

BALTO MODULAR DC High Current Circuit Breaker Tester



- New – Portable DC High Current Circuit Breaker Tester – for testing DC High Speed Circuit Breakers
- Ergonomic design
- Power source from batteries, buffer through ultra-caps
- Current Generator: DC/DC current converters
- Current rising slope according to IEC 61992-2 (Traction Power Substations) & IEC 60077-2 (Rolling Stock)
- Adjustable parameters of the Circuit Breaker Trip Current
- USB & Ethernet RJ45 Interfaces
- BALTO Win – Communication software for PC
- Test Reports
- Bespoke connection for high speed circuit breakers
- Registered International Patents

DESCRIPTION

Railway operators involved in the service and maintenance of the railway network are challenged with testing DC high speed circuit breakers and in particular when it comes to the control and the adjustment of the threshold circuit breaker trip current, known as I_{ds} , and when comparing results to the circuit breaker OEM specification.

The solution is the Megger Balto. Designed with the user in mind this innovative mobile Megger Balto system is useable for up to 40000A which meets the challenges of the manufacturers and users of DC high speed circuit-breakers. The Megger Balto DC High Current Circuit Breaker Tester was developed to generate very high and precise DC test currents in order to carry out functional tests on DC high speed circuit-breakers. These very high currents are injected in the main circuit of DC high speed circuit-breakers and allow control of the entire circuit including the measurement elements, current converters and protection relays.

FEATURES

To meet the needs of the market, Megger provides the innovative Megger Balto Modular system based on the requirements of the DC high speed circuit-breakers' manufacturers and from various railway networks managers and users.

Each Megger Balto Modular complete system consists of a.....

- **Control Unit** – the operator terminal
- **Current Generator(s)** – the power source or power unit– up to 5 units
- **Trolley** - housing batteries, ultra-caps and battery charger.
- **Cable Set** – Connection to the test piece

The Megger Balto Modular

- Supports from 4000A and extended up to (5x 4000A Current Generators) 20000A and up to 40000A in a Master/Slave configuration
- Uses the 4000A Current Generator
- Uses the Trolley and Battery Pack 8000, 12000, 20000A

Each system is modular and can be extended:

- All the modules are portable, and the entire system is transportable to site on the convenient trolley & battery pack
- The system is easy to setup and straightforward to connect to the asset

User safety is paramount and the Megger Balto Modular system provides the automated monitoring of the system and temperature guarding of the ultra-caps.

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In addition the system also provides...

- Automatic recognition of the Current Generators
- Auto diagnostic – Control and calibrate of current measurement per Current Generator
- Current increase management
- Accurate display of measurements

The Megger Balto Modular system provides a number of Standard Test Modes...

Standard Test Modes

- Automatic mode with quick test
 - Quick test to determine approximate Circuit Breaker Trip Current - I_{ds} .
 - Automatic test with current increase slope according to IEC 61992-2 (Traction Power Substations) & IEC 60077-2 (Rolling Stock) for accurate testing of I_{ds}
 - Graphical display of measurement results
- Manual mode
 - Measurement of the DC high speed circuit-breakers opening time
 - Test of the DC protection
 - Calibration of the external devices
- Voltage drop measurement
 - Voltage drop measurement according to the DC high speed circuit-breakers manufacturer's procedure

APPLICATIONS

The Megger Balto System was developed for specific applications in the railway field, namely:

- Tests of DC high speed circuit-breakers for sub-stations and their protections
- Tests of DC high speed circuit-breakers in locomotives, train sets, subways, undergrounds and tramways
- Tests of electromagnetic contactors (control and main) in tramways and trolleybuses

The Megger Balto system can also be used for other applications where very high currents are required e.g. mining, steel factories, marine and solar.

SPECIFICATIONS

Power supply

Mains input	120VAC 60Hz
	230VAC 50Hz

Power consumption	120VAC 60Hz - 7.20A
	230VAC 50Hz - 3.50A

Power supply voltage

Batteries & ULTRA-caps	12VDC – 15.7VDC
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Power cord	CEE 7/7 Plug to IEC 60320 C13, 2m, 10A, 250VAC
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Available ranges

System 4000A - 20000A per 4000A unit

System master/slave 24000A, 32000A, 40000A

Complete Modular System

Weight:	249kg (548lbs) for configuration with 5 Current Generator 4000A, excl. power cables
Max. No. of Current Generators:	5 (10 in master/slave configuration.)
Duration of injection:	2-5 sec
Accuracy of results:	0.2% ... 0.5%

Control Unit

Offers the following features:

- Operator Terminal – Operation, control and management
- Communication interfaces
- Auxiliary supplies

Weight:	16.4Kg
Dimensions:	500 x 480 x 230mm
Functionality:	HMI (Human machine Interface) and CPU
Screen Type:	TFT touchscreen
Diagonal:	14.5cm (5.7")
Resolution:	640 x 480 pixels

Secondary injection

■ Outputs:

