

KEMA Labs

CESI Group



Transformer Rectifier Unit (TRU) Testing

Who We Are

KEMA Labs is a globally recognized organization specializing in Testing, Inspections & Certification. With locations worldwide, we merge traditional methods with cutting-edge technology to test a wide range of grid equipment. This ensures compliance with the latest rigorous standards for performance and safety. We also provide quality assurance and advisory services, leveraging our horizontally integrated global expertise to support clients throughout the entire energy value chain.



+4000

Global
customers per year

50+

Accredited Labs

200+

Talented People

6+

Labs & Offices
Worldwide

Industries Served

KEMA Labs is a globally recognized organization specializing in Testing, Inspections & Certification. With locations worldwide, we serve multiple industries by merging traditional methods with cutting-edge technology, supported by cross expertise and state-of-the-art facilities, to test a wide range of grid equipment.



Independent Testing for Reliable Rail Power

KEMA Labs Chalfont provides comprehensive testing services for railway electrification equipment, helping manufacturers and operators verify safety, performance, and compliance with international standards.

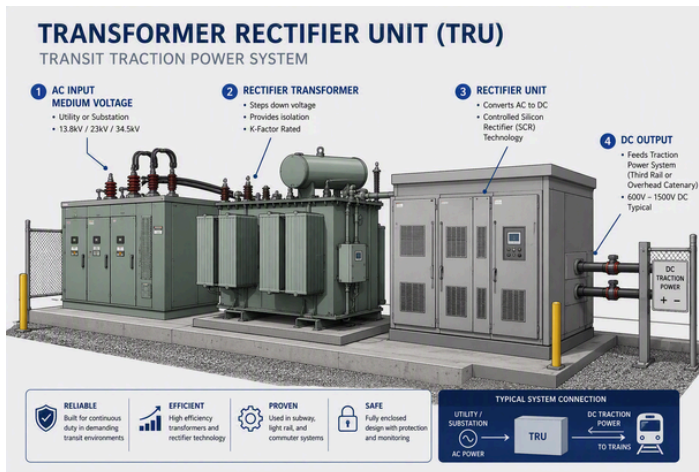
Our specialized transit testing capabilities cover Transformer Rectifier Units (TRUs), AC switchgear, circuit breakers, and DC traction equipment used in rail, metro, tramway, and transportation power systems. Tests are performed by experienced engineers in independent laboratories equipped to handle high-power and high-current applications.



Transformer Rectifier Unit (TRU) Testing

Supporting railway power conversion systems up to 5 MW and 34.5 kV, KEMA Labs performs a complete range of high power and high voltage tests, including:

- Cold & Hot Resistance
- Harmonic Analysis
- Transient Surge Voltage
- Commutating Reactance
- Loss Measurements
- Dielectric Strength (Rectifier)
- Rated Voltage (Rectifier)
- Audible Sound Level (Rated Voltage / Current)
- Efficiency, Displacement Power Factor, and Voltage Regulation
- Current Balance Measurement
- RI-9 Overload Sequence
- Short-Circuit Current



AC Switchgear & Circuit Breaker Testing

Our laboratory tests Low & Medium Voltage AC switchgear and Circuit Breakers for rail applications through:

- Short-time and momentary current withstand tests
- Interruption and switching performance verification
- Continuous current tests
- Mechanical endurance testing
- Electrical endurance testing

Tests can be performed according to IEEE, ANSI, UL, CSA, IEC and EN standards.

SWITCHGEAR & CIRCUIT BREAKERS

Reliable Power Control, Protection & Distribution

SWITCHGEAR

CONTROL & MONITORING DEVICES
Meters, Relays, Indicators

CIRCUIT BREAKER COMPARTMENT
Draw-out or Fixed Type

ISOLATION & PROTECTION DEVICES
Disconnect Switch, Fuses, Grounding Switch

BUSBAR COMPARTMENT
Main Busbars & Connections

CABLE COMPARTMENT
Incoming / Outgoing Cable Connections

GROUND BUS COMPARTMENT
Grounding Connections

TYPICAL APPLICATIONS

Utilities & Substations

Industrial Facilities

Transit & Railway Systems

Data Centers & Commercial Buildings

CIRCUIT BREAKER

OPERATING MECHANISM
Spring Charge Motor / Manual Operation

CONTROL PANEL
Close / Open Push Buttons, Position Indicator, Counter

DRAW-OUT MECHANISM
For Easy Installation & Maintenance

PRIMARY TERMINALS
Connection to Busbar / Cable

INTERRUPTING UNIT
Vacuum / SF₆ Technology for High Breaking Capacity

CURRENT SENSORS
CTs for Protection & Metering

TYPES OF CIRCUIT BREAKERS

Air Circuit Breaker (ACB)

