

# City & Guilds Level 3 NVQ Diplomas in Domestic Plumbing and Heating (6189)



**Qualification Handbook**

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April 2026 version 6.4

# 1 Qualification at a glance

<b>Subject area</b>	<b>Domestic Plumbing and Heating</b>
<b>City &amp; Guilds number</b>	6189
<b>Age group approved</b>	16+
<b>Entry requirements</b>	Level 2
<b>Assessment</b>	By portfolio and online assessment
<b>Fast track</b>	Not available
<b>Support materials</b>	Centre handbook Assessment pack Candidate logbook
<b>Registration and certification</b>	Consult the City & Guilds website for information

## Recognition by Water Safe

All Level 3 6189 qualifications are recognised by Water Safe. Successfully completing this qualification will also enable candidates to prove competence, if they wish to join a competent person scheme in relation to Part G and H of the Building regulations, subject to scheme rules and successful company certification by a recognised Competent Person Scheme Certification Body.

<b>Title and level</b>	<b>City &amp; Guilds number</b>	<b>Accreditation number</b>	<b>QW Approval/Designation No.</b>	<b>GLH</b>	<b>TQT</b>
City & Guilds Level 3 NVQ Diploma in Domestic Plumbing and Heating	6189-31	600/1122/1	C00/0342/3	549	680
*City & Guilds Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Warm Air Appliances) (EUSGU0021)	6189-32	600/1124/5	C00/1151/8	No longer available	
City & Guilds Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Water and Central Heating Appliances) (EUSGU0022)	6189-33	600/1134/8	C00/0342/2	1034	1460
*City & Guilds Level 3 NVQ Diploma in Domestic Heating	6189-41	600/1473/8	C00/0345/2	Qualifications no longer available	
*City & Guilds Level 3 NVQ Diploma in Domestic Heating (Gas Fired Warm Air Appliances)	6189-42	600/1116/6	C00/0345/0		

(EUSGU0021)				
*City & Guilds Level 3 NVQ Diploma in Domestic Heating (Gas Fired Water and Central Heating Appliances) (EUSGU0022)	6189-43	600/1117/8	C00/0345/1	
*Qualification no longer available				

These qualifications allow learners to become competent to industry standards in either plumbing and heating or domestic heating. Learners are required to demonstrate the ability to perform the necessary skills and the knowledge required to be assessed against the National Occupational Standards.

These qualifications form the core element of the apprenticeship for the sector.

<b>Version and date</b>	<b>Change detail</b>	<b>Section</b>
1.2 Oct 2011	Amend Assessment Type – Unit 212	Assessment
1.3 Feb 2012	Additional Assessment Information	Assessment
1.4 May 2012	Update on Gas registration categories	Structure
1.5 May 2012	Updated UAN of unit 212	Structures
	Updated assessment methods	Assessment
1.6 May 2012	Amend assessment criteria numbering – Unit 343	Units
2.0 November 2012	Permitted material amended from CIBSE Domestic Heating Design Guide, published by CIBSE, 2007 to ISBN 1 903287 40 5 CIBSE Domestic Heating Design Guide, revised 2011	Unit 304/024 – permitted materials
3.0	Permitted material list added	Assessment 4.5
4.0 May 2013	Split into two documents, one Qualification Handbook and one Unit Pack. Updated assessment information in the Qualification Handbook.	Assessment
4.1 May 2013	Added City & Guilds qualification numbers to Level 2 NVQ Diplomas in ‘RPL– Additional requirements for achievements of qualification’ table Deleted – ‘learners with a L2 NVQ (6089)’ from ‘RPL– Additional requirements for achievements of qualification’ table	Appendix 3
4.2 September 2013	Added ‘recognition by Water Safe’ statement	Qualification at a glance
5.0 October 2013	Replaced references to BS 6700 with BS EN 806	Assessment
5.1 January 2014	Corrected Unit Accreditation Number for Unit 308	2.1 Structures
5.2 November 2014	Added guidance regarding ACS acceptance as part of a qualification	Assessment
5.3 November 14	Added additional wording re BS EN 806	Test Specifications
5.4 September 15	Updated Permitted reference materials (IET 2015)	Assessment
5.5 April 16	Updated Oil Assignment information	Assessment
5.6 June 16	QW Designation No. and TQT added	Qualification at a glance Assessment
5.7 February 17	Updated Permitted reference materials for Unit 322 (2013 edition)	Assessment
5.8 October 17	Added TQT and GLH details  Deleted QCF	Qualification Structure  Throughout
6.0 November 2020	Conflict of Interest statement added	Centre requirements

6.1 August 2021	Relationships to other qualifications information added	Appendix 4
6.2 March 2022	GLH and TQT clarified and Highlighted GLH and TQT totals added to table on page 2 Incorrect TQT for 6189-31 on page 7 has been corrected from 549 (which was the GLH) to 680. Changed address on rear and City & Guilds to front cover	Page 2, page 7/8, front and rear cover
6.3 March 2025	Updated title on front cover and footer.  Added statement around knowledge of legislative requirements for devolved nations.	Front cover and footer 4.2 Recommended delivery strategies
6.4 April 2026	Staffing roles and responsibilities requirements for EU Skills units updated  Principles of Assessment (EU Skills Units) removed	3.7 Assessors and internal quality assurers

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## 2 Introduction

This document tells you what you need to do to deliver the qualifications.

<b>Area</b>	<b>Description</b>
Who are the qualifications for?	The Level 3 NVQ Diploma in Plumbing and Domestic Heating is for candidates who want to work within the mechanical engineering services sector and wish to progress as a qualified plumber or heating engineer. Learners are required to demonstrate the ability to perform the necessary skills and the knowledge required to be assessed against the National Occupational Standards.
What do the qualifications cover?	The qualifications cover elements of health and safety, hot and cold water, domestic central heating, and servicing and maintaining plumbing systems. There are optional pathways that learners can choose from these are Gas, Oil, Solid Fuel and Environmental technologies.
Are the qualifications part of a framework or initiative?	The Level 3 qualifications are the core element of the Apprenticeship Framework.
What opportunities for progression are there?	On completion of this qualification candidates may progress into employment or to the following City & Guilds qualifications: <ul style="list-style-type: none"><li>• City &amp; Guilds Level 3 Award in the Installation of Solar Thermal Hot Water Systems 2399-21</li><li>• City &amp; Guilds Level 3 Award in the Installation and Maintenance of Solar Thermal Hot Water Systems 2399-22</li><li>• City &amp; Guilds Level 3 Award in the Installation of Heat Pumps Systems (Non-refrigerant Circuits) 2399-31</li><li>• City &amp; Guilds Level 3 Award in the Installation and Maintenance of Heat Pumps Systems (Non-refrigerant Circuits) 2399-32</li><li>• City &amp; Guilds Level 3 Award in the Installation of Water Harvesting and Re-use Systems 2399-41</li><li>• City &amp; Guilds Level 3 Award in the Installation and Maintenance of Water Harvesting and Re-use Systems 2399-42</li><li>• Level 4 Higher Professional Diploma in Building Services Engineering (4467).</li></ul>

## 2.1 Structures

### Level 3 NVQ Diploma in Domestic Plumbing and Heating (6189-31) (600/1122/1)

To achieve this qualification, learners must achieve 56 credits from the core group mandatory units plus:

- a minimum of 29 credits from the **Oil Firing pathway** (16 credits from the core mandatory units of the Oil Firing pathway plus 13 credits from the Oil Firing Pressure Jet Appliances route or 13 credits from the Oil Firing Vaporising Appliances route)  
or
- a minimum of 29 credits from the **Solid Fuel pathway** (16 credits from the core mandatory units of the Solid Fuel Pathway plus 13 credits from the Solid Mineral Fuel route or 15 credits from the Biomass Fuel route)  
or
- 12 credits from the **Environmental pathway** (2 credits from the core mandatory unit of the Environmental pathway plus 10 credits from the Solar Thermal route or 10 credits from the Heat Pumps route or 10 credits from the Water Recycling route).

Total qualification time = 680 hours

#### Core Group

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Core group mandatory units</b>				
R/602/2498	301	Understand how to organise resources within BSE	3	26
K/502/8930	302/012	Understand and apply domestic cold water system installation, commissioning, service and maintenance techniques	9	76
K/502/9155	303/023	Understand and apply domestic hot water system installation, commissioning, service and maintenance techniques	9	76
M/502/9156	304/024	Understand and apply domestic central heating system installation, commissioning, service and maintenance techniques	12	98
T/502/9157	305/025	Understand and carry out electrical work on domestic plumbing and heating systems and components	12	102
D/502/9296	344/026	Understand and apply domestic sanitation system installation, commissioning, service and maintenance techniques	8	72
K/502/9298	345	Install, commission, service and maintain domestic plumbing and heating systems	3	4

## Pathways

### Oil Firing Pathway

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Core mandatory units within pathway</b>				
H/502/9557	307	Understand core oil firing safety principles within domestic building services engineering	12	110
L/502/9391	308	Apply core oil firing safety within domestic building services engineering	4	6
<b>Oil firing pressure jet appliances (option within pathway)</b>				
D/502/9394	309	Understand the principles of domestic oil firing pressure jet appliances	7	60
M/502/9402	310	Service and maintain domestic oil firing pressure jet appliances	3	4
Y/502/9393	311	Install, test and commission domestic oil firing pressure jet appliances	3	4
<b>Oil firing vaporising appliances (option within pathway)</b>				
A/502/9404	312	Install, test and commission domestic oil firing vaporising appliances	3	4
F/502/9405	313	Service and maintain domestic oil firing vaporising appliances	3	4
T/502/9403	314	Understand the principles of domestic oil firing vaporising appliances	7	60
<b>Solid Fuel Pathway</b>				
Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Core mandatory units within pathway</b>				
J/502/9406	315	Understand core solid fuel safety principles within domestic building services engineering	12	110
L/502/9407	316	Apply core solid fuel safety within domestic building services engineering	4	6
<b>Solid Mineral Fuel (option within pathway)</b>				
L/502/9410	317	Service and maintain domestic solid mineral fuel burning appliances	3	4
R/502/9408	318	Understand the principles of domestic solid mineral fuel burning appliances	7	60
Y/502/9409	319	Install, test and commission domestic solid mineral fuel burning appliances	3	4
<b>Biomass Fuel (option within pathway)</b>				
H/502/9414	320	Service and maintain domestic biomass fuel burning appliances	2	3
K/502/9415	321	Install, test and commission domestic biomass fuel burning appliances	3	4
R/502/9411	322	Understand the installation and commissioning principles of biomass fuel burning appliances	7	60
Y/502/9412	323	Understand the service and maintenance	3	22

### Environmental Pathway

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Core mandatory unit within pathway</b>				
K/602/3138	324	Understand the fundamental principles and requirements of environmental technology systems	2	15
<b>Solar Thermal Route (option within pathway)</b>				
F/602/3100	325	Know the requirements to install, commission and handover solar thermal hot water systems	4	35
L/602/3102	326	Install, commission and handover 'active' solar thermal hot water systems	2	15
Y/602/3104	327	Know the requirements to inspect, service and maintain 'active' solar thermal hot water systems	2	15
K/602/3107	328	Inspect, service and maintain 'active' solar thermal hot water systems	2	15
<b>Heat Pumps Route (option within pathway)</b>				
D/602/3072	329	Install, commission and handover heat pumps non-refrigerant circuits	2	15
F/602/3078	330	Know the requirements to inspect, service and maintain heat pump system installations non-refrigerant circuits	2	15
L/602/3083	331	Inspect, service and maintain heat pump installations non-refrigerant circuits	2	15
Y/602/3054	332	Know the requirements to install, commission and handover heat pump systems non-refrigerant circuits	4	35
<b>Water Recycling Route (option within pathway)</b>				
A/602/3130	333	Inspect, service and maintain rainwater harvesting and greywater reuse systems	2	15
K/602/3110	334	Install, commission and handover rainwater harvesting and greywater reuse systems	2	15
M/602/3111	335	Know the requirements to inspect, service and maintain rainwater harvesting and greywater reuse systems	2	15
T/602/3109	336	Know the requirements to install, commission and handover rainwater harvesting and greywater reuse systems	4	35

## Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Warm Air Appliances) (EUSGU0021) (6189-32) (600/1124/5)

To achieve this qualification the learner must achieve 135 credits from the mandatory units.

