

**SQA/SNIJIB**



# **Training and Assessment Programme for SVQ 3 SVQ level 3 Domestic Plumbing and Heating**

## **Final Competence Assessment**

### **Contents**

- ◆ **Introduction**
- ◆ **Electrical Test**
  - Test guidelines
  - Model answer
  - Learner feedback
- ◆ **Gas, Oil, Solid fuel Test**
  - Test guidelines
  - Model answer
  - Learner feedback
- ◆ **Unvented Hot Water Test**
  - Test guidelines
  - Model answer
  - Learner feedback
- ◆ **Backflow Prevention Test**
  - Test guidelines
  - Model answer
  - Learner feedback

## Introduction

The term Final Competence Assessment specifically relates to a means of assessment of the safety critical aspects for the SVQ. It is an independent holistic assessment of the SVQ candidate's occupational competence (skills and knowledge) via an assessment process as required by the industry and approved by the Awarding Body. This final assessment is a mandatory requirement for the achievement of the full qualification.

In order to undertake this final stage of the qualification's assessment procedure/requirements, evidence of a candidate's involvement, relevant experience and progressive competence development in the identified safety-critical and technically critical aspects of the qualification must be provided before the FCA.

Competence of these safety critical aspects must be assessed via simulated conditions. An extract from the assessment strategy outlining the safety critical aspects is shown below.

- ◆ activities relating to 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

It must be independent from the normal teaching and learning programme of the candidate although the same facilities equipment and materials used in training can be utilised for the formal assessment.

There is no requirement for an independent assessor to carry out final competence assessment, although it would be seen as good practice to use an assessor who has not been involved in the training of the candidate where time and staff resources within the centre permit this.

As holistic an approach as possible is to be encouraged towards final competence assessment. Due to the large range of the safety critical points it is permissible to use a series of FCAs, scheduled at appropriate points, to gather evidence of the relevant safety critical aspects the candidate is being assessed on. Any FCA should be undertaken at a point that suits both centre delivery and the readiness of the candidate to undertake such an assessment. Evidence of all key safety critical aspects relevant to the SVQ must be gathered under simulated conditions in a realistic work environment and made available for external verification.

# FCA Electrical — activities relating to limited scope electrical work

## End test

Carry out work on electrical systems

<b>Name:</b>	<b>Class:</b>	<b>Date:</b>
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### Candidate's instructions

You are required to exchange the electronic programmer of the central heating installation and test the operation of the controls and boiler, recording your findings below. The new programmer should have a different back plate and so you will have to alter the wiring to suit.

If the system does not work correctly, you should then identify the cause(s) of any fault(s) which you may have identified, recording the details below.

Following the identification of the cause(s) you should carry out any remedial work required.

You should also record any safe working methods and risk assessments required for all work involved.

You should also complete any documentation required by the work you have completed.

### PART 1 — Safe working methods and risk assessments

**Carry out work on electrical systems End test**

<b>Name:</b>	<b>Class:</b>	<b>Date:</b>
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**PART 2 — Faults/Defects identified****PART 3 — Remedial work required****PART 4 — Additional documentation required**

(Indicate below any documentation as needed, then complete the appropriate documents)

<b>Electrical Installation Testing</b>					
NON-WARRANTED ELECTRICAL INSTALLATION WORKS COMPLIANCE CERTIFICATE					
REQUIREMENTS FOR ELECTRICAL INSTALLATIONS — BS 7671 (IEE WIRING REGULATIONS)					
To be used only for minor electrical work associated with the installation of plumbing systems.					
<b>PART 1 — Description of electrical works associated with plumbing system</b>					
1	Description of works				
2	Location/address				
3	Date of completion				
<b>PART 2 — Installation details</b>					
1	System earthing arrangement		TNC-S	TN-s	TT
2	Method of protection against indirect contact				
3	Protective device for the installation/appliance	Type— BS		Rating	
4	Comments on existing installation, including adequacy of earthing and bonding arrangements				
<b>PART 3 — Essential tests</b>					
1	Earth continuity satisfactory				
2	Insulation resistance				
	Line — Neutral				
	Line — Earth				
	Neutral — Earth				
3	Polarity satisfactory?				
<b>PART 4 — Declaration</b>					
I/we CERTIFY that the said works do not impair the safety of the existing installation, that the said works have been designed, constructed, inspected and tested in accordance with BS 7671: ..... (IEE Wiring Regulations), amended to ..... and that the said works, to the best of my/our knowledge and belief, at the time of my/our inspection, complied with current standards and approved codes of practice.					
Name				Signature	
For and on behalf of:				Date	

