



ABB and PEHLA Testing Laboratories

Ratingen, Germany

Since 1954, the laboratories of ABB AG have performed tests on medium and low voltage equipment. Our laboratories, which are located in Ratingen, Germany, contain all the facilities necessary for tests in the medium and low voltage range.

Content

004	Introducing
005	Why testing at Laboratories Ratingen?
006	Our documentation to the customers
007	Development tests, type tests or acceptance tests
008	Testing facilities
015	Workshop of the Laboratories
017	Contacts at the Laboratories Ratingen

Introduction

Laboratories Ratingen

The ABB and PEHLA Testing Laboratories Ratingen are accredited by the German Accreditation Authority (DAkkS). As a shareholder of PEHLA GbR we are also a member laboratory of the Short-circuit Testing Liaison (STL). We provide our customers with high performance and independent testing carried out in accordance with customer requirements or national and international standards.



Accreditation



The Deutsche Akkreditierungsstelle attests with this Accreditation Certificate that

PEHLA GmbH

with its testing laboratory

PEHLA GmbH
PEHLA-Prüfelfeld Ratingen
Oberhausener Straße 33, 40472 Ratingen, Germany

meets the requirements according to DIN EN ISO/IEC 17025:2018 for the conformity assessment activities listed in the annex to this certificate. This includes additional existing legal and normative requirements for the testing laboratory, including those in relevant sectoral schemes, provided they are explicitly confirmed in the annex to this certificate

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories and confirm generally with the principles of DIN EN ISO 9001.

This accreditation was issued in accordance with Art. 5 Para. 1 Sentence 2 of Regulation (EC) 765/2008, after an accreditation procedure was carried out in compliance with the minimum requirements of DIN EN ISO/IEC 17011 and on the basis of a review and decision of the appointed accreditation committees.

This accreditation certificate only applies in connection with the notices of 03.11.2023 with accreditation number D-PL-12072-06. It consists of this cover sheet, the reverse side of the cover sheet and the following annex with a total of 10 pages.

Registration number of the accreditation certificate: D-PL-12072-06-00

Berlin, 03.11.2023 Florian Burkart
 Head of Technical Unit

Translation issued: 
 Dipl.-Ing. (FH) Florian Burkart
 Head of Technical Unit

The certificate together with the annex reflects the status as indicated by the date of issue. The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH (www.dakks.de).

This document is a translation. The definitive version is the original German accreditation certificate.
 See notes attached



Safety. Science. Transformation.™

UL LLC ISSUES THIS

Certificate of Participation

ABB AG CALOR EMAG MEDIUM VOLTAGE PRODUCTS
 OBERHAUSENER STRASSE 33, RATINGEN 40472, DE

The laboratory above has been assessed and found to comply with the applicable requirements of ISO/IEC 17025 in accordance with UL's Data Acceptance Program (DAP) and has been qualified as a DAP participant. The laboratory is hereby authorized to submit testing data to UL for product certification purposes as allowed by the schemes and for the product types and standards identified in the DAP Scope.
 Client Test Data Program (CTDP)

DA File: DA2592
 Issued: 5/22/2024
 Expires: 2/14/2025


 Paul Mousard
 Program Owner

Why testing at Laboratories Ratingen?

With over 70 years of experience we know how to perform tests professionally. Starting with the planning and preparation phase we cooperate closely with our customers in order to ensure an optimal testing. Our organization provides flexible planning which ensures short-term reservation.