Total qualification time = 1350 hours

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Mandatory units</b>				
D/503/8628	212	Tightness test, purge, commission and de-commission gas pipework up to 35mm 1¼ diameter in small natural gas installations	3	16
R/602/2498	301	Understand how to organise resources within BSE	3	26
K/502/8930	302/012	Understand and apply domestic cold water system installation, commissioning, service and maintenance techniques	9	76
K/502/9155	303/023	Understand and apply domestic hot water system installation, commissioning, service and maintenance techniques	9	76
M/502/9156	304/024	Understand and apply domestic central heating system installation, commissioning, service and maintenance techniques	12	98
T/502/9157	305/025	Understand and carry out electrical work on domestic plumbing and heating systems and components	12	102
T/502/8381	337	Install, commission and de-commission gas pipework up to 35mm 1¼ diameter in domestic and small commercial premises	19	115
H/502/8487	338	Specific core installation and maintenance	21	120
J/502/9390	339	Understand core gas safety principles for natural gas within domestic building services engineering	13	120
T/502/8302	340	Maintain gas warm air central heating systems and appliances	11	54
F/502/8299	341	Install domestic gas warm air central heating appliances	12	54
D/502/9296	344/026	Understand and apply domestic sanitation system installation, commissioning, service and maintenance techniques	8	72
K/502/9298	345	Install, commission, service and maintain domestic plumbing and heating systems	3	4

**Note:** Completion of this qualification combination will provide evidence of competence to Gas Safe Register in the following competence categories: CCN 1, CoNGLP 1PD, CPA 1, MET 1, DAH 1. The results of successful completion of the qualification will be downloaded to Gas Safe Register by City & Guilds.

## Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Water and Central Heating Appliances) (6189-33) (600/1134/8)

To achieve this qualification the learner must achieve 146 credits from the mandatory units.

Total qualification time = 1460 hours

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Mandatory units</b>				
D/503/8628	212	Tightness test, purge, commission and de-commission gas pipework up to 35mm 1¼ diameter in small natural gas installations	3	16
R/602/2498	301	Understand how to organise resources within BSE	3	26
K/502/8930	302/012	Understand and apply domestic cold water system installation, commissioning, service and maintenance techniques	9	76
K/502/9155	303/023	Understand and apply domestic hot water system installation, commissioning, service and maintenance techniques	9	76
M/502/9156	304/024	Understand and apply domestic central heating system installation, commissioning, service and maintenance techniques	12	98
T/502/9157	305/025	Understand and carry out electrical work on domestic plumbing and heating systems and components	12	102
T/502/8381	337	Install, commission and de-commission gas pipework up to 35mm 1¼ diameter in domestic and small commercial premises	19	115
H/502/8487	338	Specific core installation and maintenance	21	120
J/502/9390	339	Understand core gas safety principles for natural gas within domestic building services engineering	13	120
T/502/8459	342	Maintain gas water heating and wet central heating appliances	16	75
Y/502/8454	343	Install domestic gas water heaters and wet central heating appliances	18	134
D/502/9296	344/026	Understand and apply domestic sanitation system installation, commissioning, service and maintenance techniques	8	72
K/502/9298	345	Install, commission, service and maintain domestic plumbing and heating systems	3	4

**Note:** Completion of this qualification combination will provide evidence of competence to Gas Safe Register in the following competence categories: CCN 1, CoNGLP 1PD, CPA 1, MET 1, CENWAT. The results of successful completion of the qualification will be downloaded to Gas Safe Register by City & Guilds.

## Level 3 NVQ Diploma in Domestic Heating (6189-41) (600/1473/8)

To achieve this qualification the learner must achieve 48 credits from the mandatory group units, plus:

- a minimum of 29 credits from the **Oil Firing Fuel pathway** (16 credits from the mandatory Oil Firing pathway units plus 13 credits from the Oil Firing Pressure Jet Appliances route or 13 credits from the Oil Firing Vaporising Appliances route) or
- a minimum of 29 credits from the **Solid Fuel pathway** (16 credits from the core mandatory Solid Fuel pathway units plus 13 credits from the Solid Mineral Fuel route or 15 credits from the Biomass Fuel route) or
- 12 credits from the **Environmental pathway** (2 credits from the core mandatory unit in the Environmental pathway plus 10 credits from the Solar Thermal route or 10 credits from the Heat Pumps route or 10 credits from the Water Recycling route).

Total qualification time = 480 hours

### Mandatory group

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Mandatory units</b>				
R/602/2498	301	Understand how to organise resources within BSE	3	26
K/502/8930	302/012	Understand and apply domestic cold water system installation, commissioning, service and maintenance techniques	9	76
K/502/9155	303/023	Understand and apply domestic hot water system installation, commissioning, service and maintenance techniques	9	76
M/502/9156	304/024	Understand and apply domestic central heating system installation, commissioning, service and maintenance techniques	12	98
T/502/9157	305/025	Understand and carry out electrical work on domestic plumbing and heating systems and components	12	102
A/502/8933	306	Install, commission, service and maintain domestic heating systems	3	4

## Pathways

### Oil Firing Fuel Pathway

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Core mandatory units within pathway</b>				
H/502/9557	307	Understand core oil firing safety principles within domestic building services engineering	12	110
L/502/9391	308	Apply core oil firing safety within domestic building services engineering	4	6
<b>Oil firing pressure jet appliances (option within pathway)</b>				
D/502/9394	309	Understand the principles of domestic oil firing pressure jet appliances	7	60
M/502/9402	310	Service and maintain domestic oil firing pressure jet appliances	3	4
Y/502/9393	311	Install, test and commission domestic oil firing pressure jet appliances	3	4
<b>Oil firing vaporising appliances (option within pathway)</b>				
A/502/9404	312	Install, test and commission domestic oil firing vaporising appliances	3	4
F/502/9405	313	Service and maintain domestic oil firing vaporising appliances	3	4
T/502/9403	314	Understand the principles of domestic oil firing vaporising appliances	7	60
<b>Solid Fuel Pathway</b>				
Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Core mandatory units within pathway</b>				
J/502/9406	315	Understand core solid fuel safety principles within domestic building services engineering	12	110
L/502/9407	316	Apply core solid fuel safety within domestic building services engineering	4	6
<b>Solid Mineral Fuel (option within pathway)</b>				
L/502/9410	317	Service and maintain domestic solid mineral fuel burning appliances	3	4
R/502/9408	318	Understand the principles of domestic solid mineral fuel burning appliances	7	60
Y/502/9409	319	Install, test and commission domestic solid mineral fuel burning appliances	3	4
<b>Biomass Fuel (option within pathway)</b>				
H/502/9414	320	Service and maintain domestic biomass fuel burning appliances	2	3
K/502/9415	321	Install, test and commission domestic biomass fuel burning appliances	3	4
R/502/9411	322	Understand the installation and commissioning	7	60

		principles of biomass fuel burning appliances		
Y/502/9412	323	Understand the service and maintenance principles of biomass fuel burning appliances	3	22

### Environmental Pathway

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
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#### Core mandatory unit within pathway

K/602/3138	324	Understand the fundamental principles and requirements of environmental technology systems	2	15
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#### Solar Thermal Route (option within pathway)

F/602/3100	325	Know the requirements to install, commission and handover solar thermal hot water systems	4	35
L/602/3102	326	Install, commission and handover 'active' solar thermal hot water systems	2	15
Y/602/3104	327	Know the requirements to inspect, service and maintain 'active' solar thermal hot water systems	2	15
K/602/3107	328	Inspect, service and maintain 'active' solar thermal hot water systems	2	15

#### Heat Pumps Route (option within pathway)

D/602/3072	329	Install, commission and handover heat pumps non-refrigerant circuits	2	15
F/602/3078	330	Know the requirements to inspect, service and maintain heat pump system installations non-refrigerant circuits	2	15
L/602/3083	331	Inspect, service and maintain heat pump installations non-refrigerant circuits	2	15
Y/602/3054	332	Know the requirements to install, commission and handover heat pump systems non-refrigerant circuits	4	35

#### Water Recycling Route (option within pathway)

A/602/3130	333	Inspect, service and maintain rainwater harvesting and greywater reuse systems	2	15
K/602/3110	334	Install, commission and handover rainwater harvesting and greywater reuse systems	2	15
M/602/3111	335	Know the requirements to inspect, service and maintain rainwater harvesting and greywater reuse systems	2	15
T/602/3109	336	Know the requirements to install, commission and handover rainwater harvesting and greywater reuse systems	4	35

### Level 3 NVQ Diploma in Domestic Heating (Gas Fired Warm Air Appliances) (EUSGU0021) (6189-42) (600/1116/6)

To achieve this qualification the learner must achieve 127 credits from the mandatory units.

