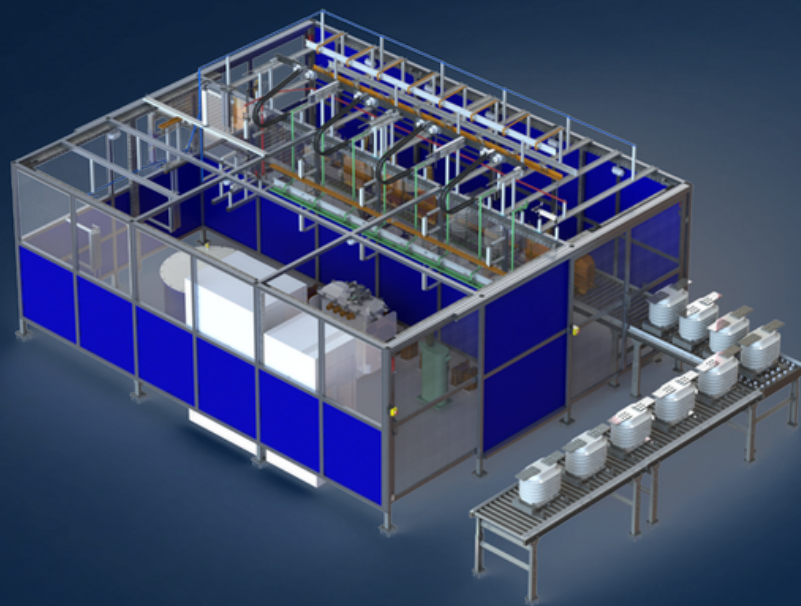


Routine Testing Laboratory

in Instrument Transformers — PTs and CTs



Standards

ABNT NBR 6855:2021 (Potential Transformer) · ABNT NBR 6856:2021 (Current Transformer)

Description and Operation

Description

The Routine Testing Laboratory is a complete and automated solution developed by HVEX for performing routine tests on transformers of instrumentation — potential transformers (PT) and current transformers (CT). It integrates, in a single system, the power, control and induced panels, the high voltage circuit, the test cell with conveyor belts and proprietary operation and analysis software.

Its main distinguishing feature is the test cell, capable of accommodating and testing up to six specimens simultaneously, provided they are of the same class. The switching of connections between the settings of each rehearsal and automatically by actuators made with pneumatic tools, ensuring repeatability and reducing manual intervention.

An integrated security system — magnetic locks, emergency buttons, area scanner, and light curtains — monitors everything. Accesses, driving the flow do register . From equipment to the issuance of a standardized report, all in a single interface.

Operation

Preparation and registration

The operator enters the plate parameters of the TPs/TCs into the software and positions the test specimens in the cell using the conveyor belts.

Automated connection

Feed and return clamps connect each test specimen; pneumatic pistons switch the HV, LV and grounding busbars according to the test.

Execution of the tests

Applied voltage (HV/LV), induced voltage and partial discharges, controlled via software in manual or automatic mode, with real-time measurement and graphs.

Analysis and reports

Results grouped by family (TP or TC), with generation of standardized reports exportable to Excel, Word, PDF, and CSV.

Technical Specifications

Standards Followed

ABNT NBR 6855:2021 (TP) · ABNT NBR 6856:2021 (TC)

Tests Performed

Applied Voltage	High voltage (HV) and low voltage (LV)
Induced Voltage	Low voltage winding energized / High voltage winding open or with representative load.
Partial Discharges	Detection via DP array (coupling capacitor, quad pole, calibrator)

Testing Capability

Test specimens	Up to 6 simultaneous entries of the same class.
Movement	Conveyor belts in the test cell
Switching	Automatic operation via pneumatic actuators (pistons)

High Voltage Circuit

HV Transformer	20 kVA · 220 V – 100 kV (available at AT)
BT Transformer	10 kVA · 220 V – 13.8 kV (applied LV)
Induced Transformer	180 kVA · BT 220 V / AT TAPs 220 / 660 / 1320 / 2200 / 3200 V
DP Set	Coupling capacitor, four-terminal network, oscilloscope and partial discharge calibrator.
AT Source	HVEX Hipot · Monitoring PTs and CTs