**END TEST — Model Answer (Electrical)**

**PART 1 — Safe working methods and risk assessments**

**Visual inspection (may need to check operation).**

**Carry out Safe Isolation Procedure (shortened version of the nine steps)**

**Isolate the circuit being worked on (check it is safe and convenient to do so).**

**Prove test equipment is working correctly (use proving unit).**

**Confirm circuit is dead (test between L to N, L to E, N to E).**

**Re-prove test equipment (use proving unit).**

**Secure isolator, lock off and label.**

**PART 2 — Faults/Defects identified**

**Visual inspection (may need to check operation).**

**Carry out Safe Isolation Procedure (shortened version of the nine steps)**

**Isolate the circuit being worked on (check it is safe and convenient to do so).**

**Prove test equipment is working correctly (use proving unit).**

**Confirm circuit is dead (test between L to N, L to E, N to E).**

**Re-prove test equipment (use proving unit).**

**Secure isolator, lock off and label.**

**Trace fault through continuity checks (wiring diagram available).**

**(Faults may be incorrectly wired room thermostat, boiler thermostat or any other fault that is easily put in place.)**

**PART 3 — Remedial work required**

**Remedial work for Fault as found.**

**PART 4 — Additional documentation required**

(Indicate below any documentation as needed, then complete the appropriate documents)

NON-WARRANTED ELECTRICAL INSTALLATION WORKS COMPLIANCE CERTIFICATE

<b>Electrical Installation Testing</b>					
NON-WARRANTED ELECTRICAL INSTALLATION WORKS COMPLIANCE CERTIFICATE REQUIREMENTS FOR ELECTRICAL INSTALLATIONS — BS 7671 (IEE WIRING REGULATIONS) To be used only for minor electrical work associated with the installation of plumbing systems.					
<b>PART 1 — Description of Electrical works associated with plumbing system</b>					
1 Description of works	<b>Replacing Central heating Programmer</b>				
2 Location/address	_____ @ _____ <b>College/Training Centre</b>				
3 Date of completion	<b>## /##/####</b>				
<b>PART 2 — Installation details</b>					
1 System earthing arrangement	<b>As found</b>	TNC-S	TN-s	TT	
2 Method of protection against indirect contact	<b>ADS (Automatic Disconnection Of Supply) 17th or EEBADS (Earth Equipotential Bonding and Automatic Disconnection Of Supply) 16th.</b>				
3 Protective device for the installation/appliance	Type — BS	<b>BS EN 60898/BS 1362</b>	Rating	6 A / 3 A	
4 Comments on existing installation, including adequacy of earthing and bonding arrangements	<b>Satisfactory.</b>				
<b>PART 3 — Essential tests</b>					
1 Earth continuity satisfactory	<b>YES</b>				
2 Insulation resistance Line — Neutral	<b>&gt;500 megohms (reading will depend on range of test equipment).</b>				
Line — Earth	<b>&gt;500 megohms (reading will depend on range of test equipment).</b>				
Neutral — Earth	<b>&gt;500 megohms (reading will depend on range of test equipment).</b>				
3 Polarity satisfactory?	<b>YES</b>				
<b>PART 4 — Declaration</b>					
I/we CERTIFY that the said works do not impair the safety of the existing installation, that the said works have been designed, constructed, inspected and tested in accordance with current standards (IEE Wiring Regulations), and that the said works, to the best of my/our knowledge and belief, at the time of my/our inspection, complied with current standards.					
Name	<b>N A BODY</b>			Signature	
For and on behalf of	<b>Some Firm</b>			Date	



**Learner Feedback**

Name:		Class:	Date:
Result:	Assessor:		Date:

