

1. Title	Repair air-conditioning and refrigeration systems
2. Code	EMCUMA304A
3. Range	Repair air-conditioning and refrigeration systems in servicing stations or external sites
4. Level	3
5. Credit	6
6. Competency	<p style="text-align: center;"><u>Performance Requirements</u></p> <p>6.1 Construction and operating principles of air-conditioning and refrigeration systems</p> <ul style="list-style-type: none"> ◆ Understand the construction and operating principles of air-conditioning and refrigeration systems, including the refrigerant piping, condenser, filter and evaporator, etc. <p>6.2 Method of repairing air-conditioning and refrigeration systems</p> <ul style="list-style-type: none"> ◆ Clean and wash the air-conditioning and refrigeration systems, including: <ul style="list-style-type: none"> • Air filter • Using nitrogen to flush the refrigerant piping • Water-cooled condenser and defouling • Air-cooled condenser • Evaporator ◆ Pressure leak check and vacuuming of refrigeration system <ul style="list-style-type: none"> • Use nitrogen to perform pressure leak check for the refrigeration system • Vacuum the refrigeration system with the compressor • Vacuum the refrigeration system with the vacuum pump ◆ Charge the refrigeration system with refrigerant <ul style="list-style-type: none"> • Determine the correct amount of refrigerant to be charged • Understand the advantages and disadvantages of charging refrigerant • Charge a large refrigeration system with refrigerant at the charging valve • Charge liquid refrigerant at the discharge valve of compressor • Charge vapour refrigerant at the suction valve of compressor • Charge refrigerant to a hermetic compressor • Know the methods of liquid charging and vapour charging of refrigerant • Understand the safety precautions for charging liquid refrigerant

	<ul style="list-style-type: none"> ◆ Evacuate air and water from the refrigeration system <ul style="list-style-type: none"> • Understand the harm of air and water in the refrigeration system • Determine whether there is air and water in the refrigeration system • Evacuate the air from the refrigeration system • Evacuate the water from the refrigeration system ◆ Pump down and recover refrigerant from the refrigeration system <ul style="list-style-type: none"> • Understand the purpose of pumping down and recovering the refrigerant • Pump down the refrigerant from the refrigeration system to the liquid receiver or condenser • Use a refrigerant recovering machine to recover the refrigerant from the refrigeration system to the refrigerant recovery cylinder ◆ Add and remove refrigerant oil <ul style="list-style-type: none"> • Choose suitable refrigerant oil • Remove refrigerant oil from and add it to the hermetic reciprocating compressor • Remove refrigerant oil from and add it to the hermetic rotary compressor • Remove refrigerant oil from and add it to the open-type compressor <p>6.3 Professionalism in repairing air-conditioning and refrigeration systems</p> <ul style="list-style-type: none"> ◆ Perform air-conditioning and refrigeration systems repairing according to safety regulations and code of practice as required by the law
7. Assessment Criteria	<p>The integrated outcome requirement of this unit of competency is:</p> <p>(i) Capable to repair air-conditioning and refrigeration systems properly and efficiently, including filling and recovering refrigerant and filling and exhausting coolant oil, according to safety regulations and code of practice.</p>
8. Remarks	<p>This unit of competency is suitable for training air-conditioning and refrigeration engineering personnel. The credit value of this unit of competency is set on the presumption that the person already possesses basic air-conditioning and refrigeration knowledge.</p>