HVEX
Driving innovation

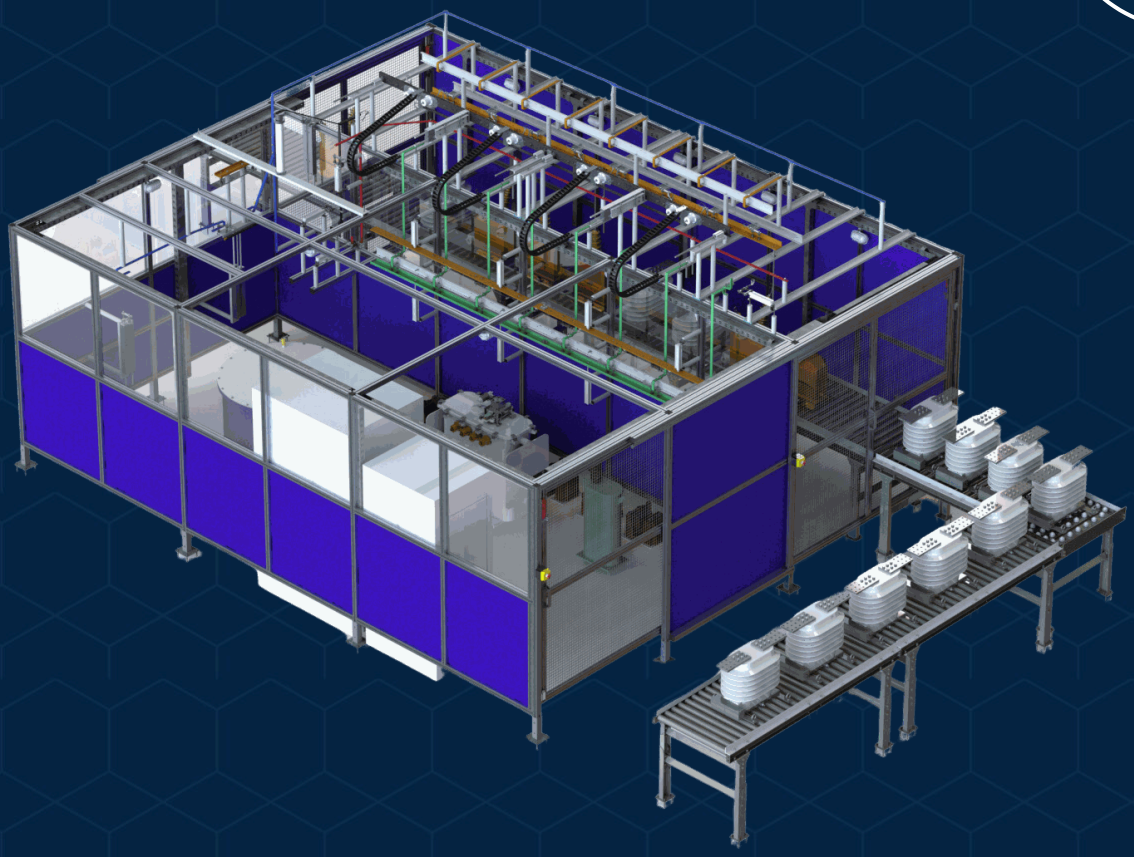
LABORATORY

RAPID TEST LABORATORY FOR DISTRIBUTION TRANSFORMERS

Automated routine tests · Up to 36 kV · 5 to 300 kVA · ≈ 8 min per unit

Reference standards
ABNT NBR 5356-1, NBR 5356-3 and NBR 5440; IEC 60076-1, IEC 60076-3 and IEC 60060-1

≈ 8 min
PER
TRANSFORMER



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Rapid Test Laboratory for Transformers

Description

The HVEX Rapid Test Laboratory is an automated, container-based test line for routine tests on distribution transformers rated up to 36 kV and 5 to 300 kVA. A pneumatic circuit switches the transformer connections between tests, with no operator intervention.

Each unit is tested in about 8 minutes; the software shows pass or fail and issues the report at the end.

Operating principle

After oil filling and thermal stabilization, the transformer enters the test module. The operator connects 8 cables (three-phase) or 5 cables (single-phase), closes the module and loads the unit record in the software, which fills in the test variables.

