Overview

This standard identifies the competences you need to assemble electrical or electronic components to mechanical equipment, in accordance with approved procedures. You will be required to check that specified components are available and fit for purpose, to obtain all relevant and current documentation, to obtain the tools and equipment required for the assembly operations and to check that they are in a safe and usable condition. In carrying out the assembly operations, you will be required to follow company procedures and specified assembly techniques, in order to fit the electrical or electronic components to the mechanical assembly.

The assembly activities will also include making all necessary checks and adjustments, to ensure that the electrical or electronic components are correctly orientated, positioned and secured correctly. You must also check that any cables and wires are routed correctly and are tidy in appearance, and that connections are mechanically sound and checked for electrical continuity.

Your responsibilities will require you to comply with organisational policy and procedures for the assembly activities undertaken, and to report any problems with the assembly activities, materials or equipment that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will be sufficient to provide a good understanding of your work, and will provide an informed approach to applying electrical or electronic fitting and assembly techniques and procedures. You will have an understanding of the product being assembled and its application, and will know about the equipment, relevant components and joining techniques, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the assembly activities. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.
Performance criteria

You must be able to:

P1 work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
P2 follow the relevant instructions, assembly drawings and any other specifications
P3 ensure that the specified components are available and that they are in a usable condition
P4 use the appropriate methods and techniques to fit the components in their correct positions
P5 secure the components using the specified connectors and securing devices
P6 check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification
P7 complete the required production documentation
P8 deal promptly and effectively with problems within your control and report those that cannot be solved
Assembling electrical or electronic components to mechanical equipment

Knowledge and understanding

You need to know and understand:

K1 the specific safety precautions to be taken while carrying out the assembly (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
K2 the health and safety requirements of the work area in which you are carrying out the assembly activities, and the responsibility these requirements place on you
K3 COSHH regulations with regard to the substances used in the assembly process
K4 the hazards associated with assembling electrical or electronic components to mechanical equipment, and how to minimise them and reduce any risks
K5 the personal protective equipment and clothing (PPE) to be worn during the assembly activities
K6 how to extract and use information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS, ISO or BSEN standards) in relation to work undertaken
K7 the general principles of electrical and electronic fitting techniques
K8 the purpose and function of the components, including identification systems (such as colour codes, symbols, manufacturers specification)
K9 preparations to be undertaken on the electrical or electronic components prior to fitting them into the assembly
K10 the correct component handling procedures, including any relevant handling equipment
K11 the assembly and securing methods and procedures to be used, and the importance of adhering to these
K12 how the components are to be positioned, aligned and secured, and the tools and equipment that are used
K13 the importance of using the specified electrical or electronic components and securing devices for the assembly, and why you must not use substitutes
K14 the quality control procedures to be followed during the assembly operations
K15 how to conduct any necessary checks to ensure the accuracy, position, security, function, completeness and electrical continuity of the assembly
K16 how to detect assembly defects (such as ineffective joining techniques, component damage), and what to do to rectify them
K17 how to check that the tools and equipment to be used are in a safe and serviceable condition
K18 the importance of ensuring that all tools are used correctly and within their permitted operating range
K19 the importance of ensuring all tools, equipment and components are
accounted for and returned to their correct location on completion of the assembly activities

K20 the problems that can occur with the assembly operations, and what to do if they occur

K21 the extent of your own authority and to whom you should report if you have problems that you cannot resolve
Additional Information

1. Carry out all of the following during the assembly activities:
   1.1 obtain and use the appropriate documentation (such as job instructions, drawings, quality control documentation)
   1.2 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
   1.3 use lifting and slinging equipment (where appropriate) in accordance with health and safety guidelines and procedures
   1.4 check that tools and measuring instruments to be used are fit for service
   1.5 use appropriate and approved fitting and assembly techniques at all times
   1.6 ensure that the components used are free from damage, foreign objects, dirt or other contamination
   1.7 leave the work area in a safe and appropriate condition on completion of the activities

2. Fit electrical or electronic components using all of the following techniques:
   2.1 routeing cables and wires
   2.2 mounting/securing components
   2.3 cable fixings and fasteners

3. Terminate and join cables/wires to components using two of the following:
   3.1 screwed connections
   3.2 clamped connections
   3.3 soldering
   3.4 crimping
   3.5 cable protection devices (such as sleeving or grommets)

4. Fit four of the following electrical components on the mechanical equipment:
   4.1 cable enclosures (such as conduit, trunking, tray work)
   4.2 circuit connection devices (such as plugs, sockets)
   4.3 monitoring components (such as sensors)
   4.4 power generation components (such as motors, transformers)
   4.5 control components (such as relays, solenoids, switches)
   4.6 cables and wires
   4.7 electronic modules
   4.8 circuit protection devices
   4.9 lamps/lighting
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4.10 instrumentation units
4.11 other specific components

5. Carry out the required checks using the correct tools and equipment, to include four of the following:
5.1 position
5.2 completeness
5.3 electrical continuity
5.4 alignment
5.5 free from damage or foreign objects
5.6 component security

6. Produce mechanical assemblies which comply with one of the following standards:
6.1 BS, ISO or BSEN standards and procedures
6.2 customer standards and requirements
6.3 company standards and procedures
6.4 specific system requirements
### SEMMME229 – SQA Unit Code HF43 04
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<tr>
<td>Date approved</td>
<td>February 2016</td>
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<tr>
<td>Indicative review</td>
<td>March 2019</td>
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