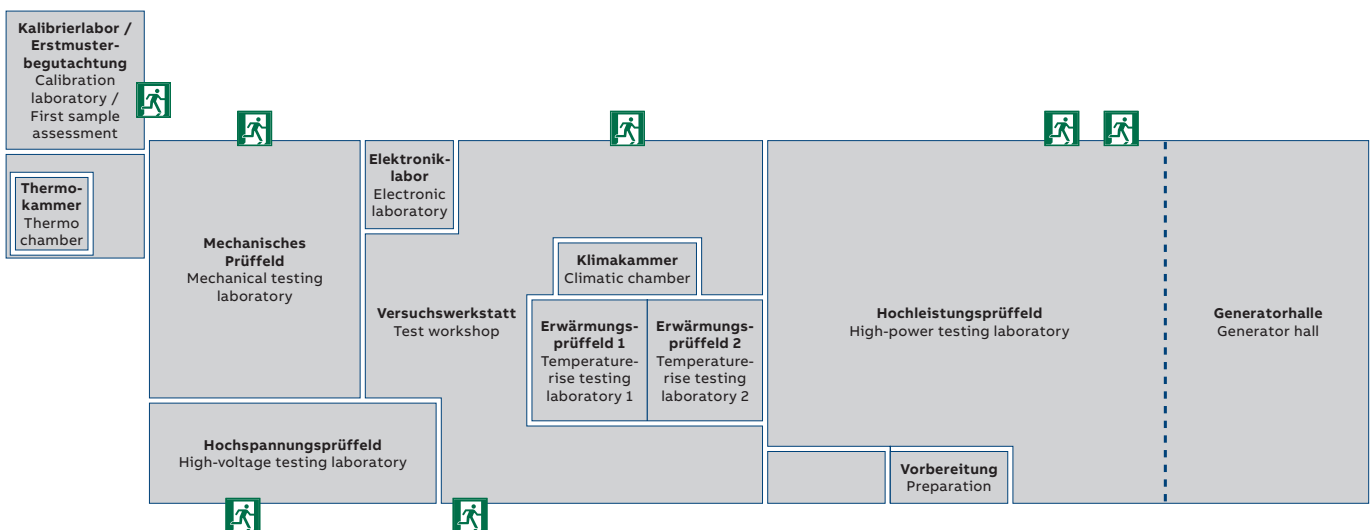
When testing at the Laboratories Ratingen our customers may choose to either prepare the test objects on their own or make use of our assembly and installation service. By request an on-site testing can be performed in the customer's facilities. All test results will be evaluated by our team of highly qualified and experienced experts in close cooperation with the customers.

Our laboratories are equipped with a gas module to handle and recycle the gas for environmental safety.

The accreditation as ABB Laboratories Ratingen and as PEHLA Testing Laboratories Ratingen ensures that all tests are fully independent.

Services we provide

- On-site testing and diagnostics with mobile test equipment
- Independent witnessing of tests
- Inspections, examinations and diagnostics
- Manufacturing of prototypes and individual parts
- Assembly of prototypes and test objects
- Assembly and installation work
- Calibration of electrical and mechanical measuring equipment
- Consulting concerning type testing, optimization of test objects and planning
- Damage investigations and root cause analysis by technical experts



Our documentation to the customers

When testing at Laboratories Ratingen different types of documentation can be issued.

Type test certificate

A type test certificate is issued for type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of the test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

Test Certificate

A test certificate is issued for parts of type tests which have successfully been carried out in full compliance with the relevant specifications or standards and STL Guides valid at the time of test. For these tests the test object must be clearly identified by technical description, drawings and additional specifications.

Test report

A test report is issued for all other tests which have been carried out according to specifications, standards or “PEHLA-Richtlinien” (PEHLA Guides) and/or clients’ instructions. Similarly, this test report contains all test results, details of the conditions under which the tests were carried out, also details relating to the behaviour of the test object, and its condition after the tests.

Test confirmation

A test confirmation is issued immediately after the tests. It confirms that the tests have been conducted and is valid only until publishing the detailed results in an entire document.



Development test, type tests or acceptance tests

Laboratories Ratingen are able to offer any kind of test your company needs.

The laboratories are fully equipped to perform complete type tests on medium voltage equipment with state-of-the-art technology. All tests can be carried out as ABB tests or as PEHLA tests.

Tests we provide

- Type tests
- Development tests
- Acceptance tests (also in other test laboratories)
- Certification tests

Our test portfolio

Tests	Products											
	MV circuit-breaker	Metal enclosed switchgear	Power transformer	Disconnecter & earthing switch	Switch fuse unit	Earthing facility	Bushing	Instrument transformer	Fuse	Cable accessory	Auxiliary circuit	Substation
Making and Breaking test	●	●		●	●				●		●	●
STC test	●	●	●	●		●	●	●		●	●	●
Internal arc test		●										●
Capacitive switching test	●			●								
Temperature rise test	●	●		●	●	●	●	●	●	●	●	●
Climatic test	●	●	●	●	●	●	●	●	●	●	●	
Dielectric test	●	●		●	●	●	●	●	●	●	●	●
IP/IK-coding test	●	●										●
Partial discharge test	●	●		●	●	●	●	●		●		●
Mechanical operation test	●	●		●	●						●	
Mechanical endurance test	●			●	●						●	
High and low temperature test	●	●		●			●		●		●	
Tightness test	●	●		●			●					
Pressure test	●	●		●								

● Tests at Ratingen possible

■ Tests not applicable to this product

Testing facilities

The Laboratories Ratingen are coordinating tests very well even if different kind of tests in more than one laboratory are required.