Total qualification time = 1270 hours

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Mandatory units</b>				
D/503/8628	212	Tightness test, purge, commission and de-commission gas pipework up to 35mm 1¼ diameter in small natural gas installations	3	16
R/602/2498	301	Understand how to organise resources within BSE	3	26
K/502/8930	302/012	Understand and apply domestic cold water system installation, commissioning, service and maintenance techniques	9	76
K/502/9155	303/023	Understand and apply domestic hot water system installation, commissioning, service and maintenance techniques	9	76
M/502/9156	304/024	Understand and apply domestic central heating system installation, commissioning, service and maintenance techniques	12	98
T/502/9157	305/025	Understand and carry out electrical work on domestic plumbing and heating systems and components	12	102
A/502/8933	306	Install, commission, service and maintain domestic heating systems	3	4
T/502/8381	337	Install, commission and de-commission gas pipework up to 35mm 1¼ diameter in domestic and small commercial premises	19	115
H/502/8487	338	Specific core installation and maintenance	21	120
J/502/9390	339	Understand core gas safety principles for natural gas within domestic building services engineering	13	120
T/502/8302	340	Maintain gas warm air central heating systems and appliances	11	54
F/502/8299	341	Install domestic gas warm air central heating appliances	12	54

**Note:** Completion of this qualification combination will provide evidence of competence to Gas Safe Register in the following competence categories: CCN 1, CoNGLP 1PD, CPA 1, MET 1, DAH 1. The results of successful completion of the qualification will be downloaded to Gas Safe Register by City & Guilds.

## Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Water and Central Heating Appliances) (EUSGU0022) (6189-43) (600/1117/8)

To achieve this qualification the learner must achieve 138 credits from the mandatory units.

Total qualification time = 1380 hours

Unit accreditation no.	City & Guilds unit no.	Unit title	Credit value	GLH
<b>Mandatory units</b>				
D/503/8628	212	Tightness test, purge, commission and de-commission gas pipework up to 35mm 1¼ diameter in small natural gas installations	3	16
R/602/2498	301	Understand how to organise resources within BSE	3	26
K/502/8930	302/012	Understand and apply domestic cold water system installation, commissioning, service and maintenance techniques	9	76
K/502/9155	303/023	Understand and apply domestic hot water system installation, commissioning, service and maintenance techniques	9	76
M/502/9156	304/024	Understand and apply domestic central heating system installation, commissioning, service and maintenance techniques	12	98
T/502/9157	305/025	Understand and carry out electrical work on domestic plumbing and heating systems and components	12	102
A/502/8933	306	Install, commission, service and maintain domestic heating systems	3	4
T/502/8381	337	Install, commission and de-commission gas pipework up to 35mm 1¼ diameter in domestic and small commercial premises	19	115
H/502/8487	338	Specific core installation and maintenance	21	120
J/502/9390	339	Understand core gas safety principles for natural gas within domestic building services engineering	13	120
T/502/8459	342	Maintain gas water heating and wet central heating appliances	16	75
Y/502/8454	343	Install domestic gas water heaters and wet central heating appliances	18	134

**Note:** Completion of this qualification combination will provide evidence of competence to Gas Safe Register in the following competence categories: CCN 1, CoNGLP 1PD, CPA 1, MET 1, CENWAT. The results of successful completion of the qualification will be downloaded to Gas Safe Register by City & Guilds.

## Total Qualification Time

Total Qualification Time (TQT) is the total amount of time, in hours, expected to be spent by a Learner to achieve a qualification. It includes both guided learning hours (which are listed separately) and hours spent in preparation, study and assessment.

<b>Title and level</b>	<b>GLH</b>	<b>TQT</b>
City & Guilds Level 3 NVQ Diploma in Domestic Plumbing and Heating	549	680
City & Guilds Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Water and Central Heating Appliances)	1034	1460

## 3 Centre requirements

This section outlines the centre approval processes and any resources that centres will need in place to offer these qualifications, including qualification-specific requirements for centre staff.

### 3.1 Approval process

To offer this qualification, new centres will need to gain both centre and qualification approval. Please refer to the **Centre Manual - Supporting Customer Excellence** for further information.

Centres that are currently delivering either the 6089 or the 6129 Level 3 schemes, and have been active during the last two years, will be granted automatic approval for registration.

### 3.2 Physical resources and site agreements

It is acceptable for centres to use specially designated areas within a centre to teach practical skills and to assess the simulated practical assignments within the combination units. The equipment, systems and machinery must meet current industrial standards and be capable of being used under normal working conditions.

### 3.3 Safety

The need for candidates to wear appropriate clothing whilst in workshops or project areas cannot be over-emphasised. Candidates should wear overalls and safety shoes. Safety hats should be worn when working in any site simulation area; these areas should be designated as hard hat areas and appropriate signs displayed. All other items of Personal Protective Equipment (PPE) shall be provided and worn as appropriate. It is the responsibility of the centre to ensure that PPE is provided and worn.

### 3.4 Candidate entry requirements

Candidates should not be entered for a qualification of the same type, content and level as that of a qualification they already hold.

There are no formal entry requirements for candidates undertaking these qualifications. However, centres must ensure that candidates have the potential and opportunity to gain the qualifications successfully.

#### **Age restrictions**

These qualifications are not approved for use by candidates under the age of 16, and City & Guilds cannot accept any registrations for candidates in this age group.

#### **Other legal considerations**

All legal requirements related to the subject matter must be met by candidates and centres.

**Note:** Centres teaching qualifications/units that contain work on gas fittings, appliances, etc need to comply with the requirements of the Gas Safety (Installation & Use) Regulations 1998. Whilst there are a number of noted exclusions within these regulations for colleges or other training establishments (see Regulation 2 (7)) it should be remembered that they do have to comply with Regulations 3 (1) to (5) and (7).

### 3.5 Human resources

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be technically competent in the areas for which they are delivering training and/or have experience of providing training; this knowledge must be at least to the same level as the training being delivered
- hold the appropriate qualifications detailed in this handbook
- have recent relevant experience in the specific area they will be assessing
- be occupationally knowledgeable in the areas of plumbing and heating for which they are delivering training; this knowledge must be at least to the same level as the training being delivered and must include up-to-date knowledge of each industry (for which the assessment is taking place), its settings, legislative and regulatory requirements, codes of practice and guidance
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal quality assurer, but must never internally quality assure their own assessments.

### 3.6 Assessors and internal quality assurers (Summit Skills units)

**Note:** The following information applies to Summit Skills units only (Units 301 to 336 inclusive).

#### Assessors must:

- be working towards or have achieved A1 or A2 Standards and continue to practice to those standards, or
- have achieved D32 or D33 or TQFE/TQSE and possess CPD evidence of practicing to A1 or A2 Standards, or
- have other suitable 'equivalent assessor qualifications' endorsed by Summit Skills, which apply the principles of the A1/A2 Standards.

#### Assessor occupational competence

Assessors must have verifiable relevant industry experience and current knowledge of industry working practices and techniques relevant to the occupational working area. This verifiable evidence must be **at or above the level being assessed** and include one or more of the following:

- A relevant qualification. Assessors must be able to demonstrate that they are registered and up-to-date with their registration with an appropriate approved industry registration body or have one or more of a relevant occupational qualification to ensure that they can be regarded as occupationally competent in terms of assessing or verifying the relevant qualifications and units therein.
- NVQs/SVQs at Level 3 as a minimum or their equivalents:
  - Plumbing
  - Plumbing (Domestic) (SVQ)
  - Heating and Ventilating Installation (Domestic)

If older forerunner qualifications are held such as the City & Guilds Craft Certificate in Plumbing, then the assessor must have completed CPD updating as outlined under assessor continuing professional development.

Assessment of competence-based units/qualifications for mechanical services occupations will require assessors **to have the relevant qualification** that certifies their competence in key technical areas pertinent to the completion of the unit/qualification.

### **Assessor continuing professional development**

The occupational competence of assessors must be updated on a regular basis and be periodically reconfirmed via Continuing Professional Development (CPD) via the assessment centres and quality assured by City & Guilds.

It is the responsibility of each assessor to identify and make use of opportunities for CPD, such as industry conferences, access to trade journals, and SSC and Professional Body/Trade Association events, at least on an annual basis to enhance and upgrade their professional development and technical knowledge. It is imperative that records are kept of all such CPD opportunities/occasions and that they provide evidence of cascading such technical knowledge and industry intelligence to all relevant colleagues.

### **Internal quality assurers' role and responsibilities**

The Sector Skills Council, Summit Skills considers the main focus of internal quality assurers to be the quality assurance of assessment procedures. The internal quality assurer is also required to have a minimum of occupational experience evidenced by having a building services engineering sector-related qualification or proven sector competence/experience, plus access to relevant 'occupational expertise' to enable them to conduct their role as internal quality assurer appropriately. This evidence and access to 'occupational expertise' is quality assured by City & Guilds.

#### **Internal quality assurers must:**

be working towards or have achieved the V1 Standard and continue to practice to that standard, or have achieved D34 and possess CPD evidence of practicing to the V1 Standard, and

- demonstrate an understanding of the assessment process.

### **Internal Quality Assurers' Continuing Professional Development**

The occupational experience of internal quality assurers must be updated on a regular basis and be periodically reconfirmed via Continuing Professional Development (CPD) via the assessment centres and quality assured by City & Guilds.

It is the responsibility of each internal quality assurer to identify and make use of opportunities for CPD, such as industry conferences, access to trade journals, and SSC and Professional Body/Trade Association events, at least on an annual basis to enhance and upgrade their professional development and technical knowledge.

It is imperative that records are kept of all such CPD opportunities/occasions.

### **Conflict of interests**

Assessors involved in providing direct training to a learner, either as part of a group or on a 'one to one' basis should not carry out assessment for any of those trained aspects. Alternatively, centres must agree effective quality control measures (includes enhanced IQA and data monitoring) with the assessment organisation to ensure that any potential conflicts of interest do not have an adverse effect on assessment outcomes. Any potential conflict of interest must be documented and available for scrutiny in line with our [Quality Assurance Requirements](#)

For further details of onsite assessments please refer to the '*Gas common assessment strategy*' on our website

### **Expert witnesses**

Where expert witnesses are used in the assessment process identified above they must be sector competent individuals who can attest to the learner's performance in the workplace. It is not necessary for expert witnesses to hold an assessor qualification, as a qualified assessor must assess the performance evidence provided by an expert witness. Evidence from expert witnesses must meet the tests of validity, reliability, authenticity and sufficiency.

Expert witnesses will need to demonstrate that they have:

- relevant current knowledge of industry working practices and techniques
- no conflict of interest in the outcome of their evidence.

### 3.7 Assessors and internal quality assurers (EU Skills units)

**Note:** The following information applies to EU Skills units (212, 337, 338, 340, 341, 342, 343) only

#### Roles and Responsibilities

##### Principal Assessor

To include the following:

- Occupationally competent<sup>^</sup> in the sector/qualification being assessed.
- Assessor qualified and registered with the centre.
- Principal Assessors must be fully conversant with the assessments and subject to annual review by an IQA.

The centre's assessors for all the City & Guilds and Blue Flame Associates ISA's and Question Papers contained in the Assessors Packs - Part 1 & 2 (GSR Alignment) and Candidate Assessment Pack (GSR Alignment) must meet the requirements of the 'Principal Assessor' as listed as role requirements of the Principal Assessor above.

