

INSTALL, SERVICE AND REPAIR WINDOW TYPE AIR CONDITIONING UNITS

UNIT CODE: ENG/OS/RAC/CR/03/4/A

UNIT DESCRIPTION

This unit covers the competencies required to install, service and repair window type air conditioning units. It involves conducting site survey, installing, servicing, identifying and repairing faults in window type air conditioning units. It also entails carrying out refrigerant recovery, recycling and evacuation; charging, maintaining, test-running and commissioning serviced window type air conditioning unit.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Conduct site survey	1.1. Site conditions and installation requirements are assessed according to manufacturer's specifications 1.2. <i>Tools, equipment and materials</i> are determined according to installation requirements 1.3. Site survey report is prepared in accordance with work place procedures 1.4. Safety procedures are adhered to according to workplace procedures
2. Install air conditioning unit	2.1 Tools, equipment and materials are assembled according to workplace procedures 2.2 <i>Air conditioning unit</i> and components are prepared based on work place procedures 2.3 Air conditioning unit base is leveled and unit positioned in line with manufacturer's specifications 2.4 Air conditioning unit is installed according to work place procedures and manufacturer's specifications 2.5 Safe handling techniques are employed in line with manufacturer's specifications 2.6 Voltage and current are ascertained according to unit ratings.
3. Service air conditioning unit	3.1 Appropriate manuals are interpreted in line with the job requirements 3.2 Tools, equipment and materials are selected as per workplace procedures

	<p>3.3 Safe working practices are observed throughout the task as per work place procedures</p> <p>3.4 Air conditioning unit components are serviced according to manufacturer's specifications and workplace procedures</p> <p>3.5 Temperature settings are performed according to user requirements</p> <p>3.6 Air conditioning unit is handed over to user as per work place procedures</p> <p>3.7 Task is completed in line with workplace procedures and environmental requirements</p>
4. Identify and repair faults in air conditioning unit	<p>4.1 Appropriate manuals are interpreted in line with the job requirements</p> <p>4.2 Safe working practices are observed as per work place procedures</p> <p>4.3 Tools, equipment and instruments are selected and used in line with job requirements</p> <p>4.4 Air conditioning unit components are tested according to manufacturer's specifications</p> <p>4.5 Faulty components are repaired or replaced in line with manufacturer's specifications</p> <p>4.6 Air conditioning unit requiring recovery/recycling is identified</p> <p>4.7 Refrigerant recovery/recycling is performed according to workplace procedures</p> <p>4.8 Air conditioning unit is repaired according to workplace procedures</p> <p>4.9 Housekeeping is performed</p> <p>4.10 Task is completed in line with workplace procedures and environmental requirements</p>
5. Carry out refrigerant evacuation, recovery and recycling	<p>5.1 Identified unit for evacuation and recovery</p> <p>5.2 Observed health, safety and environmental requirements as per work place procedures</p> <p>5.3 Identified necessary tools, equipment and instruments</p> <p>5.4 Carried out refrigerant evacuation, recovery and recycling as per work place procedures</p> <p>5.5 Carried out housekeeping</p> <p>5.6 Task is completed in line with workplace procedures and environmental requirements</p>
6. Carry out refrigerant charging	<p>6.1 Identified air conditioning unit to be charged</p> <p>6.2 Observed health and safety requirements as per work place</p>

	<p>procedures</p> <p>6.3 Identified tools and equipment</p> <p>6.4 Identified refrigerant as per the Air conditioning unit requirement</p> <p>6.5 Carried out charging as per the Air conditioning unit requirement and work place procedures</p> <p>6.6 Carried out housekeeping</p> <p>6.7 Task is completed in line with workplace procedures and environmental requirements</p>
7. Commission serviced air conditioning unit	<p>7.1 Identified unit to be commissioned</p> <p>7.2 Observed health, safety and environmental requirements as per work place procedures</p> <p>7.3 Identified tools, equipment and instruments</p> <p>7.4 Carried out unit test-running as per work place procedures</p> <p>7.5 Operating parameters of the unit are confirmed as per work place procedures</p> <p>7.6 Carried out housekeeping</p> <p>7.7 Serviced unit is handed over to user as per work place procedures</p> <p>7.8 Prepared service report as per work place procedures</p>

