

# **Level 3 NVQ Diploma in Servicing and Maintaining Refrigeration Systems (6187-06)**

**Candidate performance evidence logbook**  
600/0991/3



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## **City & Guilds Group**

The City & Guilds Group operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes the Institute of Leadership & Management (management and leadership qualifications), City & Guilds Land Based Services (land-based qualifications), the Centre for Skills Development (CSD works to improve the policy and practice of vocational education and training worldwide) and Learning Assistant (an online e-portfolio).

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# Level 3 NVQ Diploma in Servicing and Maintaining Refrigeration Systems (6187-06)

## Candidate performance evidence logbook

<b>Qualification title</b>	<b>Number</b>	<b>QAN</b>
Level 3 NVQ Diploma in Servicing and Maintaining Refrigeration Systems	6187-06	600/0991/3

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# 1 About your candidate logbook

## 1.1 Contact details

<b>Candidate name</b>	
<b>Candidate enrolment no</b>	
<b>Centre name</b>	
<b>Centre number</b>	
<b>Programme start date</b>	
<b>Date of registration with City &amp; Guilds</b>	

Keep a record of relevant contact details in the space provided below. You may find it helpful to make a note of phone numbers and e-mail addresses here.

<b>Your Assessor(s)</b>	
<b>Your Internal Verifier</b>	
<b>Quality Assurance Contact</b>	

# 1 About your candidate logbook

## 1.2 Introduction to the logbook

This logbook will help you complete the units in City & Guilds' **Level 3 NVQ Diploma in Servicing and Maintaining Refrigeration Systems (6187-06)**. It contains forms you can use to record the evidence of what you have done.

### **About City & Guilds**

City & Guilds Limited (Registered Company 16513878) is the Awarding Organisation for City & Guilds qualifications.

Information about City & Guilds and our qualifications is available on our website **[www.cityandguilds.com](http://www.cityandguilds.com)**.

## 2 The assessment process

The following people at your centre will explain the assessment process and help you achieve your unit(s).

### **The assessor/tutor**

The assessor/tutor is the person you will have the most contact with as you work towards your unit(s). You may have more than one assessor/tutor depending on which unit(s) you take or you may be assessed by a person who is not your tutor.

### **The internal verifier**

The internal verifier maintains the quality of assessment within the centre.

### **The external verifier**

The external verifier works for City & Guilds and helps to ensure that your centre meets the required standards for quality and assessment.

## **3 Using your logbook**

### **Recording forms**

This logbook contains all of the forms you and your assessor will need to plan, review and organise your evidence. Your assessor will be able to help you decide which forms you need to complete and help you fill them in.

**Please photocopy these forms as required.**

## 4 Qualification structures

To achieve the **Level 3 NVQ Diploma in Servicing and Maintaining Refrigeration Systems (6187-06)**, learners must achieve **37** credits from the following **4** mandatory units.

<b>Unit accreditation number</b>	<b>City &amp; Guilds unit</b>	<b>Unit title</b>	<b>Credit value</b>
K/602/4998	302/602	Understand and carry out electrical work on RAC systems and components	12
R/602/2498	303	Understand how to organise resources within BSE	3
H/502/9302	309	Understand halocarbon 'fluorinated' refrigeration system service and maintenance techniques	19
F/502/9307	*311	Service and maintain halocarbon 'fluorinated' refrigeration systems	3

This Logbook includes only those units assessed by performance in the workplace (marked with an \*).

## 5 Overall Unit Sign-off

The following unit is included in the rules of combination for the **Level 3 NVQ Diploma in Servicing and Maintaining Refrigeration Systems (6187-06)**. Learners must achieve this portfolio unit to contribute towards achievement of the overall qualification.

City & Guilds unit	Unit title	Unit Achieved Yes/No	Assessor Initials	Date
311	Service and maintain halocarbon 'fluorinated' refrigeration systems			

### Declaration

I confirm that the evidence supplied for the above selected unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. I have been observed in my workplace by my assessor on several occasions.