<b>Marking schedule</b>	<b>Yes</b>	<b>No</b>
a) Programmer is replaced correctly		
b) Programmer operates correctly		
c) Safe working methods and risk assessments listed correctly		
d) Safe working methods and risk assessments applied correctly		
e) Fault diagnosed correctly		
f) Correct and appropriate remedial action		
g) Compliance certificate completed correctly		
<b>Learner feedback</b>		
<b>Learner's response</b>		
<b>Learner's signature</b>		

**Note to assessor: Learner feedback should relate to the marking schedule**

## **FCA Gas; Oil; Solid Fuel — As relevant, the installation, connection and servicing/maintenance of fuel systems and equipment.**

### **End test**

Carry out work on Gas; Oil; Solid fuel systems

<b>Name:</b>	<b>Class:</b>	<b>Date:</b>
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#### **Candidate's instructions**

You are required to commission a fuel burning appliance as appropriate to the option chosen as part of your SVQ programme, eg Gas, Oil or Solid fuel. The commissioning process should commence from visual inspection to safe operation and performance, this process should be outline in part 1 below.

If the appliance and its associated components and fuel/flue pipework does not work correctly, you should then identify the cause(s) of any fault(s) which you may have identified, recording the details below.

Following the identification of the cause(s) you should carry out any remedial work required.

You should also complete any documentation required by the work you have completed.

Note: although this is primarily a commissioning process the candidate has to assume responsibility for the correct installation of pipes and components.

#### **PART 1 — Commissioning process**

**END TEST — Model Answer (Gas; Oil; Solid fuel systems)**

**PART 1 — Commissioning process**

***For example — gas fire:***

**Safe operationally: tightness test, purging and controls**

**Air: ventilation requirements**

**Flue: flue — flow/spillage testing**

**Efficient/effective: gas rate/burner pressure**

**For other appliances and fuel types the manufacturer's guidelines and appropriate regulations should be adhered to.**

**Learner Feedback**

Result:	Assessor:	Date:	
<b>Marking schedule</b> <i>(this schedule should be adapted depending on fuel type and appliance)</i>		<b>Yes</b>	<b>No</b>
(example) <b>Commissioning process:</b>			
Tightness test completed			
Purging completed			
ventilation requirements completed			
flue — flow/spillage testing carried out			
gas rate/burner pressure completed			
<b>Learner feedback</b>			
<b>Learner's response</b>			
<b>Learner's signature</b>			

**Note to assessor: Learner feedback should relate to the marking schedule**

## **FCA Unvented Water — As relevant, the installation, connection and servicing/maintenance of hot water systems and equipment.**

### **End test**

Carry out work on Unvented Water

<b>Name:</b>	<b>Class:</b>	<b>Date:</b>
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#### **Candidate's instructions**

You are required to commission an unvented hot water unit. The commissioning process should commence from visual inspection to safe operation and performance.

If the system does not work correctly, you should then identify the cause(s) of any fault(s) which you may have identified, recording the details below.

Following the identification of the cause(s) you should carry out any remedial work required.

You should also record any safe working methods and risk assessments required for all work involved.

You should also complete any documentation required by the work you have completed.

Note: although this is primarily a commissioning process the candidate has to assume responsibility for the correct installation of pipes and components.

#### **PART 1 — Commissioning process**

**Carry out work on Unvented Water systems**

<b>Name:</b>	<b>Class:</b>	<b>Date:</b>
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**PART 2 — Faults/Defects identified**

Note: faults can be simulated on an alternative system

**PART 3 — Remedial work required**

## END TEST — Model Answer (Unvented Water systems)

### PART 1 — Commissioning process

- Check the functional and safety components are installed and correctly positioned, ie Line strainer, Pressure reducing valve, non-return valve, expansion vessel, expansion and pressure relief valve. The three tier level of protection should be able to be traced, ie working thermostat, high limit thermostat and the temperature and pressure relief valve.
- Before filling, check expansion vessel charge is at the required charge.
- Open all terminal fittings on the domestic hot water circuit. Open the main supply to the unit.
- Flush the unit through until all air is expelled.
- Close hot outlets and open all cold outlets connected to the tee after the pressure control valve.
- Flush through until all air is expelled.
- The system is now full of water. Check for any leaks on pipework or joints or components.
- Switch on the heat source and observe operation.
- The system should now be ready for use.

