

Unit Title	Unit Reference Number	Type of Unit	Level	Credit Rating
Low Temperature Heating Systems	LCL-P3002	Knowledge	3	2

Qualification Structure:

- LCL Awards Level 3 Award in Low Temperature Heating and Hot Water Systems in Dwellings (LTHWS)
- QAN 603/7761/6
- The Guided Learning Hours (GLH) are 16 hours
- The Total Qualification Time (TQT) is 20 hours
- The total credit required to achieve the qualification is 2

3. Unit Grading Structure:

The learner is required to successfully achieve a pass in the single unit for this qualification to be awarded.

4. Unit Specification:

LCL-P3002: Low Temperature Heating Systems

Learning Outcome 01. The learner will know the latest industry standards and regulatory framework relating to heating design.

The learner will demonstrate knowledge of:

- 1.1 the standards and regulations that are applicable to heating and hot water system design
- 1.2 the responsibility and duty of the installer to correctly specify, design, install and commission an energy efficient low carbon hot water and heating system -
- 1.3 Other opportunities for energy efficiency upgrades within a property and their impact on the heating system

Learning Outcome 02. The learner will know the requirements for undertaking a room by room heat loss for a property.

The learner will demonstrate knowledge of:

- 2.1 different building elements and structures
- 2.2 U values
- 2.3 ventilation heat loss
- 2.4 transmission heat loss
- 2.5 Calculating a room by room heat loss for a property

Learning Outcome 03. The learner will know how to correctly size heat emitters for low temperature heating systems.

The learner will demonstrate knowledge of:

- 3.1 the effect on heat emitter size at varying flow and return temperatures
- 3.2 the variation in heat emitter heat output at various mean water temperatures with respect Δt
- 3.3 response times and their effect on the heat generator/emitter size
- 3.4 the effect of different controls on the overall size of the heat generator/emitter
- 3.5 consumers behaviour and its effect on heat generator/emitter sizing
- 3.6 the space limitations when sizing a low temperature heat emitter
- 3.7 the importance of system balancing and its benefits
- 3.8 how to advise the consumer on the benefits and limitations of a low water temperature heating system
- 3.9 Calculating the size of a heat emitter at various flow and return temperatures

Learning Outcome 04. The learner will know how to correctly size pumps and pipework.

The learner will demonstrate knowledge of:

- 4.1 the relationship between pressure, flow and velocity
- 4.2 the relationship between heat, Δt and flow rates
- 4.3 the effect of different pipe diameters at different load conditions

- 4.4 the effect on system pressure loss in relation to
 - 4.4.1 valves
 - 4.4.2 components
 - 4.4.3 pipework fittings
- 4.5 how to interpret a pump curve
- 4.6 the duty point and how to correctly size a pump to meet the needs of the index circuit
- 4.7 the effects on pressure loss with different system Δt
- 4.8 the effect of high velocities on the system design
- 4.9 the overall impact of the system on the consumer when designing for different Δt
- 4.10 Expansion Vessel sizing
- 4.11 Calculating the size of the pipework and select the correct pump for a heating system

Learning Outcome 05. The learner will know how to correctly size a domestic hot water system
The learner will demonstrate knowledge of:

- 5.1 the difference between total water volume versus usable hot water volume
- 5.2 the effects on response times with varying heat generator sizes
- 5.3 how to design a hot water system for a consumer based upon their user profile, behaviour and needs
- 5.4 how to design a hot water system based upon the needs of the property
- 5.5 importance of the location of the hot water storage system in relation to the heat generator
- 5.6 the effect of uninsulated DHW pipework on the overall system performance
- 5.7 the key factors needed to correctly size DHW pipework based upon the available dynamic pressure and flow within the property -
- 5.8 Calculating the size of the DHW system to meet the needs of both the consumer and property itself
- 5.9 Ensuring the system meets water safety requirements for a Domestic Hot Water system

Learning Outcome 06. The learner will know the basic design principles of system configurations.
The learner will demonstrate knowledge of:

- 6.1 Different design configurations utilising zone valves
- 6.2 Different design configurations between radiator and underfloor heat emitters
- 6.3 Basic principles of hydraulic separation

5 National Occupational Standard:

This qualification would be the minimum standard for the design and installation of a low temperature heating and hot water system to support the future decarbonisation of heat.

6 RQF Descriptor Level.

Knowledge descriptor: *(the holder can)*

Has knowledge and understanding of facts, procedures and ideas in an area of study or field of work to complete well-defined tasks and address straightforward problems.

Can interpret relevant information and ideas. Is aware of a range of information that is relevant to the area of study or work.

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 manufacturer courses certification or Gas Safe Register, OFTEC, MCS or HETAS registration

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

8 Units which a learner must have completed before the qualification will be awarded and any optional routes.

Learners must complete the 1 mandatory unit before the qualification will be awarded.

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;

CIBSE Domestic heating design guide

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

14 Specified levels of attainment

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

15. Other information

This qualification, for the purpose of membership to or membership retention to the Microgeneration Certification Scheme (MCS), a competent persons 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.*

MC – *Multiple Choice; 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.*

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.*