<b>Candidate Name:</b>	
<b>Candidate Signature:</b>	
<b>Date:</b>	

I confirm that this candidate has achieved all the requirements of the selected unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

<b>Assessor Name:</b>	
<b>Assessor Signature:</b>	
<b>Date:</b>	

<b>IV Name:</b>	
<b>IV Signature:</b>	
<b>Date:</b>	

## Unit 311

## Service and maintain halocarbon ‘fluorinated’ refrigeration systems

**Level:** 3

**Credit value:** 3

**UAN:** F/502/9307

<b>Outcome 1</b>	<b>Be able to plan and prepare for the servicing and maintenance of halocarbon (fluorinated) refrigeration systems</b>			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	confirm that all information is available prior to planning service or maintenance activities			
2	confirm that all tools, equipment and materials are available and fit for use prior to commencement of the work			
3	confirm that all persons relevant to the service or maintenance activity are identified and that lines of communication are established			
4	ensure that all necessary risk assessment and safe working procedure development has been undertaken prior to work commencement			
5	carry out site survey to identify any variations or deviations to planned work or any structural or access issues which need to be resolved prior to work commencement			
6	identify safe storage arrangements for tools, equipment and materials prior to commencement of service or maintenance activity			
7	plan safe access to work areas and confirm with responsible person on site			
8	complete preparatory work as necessary for system service and maintenance activities, to include consideration of :			
	• location			
	• function			
	• cooling loads served			
	• record			
	• labelling.			

<b>Outcome 2</b>		<b>Be able to carry out the maintenance of halocarbon (fluorinated) refrigeration systems</b>			
Criteria		Candidate initials	Assessor initials	Evidence reference	
1	identify appropriate sources of information which impact upon the servicing and maintenance of halocarbon (fluorinated) refrigeration systems, including:				
	<ul style="list-style-type: none"> <li>• regulatory documents</li> </ul>				
	<ul style="list-style-type: none"> <li>• industry codes of practice</li> </ul>				
	<ul style="list-style-type: none"> <li>• manufacturer's instructions</li> </ul>				
	<ul style="list-style-type: none"> <li>• maintenance and service schedules</li> </ul>				
2	interpret maintenance schedules to identify required work activities				
3	perform the following service and maintenance tasks safely and efficiently:				
	<ul style="list-style-type: none"> <li>• cleaning and checking the condition of: <ul style="list-style-type: none"> <li>– condensers (including fans)</li> <li>– filters</li> <li>– indoor units</li> <li>– evaporators (including fans)</li> </ul> </li> </ul>				
	<ul style="list-style-type: none"> <li>• checking the condition of: <ul style="list-style-type: none"> <li>– pipework and its insulation</li> <li>– electrical wiring, fuses and connections</li> </ul> </li> </ul>				
	<ul style="list-style-type: none"> <li>• checking: <ul style="list-style-type: none"> <li>– water cooled condenser flow rate</li> <li>– air flow rate through condenser and evaporator</li> <li>– oil compressor charge</li> <li>– operation of all safety devices</li> <li>– condition and operation of all compression drives</li> </ul> </li> </ul>				
	4	check system operating conditions against control settings			
	5	measure humidity and temperature in the controlled space			
	6	reconnect or re-install system components after maintenance and then carry out the following checks and tests before running the system:			
		<ul style="list-style-type: none"> <li>• tightness testing</li> </ul>			
		<ul style="list-style-type: none"> <li>• evacuation and dehydration</li> </ul>			
		<ul style="list-style-type: none"> <li>• electrical testing</li> </ul>			

7	demonstrate procedures for replacing the refrigerant type in refrigeration systems, including:			
	<ul style="list-style-type: none"> <li>• selecting suitable replacement refrigerant types for different systems</li> </ul>			
	<ul style="list-style-type: none"> <li>• safely disposing of refrigerant that is to be replaced</li> </ul>			
	<ul style="list-style-type: none"> <li>• re-commissioning the system on completion of refrigerant replacement</li> </ul>			
8	re-charge refrigerant to correct quantity and check for leakage			
9	complete system performance test			
10	complete appropriate maintenance documentation and records.			

<b>Outcome 3</b>		<b>Be able to identify and rectify faults in halocarbon (fluorinated) refrigeration systems</b>		
Criteria		Candidate initials	Assessor initials	Evidence reference
1	diagnose common faults associated with:			
	<ul style="list-style-type: none"> <li>• compressors</li> </ul>			
	<ul style="list-style-type: none"> <li>• condensers</li> </ul>			
	<ul style="list-style-type: none"> <li>• suction and discharge</li> </ul>			
	<ul style="list-style-type: none"> <li>• compressor oil supply</li> </ul>			
	<ul style="list-style-type: none"> <li>• refrigerant supply</li> </ul>			
	<ul style="list-style-type: none"> <li>• metering</li> </ul>			
2	rectify common faults associated with:			
	<ul style="list-style-type: none"> <li>• compressors</li> </ul>			
	<ul style="list-style-type: none"> <li>• condensers</li> </ul>			
	<ul style="list-style-type: none"> <li>• suction and discharge</li> </ul>			
	<ul style="list-style-type: none"> <li>• compressor oil supply</li> </ul>			
	<ul style="list-style-type: none"> <li>• refrigerant supply</li> </ul>			
	<ul style="list-style-type: none"> <li>• metering</li> </ul>			
	<ul style="list-style-type: none"> <li>• electrical connections/supply.</li> </ul>			