The automated central bench connects and disconnects the instruments and runs the sequence: applied voltage, induced voltage, no-load losses and load losses. At the end, the software shows the result and generates the report, and the operator changes the transformer.

Features

- Complete routine test sequence with no operator intervention;
- Pneumatic switching of the connections between tests;
- Applied voltage up to 70 kV and loss source up to 3400 V, 50 to 240 Hz;
- 0.6 % voltage and current accuracy in loss measurement;
- 6.1 × 2.4 × 2.6 m container supplied at 380 V three-phase.

Tests performed

- Power-frequency withstand (applied voltage);
- Short-duration induced voltage;
- No-load losses and excitation current;
- Short-circuit impedance and load losses;
- Pass/fail report for every unit.

Benefits

- One unit tested in 4 to 12 minutes, about 8 min on average;
- Safer: the operator stays out of the circuit during the tests;
- Fewer wiring errors: 8 or 5 cables and automatic switching;
- Parameters loaded from the record, no typing at every test;
- Container ready to install next to the production line.

Applications

- Distribution transformer manufacturers (end-of-line testing);
- Transformer repair and refurbishing shops;
- Utilities, for incoming inspection of transformers;
- Transformer test laboratories up to 36 kV;
- Single-phase and three-phase transformers from 5 to 300 kVA.

36 kV	5–300 kVA	≈ 8 min	70 kV
maximum voltage class	power range	average time per unit	maximum applied voltage

Rapid Test Laboratory for Transformers

Automatic test sequence

1 — Preparation
Oil filling and thermal stabilization of the transformer

2 — Connection
8 cables (three-phase) or 5 cables (single-phase); module closed

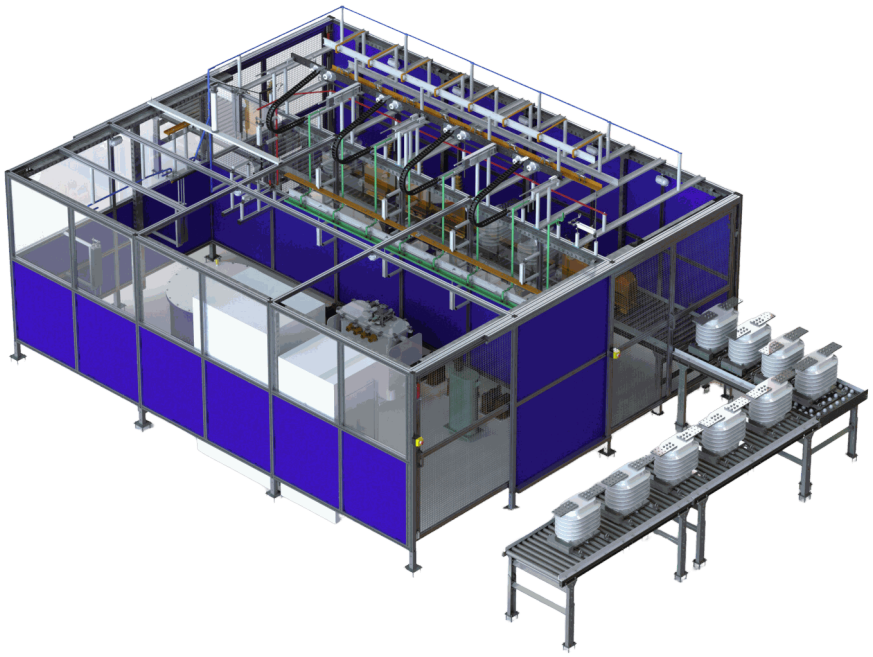
3 — Record
The software loads the unit test variables

