



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

Single Phase Air Conditioning Refrigeration Ventilation Electrical Circuits Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 116244 · NQF Level 2 · 9 Credits · 6 Days

COURSE OVERVIEW

This course equips learners with the knowledge and practical skills to safely install, maintain, and troubleshoot single-phase electrical circuits in air conditioning, refrigeration, and ventilation systems. It focuses on understanding circuit theory, component operation, and safety protocols to ensure compliance with South African standards. Learners will gain hands-on experience in diagnosing faults and performing routine maintenance.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	116244
Accreditation	SAQA Accredited · NQF Level 2 · 9 Credits
Duration	6 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply single-phase electrical theory to analyze circuits in air conditioning, refrigeration, and ventilation systems.
- Demonstrate safe isolation and testing procedures for single-phase circuits using appropriate test equipment.
- Identify and troubleshoot common electrical faults in compressors, fans, and control components.
- Implement preventive maintenance schedules to ensure optimal performance and longevity of electrical components.
- Evaluate circuit diagrams and schematics to plan installation or repair work.
- Design basic control circuits for temperature and pressure regulation in HVAC systems.

WHO SHOULD ATTEND

- This course is designed for technicians, electricians, and HVAC professionals seeking to specialize in single-phase electrical systems within the air conditioning, refrigeration, and ventilation industry.
- It is also suitable for apprentices and individuals transitioning into this field.

COURSE OUTLINE

Day 1: Fundamentals of Electrical Theory and Safety

- Introduction to electrical theory: atoms, charge, and conductors.
- Voltage, current, resistance, and power definitions and units.
- Ohm's Law and power calculations ($P=VI$, $V=IR$).
- Electrical safety: lockout/tagout, PPE, and SANS 10142.
- Circuit components: resistors, capacitors, inductors, switches.
- Schematic symbols and reading basic circuit diagrams.

Day 2: Single-Phase AC Circuits and Components

- AC waveform: frequency, amplitude, RMS values.
- Single-phase supply: live, neutral, earth.
- Impedance in RLC circuits: series and parallel.
- Power factor and its correction.
- Using multimeters for AC voltage, current, and resistance measurement.
- Practical exercise: building and measuring a simple AC circuit.

Day 3: Refrigeration Principles and Components

- Refrigeration cycle: compression, condensation, expansion, evaporation.
- Thermodynamics: heat transfer, latent heat, superheat, subcooling.
- Refrigerant types, R-134a, R-290, and regulations (F-gas).
- Compressor types: reciprocating, rotary, scroll.
- Pressure-enthalpy diagrams.
- Practical: using manifold gauges and thermometers.

Day 4: Air Conditioning Systems and Controls

- Types of AC systems: split, multi-split, window, ducted.
- Electrical wiring: compressor contactor, fan relays, capacitors.
- Thermostats and control circuits.
- Troubleshooting: compressor start/run issues, capacitor testing.
- Heat load calculation basics.
- Practical: wiring a split AC unit control circuit.

Day 5: Ventilation Systems and Integration

- Ventilation types: natural, mechanical, hybrid.
- Fans: axial, centrifugal, and controls.
- Ductwork basics and air balancing.
- Integration with AC: economizers, heat recovery.
- Indoor air quality: CO2 sensors, humidity control.
- Practical: wiring a ventilation fan with timer and speed control.

Day 6: System Integration, Fault Finding, and Final Assessment

- Integrated system wiring: combining AC, refrigeration, and ventilation.
- Advanced fault finding: using schematics and logic.
- Commissioning: start-up procedures, performance verification.
- Preventive maintenance schedules.
- Review of key concepts and practical assessment.

- Final assessment: written and practical tasks.

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 **9 NQF credits** at **NQF Level 2**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 25,600.00	R 25,600.00
1	In-House	R 33,300.00	R 33,300.00
1	On-Campus (Pretoria)	R 38,400.00	R 38,400.00

UPCOMING SESSIONS

Start	End	Method	Venue
04 Aug 2026	11 Aug 2026	On-Campus	Dubai, UAE
05 Aug 2026	12 Aug 2026	On-Campus	Pretoria, South Africa
05 Aug 2026	12 Aug 2026	On-Campus	Lagos, Nigeria
06 Aug 2026	13 Aug 2026	On-Campus	Johannesburg, South Africa
07 Aug 2026	14 Aug 2026	On-Campus	Mauritius
10 Aug 2026	17 Aug 2026	On-Campus	Dubai, UAE
11 Aug 2026	18 Aug 2026	On-Campus	Pretoria, South Africa
12 Aug 2026	19 Aug 2026	On-Campus	Abu Dhabi, UAE

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 116244) 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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