Customers, who need various tests, can therefore rely on well-organized test procedures – quickly and at fair conditions.

High-power testing laboratory

The high power testing laboratory is equipped with a 2800 MVA short-circuit test generator and oil-insulated power transformers and is therefore able to perform making and breaking tests at several voltage- and short-circuit current levels.

A special dry-type power transformer is available to perform peak-withstand current- and short-time withstand current test up to 250 kA and 100 kA r.m.s for three seconds.

Inside the room simulation of the arcing test bay, internal arcing tests can be performed for switchgear, containers or even substations.

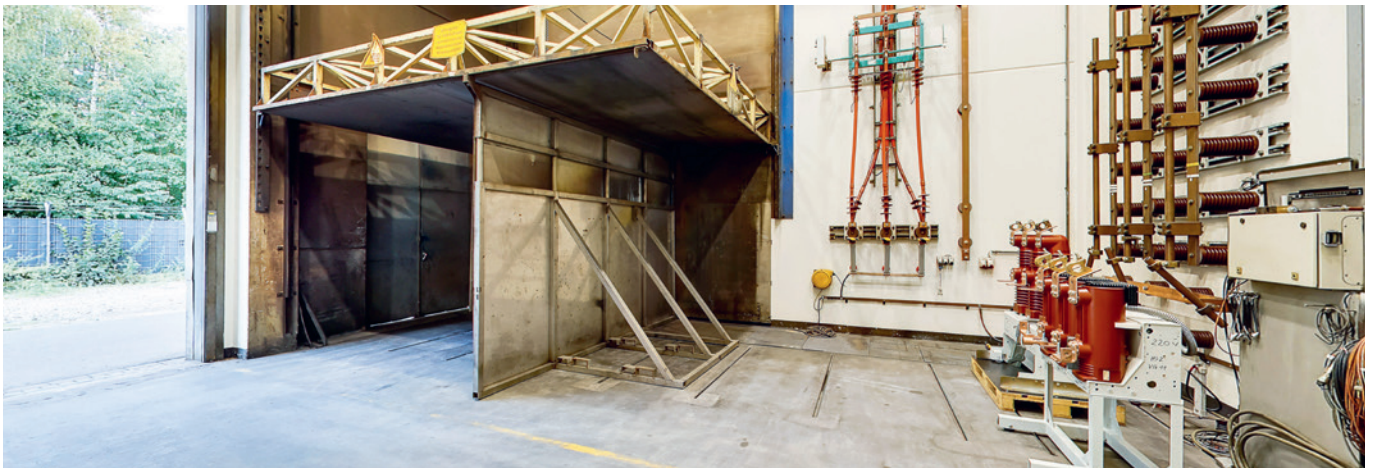
A capacitor bank allows to perform different capacitive tests (e.g. line- or cable-charging current switching tests, back-to-back- and single-capacitor-bank current switching tests).

With the miscellaneous equipment like different reactors and resistors, measurement equipment etc., it is possible to perform a wide range of load current switching tests as well.



The tests, which can be performed at our high power testing laboratory, are:

- Short-circuit making and breaking capacity test
 - up to
 - 50 kA at 12 kV
 - 31.5 kA at 17.5 kV
 - 25 kA at 24 kV
 - 16 kA at 40.5 kV
- Switching capacity test
 - Load currents
 - Capacitive
 - Inductive
 - Ohmic
 - Inductive-ohmic
- Peak withstand current test
 - Up to 250 kA
- Short-time withstand current test
 - Up to 100 kA and up to 3s (4s)
- Internal arc fault test
 - Up to 50 kA
- Different tests
 - beyond the standards according to client's instructions



Testing facilities

Temperature-rise testing laboratory

The temperature-rise testing laboratory is suited to perform tests with a continuous current up to 5000 A on switchgear and switching devices. Through automated and computer controlled tests we use our recourses in the most efficient and effective way. Therefore we can offer precise, reliable and quick tests during day and night-time to our customers.