4 — Tests
Applied, induced, no-load and load with pneumatic switching

5 — Report
Pass or fail and test report

Tests and laboratory ranges

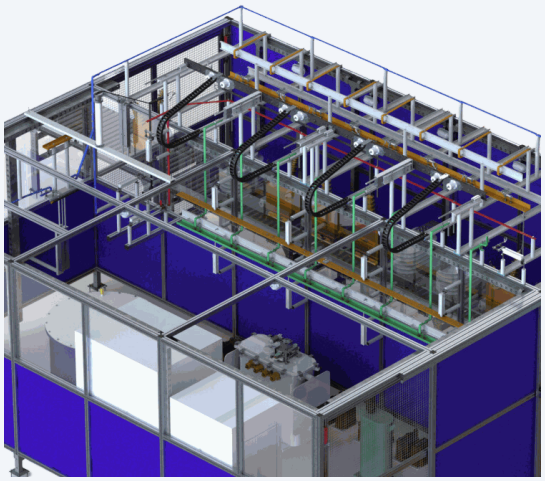
Test	What it checks	Range and accuracy
Applied voltage	Insulation between windings and to ground	Up to 70 kV; 1.0 % voltage accuracy
Induced voltage	Turn-to-turn and phase-to-phase insulation	50 to 240 Hz source; 1.0 % voltage accuracy
No-load losses	Core losses and excitation current	Up to 3400 V; 0.6 % voltage and current accuracy
Load losses	Short-circuit impedance and winding losses	Impedance up to 10 %; X/R up to 8; temperature within 1.0 °C
Final assessment	Results compared with the record limits	Pass/fail and report per unit



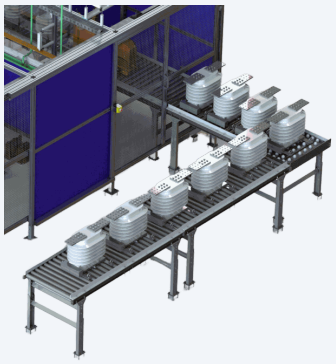
Test module with automated bench and transformer transfer conveyor (illustrative render).

Rapid Test Laboratory for Transformers

Container and automated bench



Central bench: connects and disconnects the test instruments.



Infeed and outfeed conveyor for the transformers.

- 6.1 × 2.4 × 2.6 m container (L × W × H), 5,000 kg;
- 380 V three-phase supply, 200 kVA;
- Pneumatic circuit at 3 to 6 bar, 0.5 m^3/h flow;
- 50 to 240 Hz test source with 6.0 % maximum THD;
- Applied voltage up to 70 kV; loss tests up to 3400 V;
- Transformer low voltage from 220 to 440 V;
- Test module closed while voltage is applied;
- Three-phase connection with 8 cables, single-phase with 5;
- HVEX Container Lab Acquisition software;
- Report for every unit at the end of each sequence.

HVEX Container Lab Acquisition software

- Transformer records with the test variables;
- Automatic execution of the complete sequence;
- Results compared with the limits, with pass or fail;
- Test report issued for every unit.

Safety

- Tests run with the test module closed;
- No operator interaction while voltage is applied;
- Pneumatic switching: no manual cable changes between tests.

Rapid Test × Routine Test Laboratory: the Rapid Test Laboratory is dedicated to series production of distribution transformers up to 36 kV and 300 kVA, with an automatic sequence in a container. For larger transformers or motors, HVEX offers the custom-configured Laboratory for Routine Tests.

Rapid Test Laboratory for Transformers

Technical Specifications

Transformers tested

Voltage class	Up to 36 kV on the HV side; 220 to 440 V on the LV side
Power	5 to 300 kVA, single-phase and three-phase
Impedance	Up to 10 %; X/R ratio up to 8
Connection	Three-phase: 8 cables; single-phase: 5 cables

Tests and accuracy

Tests	Applied voltage; short-duration induced voltage; no-load losses and excitation current; short-circuit impedance and load losses
Accuracy — losses	0.6 % voltage and current; 1.0 °C temperature
Accuracy — applied and induced	1.0 % voltage
Maximum voltages	Losses: 3400 V; applied: 70 kV
Test frequency	50 to 240 Hz
Maximum THD	6.0 %
Test time	4 to 12 min per unit, depending on power and voltage (≈ 8 min average)

Installation

Power supply	380 V three-phase, 200 kVA
Pneumatic circuit	3 to 6 bar; 0.5 m³/h
Container	6.1 × 2.4 × 2.6 m (L × W × H); 5,000 kg

Software and standards

Software	HVEX Container Lab Acquisition
Standards	ABNT NBR 5356-1, NBR 5356-3 and NBR 5440

The standards listed identify the equipment's field of application and do not constitute certification of the test object. Weights and dimensions are approximate. Specifications subject to change without notice. Rev. 11/2026.

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