Reactive Power Compensation (Induced)

Capacitor bank	Up to 50 kVar (1–3 units) or 100 kVar (4–6 units)
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Technical Specifications (continuation)

Power Panel	
Frequency inverter	Inverter: 20 kVA (1–3 units) or 40 kVA (4–6 units)
Sinusoidal filter	Three-phase Pollux · 380–500 V · 60 Hz
Main circuit breaker	Siemens · 250 A · 36 kA (Class S) · 690 V
Surge protection	DPS Embrastec · 15 kA · Uc 275 V

Control, Automation and Measurement	
Controller (PLC)	Nexto NX3004
Data acquisition	HVEX Acquisition Module
Measurement	HVEX Kilovoltmeter · HVEX Multimeter (MULT-X) · Precision Shunt
Actuators	Self-lubricating pneumatic pistons

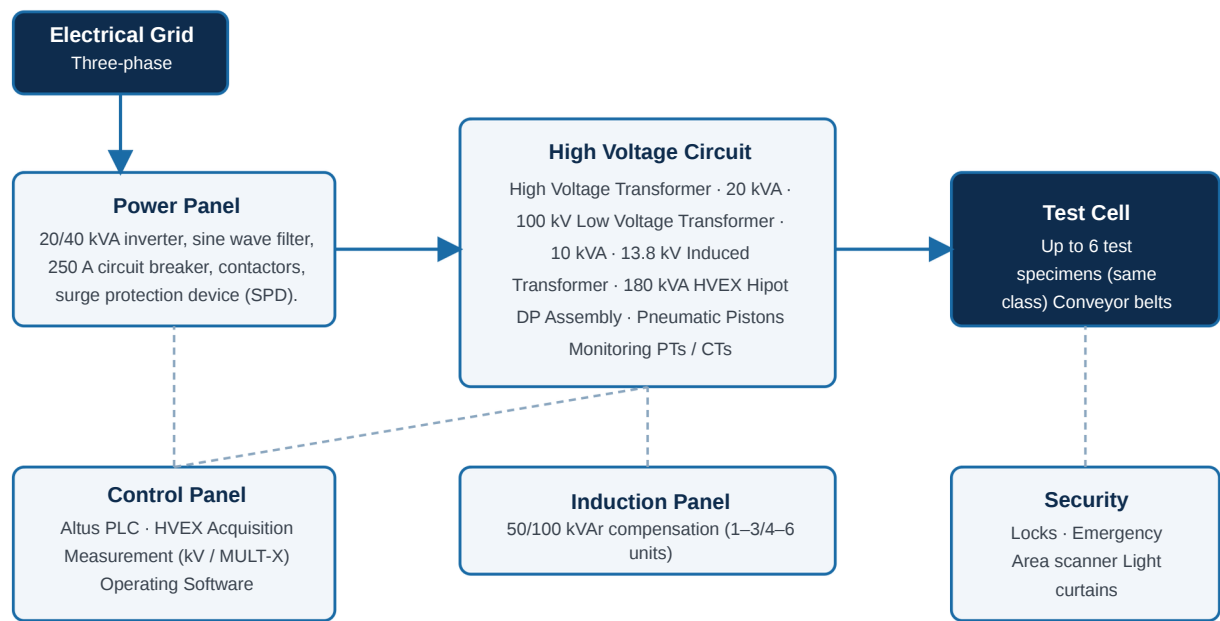
Communication	
Protocols	Modbus (via CLP / Acquisition)
Integration	Remote control and software acquisition · Configurable IP

Technical Specifications (continuation)

Security	
Interlocking	Magnetic locks and sensors for doors and windows.
Emergency	Emergency buttons · Schneider safety relay (Category 4)
Area monitoring	Area scanner · light curtains · signage and siren

Software	
User levels	Administrator · Operator · Viewer
Register	Test specimens (TP/TC), measuring instruments and sensors
Test control	Real-time measurement and graphing · piston and thermocouple calibration · logs
Reports	Export to Excel, Word, PDF, and CSV formats.

System Diagram



Functional layout of the laboratory. The complete electrical diagram (Figure 1-18 of the technical manual), with details of the busbars, power supplies, and piston actuation sequence, can be inserted in this section.



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