



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Basic Vapour Compression Refrigeration Systems Operation Components Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 116224 · NQF Level 2 · 8 Credits · 5 Days

COURSE OVERVIEW

This course provides a comprehensive understanding of the operation and components of basic vapour compression refrigeration systems. Participants will gain the knowledge and skills necessary to identify, describe, and troubleshoot key components such as compressors, condensers, expansion devices, and evaporators. The course is designed to equip learners with practical competencies for safe and efficient system operation and maintenance.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	116224
Accreditation	SAQA Accredited · NQF Level 2 · 8 Credits
Duration	5 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Identify and describe the main components of a basic vapour compression refrigeration system and their functions.
- Explain the thermodynamic principles underlying the vapour compression refrigeration cycle.
- Apply safety procedures and best practices when operating and maintaining refrigeration systems.
- Analyze system performance by interpreting pressure-enthalpy diagrams and temperature measurements.
- Demonstrate proper techniques for charging, recovering, and handling refrigerants in accordance with regulations.
- Evaluate common system faults and propose corrective actions to restore optimal operation.

WHO SHOULD ATTEND

- This course is ideal for technicians, engineers, and maintenance personnel working in refrigeration, air conditioning, or related fields who require foundational knowledge of vapour compression refrigeration systems.

COURSE OUTLINE

Day 1: Introduction to Refrigeration and Thermodynamic Principles

- Overview of refrigeration and its applications
- Basic thermodynamics: heat, temperature, pressure, and enthalpy
- The vapour compression refrigeration cycle: evaporation, compression, condensation, expansion
- Refrigerants: types, properties, and environmental considerations
- Safety precautions and handling of refrigerants
- Introduction to system components: compressor, condenser, expansion device, evaporator

Day 2: Compressors and Condensers – Operation and Maintenance

- Types of compressors: reciprocating, rotary, screw, centrifugal
- Compressor construction, lubrication, and cooling
- Compressor performance and capacity control
- Condenser types: air-cooled, water-cooled, evaporative
- Condenser operation, heat rejection, and maintenance
- Common compressor and condenser faults: overheating, oil issues, refrigerant leaks
- Practical exercise: compressor and condenser inspection

Day 3: Expansion Devices and Evaporators – Control and Efficiency

- Expansion devices: thermostatic expansion valves, capillary tubes, electronic expansion valves
- Expansion device selection and adjustment
- Evaporator types: dry expansion, flooded, plate, finned
- Evaporator heat transfer and defrost methods
- Superheat and subcooling: measurement and significance
- Energy efficiency in evaporators: frosting, airflow, and load matching
- Practical exercise: setting superheat on a TXV

Day 4: System Controls, Accessories, and Troubleshooting

- Controls: thermostats, pressure switches, solenoid valves, controllers
- Safety devices: high-pressure cut-out, low-pressure cut-out, oil pressure switch
- Accessories: liquid receivers, suction accumulators, filter-driers, sight glasses
- System diagnostics: using gauges, thermometers, and data loggers
- Common faults: low/high head pressure, refrigerant shortage, contamination
- Refrigerant recovery, evacuation, and charging procedures
- Practical exercise: troubleshooting a simulated system fault

Day 5: System Integration, Commissioning, and Practical Assessment

- System commissioning: pre-start checks, start-up procedures, and log sheets
- Performance evaluation: measuring COP, capacities, and efficiencies
- Preventive maintenance planning and documentation
- Regulatory compliance and environmental best practices
- Practical assessment: start-up, operation, and fault diagnosis
- Course review and Q&A;

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **8 NQF credits** at **NQF Level 2**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 23,000.00	R 23,000.00
1	In-House	R 29,900.00	R 29,900.00
1	On-Campus (Pretoria)	R 34,500.00	R 34,500.00

UPCOMING SESSIONS

Start	End	Method	Venue
10 Aug 2026	14 Aug 2026	On-Campus	Durban, South Africa
10 Aug 2026	14 Aug 2026	On-Campus	Abu Dhabi, UAE
10 Aug 2026	14 Aug 2026	On-Campus	Pretoria, South Africa
10 Aug 2026	14 Aug 2026	On-Campus	Dubai, UAE
10 Aug 2026	14 Aug 2026	On-Campus	Cape Town, South Africa
10 Aug 2026	14 Aug 2026	On-Campus	Mauritius
17 Aug 2026	21 Aug 2026	On-Campus	Dubai, UAE
17 Aug 2026	21 Aug 2026	On-Campus	Pretoria, South Africa

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 116224) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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