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Air conditioning unit may include but not limited to:	<ul style="list-style-type: none"> • window type
2. Tools, equipment and instruments	<ul style="list-style-type: none"> • Pliers • Screwdrivers • Hammers • Chisels • Spirit levels • Phase tester • Files • Fin combs • Brazing equipment • Multi-meter • Leak detector

	<ul style="list-style-type: none"> • System analyzer • Recovery/recycling unit • Weighing scale • Vacuum pump • Refrigerant identifier • Clamp on ammeter • Lokring tools • Flaring tools • Swaging tools • Mallets • Vices • Punches • Adjustable spanner • Wire brush • Tube bender • Tube cutter • Capillary cutter • Combination pressure gauge set • Micrometer gauge • Vernier caliper • Anemometer
<p>3. Air conditioning unit components May include but not limited to:</p>	<ul style="list-style-type: none"> • Electrical controls <ul style="list-style-type: none"> ○ Thermostats ○ Defrost heaters ○ Relays ○ Switches • Compressors • Fan motors • Capacitors • Electronic control cards • Overload protectors
<p>4. Environmental legislations may include but not limited to:</p>	<ul style="list-style-type: none"> • Environmental Management Coordination Act • ISO standards on environment 140001
<p>5. Materials may include but not limited to</p>	<ul style="list-style-type: none"> • Insulators • Socket outlets

	<ul style="list-style-type: none"> • Conduits and trunkings • Refrigerants • Lubricating oil • Copper tubing
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REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Use of PPEs
- Interpreting manufacturers manual
- Preparing materials
- Handling of tools, equipment and instruments
- Tube processing
- Safe handling of refrigerants and lubricants
- Recovering/recycling refrigerants
- Brazing
- Installation of air conditioning units
- Troubleshooting
- Repairing of air conditioning units
- Servicing air conditioning units

Required Knowledge

The individual needs to demonstrate knowledge of:

- Personal protective equipment
- Uses and handling of tools, equipment and instruments
- Safety signs and symbols
- Housekeeping
- Interpretation of manufactures manual
- Uses and specifications of refrigerants, air conditioning oil and air conditioning components
- Basic electronics
- Electrical principles
- Technical drawing
- Heat transfer
- Air conditioning principles
- Recovery/recycling process
- Compressor operations

- Motor starters
- Motors protection
- Applicable Legislations

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Adhered to safety procedures 1.2 Selected tools, equipment and materials 1.3 Diagnosed air conditioning unit faults 1.4 Recovered/recycled refrigerants 1.5 Repaired air conditioning unit 1.6 Tested air conditioning air conditioning unit 1.7 Performed housekeeping 1.8 Installed air conditioning air conditioning units 1.9 Prepared Air conditioning unit and components 1.10 Levelled and positioned Air conditioning unit base 1.11 Installed Air conditioning unit 1.12 Employed safe handling techniques 1.13 Ascertained voltage and current 1.14 Performed temperature settings 1.15 Serviced and maintained air conditioning air conditioning unit components 1.16 Interpreted manufacturers manuals 1.17 Observed safe working practices 1.18 Tested air conditioning air conditioning unit components 1.19 Repaired or replaced faulty components 1.20 Identified air conditioning air conditioning unit requiring recovery/recycling 1.21 Performed refrigerant recovery/recycling 1.22 Completed work correctly 1.23 Evacuated air conditioning unit 1.24 Observed health, safety and environmental requirement 1.25 Charged air conditioning unit 1.26 Identified relevant refrigerant 1.27 Carried out charging 1.28 Air conditioning unit is maintained in line with manufacturer's manuals
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	<p>1.29 Performed test-run on air conditioning unit</p> <p>1.30 Commissioned and handed over air conditioning unit</p>
2. Resource implications	<p>The following resources must be provided:</p> <p>2.1 Work place location and air conditioning units</p> <p>2.2 Tools, equipment and instruments for installing maintaining servicing and repairing air conditioning units</p> <p>2.3 Materials relevant to the task</p> <p>2.4 Manufacturer’s specifications and manuals relevant to the task</p>
3. Methods of assessment	<p>Competency may be assessed through:</p> <p>3.1 Demonstration</p> <p>3.2 Direct observation with oral questioning</p> <p>3.3 Written tests</p> <p>3.4 Portfolio</p> <p>3.5 Third party reports</p>
4. Context for assessment	<p>Competency may be assessed individually on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment or during industrial attachment.</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the sector, workplace and job role is recommended.</p>