INSTALL, SERVICE AND REPAIR DOMESTIC REFRIGERATION UNITS

UNIT CODE: ENG/OS/RAC/CR/01/4/A

UNIT DESCRIPTION

This unit covers the competencies required to install, service and repair domestic refrigeration units. It involves conducting site survey, installing domestic refrigeration units, service domestic refrigeration unit, identifying and repairing faults in domestic refrigeration units, carrying out Refrigeration unit refrigerant recovery, recycling and evacuation. It also entails charging domestic refrigeration unit, maintaining domestic refrigeration unit and test-running repaired and serviced domestic refrigeration 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. ***Bold and italicized terms are elaborated in the Range***
1. Conduct site survey	1.1. Site conditions and installation requirements are assessed according to manufacturer's specification 1.2. ***Tools, equipment*** and ***materials*** needed for installation are determined according to site conditions and site 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 and OSHA
2. Install refrigeration unit	2.1 Tools, equipment and materials are assembled according to workplace procedures 2.2 ***Refrigeration unit*** and components are prepared based on work place procedures 2.3 Refrigeration unit base is leveled and unit positioned in line with manufacturer's specifications 2.4 Refrigeration 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 and OSHA 2.6 Voltage and current are ascertained according to unit's ratings. 2.7 Hydrocarbon RAC systems are installed, serviced and

	maintained and decommissioned 2.8 Temperature settings are performed according to user requirements 2.9 Refrigeration unit is handed over to user as per work place procedures
3. Service refrigeration 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 3.3 Safe working practices are observed throughout the task as per work place procedures 3.4 ***Refrigeration unit components*** are serviced and maintained according to manufacturer's specifications and workplace procedures 3.5 Task is completed in line with workplace procedures and environmental requirements
4. Identify and repair faults in domestic refrigeration unit	4.1 Appropriate manuals are interpreted in line with the job requirements 4.2 Safe working practices are observed throughout the task as per work place procedures 4.3 Tools, equipment and instruments are selected and used in line with job requirements 4.4 Domestic ***refrigeration unit*** components are tested following manufacturer's manuals 4.5 Faulty components are repaired or replaced in line with manufacturer's manuals 4.6 Domestic refrigeration unit requiring recovery/recycling is identified 4.7 Refrigerant recovery/recycling is performed according to manufacturer's manuals 4.8 Refrigeration unit is repaired according to workplace procedures 4.9 Housekeeping is performed 4.10 Work is completed in line with workplace procedures and ***environmental requirements***
5. Carry out refrigerant evacuation, recovery and recycling	5.1 Identified unit for evacuation and recovery 5.2 Observed health, safety and environmental requirements as per work place procedures and applicable ISO standards 5.3 Identified necessary tools, equipment and instruments 5.4 Carried out refrigerant evacuation, recovery and recycling

	as per work place procedures 5.5 Carried out housekeeping 5.6 Work is completed in line with workplace procedures and environmental requirements
6. Charge refrigeration unit	6.1 Identified refrigeration unit to be charged 6.2 Observed health and safety requirements as per work place procedures and ISO 22712 standards and KS ISO 5149-4:2014 6.3 Identified necessary tools and equipment 6.4 Identified the relevant refrigerant as per the Refrigeration unit requirement 6.5 Carried out the charging as per the Refrigeration unit requirement and work place procedures 6.6 Carried out housekeeping 6.7 Work is completed in line with workplace procedures and environmental requirements
7. Commission serviced refrigeration unit	7.1 Identified unit to be commissioned 7.2 Observed health, safety and environmental requirements as per work place procedures and ISO 22172 standards 7.3 Identified necessary tools, equipment and instruments 7.4 Carried out unit test-running as per work place procedures 7.5 Operating parameters of the unit are confirmed as per work place procedures 7.6 Carried out housekeeping 7.7 Serviced unit is handed over to user as per work place procedures 7.8 Prepared service report as per work place procedures

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. Refrigeration unit may include but not limited to:	• Refrigerators • Freezers • Water dispensers • Wine chillers • Bottle coolers • Ice makers

2. Tools, equipment and instruments may include but not limited to:	• Pliers • Screwdrivers • Hammers • Chisels • Spirit levels • Phase testers • Files • Fin combs • Nut drivers • Brazing equipment • Multi-meters • Leak detectors • System analyzers • Recovery/recycling units • Weighing balance • Vacuum pumps • Refrigerant identifier • Clamp on ammeters • Lok ring 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 • Amp-probe meter • Anemometer

3. Domestic refrigeration unit components may include but not limited to:	• Electrical controls
	  ○ Thermostats
	  ○ Defrost timers
	  ○ Defrost sensors

	○ Defrost heaters ○ Thermo discs ○ Relays ○ Switches • Compressors • Fan motors • Capacitors • Electronic control cards • Overload protectors
4. Environmental legislations may include but not limited to	• Environmental Management Coordination Act • ISO standards on environment 140001
5. Materials may include but not limited to	• Insulators • Socket outlets • Conduits and trunkings • Refrigerants • Lubricating oil • Copper tubes

EQUIRED 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 domestic refrigeration units
- Troubleshooting
- Repairing of domestic units
- Servicing domestic 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, refrigeration oil and refrigeration components
- Basic electronics
- Electrical principles
- Technical drawing
- Heat transfer
- Refrigeration principles
- Recovery/recycling process
- Compressor types, operation and application
- Compressor operations
- Motor starters
- Motor 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.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Adhered to safety procedures 1.2 Selected tools, equipment and materials 1.3 Diagnosed refrigeration unit faults 1.4 Recovered/recycled refrigerants 1.5 Repaired refrigeration unit 1.6 Tested domestic refrigeration unit 1.7 Performed housekeeping 1.8 Installed domestic refrigeration units 1.9 Prepared Refrigeration unit and components 1.10 Levelled and positioned Refrigeration unit base 1.11 Installed Refrigeration unit 1.12 Employed safe handling techniques 1.13 Ascertained voltage and current 1.14 Performed temperature settings 1.15 Serviced and maintained domestic refrigeration unit components 1.16 Interpreted manufacturers manuals

	1.17 Observed safe working practices 1.18 Tested domestic refrigeration unit components 1.19 Repaired or replaced faulty components 1.20 Identified domestic refrigeration unit requiring recovery/recycling 1.21 Performed refrigerant recovery/recycling 1.22 Completed work correctly 1.23 Evacuated domestic refrigeration unit 1.24 Observed health, safety and environmental requirement 1.25 Charged domestic refrigeration unit 1.26 Identified relevant refrigerant 1.27 Carried out charging 1.28 Refrigeration unit is maintained in line with manufacturer's manuals 1.29 Performed test-run on refrigeration unit 1.30 Commissioned and handed over refrigeration unit
2. Resource implications	The following resources must be provided: 2.1 Work place location and domestic refrigeration units 2.2 Tools, equipment and instruments for installing maintaining servicing and repairing domestic refrigeration units 2.3 Materials relevant to the task 2.4 Manufacturer's specifications and manuals relevant to the task
3. Methods of assessment	Competency may be assessed through: 3.1 Demonstration 3.2 Direct observation with oral questioning 3.3 Written tests 3.4 Portfolio 3.5 Third party reports
4. Context for assessment	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.
5. Guidance information for assessment	Holistic assessment with other units relevant to the sector, workplace and job role is recommended.