

## 1. Module details

**Module name**

**REFRIGERATION SYSTEM COMPONENTS**

**Nominal duration**

Half module

It is anticipated that students will achieve the competencies specified in 18 to 20 hours.

**Module codes**

**NR004**

**Discipline code**

## 2. Module purpose

To provide the student with the knowledge and skills of refrigeration system components, types and their applications.

## 3. Prerequisites

NR003 - Refrigerants

## 4. Relationship to competency standards

TBA

## 5. Content

1. Functions of the compressor
  - types of compressors:
    - reciprocating
    - rotary
    - centrifugal
    - scroll
    - methods of lubrication
2. Function of the condenser
  - types of condenser:
    - air cooled
    - water cooled
    - evaporative
  - pumps:
    - cooling tower/water regulator valve
    - water treatment
  - liquid receivers
    - horizontal
    - vertical
3. Function of the evaporator
  - types of evaporators:
    - air cooling
    - liquid cooling
  - secondary refrigerants:
    - chloride
    - glycol
4. Function of the flow control
  - types of flow controls

- refrigerant distributors
- venturi
- weir
- pressure drop
- centrifugal

5. High and low side pressures
- Evaporator TD and Space RH
  - Condenser TD
  - Ambient conditions

## 6. Learning outcome details

### Learning outcome 1

On the completion of this module, the learner will be able to:

Describe the different types of compressors used in refrigeration and air conditioning.

#### Assessment criteria

- 1.1 Explain the function of the compressor in the system.
- 1.2 Describe the different types of compressor used in the industry.

### Learning outcome 2

Describe the different types of compressors used in refrigeration and air conditioning.

#### Assessment criteria

- 2.1 Explain the function of the condenser in the system.
- 2.2 Identify the different types of condensers used in the industry.
- 2.3 Explain the function and application of various types of condensers used in the industry.
- 2.4 Explain the function and application of cooling towers and water regulator valves and pumps used in conjunction with condensers.
- 2.5 Explain the function and application of water treatment used in conjunction with condensers.
- 2.6 Explain the function and application of liquid receivers used in the system.
- 2.7 Identify the different types of liquid receivers as used in the industry.

### Learning outcome 3

Describe the different types of evaporators used in refrigeration and air conditioning.

#### Assessment criteria

- 3.1 Explain the function of the evaporator in the system.
- 3.2 Identify the different types of evaporators used in the industry.
- 3.3 Explain the function and application of secondary refrigerants

	in conjunction with specific evaporators.
<b>Learning outcome 4</b>	Describe the different types of flow controls-used in refrigeration and air conditioning.
<b>Assessment criteria</b>	<p>4.1 Explain the functions of the flow control in the system.</p> <p>4.2 Identify the different types of flow controls used in the industry.</p> <p>4.3 Explain the function of the refrigerant distributor in the system.</p> <p>4.4 Identify the different types of refrigerant distributor used in the industry.</p>
<b>Learning outcome 5</b>	Determine the expected high and low side system pressures, using appropriate application of evaporator and condenser temperature differences.
<b>Assessment criteria</b>	5.1 Determine expected high and low side pressures given product storage conditions/space temperatures and ambient conditions.
<b>7. Assessment Strategies</b>	<p>Written test.</p> <p>Multiple choice question.</p> <p>Practical exercises.</p>
<b>8. Module Delivery Strategies</b>	<p>Delivery strategies must be suitable for both theoretical and /or practical learning and module purpose.</p> <p>It recommended that learning and assessment be facilitated in a holistic manner which may require a learning outcome sequence other than that indicated in the body of this module.</p> <p>Also, an integrated theory/practice approach should be used where students learn by practical exercises and through research and workshop reports.</p>
<b>9. Resource Requirements</b>	<p>Appropriate practical equipment, service manuals, schematic diagrams test equipment.</p> <p>Useful references include:</p> <p>Australian Refrigeration and Air Conditioning, Volumes I &amp; II, A CR &amp; D Project Trust Publication.</p> <p>Dossat R.J., Principles of Refrigeration, Second Edition, SI Version, John Wiley and Sons, New York. Latest Edition.</p>

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## **10. Occupational health and safety requirements**

ASHRAE Handbook, Refrigeration Systems and Applications., SI Version, ASHRAE, Atlanta.

A safe and healthy environment will be provided for students in regards to classroom and workshop safety.