##### Expert Observer

To include the following:

- Occupationally competent<sup>^</sup>, suitably experienced, trained and registered with the centre.
- Training must include the requirements of assessment and the completion of related direct observation documentation.
- Training must be documented and recorded within quality assurance documentation and be subject to annual review by an IQA
- Expert Observers will be subject to the same internal quality assurance process as Assessors (see note\* relating to enhanced quality assurance).
- Expert Observers must demonstrate proof of gas safe registration

##### Direct observations

Must be carried out by a:

- Principal Assessor - **OR**
- Expert Observer

Where direct observation is carried out by the expert observer, the observation documentation must be counter signed by the principal assessor and subject to \*enhanced quality assurance.

##### Expert Witness

To include the following:

- Expert witnesses will be required to sign candidate evidence such as reflective accounts, witness testimonies and supporting documents to authenticate and ensure validity.
- Expert witnesses must be occupationally competent<sup>^</sup> and have \*\*suitable industry experience
- Expert witnesses must demonstrate proof of gas safe registration.

##### Mentor

To include the following:

- Primary responsibilities are to offer support and guidance to Candidates throughout the Programme and confirm suitability for assessment.
- Occupationally competent<sup>^</sup> and have suitable industry experience.

### **Internal Quality Assurer**

To include the following:

- Qualified in internal quality assurance and either occupationally competent<sup>^</sup> in the sector/qualification being quality assured or accompanied by an independent occupationally competent<sup>^</sup> person where required.

### **Notes:**

\*Enhanced quality assurance could include, additional IQA observations, detailed feedback, regular review, increased sampling and detailed action planning

\*\*Suitable experience - personnel will have experience applying their skills and associated competences within industry and it is expected they have a minimum of 2 years post qualification experience

Where either Expert Observers, Expert Witnesses and Mentors are the same person the centre must identify, record and mitigate any conflicts of interest and risk to impartiality

<sup>^</sup>must hold a current certificate of gas safety competence in the areas of gas work that is not more than five years old (either current Accredited Certification Scheme (ACS) Certificates of Gas Safety Competence or an aligned qualification are acceptable).

### **Conflict of interests**

Assessors involved in providing direct training to a learner, either as part of a group or on a 'one to one' basis should not carry out assessment for any of those trained aspects.

Alternatively, centres must agree effective quality control measures (includes enhanced IQA and data monitoring) with the certification body (this could be an assessment organisation or awarding body etc.) to ensure that any potential conflicts of interest do not have an adverse effect on assessment outcomes. Any potential conflict of interest must be documented and available for scrutiny in line with the certification bodies conflict of interests policy.

## 4 Course design and delivery

### 4.1 Initial assessment and induction

Centres will need to make an initial assessment of each candidate prior to the start of their programme to ensure they are entered for an appropriate type and level of qualification. The initial assessment should identify any:

- specific training needs the candidate has, and the support and guidance they may require when working towards their qualifications (this is sometimes referred to as diagnostic testing)
- units the candidate has already completed, or credit they have accumulated which is relevant to the qualification they are about to begin.

City & Guilds recommends that centres provide an induction programme to ensure the candidate fully understands:

- the requirements of the qualification they will work towards
- their responsibilities as a candidate
- the responsibilities of the centre.

It may be helpful to record the information on a learning contract.

### 4.2 Recommended delivery strategies

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification(s) before designing a course programme.

The SSCs (Summit Skills and EU Skills) expect knowledge only and combination units to be completed before performance only units are undertaken by the candidate.

**Important note to centres:** When delivering this qualification, it is necessary to ensure candidates have knowledge of legislative requirements that considers each devolved nation of the United Kingdom.

Centres may design course programmes of study in any way which:

- best meets the needs and capabilities of their candidates
- satisfies the requirements of the qualifications.

When designing and delivering the course programme, centres might wish to incorporate other teaching and learning that is not assessed as part of the qualifications. This might include the following:

- literacy, language and/or numeracy
- personal learning and thinking
- personal and social development
- employability.

Where applicable, this could involve enabling the candidate to access relevant qualifications covering these skills.

For further information to assist with the planning and development of the programme, please refer to the City & Guilds log books.

## 5 Assessment

### 5.1 Summary of assessment methods

There are four types of units within these qualifications:

<b>Knowledge Unit (K)</b>	A unit that gives the learner the opportunity to demonstrate their knowledge and understanding of identified topics and subject areas.
<b>Performance Unit (P)</b>	A unit that gives the learner the opportunity to demonstrate they have the practical skills that are in keeping with the relevant National Occupational Standards for identified activities.
<b>Combination Unit (C)</b>	A unit that gives the learner the opportunity to demonstrate their understanding and application of specific knowledge, and is assessed in simulated conditions using particularly identified 'relevant practical activities'.
<b>Gas Unit (G)</b>	A unit that gives the learner the opportunity to demonstrate their knowledge, understanding and practical skills of gas work in accordance with the National Occupational Standards for identified activities. These units are assessed in accordance with EU Skills Assessment Strategy and the additional requirements laid out in this document. These units will be assessed via gas specific question papers, assignments, Independent Summative Assessments (ISA) and the completion of the gas unit specific logbooks (as appropriate).

For these units/qualifications, candidates will be required to complete the following assessments:

<b>Unit No.</b>	<b>Title</b>	<b>Assessment Method</b>	<b>Unit type</b>	<b>Where to obtain assessment materials</b>
212	Tightness test, purge, commission and de-commission gas pipework up to 35mm 1¼ diameter in small natural gas installations	This unit will be assessed via gas question papers, gas assignment, Independent Summative Assessments (ISA) and the development of a portfolio using the gas unit logbooks and will be assessed to the assessment criteria set out in the unit.	G	<p>All assessment materials and logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Relevant question papers and ISA's for specific qualifications are listed on the appropriate 'Quick Guide' on the <b>6189 webpage</b>.</p> <p>Passwords for the gas question papers and ISA's are available from our partner Blue Flame Associates using the application form, which is also available on the <b>6189 page of the City &amp; Guilds website</b>.</p> <p>Passwords for the gas unit logbook and assignment are available on the Walled Garden.</p>
301	Understand how to organise resources within BSE	<p>City &amp; Guilds on-line multiple choice test.</p> <p>The test covers the all of the knowledge in the unit.</p>	K	Examination provided on e-assessment.
302/012	Understand and apply domestic cold water system installation, commissioning, service and maintenance techniques	<p>City &amp; Guilds on-line multiple choice test.</p> <p>Externally set knowledge and practical assignments, locally marked and externally verified. Assignment (6189-302).</p> <p>The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.</p>	C	<p>Examination provided on e-assessment.</p> <p>The assignments can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the assignments are available on the Walled Garden.</p>

303/ 023	Understand and apply domestic hot water system installation, commissioning, service and maintenance techniques	<p>City &amp; Guilds on-line multiple choice test.</p> <p>Externally set knowledge and practical assignments, locally marked and externally verified. Assignment (6189-303).</p> <p>The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.</p>	C	<p>Examination provided on e-assessment.</p> <p>The assignments can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the assignments are available on the Walled Garden.</p>
304/ 024	Understand and apply domestic central heating system installation, commissioning, service and maintenance techniques	<p>City &amp; Guilds on-line multiple choice test.</p> <p>Externally set knowledge and practical assignments, locally marked and externally verified. Assignment (6189-304).</p> <p>The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.</p>	C	<p>Examination provided on e-assessment.</p> <p>The assignments can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the assignments are available on the Walled Garden.</p>
305/ 025	Understand and carry out electrical work on domestic plumbing and heating systems and components	<p>City &amp; Guilds on-line multiple choice test.</p> <p>Externally set assignment, locally marked and externally verified. Assignment (6189-305).</p> <p>The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.</p>	C	<p>Examination provided on e-assessment.</p> <p>The assignments can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the assignments are available on the Walled Garden.</p>
306	Install, commission, service and maintain domestic heating systems	<p>This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.</p>	P	<p>The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the plumbing unit logbooks are available on the Walled Garden.</p> <p>Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b>.</p>

307/ 107/ 507	Understand core oil firing safety principles within domestic building services engineering	There are two options to complete the assessment for this unit. City & Guilds on-line multiple choice test. 307  <b>Or</b>  City & Guilds on-line multiple choice test 107 and externally set assignment, locally marked and externally verified. Assignment (6189-507).	K	Examination provided on e-assessment.   The assignments can be found on the <b>City &amp; Guilds website</b> .  Passwords for the assignments are available on the Walled Garden.
308	Apply core oil firing safety within domestic building services engineering	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b> .  Passwords for the plumbing unit logbooks are available on the Walled Garden.  Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b> .
309	Understand the principles of domestic oil firing pressure jet appliances	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
310	Service and maintain domestic oil firing pressure jet appliances	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b> .  Passwords for the plumbing unit logbooks are available on the Walled Garden.  Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b> .

311	Install, test and commission domestic oil firing pressure jet appliances	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	<p>The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the plumbing unit logbooks are available on the Walled Garden.</p> <p>Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b>.</p>
312	Install, test and commission domestic oil firing vaporising appliances	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	<p>The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the plumbing unit logbooks are available on the Walled Garden.</p> <p>Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b>.</p>
313	Service and maintain domestic oil firing vaporising appliances	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	<p>The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the plumbing unit logbooks are available on the Walled Garden.</p> <p>Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b>.</p>
314	Understand the principles of domestic oil firing vaporising appliances	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
315	Understand core solid fuel safety principles within domestic building services engineering	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.

316	Apply core solid fuel safety within domestic building services engineering	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	<p>The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the plumbing unit logbooks are available on the Walled Garden.</p> <p>Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b>.</p>
317	Service and maintain domestic solid mineral fuel burning appliances	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	<p>The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the plumbing unit logbooks are available on the Walled Garden.</p> <p>Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b>.</p>
318	Understand the principles of domestic solid mineral fuel burning appliances	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
319	Install, test and commission domestic solid mineral fuel burning appliances	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	<p>The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the plumbing unit logbooks are available on the Walled Garden.</p> <p>Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b>.</p>
320	Service and maintain domestic biomass fuel burning appliances	Externally set assignment, locally marked and externally verified. Assignment (6189-320). The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.	C	<p>The assignment can be found on the <b>City &amp; Guilds website</b>.</p> <p>The password for the assignment is available on the Walled Garden.</p>

321	Install, test and commission domestic biomass fuel burning appliances	Externally set assignment, locally marked and externally verified. Assignment (6189-321). The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.	C	The assignment can be found on the <b>City &amp; Guilds website</b> .  The password for the assignment is available on the Walled Garden.
322	Understand the installation and commissioning principles of biomass fuel burning appliances	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
323	Understand the service and maintenance principles of biomass fuel burning appliances	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
324	Understand the fundamental principles and requirements of environmental technology systems	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
325	Know the requirements to install, commission and handover solar thermal hot water systems	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
326	Install, commission and handover 'active' solar thermal hot water systems	Externally set assignment, locally marked and externally verified. Assignment (6189-326). The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.	C	The assignment can be found on the <b>City &amp; Guilds website</b> .  The password for the assignment is available on the Walled Garden.

