

# CT and VT Testing with OMICRON CT Analyzer and CPC 100 Course

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## Overview

CT and VT Testing with OMICRON CT Analyzer and CPC 100 Course is a one-week course for protection, commissioning, substation testing, relay, and maintenance teams who need a traceable instrument-transformer test record. Participants apply safe setup, ratio and polarity checks, excitation analysis, winding resistance, burden, class assessment, withstand testing, troubleshooting, and reporting. The course separates each tool's purpose through guided workflows. Agile Leaders Training Center delivers this OMICRON instrument-transformer testing course.

## Who Should Attend

- Protection teams responsible for CT performance and relay inputs
- Commissioning teams responsible for CT and VT acceptance evidence
- Substation test teams responsible for primary asset measurements
- Relay teams responsible for polarity, ratio, and circuit verification
- Maintenance teams responsible for instrument-transformer diagnostics

The course assumes participants can interpret CT and VT nameplates, secondary diagrams, and safe isolation procedures; it leaves out power-transformer diagnostics, relay coordination studies, and live testing.

## Departments and Industries

The course supports instrument-transformer testing across power and process facilities.

- Transmission and distribution substations
- Generation and renewable energy facilities
- Industrial plants and oil and gas facilities
- Protection, testing, and commissioning departments
- Electrical maintenance and reliability departments

## Learning Objectives

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

- Apply safe CT and VT test preparation
- Use CT Analyzer assessment workflows
- Build CPC 100 test plans and connections
- Analyze ratio, polarity, excitation, and burden results
- Diagnose wiring, core, and insulation anomalies
- Evaluate class compliance and commissioning evidence

## Course Agenda

### Day 1: Instrument Transformer Test Basis

- IEC 61869 Instrument Transformer Requirement Map
- CT and VT Nameplate Data Interpretation Worksheet
- Protection, Metering, and Multicore Application Matrix
- Isolation, Discharge, and Secondary Circuit Safety Checklist
- Test Scope, Acceptance Criteria, and Evidence Plan

### Day 2: CT Analyzer Setup and Assessment

- CT Analyzer Connection and Low-Signal Test Workflow
- Ratio Error and Phase Displacement Measurement
- Excitation Curve and Knee-Point Evaluation
- Winding Resistance and Burden Impedance Assessment
- CT Class, ALF, FS, and Transient Parameter Report

### Day 3: CPC 100 CT Testing

- CPC 100 Test Card and Connection Plan
- Primary Injection Ratio and Polarity Test Method
- Secondary Burden and Winding Resistance Measurement
- Excitation Current and Knee-Point Test Sequence
- Demagnetization and Post-Test Safety Record

### Day 4: VT Testing and Result Interpretation

- CPC 100 VT Ratio and Polarity Test Plan
- Secondary Voltage Withstand Test Procedure
- Insulation Condition and Dielectric Test Evidence
- Expected Result, Deviation, and Fault Diagnostic Matrix
- OMICRON Test Report Review and Commissioning Dossier

## Day 5: CT and VT Testing Practice

- Exercise: Prepare CT Analyzer Connections and Test Data
- Exercise: Evaluate Excitation, Ratio, and Class Results
- Exercise: Configure CPC 100 CT and VT Test Cards
- Exercise: Diagnose Polarity, Burden, and Insulation Exceptions
- Capstone Exercise: Produce an Instrument Transformer Test Record

## Practical Exercises

The course uses suggested activities to convert instrument-transformer measurements into controlled commissioning evidence.

- Suggested activity: verify nameplate data, wiring, isolation, and test boundaries before connection
- Suggested activity: compare CT Analyzer results with the selected class criteria
- Suggested activity: configure CPC 100 test cards for ratio, polarity, burden, and withstand checks
- Suggested activity: classify a failed result and document the retest decision

## FAQs

### Who suits CT and VT Testing with OMICRON tools and what does it assume?

It suits protection, commissioning, substation testing, relay, and maintenance personnel who can interpret nameplates and secondary drawings and follow isolation procedures. It does not cover live testing.

### How does OMICRON CT and VT testing differ from general electrical testing training?

OMICRON CT and VT testing focuses on instrument-transformer parameters, dedicated connections, tool workflows, class evaluation, and commissioning reports, while general testing covers a broader asset range with less tool-specific depth.

### When is OMICRON CT Analyzer used instead of CPC 100?

CT Analyzer is used for model-based CT assessment and class-related parameters with low test signals, while CPC 100 supports primary injection and multifunction CT and VT tests requiring current or voltage output.

### What does a CT excitation and knee-point test show?

An excitation test maps magnetic behavior and identifies the knee point where the core approaches saturation, supporting core verification, protection performance assessment, and comparison with acceptance criteria.

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## What should an OMICRON instrument-transformer test record contain?

A test record contains asset identity, nameplate data, connection diagrams, equipment settings, measured results, selected criteria, pass or exception status, diagnostic notes, demagnetization evidence, and reviewer approval.

## Conclusion

Participants take back an Instrument Transformer Test Record containing setup data, CT Analyzer results, CPC 100 measurements, exceptions, and commissioning conclusions. The record improves traceability between field testing, protection engineering, and maintenance. It supports consistent retesting and handover without replacing isolation rules or engineering authority.

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