Vacuum Circuit Breaker (VCB)

SF₆ Circuit Breaker (SF₆ CB)

Molded Case Circuit Breaker (MCCB)

Miniature Circuit Breaker (MCB)

KEY BENEFITS

RELIABLE PROTECTION

Protects equipment and personnel from faults and overloads

OPERATIONAL SAFETY

Ensures safe isolation and switching under all conditions

HIGH AVAILABILITY

Built for durability and continuous operation in demanding environments

EASY MAINTENANCE

Modular design for quick access and serviceability

FLEXIBLE SOLUTIONS

Wide range to meet various voltage, current, and application needs

DC Switchgear & Circuit Breaker Testing

For DC traction networks, KEMA Labs offers dedicated testing services to validate equipment reliability under demanding operating conditions, including:

- Short-time and momentary withstand tests
- Interruption capability tests
- Continuous current verification
- Mechanical and electrical endurance testing
- Sequence I & II performance testing

All testing activities support compliance with leading international railway and electrical standards.

DC SWITCHGEAR & DC CIRCUIT BREAKER

Safe, Reliable Protection and Switching for DC Traction Power Systems

DC SWITCHGEAR (TYPICAL ASSEMBLY)

CONTROL & MONITORING
Meters, Relays, Alarms, Indicators, HMI

DC CIRCUIT BREAKER COMPARTMENT
Main DC Breaker for Protection & Switching

ISOLATOR / DISCONNECT COMPARTMENT
Manual or Motorized Disconnect Switch

GROUND / EARTH SWITCH
For Safe Maintenance

BUS COMPARTMENT
DC Main Bussbars & Connections

CABLE COMPARTMENT
Incoming / Outgoing DC Cable Terminations

AUXILIARY COMPARTMENT
Control Power, Batteries, Terminal Blocks

DC CIRCUIT BREAKER (TYPICAL)

OPERATING MECHANISM
Spring Charged Motor / Manual Operator

ARC CHUTE ASSEMBLY
Extinguishes Arcs Quickly for DC Protection

CONTROL UNIT
Trip Unit, Sensors & Protection Functions

LINE TERMINAL
Connection to DC Busbar (Positive or Negative)

MOVING CONTACT
High Conductivity Contact for Current Carrying

LOAD TERMINAL
Connection to Outgoing DC Feeder / Cable

KEY FEATURES & BENEFITS

- HIGH RELIABILITY**
Designed for continuous operation in demanding DC systems
- SAFE MAINTENANCE**
Secure isolation with visible break and grounding provisions
- ADVANCED PROTECTION**
Fast and selective protection against faults and overloads
- EASY INTEGRATION**
Modular design for easy installation and system expansion

TYPICAL APPLICATIONS

- Rail & Metro Traction Power Systems
- DC Substations & Wayside Systems
- Battery Energy Storage Systems (BESS)
- Industrial DC Power Systems

RATINGS (TYPICAL)

Voltage Rating 600V - 3000V DC	Current Rating Up to 4000A	Interrupting Capacity Up to 100 kA	Standards IEEE / IEC
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TYPICAL DC TRACTION POWER SYSTEM

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graph LR
    AC[AC SUPPLY] --> RECT[RECTIFIER]
    RECT --> SW[DC SWITCHGEAR]
    SW --> CB[DC CIRCUIT BREAKER]
    CB --> FEED[TO FEEDER / TRAIN]
    FEED --> TRN[TRAIN]
    TRN --> RETN[RETURN / NEGATIVE BUS]
    RETN --> SW
    RETN --> CB
    
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KEY CONTACTS

MATTHEW MUTHARD

AREA MANAGER NORTH AMERICA

Email: matthew.muthard@kema.com

Mobile: (610) 390-9939

ANGELO SCHIAPPACASSE

REGIONAL SALES MANAGER - AMERICAS

Email: angelo.schiappacasse@kema.com

Mobile: +39 3357325461

Technology, Expertise and long-standing legacy for the Energy Sector



CESI S.p.a.

Via Rubattino 54
20134
Milan, Italy

KEMA B.V.

Klingelbeekseweg 195
6812 Arnhem
The Netherlands

FGH Engineering and Test Gmbh

Hallenweg 40
68219 Mannheim
Germany

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH

Landsberger Allee 378
12681 Berlin
Germany

KEMA Powertest LLC

4379 County Line Road
Chalfont, PA, 18914
United States

Zkušebníctví, a. s.,

Podnikatelská 547
190 11
Prague 9 – Běchovice
Czech Republic