

# ACS 1000 Medium-Voltage Drive Maintenance and Diagnostics Training Course

18 – 22 April 2027
Kuwait

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**Ref:** 1835_237373 **Date:** 18 – 22 April 2027 **Location:** Kuwait **Fees:** 7000 Euro

## Overview

ACS 1000 Medium-Voltage Drive Maintenance and Diagnostics Training Course is a one-week advanced course for electrical maintenance, reliability, and drive-service functions who leave with an ACS 1000 Maintenance and Diagnostic Decision Pack. The course connects medium-voltage drive architecture, safe maintenance boundaries, power conversion, cooling-system evidence, alarm analysis, fault isolation, preventive maintenance, and performance verification. Participants practice evidence-based decisions without live energized work or proprietary software access. Agile Leaders Training Center delivers this course on ACS 1000 drive maintenance and diagnostics.

## Who Should Attend

- Functions responsible for ACS 1000 inspection, preventive maintenance, and service coordination
- Teams responsible for medium-voltage drive alarms, trips, event records, and fault isolation
- Groups responsible for electrical reliability, condition evidence, and maintenance planning
- Personnel responsible for air- or water-cooling condition, contamination control, and thermal evidence
- Functions responsible for controlled testing, return-to-service evidence, and technical escalation

The course assumes participants already interpret industrial electrical diagrams, VFD operating states, measurements, alarms, and maintenance records, and leaves out introductory drive theory, live energized work, proprietary tool operation, firmware changes, unrestricted parts replacement, and authorization claims.

## Departments and Industries

The course supports departments and industries that operate ACS 1000 medium-voltage drives in critical motor applications.

- Electrical maintenance, reliability, and technical services
- Mining, minerals, cement, and bulk-material handling
- Water, wastewater, power, and utility operations
- Oil, gas, chemicals, metals, and process manufacturing
- Marine, pulp and paper, and large rotating-equipment facilities

## Learning Objectives

By the end of this course, participants will be able to:

- Analyze ACS 1000 architecture and safe maintenance boundaries.
- Diagnose input, DC-link, inverter, filter, and cooling evidence.
- Use alarms and event records to isolate probable fault paths.
- Evaluate inspection, cleaning, and maintenance decisions.
- Apply functional checks and performance verification criteria.
- Build a preventive maintenance and escalation plan.

## Course Agenda

### Day 1: Establish Architecture and Safety Boundaries

- ACS 1000 Drive, Motor, Supply, Load, and Cooling Boundary Map
- Input Stage, DC Link, Inverter, and Output Sine-Filter Functional Model
- Direct Torque Control Signal and Operating-State Diagram
- IEC 61800-5-1:2022 Electrical, Thermal, and Energy Hazard Checklist
- Owner-Permitted Task and Specialist-Escalation Decision Matrix

### Day 2: Assess Power and Cooling Evidence

- Input Supply, Transformer, Connection, and Protection Evidence Sheet
- DC-Link Condition, Capacitor, Busbar, and Connection Review Method
- Inverter Output, Motor Current, Torque, and Speed Trend Matrix
- Output Sine-Filter and Motor Interface Condition Checklist
- Air- and Water-Cooling Inspection and Thermal Evidence Register

### Day 3: Diagnose Alarms and Fault Domains

- Alarm, Trip, Event, Timestamp, and Operating-State Reconstruction Board
- Supply, Converter, Cooling, Control, Motor, and Load Isolation Tree
- Humidity, Dust, Corrosion, Overheating, and Insulation Evidence Card
- Intermittent Fault Reproduction and Exclusion Method
- Diagnostic Finding, Uncertainty, and Technical Escalation Record

### Day 4: Plan Maintenance and Verify Condition

- ACS 1000 Preventive Inspection and Cleaning Schedule
- Project Drawing, Setting, Parts List, and Test Report Evidence Pack
- Controlled Component-Replacement Planning Gate
- Post-Maintenance Functional and Performance Verification Matrix
- Condition Trigger, Interval, Owner, and Escalation Planner

## Day 5: Practice Integrated Drive Diagnostics

- Suggested Exercise: Reconstruct an ACS 1000 Alarm Sequence
- Suggested Exercise: Isolate a Power-Conversion Fault Domain
- Suggested Exercise: Evaluate Cooling and Environmental Evidence
- Suggested Exercise: Verify a Controlled Return-to-Service Decision
- Capstone Exercise: Build the ACS 1000 Maintenance and Diagnostic Decision Pack

## Practical Exercises

The course uses suggested activities to convert drive records and condition evidence into controlled maintenance and escalation decisions.

- Suggested activity: map the ACS 1000 power, control, motor, load, and cooling boundaries from project records.
- Suggested activity: rebuild an alarm sequence and separate primary faults from secondary trips.
- Suggested activity: compare inspection, cleaning, further testing, controlled replacement planning, and specialist escalation options.
- Suggested activity: assemble functional checks, acceptance criteria, responsibilities, and evidence into a maintenance decision pack.

## FAQs

### Who suits ACS 1000 drive maintenance training, and what does it assume?

ACS 1000 drive maintenance training suits experienced electrical maintenance, reliability, and drive-service personnel who already interpret industrial electrical diagrams, VFD operating states, measurements, alarms, and maintenance records.

### How does ACS 1000 diagnostics differ from general VFD maintenance training?

ACS 1000 diagnostics focuses on the product's medium-voltage architecture, power-conversion path, output sine filter, cooling variants, project records, task boundaries, alarms, and escalation decisions rather than generic VFD inspection alone.

### How should ACS 1000 alarms be analyzed during maintenance?

ACS 1000 alarms should be ordered by timestamp, operating state, command, load, cooling condition, preceding event, and affected fault domain before tests or maintenance actions are selected.

### What evidence supports an ACS 1000 maintenance decision?

An ACS 1000 maintenance decision needs repeatable symptoms, measurements, inspections, alarm history, environmental and cooling evidence, project documentation, defined task authority, and a post-maintenance verification method.

## When should an ACS 1000 finding be escalated to a specialist?

An ACS 1000 finding should be escalated when the task exceeds documented owner boundaries, requires proprietary access, involves uncertain medium-voltage hazards, conflicts with project records, or lacks a safe verification path.

## Conclusion

Participants take back an ACS 1000 Maintenance and Diagnostic Decision Pack. The pack links architecture, safety boundaries, subsystem evidence, cooling condition, alarms, fault domains, maintenance options, verification, and escalation criteria. It changes symptom-led intervention into a traceable basis for preventive work, controlled decisions, return-to-service evidence, and specialist referral.