During the test, currents and temperatures are checked every 10 minutes. Shorter measurement intervals for currents and temperatures are possible. A control circuit guarantees a constant three-phase current through the entire test. The test is automatically stopped if a temperature limit is exceeded or the test duration is over.

- Temperature-rise tests
 - Up to 270 measuring points can be connected
 - Single-phase and three-phase
 - Up to 6300 A at 50/60 Hz
- Additionally we can offer
 - Magnetic field measurement
 - Thermal imaging



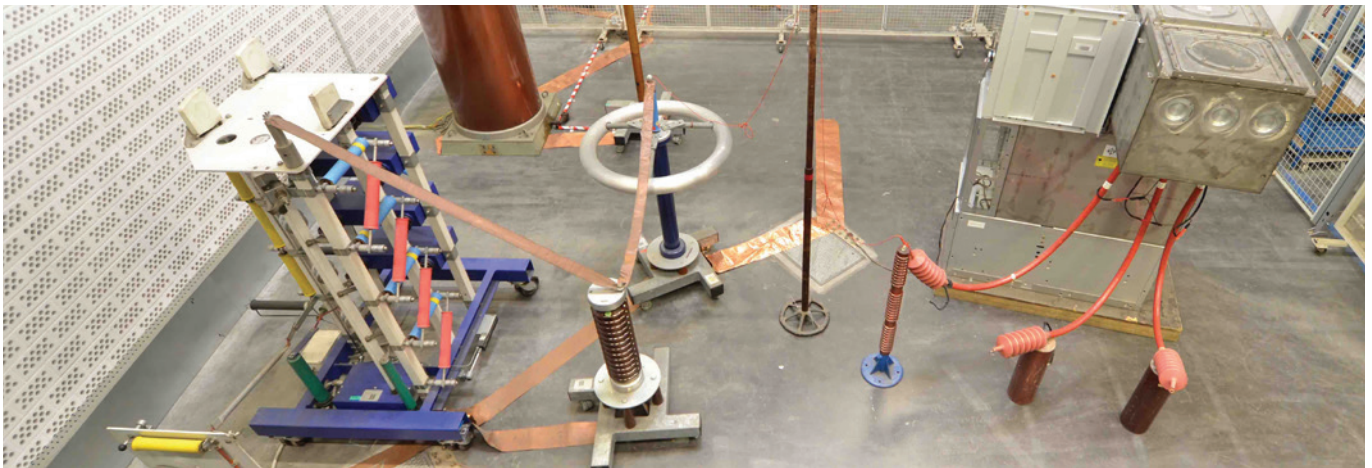
High-voltage testing laboratory

With the test facilities in our high voltage testing laboratory all dielectric and partial discharge tests for medium voltage equipment can be carried out. For sensitive partial discharge tests a special test chamber is available with a background level < 1 pC.

In order to offer on-site testing the high-voltage laboratory has mobile test equipment.

The high-voltage testing laboratory performs the following tests:

- Standard lightning impulse voltage tests
 - Up to 800 kV
- Power-frequency voltage tests
 - Stationary up to 260 kV
 - Mobile up to 230 kV
- Partial discharge tests
 - Stationary up to 150 kV
 - Mobile up to 230 kV
- Degree of protection tests
- Tests on auxiliary and control circuits



Testing facilities

Mechanical testing laboratory

The mechanical testing laboratory offers different functional, environmental and material tests especially on medium and low voltage equipment and their components.

The functional tests include endurance tests on switching devices, kinematic chain tests and function tests on any kind of interlocking or control system. For long-duration tests automatic control and monitoring systems are available to supervise various signals for diagnostics.

A wide range of measurement equipment is able to record via special sensors many additional data for detailed investigation of the test objects characteristics, like travels, rotation angles, forces, torques, pressures, temperatures, binary signal states and gas densities.

For gas-filled equipment we offer additionally gas-tightness and pressure withstand tests.