327	Know the requirements to inspect, service and maintain 'active' solar thermal hot water systems	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
328	Inspect, service and maintain 'active' solar thermal hot water systems	Externally set assignment, locally marked and externally verified. Assignment (6189-328). The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.	C	The assignment can be found on the <b>City &amp; Guilds website</b> . The password for the assignment is available on the Walled Garden.
329	Install, commission and handover heat pumps non-refrigerant circuits	Externally set assignment, locally marked and externally verified. Assignment (6189-329). The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.	C	The assignment can be found on the <b>City &amp; Guilds website</b> . The password for the assignment is available on the Walled Garden.
330	Know the requirements to inspect, service and maintain heat pump system installations non-refrigerant circuits	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
331	Inspect, service and maintain heat pump installations non-refrigerant circuits	Externally set assignment, locally marked and externally verified. Assignment (6189-331). The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.	C	The assignment can be found on the <b>City &amp; Guilds website</b> . The password for the assignment is available on the Walled Garden.

332	Know the requirements to install, commission and handover heat pump systems non-refrigerant circuits	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
333	Inspect, service and maintain rainwater harvesting and greywater reuse systems	Externally set assignment, locally marked and externally verified. Assignment (6189-333). The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.	C	The assignment can be found on the <b>City &amp; Guilds website</b> . The password for the assignment is available on the Walled Garden.
334	Install, commission and handover rainwater harvesting and greywater reuse systems	Externally set assignment, locally marked and externally verified. Assignment (6189-334). The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.	C	The assignment can be found on the <b>City &amp; Guilds website</b> . The password for the assignment is available on the Walled Garden.
335	Know the requirements to inspect, service and maintain rainwater harvesting and greywater reuse systems	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.
336	Know the requirements to install, commission and handover rainwater harvesting and greywater reuse systems	City & Guilds on-line multiple choice test. The test covers the all of the knowledge in the unit.	K	Examination provided on e-assessment.

337	Install, commission and de-commission gas pipework up to 35mm 1¼ diameter in domestic and small commercial premises	This unit will be assessed via gas question papers, gas assignment, Independent Summative Assessments (ISA) and the development of a portfolio using the gas unit logbooks and will be assessed to the assessment criteria set out in the unit.	G	<p>All assessment materials and logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Relevant question papers and ISA's for specific qualifications are listed on the appropriate 'Quick Guide' on the <b>6189 webpage</b>.</p> <p>Passwords for the gas question papers and ISA's are available from our partner Blue Flame Associates using the application form, which is also available on the <b>6189 page of the City &amp; Guilds website</b>.</p> <p>Passwords for the gas unit logbook and assignment are available on the Walled Garden.</p>
338	Specific core installation & maintenance	This unit will be assessed via gas question papers and Independent Summative Assessments (ISA)	G	<p>All assessment materials and logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Relevant question papers and ISA's for specific qualifications are listed on the appropriate 'Quick Guide' on the <b>6189 webpage</b>.</p> <p>Passwords for the gas question papers and ISA's are available from our partner Blue Flame Associates using the application form, which is also available on the <b>6189 page of the City &amp; Guilds website</b>.</p>
339	Understand core gas safety principles for natural gas within domestic building services engineering	This unit will be assessed via gas question papers and Independent Summative Assessments (ISA)	G	<p>All assessment materials and logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Relevant question papers and ISA's for specific qualifications are listed on the appropriate 'Quick Guide' on the <b>6189 webpage</b>.</p> <p>Passwords for the gas question papers and ISA's are available from our partner Blue Flame Associates using the application form, which is also available on the <b>6189 page of the City &amp; Guilds website</b>.</p>

340	Maintain gas warm air central heating systems and appliances	This unit will be assessed via gas question papers, gas assignment, Independent Summative Assessments (ISA) and the development of a portfolio using the gas unit logbooks and will be assessed to the assessment criteria set out in the unit.	G	<p>All assessment materials and logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Relevant question papers and ISA's for specific qualifications are listed on the appropriate 'Quick Guide' on the <b>6189 webpage</b>.</p> <p>Passwords for the gas question papers and ISA's are available from our partner Blue Flame Associates using the application form, which is also available on the <b>6189 page of the City &amp; Guilds website</b>.</p> <p>Passwords for the gas unit logbook and assignment are available on the Walled Garden.</p>
341	Install domestic gas warm air central heating appliances	This unit will be assessed via gas question papers, gas assignment, Independent Summative Assessments (ISA) and the development of a portfolio using the gas unit logbooks and will be assessed to the assessment criteria set out in the unit.	G	<p>All assessment materials and logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Relevant question papers and ISA's for specific qualifications are listed on the appropriate 'Quick Guide' on the <b>6189 webpage</b>.</p> <p>Passwords for the gas question papers and ISA's are available from our partner Blue Flame Associates using the application form, which is also available on the <b>6189 page of the City &amp; Guilds website</b>.</p> <p>Passwords for the gas unit logbook and assignment are available on the Walled Garden.</p>
342	Maintain gas water heating and wet central heating appliances	This unit will be assessed via gas question papers, gas assignment, Independent Summative Assessments (ISA) and the development of a portfolio using the gas unit logbooks and will be assessed to the assessment criteria set out in the unit.	G	<p>All assessment materials and logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Relevant question papers and ISA's for specific qualifications are listed on the appropriate 'Quick Guide' on the <b>6189 webpage</b>.</p> <p>Passwords for the gas question papers and ISA's are available from our partner Blue Flame Associates using the application form, which is also available on the <b>6189 page of the City &amp; Guilds website</b>.</p> <p>Passwords for the gas unit logbook and assignment are available on the Walled Garden.</p>

343	Install domestic gas water heaters and wet central heating appliances	This unit will be assessed via gas question papers, gas assignment, Independent Summative Assessments (ISA) and the development of a portfolio using the gas unit logbooks and will be assessed to the assessment criteria set out in the unit.	G	<p>All assessment materials and logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Relevant question papers and ISA's for specific qualifications are listed on the appropriate 'Quick Guide' on the <b>6189 webpage</b>.</p> <p>Passwords for the gas question papers and ISA's are available from our partner Blue Flame Associates using the application form, which is also available on the <b>6189 page of the City &amp; Guilds website</b>.</p> <p>Passwords for the gas unit logbook and assignment are available on the Walled Garden.</p>
344/ 026	Understand and apply domestic sanitation system installation, commissioning, service and maintenance techniques	<p>City &amp; Guilds on-line multiple choice test.</p> <p>Externally set knowledge and practical assignments, locally marked and externally verified. Assignment (6189-344).</p> <p>The assessment covers the knowledge requirement of the unit and assesses all learning outcomes to verify coverage of the unit.</p>	C	<p>Examination provided on e-assessment.</p> <p>The assignments can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the assignments are available on the Walled Garden.</p>
345	Install, commission, service and maintain domestic plumbing and heating systems	This unit will be assessed via observation and the development of a portfolio in a working environment and will be assessed to the assessment criteria set out in the unit.	P	<p>The plumbing unit logbooks can be found on the <b>City &amp; Guilds website</b>.</p> <p>Passwords for the plumbing unit logbooks are available on the Walled Garden.</p> <p>Alternatively, centres may wish to use approved e-portfolios, more details are available on the <b>Learning Assistant section of the City &amp; Guilds website</b>.</p>

## 5.2 Principles of Assessment (Summit Skills Units)

**Note:** The following information applies to Summit Skills units only (Units 301 to 336 inclusive).

### Evidence requirements

The evidence requirements and City & Guilds Assessment Strategy for these qualifications has been designed within the confines of the SSC Summit Skills 'Consolidated Assessment Strategy for Units and Qualifications of 'Occupational Competence' in the Qualifications and Credit Framework (England, Northern Ireland and Wales) for the Building Services Engineering Sector' (April 2010 v2.1a 06.10)'.

**Knowledge units** must be undertaken in line with the City & Guilds Assessment Strategy for each unit as detailed in this Handbook. All knowledge only units for the qualifications are assessed by online multiple choice tests.

Evidence that is sourced from the real working environment for **performance units** must be naturally occurring and can be generated by:

- direct observation of performance in the workplace by a qualified assessor and/or testimony from an expert witness subject to the activity being assessed; this will be the primary source of evidence
- candidate's reflective account of performance
- work plans and work based products, eg diagrams, drawings, specifications, customer testimony, authorised and authenticated photographs/images and audiovisual records of work completed
- evidence from prior achievements that demonstrably match the requirements of the performance unit
- witness testimony.

Meeting the assessment requirements of **performance units** will need initial discussions and assessment planning between the learner and assessor, as an essential activity to identify opportunities to assess real working environment evidence, gaps that need to be filled or opportunities to recognise the prior achievement of the learner.

Competence must be demonstrated **consistently over a period of time and on more than one occasion**. Unless specifically stated otherwise within the unit, there is no stipulation of what that period of time might be as this is a decision for the assessor. Based on their own professional judgement assessors must be capable of identifying when competence has been demonstrated by the learner.

### Simulation and simulated conditions (performance units)

#### Permissible

Simulation can take place in those rare circumstances where the opportunities to collect naturally occurring evidence are limited or absent and the learner lacks evidence for completion of the unit. However, this scenario is anticipated to be rare in relation to the qualifications and the units to which this strategy applies given the inherent flexibility of the evidence-gathering process.

## **Mandatory**

Simulation **must** take place for industry-identified key safety critical aspects of the qualifications as listed below:

- activities relating to F Gas installations/service and maintenance
- pressure testing
- handling of refrigerants (ODS, Ammonia, HC and CO<sub>2</sub>)
- thermal pipe joining methods:
  - welding
  - brazing
  - soldering activities
- limited scope electrical work
- as relevant, the installation, connection and servicing/maintenance of fuel systems and equipment:
  - gas
  - oil
  - solid fuel
- as relevant, the installation, connection and servicing/maintenance of hot/cold water systems and equipment:
  - unvented water
  - backflow prevention.

The activities that will be undertaken demonstrating competence in these areas are contained within each industries '**Assessment of Occupational Competence**' arrangement and this must not be undertaken before the learner has demonstrated sufficient technical expertise, knowledge, skill and maturity.

Where simulation does take place it must be in a realistic working environment and/or an independent assessment structure.