**PART 2 — Faults/Defects identified**

**Faults can be set and identified on a simulation rig, eg thermostat failure.**

**Note: faults should be focused on the safety critical aspects of the system and not the functional aspects.**

(at least one fault to be identified)

**PART 3 — Remedial work required**

**Remedial work for Fault as found.**



## Learner Feedback

Result:	Assessor:	Date:	
<b>Marking schedule</b>		<b>Yes</b>	<b>No</b>
<b>Commissioning process:</b>			
Functional components are correct in installation and operation			
Safety components are correct in installation and operation			
Filling procedure adopted was logical in sequence			
Heat source turned on and operation observed			
<b>Faults/Defects identified:</b>			
<i>List as appropriate</i>			
<b>Remedial work completed:</b>			
<i>List as appropriate</i>			
<b>Learner's response</b>			
<b>Learner's signature</b>			

**Note to assessor: Learner feedback should relate to the marking schedule**

## **FCA Backflow Prevention — As relevant, the installation, connection and servicing/maintenance of hot and cold water systems and equipment.**

### **End test**

Carry out work on hot and cold water systems

<b>Name:</b>	<b>Class:</b>	<b>Date:</b>
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#### **Candidate's instructions**

**NOTE:** The systems installed with unit 'H98F 04 / SUMP04 Install and test domestic plumbing and heating systems' are appropriate to this end test

You are required to install a hot and cold water system in compliance with the standards set out in the Water Byelaws. Reference should be made to the 'fluid categories' and the means of backflow protection, ie mechanical devices and air gaps.

On completing and commissioning the system observance should be made of the system operation and performance.

Installation methods reduce the likelihood of debris entering the system.

Flushing the system is carried out under water byelaw/BS EN standards. (assume that the installation is for a single family)

#### **PART 2 — Installation and commissioning process**

**Carry out work on hot and cold water systems**

<b>Name:</b>	<b>Class:</b>	<b>Date:</b>
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**PART 2 — Faults/Defects identified**

*Note: faults can be simulated on an alternative system*

**PART 3 — Remedial work required**

## END TEST — Model Answer (hot and cold water systems)

### PART 1 — Installation and commissioning process

- **Appliances are installed in accordance with industry standards**
- **Water levels in cisterns are set accordance with the water byelaws and manufacturer guidelines.**
- **Pipework is installed in a manner that backflow is prevented, ie.**
- **Appliance components are selected and installed in accordance with the water byelaws and industry standards, ie appropriate taps are used with proper air gap, chains and plugs are properly fixed, filling loop with appropriate backflow protection is used.**
- **System operation does not present backflow issues or problems.**
- **Installation methods reduce the likelihood of debris entering the system.**
- **Flushing the system is carried out under water byelaw/BS EN standards.**

**PART 2 — Faults/Defects identified**

**Possible faults/defects that could be identified:**

**Cross connection of pipework**

**No plug and chain on an appliance**

**Water levels in cisterns incorrect**

**Filling loop permanently connected or double check valve missing.**

**Fixing bracket for shower hose is missing.**

(at least one fault to be identified)

**PART 3 — Remedial work required**

**Remedial work for Fault as found.**

## Learner Feedback

Result:	Assessor:	Date:	
<b>Marking schedule</b>		<b>Yes</b>	<b>No</b>
Appliances are installed in accordance with industry standards			
Water levels in cisterns are set accordance with the water byelaws and manufacturer guidelines			
Appliance components are selected and installed in accordance with the water byelaws and industry standards			
System operation does not present backflow issues or problems			
Flushing the system is carried out under water byelaw/BS EN standards.			
<b>Faults/Defects identified:</b>			
<i>List as appropriate</i>			
<b>Remedial work completed:</b>			
<i>List as appropriate</i>			
Learner feedback			
Learner's response			
Learner's signature			

**Note to assessor: Learner feedback should relate to the marking schedule**