The environmental tests combine the above mentioned measurements and functional tests with special conditions during storage and/or operation like extreme temperatures, humidity, vibrations, inclination and other impacts.

Material testing concentrates on load tests like tensile, compression, mechanical impact IK-coding, torsion and bending tests.

High-speed video recording can be used for visual examination of very fast processes (up to 10,000 pic./s).



Environmental Testing Laboratory

In this laboratory various climatic tests on materials, components and complete medium voltage switchgear panels can be carried out.

The testing facilities include two climatic chambers and one climatic shock chamber:

Accessible Climatic-Chamber

- Dimensions 2 m (W) x 2 m (H) x 2 m (D)
- Temperature range: -70 °C - +130 °C /1 K/min
- Humidity range: 10 – 98 %
- AC Test voltage (single phase): 100 kV

Accessible Climatic-Chamber

- Dimensions 2.4 m (W) x 3.5 m (H) x 3.2 m (D)
- Temperature range: -70 °C - +150 °C /1 K/min
- Humidity range: 10 – 98 %
- AC Test voltage (3-phase): 100 kV

Climatic Shock-Chamber

- Dimensions 0.8 m (W) x 0.6 m (H) x 0.6 m (D)
- Temperature range: -85°C - +220°C/<1min

Material Testing Laboratory

Solid materials (Insulation materials and metals), liquids and gases can be tested in the material testing laboratory.

The following tests can be performed in this laboratory:

- Destructive and non destructive mechanical tests
- Thermal tests and ageing tests
- Tests to verify the dielectric behavior of insulation materials
 - Measurement of conductivity
 - Measurement of tan d
- Chemical and physical Analyses (RFX, FTIR, EDX)



Testing facilities

Calibration Service

At the calibration laboratory we are able to calibrate electrical measurement instruments, force measurement instruments, length measurement equipment, torque wrenches and pressure gas equipment.

Initial Sampling Inspection

Objects with different size can be digitized with top-quality by 3D-scanning.

The 3D scanner will also be used for:

- Quality checks
 - Comparison of nominal/actual measurement data according to CAD data set
 - Measurement of form and position tolerances without complex construction
 - Measurement of free formed surfaces
 - Serial measurement for quality checks, process safety
- Toolroom
 - Generation of drawings for CAD system derives from scan process
 - Check of initial batches



Workshop of the Laboratories

The workshop manufactures prototypes and test arrangements as well as provides complete assembly and installation service in connection with tests.

If defects occur during tests our workshop offers immediate repair service and manufacturing of spare parts.

In order to offer optimal service the workshop is fully equipped for all kind of metal processing.





Contacts at the Laboratories Ratingen

If you need more information on Laboratories Ratingen or if you would like to make reservations for a test please contact

General contact

Phone: +49 2102 12-1477

E-Mail: testing@de.abb.com

abb.com/laboratories-ratingen

General manager

Alexander Steffens

Phone: +49 160 972 656 33

E-Mail: alexander.steffens@de.abb.com

Manager of high-power testing laboratory

Martin Forschelen

Phone: +49 151 407 158 51

E-Mail: martin.forschelen@de.abb.com

**Manager of temperature-rise
and high voltage testing laboratory**

Ralf Hutmacher

Phone: +49 175 225 81 56

E-Mail: ralf.hutmacher@de.abb.com

**Manager of mechanical and electronic
testing laboratory**

Michael Schöttler

Phone: +49 170 780 30 24

E-Mail: michael.schoettler@de.abb.com

Manager of workshop

Philipp Holland

Phone: +49 151 628 757 19

E-Mail: philipp.holland@de.abb.com

Manager of material laboratory

Dr. Martin Wember

Phone: +49 2102 12-1353

E-Mail: martin.wember@de.abb.com

Manager of Quality Management Laboratories

Stephan Schmidt

Phone: +49 151 506 838 27

E-Mail: stephan.s.schmidt@de.abb.com

Technical Sales Engineer

Tim Cremer

Phone: +49 171 203 99 45

E-Mail: tim.cremer@de.abb.com

Additional information

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB AG.



—
ABB AG

Medium Voltage Products

Oberhausener Strasse 33

40472 Ratingen

Germany

Phone: 02102 12-0

testing@de.abb.com