## **Industry arrangements for the assessment of occupational competence**

This is an independent part of the assessment process. Each industry will have its own arrangements which will be compliant with the following requirements:

- activities relating to limited scope electrical work
- assessment in the following competence areas must meet the minimum standards laid down by the following bodies and be capable of facilitating separate operative registration (without further assessment and training) with industry recognised bodies approved to register operatives in the listed competence area:
  - Water Regulations – DEFRA (WRAS)
  - Unvented hot water – Building Regulations/Standards
  - Energy efficiency – Building Regulations/Standards (Part L1 of the Building Regulations in England & Wales)
  - Gas – gas registration provider
  - Oil – OFTEC
  - Solid fuel – HETAS
  - Electrical – defined scope Part P electrics
  - Emerging technologies – MTC proposals (Competent Persons Schemes).

## **Additional delivery and assessment requirements**

MES Electrical Unit: 305/025 Understand and carry out electrical work on domestic plumbing and heating systems and components (T/502/9157).

In relation to the delivery and assessment of the above unit, the two statements below **must** be prominently included in any learner and assessor / assessment support and guidance documentation for the unit and/or the qualification the unit is a component of:

- A learner who completes this unit is **not** competent to inspect and test a complete electrical installation. The competencies identified in the unit and demonstrated by the learner are only applicable to **electrically operated mechanical services components and controls** up to 230V single phase supply.
- Individuals responsible for the delivery and / or assessment of this unit must provide auditable evidence that, as a minimum, they have the competencies that equate with the **Learning Outcomes and Assessment Criteria** of the unit.

### 5.3 Test specifications

The way the knowledge is covered by each test is laid out in the tables below:

Unit	Outcome	Number of questions	%
301	Know the responsibilities of relevant people in the building services industry	7	35
	Know how to oversee building services work	3	15
	Know how to produce risk assessments and method statements for the building services industry	4	20
	Know how to plan work programmes for work tasks in the building services industry	6	30
	<b>Total</b>	<b>20</b>	<b>100</b>

Unit	Outcome	Number of questions	%
302	Know the legislation relating to the installation and maintenance of cold water supplied for domestic purposes	3	6
	Know the types of cold water system layout used in multi-storey dwellings	6	12
	Know the types of cold water system layout used with single occupancy dwellings fed by private water supplies	6	12
	Know the requirements for backflow protection in plumbing systems	7	14
	Know the uses of specialist components in cold water systems	3	6
	Know the design techniques for cold water systems	4	8
	Know the fault diagnosis and rectification procedures for cold water systems and components	10	20
	Know the commissioning requirements of cold water systems and components	11	22
	<b>Total</b>	<b>50</b>	<b>100</b>

Unit	Outcome	Number of questions	%
303	Know the types of hot water system and their layout requirements	14	26
	Know the uses of specialist components in hot water systems	3	5
	Know the design techniques for hot water systems	7	13
	Know the installation requirements of hot water systems and components	10	18
	Know the fault diagnosis and rectification procedures for hot water systems and components	10	18
	Know the commissioning requirements of hot water systems and components	11	20
	<b>Total</b>	<b>55</b>	<b>100</b>

Unit	Outcome	Number of questions	%
304	Know the types of central heating system and their layout requirements	11	22
	Know the design techniques for central heating systems	14	28
	Know the installation requirements of central heating systems and components	5	10
	Know the fault diagnosis and rectification procedures for central heating systems and components	9	18
	Know the commissioning requirements of central heating systems and components	11	22
	<b>Total</b>	<b>50</b>	<b>100</b>

Unit	Outcome	Number of questions	%
305	Know the electrical standards that apply to the mechanical services industry	2	5
	Know the principles of electricity supply to buildings	2	5
	Know the layout features of electrical circuits in buildings	9	25
	Understand the electrical industry safe isolation procedure	2	5
	Know the site preparation techniques for the electrical connection of mechanical services components	4	10
	Understand the installation and connection requirements of electrically operated mechanical services components	5	15
	Know the inspection and testing requirements of electrically operated mechanical services components	5	15
	Know the procedures for safely diagnosing and rectifying faults in electrically operated mechanical services components	7	20
	<b>Total</b>	<b>36</b>	<b>100</b>

Unit	Outcome	Number of questions	%
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307	Know the oil supply legislation that applies to work in dwellings	6	7
	Know the types of oil storage tank, associated fittings and installation requirements in dwellings	9	11
	Know the positioning requirements of oil storage tanks in dwellings	8	9
	Know the installation requirements of oil supply pipelines in dwellings	14	16
	Know the sizing requirements of oil storage and supply systems in dwellings	3	4
	Know how to test oil pipework for soundness	2	2
	Know the fault diagnosis and rectification procedures for oil supply systems in dwellings	4	5
	Know the decommissioning requirements of oil storage tanks	3	4
	Know the combustion process and the types of burners used in oil fired appliances in dwellings	9	10
	Know the ventilation requirements of oil fired appliances installed in dwellings	8	9
	Know the standards of chimneys and flue systems to be used with oil fired appliances in dwellings	13	15
	Know how to test oil fired appliance flue systems in dwellings for effective operation	5	6
	Know how to identify and respond to unsafe situations relating to oil systems and appliances in dwellings	2	2
	<b>Total</b>	<b>86</b>	<b>100</b>

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
107	Know the oil supply legislation that applies to work in dwellings	6	11
	Know how to test oil pipework for soundness	2	5
	Know the fault diagnosis and rectification procedures for oil supply systems in dwellings	4	8
	Know the decommissioning requirements of oil storage tanks	2	4
	Know the combustion process and the types of burners used in oil fired appliances in dwellings	9	17
	Know the ventilation requirements of oil fired appliances installed in dwellings	8	15
	Know the standards of chimneys and flue systems to be used with oil fired appliances in dwellings	13	25
	Know how to test oil fired appliance flue systems in dwellings for effective operation	5	10
	Know how to identify and respond to unsafe situations relating to oil systems and appliances in dwellings	2	5
	<b>Total</b>	<b>51</b>	<b>100</b>

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
309	Know the types of pressure jet oil fired appliance and their	3	6

	operating principles		
	Know the condensate disposal requirements of condensing oil fired appliances	3	6
	Know the energy efficiency legislation applicable to pressure jet oil fired appliances	3	6
	Know the factors to be considered when selecting pressure jet oil fired appliances to meet customers needs	6	12
	Know the installation requirements of pressure jet oil fired appliances	3	6
	Know the fault diagnosis and rectification procedures for pressure jet oil fired appliances	10	20
	Know the range of equipment used to commission pressure jet oil fired appliances	4	8
	Know the commissioning requirements of pressure jet oil fired appliances	12	24
	Know the decommissioning requirements of pressure jet oil fired appliances	6	12
	<b>Total</b>	<b>50</b>	<b>100</b>

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
314	Know the types of vaporising oil fired appliance and their operating principles	5	11
	Know the energy efficiency legislation applicable to vaporising oil fired appliances	2	4
	Know the factors to be considered when selecting vaporising oil fired appliances to meet customers needs	4	8
	Know the installation requirements of vaporising oil fired appliances	3	7
	Know the fault diagnosis and rectification procedures for vaporising oil fired appliances	9	20
	Know the range of equipment used to commission vaporising oil fired appliances	4	8
	Know the commissioning requirements of vaporising oil fired appliances	13	29
	Know the decommissioning requirements of vaporising oil fired appliances	6	13
	<b>Total</b>	<b>46</b>	<b>100</b>

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
315	Know the solid fuel legislation that applies to work in dwellings	6	9
	Know the types of solid fuels and the factors affecting fuel selection	4	6
	Know the basic operating principles of solid fuel appliances	5	8
	Know the factors which affect the selection of solid fuel appliances	5	8
	Know the combustion process and the principles of safe	7	11

	combustion of solid fuels		
	Know the ventilation requirements of solid fuel appliances installed in dwellings	6	9
	Know the standards of chimneys and flue systems to be used with solid fuel appliances in dwellings	14	21
	Know the methods of diagnosing problems with flue/chimney performance	4	6
	Know the requirements for hearths and fireplace surrounds to solid fuel appliances	5	8
	Know how to test solid fuel appliances and associated flue systems in dwellings for effective operation	7	11
	Know how to identify and respond to unsafe situations relating to solid fuel flue systems and appliances in dwellings	2	3
	<b>Total</b>	<b>65</b>	<b>100</b>

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
318	Know the types of solid mineral fuel appliance and their operating principles	6	13
	Know the energy efficiency legislation applicable to solid mineral fuel appliances	3	6
	Know the factors to be considered when selecting solid mineral fuel appliances to meet customers needs	6	13
	Know the installation requirements of solid mineral fuel appliances	3	6
	Know the fault diagnosis and rectification procedures for solid mineral fuel appliances	9	19
	Know the range of equipment used to commission solid mineral fuel appliances	2	4
	Know the commissioning requirements of solid mineral fuel appliances	12	26
	Know the decommissioning requirements of solid mineral fuel appliances	6	13
	<b>Total</b>	<b>47</b>	<b>100</b>

Unit	Outcome	Number of questions	%
322	Know the types of biomass appliance and their operating principles	5	15
	Know the energy efficiency legislation applicable to biomass appliances	3	8
	Know the factors to be considered when selecting biomass appliances to meet customers' needs	5	15
	Know the installation requirements of biomass appliances	2	5
	Know the range of equipment used to commission biomass appliances	3	8
	Know the commissioning requirements of biomass appliances	12	33
	Know the decommissioning requirements of biomass appliances	6	16
	<b>Total</b>	<b>36</b>	<b>100</b>

Unit	Outcome	Number of questions	%
323	Know the requirements for the routine service of biomass appliances	4	34
	Know the how to diagnose faults in biomass appliances	4	33
	Know how to rectify faults in biomass appliances	4	33
	<b>Total</b>	<b>12</b>	<b>100</b>

Unit	Outcome	Number of questions	%
324	Know the fundamental working principles of micro-renewable energy and water conservation technologies	10	36
	Know the fundamental requirements of building location/building features for the potential to install micro-renewable energy and water conservation systems to exist	9	32
	Know the fundamental regulatory requirements relating to micro-renewable energy and water conservation technologies	4	16
	Know the typical advantages and disadvantages associated with micro-renewable energy and water conservation technologies	4	16
	<b>Total</b>	<b>27</b>	<b>100</b>

Unit	Outcome	Number of questions	%
325	Know the health and safety risks and safe systems of work associated with solar thermal hot water system installation work	3	5
	Know the requirements of relevant regulations/standards relating to practical installation, testing and commissioning activities for solar thermal hot water system installation work	3	5
	Know the types and layouts of solar thermal hot water system	3	5
	Know the purpose of components used within solar thermal hot water system installations	2	4
	Know the types and key operating principles of solar collectors	3	5
	Know the information requirements to enable system component selection and sizing	3	5
	Know the fundamental techniques used to select, size and position components for solar thermal hot water systems	10	20
	Know how the performance of solar hot water systems is measured	2	4
	Know the preparatory work required for solar thermal hot water system installation work	3	5
	Know the requirements for connecting solar thermal hot water system collector circuits to combination boiler domestic hot water circuits	2	4
	Know the requirements for installing solar collector arrays	5	9
	Know the requirements for installing for solar thermal hot water system pipework	6	11
	Know the requirements to test and commission solar thermal hot water system installations	8	14
	Know the requirements to handover solar thermal hot water systems	2	4
	<b>Total</b>	<b>55</b>	<b>100</b>