<b>Outcome 4</b>	<b>Be able to carry out the commissioning of halocarbon (fluorinated) refrigeration systems</b>			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	revisit risk assessment and safe working procedure to confirm currency and validity prior to commencement of testing			
2	carry out the checks and tests in accordance with industry and safety requirements, including:			
	• checking:			
	– safety mechanisms			
	– emergency procedures			
	– insulated structure for heat leakage (use of thermographic testing techniques)			
	– the performance of the refrigeration system			
	– the electrical energy consumption of the plant			
	– defrost system controls and operation			
	– sediment levels in brine tanks			
	– filters (and cleaning)			
	– pumping arrangements for noise, vibration, rotary shaft seals, stuffing boxes			
	• inspecting:			
	– condenser coils and fans			
	– evaporators and fans			
– pressure relief valves				
– condensate drains				
– testing specific gravity of secondary refrigerant				
3	carry out the following tests in accordance with appropriate legislation:			
	• strength integrity test			
	• leak test			
	• pressure tightness test			
	• evacuation, dehydration and vacuum rise test			
4	compare pipework length with system factory charge and determine whether extra refrigerant charge is required			
5	add additional refrigerant charge by weight in accordance with manufacturer's instructions			

6	carry out basic electrical tests to confirm that system is safe to switch on:			
	• visual integrity check			
	• continuity			
	• insulation resistance			
	• polarity			
	• resistance to earth			
7	open system valves and run system			
8	complete checks to confirm system is leak free			
9	confirm that the system provides cooling and/or heating by measuring air flow temperature difference across indoor and outdoor unit heat exchangers			
10	record temperature differences			
11	remove analysers/gauges from systems without refrigerant loss			
12	replace valve caps and confirm valves are leak free.			

<b>Outcome 5</b>		<b>Be able to handover halocarbon (fluorinated) refrigeration systems</b>		
Criteria		Candidate initials	Assessor initials	Evidence reference
1	complete system records for hand over documentation, including those which detail:			
	• strength integrity test			
	• pressure tightness test			
	• evacuation and dehydration			
	• leak test			
	• system refrigerant charge and type			
	• performance testing			
	• electrical testing			
2	demonstrate system operation and operating controls to customer			
3	pass over system documentation and records to customer			
4	report to line manager that servicing or maintenance work is complete and fill in appropriate company documentation.			

<b>Outcome 6</b>	<b>Be able to carry out the de-commissioning of halocarbon (fluorinated) refrigeration systems</b>			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	follow appropriate risk assessments and method statements to ensure decommissioning activities are completed safely			
2	demonstrate work sequences for permanently decommissioning:			
	<ul style="list-style-type: none"> <li>a complete halocarbon (fluorinated) refrigeration system</li> </ul>			
	<ul style="list-style-type: none"> <li>part of a halocarbon (fluorinated) refrigeration system</li> </ul>			
3	demonstrate how oil, refrigerant and cleaning solvents can be safely recovered from a system and disposed of in accordance with appropriate regulations.			

## Unit 311

## Service and maintain halocarbon 'fluorinated' refrigeration systems

### Declaration

I confirm that the evidence supplied for this unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. I have been observed in my workplace by my assessor on several occasions.

<b>Candidate Name:</b>	
<b>Candidate Signature:</b>	
<b>Date:</b>	

I confirm that this candidate has achieved all the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

<b>Assessor Name:</b>	
<b>Assessor Signature:</b>	
<b>Date:</b>	

<b>IV Name:</b>	
<b>IV Signature:</b>	
<b>Date:</b>	

# On Site Assessment Plan / Feedback



Evidence Reference:	
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Qualification:  
Level:

Qualification number:

Candidate name:  
Assessor name:

Date:

<b>Candidate prepared for assessment</b> (Provide details below)	<b>Yes / No</b>	<b>Candidate requires support</b>	<b>Yes / No</b>
Candidate briefed on appeals procedure	Yes / No	Support required	

## Assessment Location / Address and postcode:

Type of work to be carried out:

Assessor Feedback:  
(Use Assessor continuation sheet if required)

Forward Planning:

Candidate Signature:		
Assessor Signature:		Date:
IV/IQA Name:	IV/IQA Signature:	Date:







# Photographic Supplementary Evidence



Evidence Reference:	
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Scheme / Award:

Scheme Number:

Level:

Candidate Name:

Unit Number:

**Brief description of task being carried out in the photograph (to be completed by candidate):**

**(Attach Photo in this Box)**

Location of photograph:

Candidate Signature:		
Assessor Signature:		Date:
IV/IQA Name:	IV/IQA Signature:	Date:

## Workplace Recorder Details



I confirm I am suitably experienced or qualified in line with the industry requirements to act as a witness for this learner. I acknowledge that I will only counter sign documentation requested by the learner where to my knowledge only the learner has completed the work and on the understanding that the work has been carried out to the acceptable standard.