Unit	Outcome	Number of questions	%
327	Know the requirements for the routine service and maintenance of 'active' solar thermal hot water systems	6	40
	Know how to diagnose faults in 'active' solar thermal hot water system installations	5	33
	Know how to rectify faults in 'active' solar thermal hot water systems	4	27
	<b>Total</b>	<b>15</b>	<b>100</b>

Unit	Outcome	Number of questions	%
330	Know the requirements for the non-refrigerant circuit routine service and maintenance of heat pump system installations	5	50
	Know how to diagnose faults in heat pump system installations	3	30

	Know how to rectify non-refrigerant circuit faults in heat pump system installations	2	20
	<b>Total</b>	<b>10</b>	<b>100</b>
<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
332	Know the health and safety risks and safe systems of work associated with heat pump system installation work (non-refrigerant circuits)	2	2
	Know the requirements of relevant regulations/standards relating to practical installation, testing and commissioning activities for heat pump installation work	4	5
	Know the purpose and operational characteristics of heat pump unit and heat pump system components	5	6
	Know the different types of heat pump units and system arrangements for hydraulic emitter circuits	6	8
	Know the fundamental principles of heat pump selection and system design that are common to both air and ground source heat pumps	24	32
	Know the fundamental design principles for ground source 'closed loop' heat pump collector circuit design, component sizing and installation	15	20
	Know the layouts of 'open loop' water filled heat pump collector circuits	1	1
	Know the fundamental design considerations and principles that are specific to air source heat pumps	3	4
	Know the preparatory work required for heat pump installation work	3	4
	Know the requirements to install and test heat pump systems (non-refrigerant circuits)	6	8
	Understand the requirements to commission heat pump system installations (non-refrigerant circuits)	4	5
	Understand the requirements to handover heat pump system installations	4	5
	<b>Total</b>	<b>77</b>	<b>100</b>
<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
335	Know the requirements for the routine service and maintenance of rainwater harvesting and reuse systems	7	58
	Know how to diagnose faults in rainwater harvesting and greywater reuse systems	3	25
	Know how to rectify faults in rainwater harvesting and greywater reuse systems	2	17
	<b>Total</b>	<b>12</b>	<b>100</b>
<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>

336	Know the health and safety risks and safe systems of work associated with rainwater harvesting and greywater reuse system installation work	2	5
	Know the requirements of relevant regulations/standards relating to practical installation, testing and commissioning activities for solar thermal hot water system installation work	3	6
	Know the types and layouts of rainwater harvesting and greywater reuse system used for single premises installations	4	8
	Know the purpose of components used within rainwater harvesting and greywater reuse systems	2	5
	Know the information requirements to enable rainwater harvesting and greywater reuse system component selection and sizing	3	6
	Know the fundamental techniques used to select, size and position components for rainwater harvesting and greywater reuse systems	12	25
	Know options and requirements for the treatment of water in biological, physical, biomechanical and hybrid rainwater harvesting/greywater recycling systems	4	8
	Know the preparatory work required for rainwater harvesting and greywater recycling system installation work	3	6
	Know the requirements for installing rainwater harvesting and greywater reuse storage tanks	2	5
	Know the requirements for installing for rainwater harvesting and greywater recycling system pipework	3	6
	Know the requirements to test and commission rainwater harvesting and greywater re-use system installations	7	15
	Know the requirements to handover rainwater harvesting and greywater recycling systems	2	5
	<b>Total</b>	<b>47</b>	<b>100</b>

<b>Unit</b>	<b>Outcome</b>	<b>Number of questions</b>	<b>%</b>
344	Know the types of sanitation system and their layout requirements	6	15
	Know the design techniques for sanitation and rainwater systems	11	28
	Understand the installation requirements of sanitation system components	7	17
	Know the fault diagnosis and rectification procedures for sanitary pipework systems and components	7	17
	Know the commissioning requirements of sanitary pipework systems and components	9	23
	<b>Total</b>	<b>40</b>	<b>100</b>

**All questions reflect BS EN 806 with the exception of those relating to pressure testing which are in relation to Water Regulations.**

## 5.4 Permitted open book reference materials

Reference materials permitted for:

- Unit 325 Know the requirements to install, commission and handover solar thermal hot water systems
- Unit 327 Know the requirements to inspect, service and maintain 'active' solar thermal hot water systems

Publication	Edition/ Version	Author/ Publisher	ISBN:
Solar Heating Design and Installation Guide	2007	CIBSE	9781903287842
CE 131 Solar water heating systems – guidance for professionals, conventional indirect models	March 2006	Energy Saving Trust	
Water Regulations Guide: including the Water Byelaws 2000 (Scotland)	2001	WRAS	9780953970803
BS 5918 Solar Heating systems for domestic hot water	1989	BSI	0 580 16616 3

Reference materials permitted for:

- Unit 330 Know the requirements to inspect, service and maintain heat pump system installations non-refrigerant circuits
- Unit 332 Know the requirements to install, commission and handover heat pump systems non-refrigerant circuits

Publication	Edition/ Version	Author /Publisher	ISBN:
BS EN 15450: 2007 Heating systems in buildings: Design of heat pump heating systems		BSI	9780580563850
TR/30 – Guide to Good Practice Heat Pumps	2007	HVCA	0903783584
CE 82 Domestic Ground Source Heat Pumps: Design and installation of closed-loop systems	2007	Energy Saving Trust	
Water Regulations Guide: including the Water Byelaws 2000 (Scotland)	2001	WRAS	9780953970803

Reference materials permitted for:

- Unit 335 Know the requirements to inspect, service and maintain rainwater harvesting and greywater reuse systems
- Unit 336 Know the requirements to install, commission and handover rainwater harvesting and greywater reuse systems

Publication	Edition/ Version	Author /Publisher	ISBN:
BS8515: 2009 Rainwater harvesting systems – Code of Practice		BSI	9780580604904
BS8525 – 1:2010 Greywater systems – Part 1: Code of Practice			9780580634758
Rainwater Harvesting Design & Installation	2010	CIBSE	9781906846084

Guide			
Water Regulations Guide: including the Water Byelaws 2000 (Scotland)	2001	WRAS	9780953970803

Reference materials permitted for:

- Unit 302/012 Understand and apply domestic cold water system installation, commissioning, service and maintenance techniques

<b>Publication</b>
Water Regulations Guide by Laurie Young & Graham May, published by WRAS, 2000
BS EN 806- Specification for installations inside buildings conveying water for human consumption (parts 1-5)
BS 8558- Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages – Complementary guidance to BS EN 806
Building Regulations Approved Document G (P in Northern Ireland), freely downloaded at <a href="http://www.planningportal.gov.uk">www.planningportal.gov.uk</a> ( <a href="http://www.dfpni.gov.uk">www.dfpni.gov.uk</a> in Northern Ireland)
OFWAT guaranteed standards scheme paper freely downloaded from <a href="http://www.ofwat.gov.uk">www.ofwat.gov.uk</a>
The Water Supply (Water Fittings) Regulations freely downloaded from <a href="http://www.legislation.gov.uk">www.legislation.gov.uk</a>

Reference materials permitted for:

- Unit 303/023 Understand and apply domestic hot water system installation, commissioning, service and maintenance techniques

<b>Publication</b>
Water Regulations Guide by Laurie Young & Graham May, published by WRAS, 2000
BS EN 806- Specification for installations inside buildings conveying water for human consumption (parts 1-5)
BS 8558- Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages – Complementary guidance to BS EN 806
Building Regulations Approved Document G (P in Northern Ireland), freely downloaded at <a href="http://www.planningportal.gov.uk">www.planningportal.gov.uk</a> ( <a href="http://www.dfpni.gov.uk">www.dfpni.gov.uk</a> in Northern Ireland)
Domestic Building Services Compliance Guide, freely downloaded at <a href="http://www.planningportal.gov.uk">www.planningportal.gov.uk</a>
The Water Supply (Water Fittings) Regulations freely downloaded from <a href="http://www.legislation.gov.uk">www.legislation.gov.uk</a>

Reference materials permitted for:

- Unit 304/024 Understand and apply domestic central heating system installation, commissioning, service and maintenance techniques

<b>Publication</b>
Water Regulations Guide by Laurie Young & Graham May, published by WRAS, 2000
ISBN 1 903287 40 5 CIBSE Domestic Heating Design Guide, revised 2011

Domestic Building Services Compliance Guide, freely downloaded at:  
[www.planningportal.gov.uk](http://www.planningportal.gov.uk)

Reference materials permitted for:

- Unit 305/025 Understand and carry out electrical work on domestic plumbing and heating systems and components

**Publication**

IET On-Site Guide (BS 7671:2008 Wiring Regulations, incorporating Amendment 3:2015)

Reference materials permitted for:

- Unit 322 Understand the installation and commissioning principles of biomass fuel burning appliances

**Publication**

Domestic Building Services Compliance Guide 2010 or 2013 edition

Reference materials permitted for:

- Unit 344/026 Understand and apply domestic sanitation system installation, commissioning, service and maintenance techniques

**Publication**

BS 6465 part 2 - Code of practice for space requirements for sanitary appliances

BS EN 12056 part 2 - BS EN 12056: 2 - Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation

Building Regulations Approved Document H (N in Northern Ireland), freely downloaded at [www.planningportal.gov.uk](http://www.planningportal.gov.uk) ([www.dfpni.gov.uk](http://www.dfpni.gov.uk) in Northern Ireland)

## **5.5 Recognition of Prior Learning (RPL)**

Recognition of prior learning means using a person's previous experience or qualifications already achieved to contribute to a new qualification. If learners have completed the 6129 or the 6089, see Appendix 3 for RPL guidance.

## Appendix 1 Sources of general Information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on [www.cityandguilds.com](http://www.cityandguilds.com).

**Centre Manual - Supporting Customer Excellence** contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance

**Our Quality Assurance Requirements** encompasses all of the relevant requirements of key regulatory documents such as:

- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

**Access to Assessment & Qualifications** provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such on such things as:

- **Walled Garden**: how to register and certificate candidates on line
- **Events**: dates and information on the latest centre events
- **Online assessment**: information on how to register for e-assessments.

## Appendix 2 Glossary of terms

### Summit Skills Assessment Strategy

Terminology	Explanation/Definition
Assessment of Occupational Competence	<p>A term specifically relating to a means of assessment of the safety-critical and technically critical aspects for the units and qualifications that are the subject of this assessment strategy. It is an independent holistic assessment of the learner's <b>occupational competence</b> via an assessment process as determined by the industry and endorsed by Summit Skills and the Awarding Organisation(s).</p> <p>In order to undertake this stage of the qualification's assessment procedure/requirements, evidence of a learner's involvement, relevant experience and progressive development of occupational competence must be available before an 'Assessment of Occupational Competence' is undertaken.</p>
RoC	Rules of Combination – a combination of units, determined by SummitSkills, that are required for a learner to be awarded an identified qualification.
Knowledge Unit	A unit that gives the learner the opportunity to demonstrate their knowledge and understanding of identified topics and subject areas.
Performance Unit	A unit that gives the learner the opportunity to demonstrate they have the practical skills that are in keeping with the relevant National Occupational Standards for identified activities.
Combination Unit	A unit that gives the learner the opportunity to demonstrate their understanding and application of specific knowledge, and is assessed in simulated conditions using particularly identified 'relevant practical activities'.
Simulation and Simulated Conditions	An environment in which simulated activities take place involving the replication of a real working environment. The criteria for which must be to supply fit-for-purpose tools, equipment, full-size components, realistic deadlines and other commercial requirements.
Independent Assessment Structure	The independent assessment structure must not be a part of the learner's working or training environment and will provide facilities for assessment in keeping with the industry arrangements (See Annex 3). Therefore, the learner will be independently assessed by an independent assessor in keeping with an industry determined specification.
Key safety-critical aspects	Any 'technical' activity with the potential to harm/damage personnel/property if carried out incorrectly (See section 4).

Technically critical Any activity that is fundamental to the safe and efficient operation of equipment, components and systems.

## EU Skills Assessment Strategy

<b>Terminology</b>	<b>Explanation/Definition</b>
Approved Centre	An organisation inspected by the Awarding Body and deemed to have the trained staff and resources to make assessment arrangements for particular qualifications.
Assessor	Person accountable to the qualification consultant (through the Internal Quality Assurer) who is both experienced and qualified/or working towards qualifications in assessing learners. Assessor skills include observation, evaluation, making judgements about individual performance. Assessors may be based in the workplace, in an approved centre such as a college, or be peripatetic, visiting learners in a variety of situations.
Assessment Plan	Between assessor and learner a structured approach is used to specify how, where and when evidence will be generated and what method of assessment will be used. This information is recorded, dated and signed by assessor and learner and is used as the basis for review meetings between learner and assessor.
Awarding Organisation	An organisation recognised by Ofqual for the purpose of awarding qualifications.
Learner	Employee or student / trainee who wishes to be assessed in order to gain a qualification (formerly referred to as a candidate).
Competence	An assessment based on the learner's ability to perform a task to a defined standard specified in the national occupational standards.
Evidence	The means by which a qualification consultant can be satisfied that an individual has been properly assessed, usually a combination of completed/endorsed witness statements, and assessments by a qualified assessor with additional documentation collected in a portfolio of evidence.
Qualification Consultant	(Previously known as the External Verifier.) Person accountable to the Awarding Body who by monitoring and advising Internal Quality Assurers and assessors effects quality assurance.
Internal Quality Assurer	(Previously known as the Internal Verifier.) Person accountable to the qualification consultant and the Awarding Body who is based in the approved centre and who co-ordinates assessment arrangements and monitors assessor standards.
National Standard of Work (Performance Criteria)	Required from learners to demonstrate their capability.
National Vocational Qualification	A qualification recognised by UKCES as being relevant to the need of industry.

Portfolio	A structured collection of evidence from several sources gathered together and referenced to the national occupational standards, in which a learner's achievements are recorded.
Real Work	Where the provision of the product or service by the learner, if not carried out, would require an organisation to employ someone else to do it.
Realistic Working Environment (RWE)	<p>An environment within which learners are producing performance evidence subject to the following conditions:</p> <ul style="list-style-type: none"> <li>• real work pressures (eg working hours, timescales, accountability, establishing priorities)</li> <li>• real work problems</li> <li>• real tools to do the job (eg real information, industry standard equipment)</li> <li>• a real client or customer.</li> </ul>
RPL	The Recognition of Prior Learning- the facility for an individual to receive credit for previously acquired (and still current) competence.
Technically & Occupationally Competent Witness	A gas operative who holds a current certificate of competence in the area of work for which they are providing witness testimony (these operatives must be a 'member of a class of persons' as outlined in Regulation 3(3) of the Gas Safety (Installation and Use) Regulations).

## Appendix 3 RPL– Additional requirements for achievements of qualification

NQF qualification already achieved	APL additional requirements for achievement of qualification
<p><b>Level 3 VRQ (6129-33 and 36)</b></p>	<p><b>6189-71- Level 3 NVQ Diploma in Domestic Plumbing and Heating APL route</b></p> <ul style="list-style-type: none"> <li>• Certificate in water supply (water fittings) water regulations 1999</li> <li>• Certificate covering the latest requirements of Part G (Building regulations)</li> <li>• All the units within the chosen pathway: <ul style="list-style-type: none"> <li><b>Oil firing pressure jet appliances</b> (345, 307, 308, 309, 310, 311)</li> <li><b>Oil firing vaporising appliances</b> (345, 307, 308, 312, 313, 314)</li> <li><b>Solid mineral fuel</b> (345, 315, 316, 317, 318, 319)</li> <li><b>Biomass fuel</b> (345, 315, 316, 320, 321, 322, 323)</li> <li><b>Solar thermal</b> (345, 324, 325, 326, 327, 328)</li> <li><b>Heat pumps</b> (345, 324, 329, 330, 331, 332)</li> <li><b>Water recycling</b> (345, 324, 333, 334, 335, 336)</li> </ul> </li> </ul> <p><b>* Achieve Level 3 6189-31- Level 3 NVQ Diploma in Domestic Plumbing and Heating (600/1122/1)*</b></p> <p><b>6189-72 - Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Warm Air Appliances) APL route</b></p> <ul style="list-style-type: none"> <li>• Certificate in water supply (water fittings) water regulations 1999</li> <li>• Certificate covering the latest requirements of Part G (Building regulations)</li> <li>• Complete units (212, 337, 338, 339, 340, 341, 345)</li> </ul> <p><b>* Achieve Level 3 6189-62 - Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Warm Air Appliances) (600/1124/5)*</b></p> <p><b>6189-73- Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Water and Central Heating Appliances) APL route</b></p> <ul style="list-style-type: none"> <li>• Certificate in water supply (water fittings) water regulations 1999</li> <li>• Certificate covering the latest requirements of Part G (Building regulations)</li> <li>• Complete units (212, 337, 338, 339, 342, 343, 345)</li> </ul> <p><b>* Achieve Level 3 6189-33 - Level 3 NVQ Diploma in Domestic Plumbing and Heating (Gas Fired Water and Central Heating Appliances) (600/1134/8)*</b></p>

	<p><b>6189-81 - Level 3 NVQ Diploma in Domestic Heating APL route</b></p> <ul style="list-style-type: none"> <li>• Certificate in water supply (water fittings) water regulations 1999</li> <li>• Certificate covering the latest requirements of Part G (Building regulations)</li> <li>• All the units within the chosen pathway:  <b>Oil firing pressure jet appliances</b> (306, 307, 308, 309, 310, 311)  <b>Oil firing vaporising appliances</b> (306, 307, 308, 312, 313, 314)  <b>Solid mineral fuel</b> (306, 315, 316, 317, 318, 319)  <b>Biomass fuel</b> (306, 315, 316, 320, 321, 322, 323)  <b>Solar thermal</b> (306, 324, 325, 326, 327, 328)  <b>Heat pumps</b> (306, 324, 329, 330, 331, 332)  <b>Water recycling</b> (306, 324, 333, 334, 335, 336)</li> </ul> <p><b>* Achieve Level 3 Level 3 NVQ Diploma in Domestic Heating (600/1473/8)</b></p> <p><b>6189-82 - Level 3 NVQ Diploma in Domestic Heating (Gas Fired Warm Air Appliances)</b></p> <ul style="list-style-type: none"> <li>• Certificate in water supply (water fittings) water regulations 1999</li> <li>• Certificate covering the latest requirements of Part G (Building regulations)</li> <li>• Complete units (212, 306, 337, 338, 339, 339, 340, 341)</li> </ul> <p><b>* Achieve Level 3 NVQ Diploma in Domestic Heating (Gas Fired Warm Air Appliances) (600/1116/6)*</b></p> <p><b>6189-83 - Level 3 NVQ Diploma in Domestic Heating (Gas Fired Water and Central Heating Appliances) (600/1117/8)</b></p> <ul style="list-style-type: none"> <li>• Certificate in water supply (water fittings) water regulations 1999</li> <li>• Certificate covering the latest requirements of Part G (Building regulations)</li> <li>• Complete units (212, 306, 337, 338, 339, 342, 343)</li> </ul> <p><b>* Achieve Level 3 Diploma in Domestic Heating (Gas Fired Water and Central Heating Appliances) (600/1117/8)*</b></p>
<p><b>Learners with L2 VRQ (6129-22 AND 26)</b></p>	<p><b>6189-74 Level 2 NVQ Diploma in Plumbing and Heating (APL)</b></p> <ul style="list-style-type: none"> <li>• Complete 019, 020.</li> </ul> <p><b>6189-75 Level 2 NVQ Diploma in Installing and Maintaining Domestic Heating Systems</b></p> <ul style="list-style-type: none"> <li>• Complete 019, 022.</li> </ul>

## Appendix 4 Relationships to other qualifications

### Links to other qualifications

City & Guilds offers a series of qualifications within the Plumbing & Heating industries for qualified learners to progress onto upon completion of this qualification.

This qualification has connections to the following within the Plumbing & Heating suite offered by City & Guilds:

- 3345-21 Level 3 Award in Water Supply (Water Fittings) Regulations and Water Byelaws in the UK
- 3345-31 Level 3 Award in the Installation, Commissioning and Safety Aspects of Hot Water Systems for Domestic Use in Accordance With UK Building Regulations

### 3345 Water Regulations & Unvented Hot Water Systems

#### 3345-21

To gain certification for the Level 3 Award in Water Supply (Water Fittings) Regulations and Water Byelaws in the UK candidates must have achieved a full certificate within the Level 3 6189 or 9189 suite of qualifications.

Centres can then register the learners on 3345-21 and claim the certification module 3345-820 which will then generate this certificate.

#### 3345-31

To gain certification for the Level 3 Award in the Installation, Commissioning and Safety Aspects of Hot Water Systems for Domestic Use in Accordance With UK Building Regulations candidates must have achieved a full certificate within the Level 3 6189 or 9189 suite of qualifications.

Centres can then register the learners on 3345-31 and claim the certification module 3345-830 which will then generate this certificate.

## City & Guilds

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