Workplace Recorder Name:	
Workplace Recorder Signature:	Date:

I confirm I am suitably experienced or qualified in line with the industry requirements to act as a witness for this learner. I acknowledge that I will only counter sign documentation requested by the learner where to my knowledge only the learner has completed the work and on the understanding that the work has been carried out to the acceptable standard.

Workplace Recorder Name:	
Workplace Recorder Signature:	Date:

I confirm I am suitably experienced or qualified in line with the industry requirements to act as a witness for this learner. I acknowledge that I will only counter sign documentation requested by the learner where to my knowledge only the learner has completed the work and on the understanding that the work has been carried out to the acceptable standard.

Workplace Recorder Name:	
Workplace Recorder Signature:	Date:





# Appendix 1 Summary of City & Guilds assessment policies

## Health and Safety

All centres have to make sure that they provide a safe and healthy environment for learning, including induction and assessment. City & Guilds external verifiers check this when they visit assessment centres.

## Equal Opportunities

Your centre will have an equal opportunities policy. Your centre will explain this to you during your induction, and may give you a copy of the policy.

City & Guilds equal opportunities policy is available from our website [www.cityandguilds.com](http://www.cityandguilds.com), City & Guilds Customer Relations Team or your centre.

## Access to assessment

City & Guilds qualifications are open to all candidates, whatever their gender, race, creed, age or special needs. Some candidates may need extra help with their assessment, for example, a person with a visual impairment may need a reader.

If you think you will need alternative assessment arrangements because you have special needs, you should discuss this with your centre during your induction, and record this on your assessment plan. City & Guilds will allow centres to make alternative arrangements for you if you are eligible and if the qualification allows for this. This must be agreed before you start your qualification.

City & Guilds guidance and regulations document *Access to assessment and qualifications* is available on the City & Guilds website [www.cityandguilds.com](http://www.cityandguilds.com), from the City & Guilds Customer Relations Team or your centre.

## Complaints and appeals

Centres must have a policy and procedure to deal with any complaints you may have. You may feel you have not been assessed fairly, or may want to appeal against an assessment decision if you do not agree with your assessor.

These procedures will be explained during induction and you will be provided with information about the Quality Assurance Co-ordinator within your centre who is responsible for this.

Most complaints and appeals can be resolved within the centre, but if you follow the centre procedure and are still not satisfied you can complain to City & Guilds.

Our complaints policy is on our website [www.cityandguilds.com](http://www.cityandguilds.com) or is available from the City & Guilds Customer Relations Team or your centre.

## Useful contacts

### UK learners

General qualification information

T: +44 (0)844 543 0033

E: [learnersupport@cityandguilds.com](mailto:learnersupport@cityandguilds.com)

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### International learners

General qualification information

T: +44 (0)844 543 0033

F: +44 (0)20 7294 2413

E: [intcg@cityandguilds.com](mailto:intcg@cityandguilds.com)

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### Centres

Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: [centresupport@cityandguilds.com](mailto:centresupport@cityandguilds.com)

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### Single subject qualifications

Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

F: +44 (0)20 7294 2404 (BB forms)

E: [singlesubjects@cityandguilds.com](mailto:singlesubjects@cityandguilds.com)

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### International awards

Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: [intops@cityandguilds.com](mailto:intops@cityandguilds.com)

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### Walled Garden

Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: [walledgarden@cityandguilds.com](mailto:walledgarden@cityandguilds.com)

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### Employer

Employer solutions, Mapping, Accreditation, Development Skills, Consultancy

T: +44 (0)121 503 8993

E: [business@cityandguilds.com](mailto:business@cityandguilds.com)

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### Publications

Logbooks, Centre documents, Forms, Free literature

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

If you have a complaint, or any suggestions for improvement about any of the services that City & Guilds provides, email: [feedbackandcomplaints@cityandguilds.com](mailto:feedbackandcomplaints@cityandguilds.com)

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