- Voltage outputs : -60mV/+60mV...-10V/+10V
- Current outputs : -20mA...+20mA and +4mA...+20mA

■ Inputs:

- Trip contact DC protection Relay
- Trip contact (spare)

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■ Curves:

- Standard
- User defined

Current Generator

Current converters: DC/DC 4000A
Weight per unit: 24.5Kg
Dimensions: 700 x 430 x 160mm

Trolley

- Control unit
- Current Generator 4000A – 20000A- Max. No. of Current Generators: 5 (10 in master/slave configuration providing 2x 20000A = 40000A)
- Batteries & chargers – Disposition according the power range (fixed)
- Ultra-caps – Disposition according the power range (fixed)

Dimension: 1100 x 700 x 750mm
Energy compartments: Batteries and Ultra caps
Chargers: 1 or 2, 20A DC each
Max. Energy: Approx. 1.5 kWh
Output voltage: 15.7VDC
Earth cable cross-section: 2.5mm²
Max. No. of power units: 5

Output characteristics

Output voltage: 3.6VDC - 4.71VDC
Output current: 100A - 4000A up to 20000A
Master/Slave: Up to 40000A

Duration of injection: 2-5 sec

Accuracy of results: 0.2% ... 0.5%

Measures characteristic

Measure of the effective trip current I_{ds}

Measure of the mechanical reaction time - opening time

Measure of the voltage drop

Environment

Application area: This test equipment is destined for applications in substations, electrical areas and industrial environments.
According harmonized document EC directive 2006/42/EEC

LVD: EN-IEC 61010-1:2010
EMC: 2004/108/EEC (EC EN61326-:2013)

Connections

Power supply cable: Standard

Output connections:

- High current flex cables, BALTO Modular Cable Set 1 - Power Supply Cables 4000 A; Power supply cable set - 240 mm²; Length 2m Flex Conn Single
- From 20000A up to 40000A - Option: with Master-Slave
- Earth cable: 16 mm²

Software

Primary injection testing and calibration.

Optional: Secondary injection testing.

On-screen keyboard: QWERTY, AZERTY

Reporting: PDF (standard), CVS (standard), XLS (optional).

Operating temperature

0C° ... +55C° / 32F° ... +131F°

Storage temperature

-20C° ... +65C° / -13F° ... +149F°

Humidity

5% - 95% non-condensing

Railway Standards/Railway applications/Fixed installations - DC switchgear

IEC 61992-1 Ed.2 - Part 1

IEC 61992-2 Ed.2 - Part 2

Railway applications/Electric equipment for rolling stock

IEC 60077-1 Part 1

IEC 60077-2 Part 2

Ingress Protection Rating IP20

Altitude 2000m

Communication Ethernet 100 base-TX and USB 2.0

Emergency stop Stops all injections immediately

Interfaces languages English, French, Dutch, German, Spanish, Italian, Chinese, Czech

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Systems Configuration

BALTO Modular System	Current Output	Trolley Extendable (with additional BALTO Modular Current Genera- tor 4000A)	Includes BALTO Stretcher, Lifting Tool, Mounting Kit Power Modules	Protection Relay Test Licence Key	BALTO Win Software
BALTO Modular 4000-8	4000A	8000A	1x	Optional	Optional
BALTO Modular 4000-12	4000A	12000A	1x	Optional	Optional
BALTO Modular 4000-20	4000A	20000A	1x	Optional	Optional
BALTO Modular 8000	8000A	8000A	1x	Optional	Optional
BALTO Modular 8000-12	8000A	12000A	1x	Optional	Optional
BALTO Modular 8000-20	8000A	20000A	1x	Optional	Optional
BALTO Modular 12000	12000A	12000A	1x	Optional	Optional
BALTO Modular 12000-20	12000A	20000A	1x	Optional	Optional
BALTO Modular 16000-20	16000A	20000A	1x	Optional	Optional
BALTO Modular 20000	20000A	20000A	1x	Optional	Optional
BALTO Modular 24000-40	24000A	40000A	2x	Optional	Optional
BALTO Modular 32000-40	32000A	40000A	2x	Optional	Optional
BALTO Modular 40000	40000A	40000A	2x	Optional	Optional

ORDERING INFORMATION

BALTO Modular 4000-8

1013-638

BALTO Modular 4000-8 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 8000A, BALTO Modular Current Generator 4000A, BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 4000-12

1013-640

BALTO Modular 4000-12 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 12000A, BALTO Modular Current Generator 4000A, BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 4000-20

1013-643

BALTO Modular 4000-20 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 20000A, BALTO Modular Current Generator 4000A, BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 8000

1013-639

BALTO Modular 8000 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 8000A, 2x BALTO Modular Current Generator 4000A, 2x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 8000-12

1013-641

BALTO Modular 8000-12 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 12000A, 2x BALTO Modular Current Generator 4000A, 2x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

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BALTO Modular 8000-20

1013-644

BALTO Modular 8000-20 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 20000A, 2x BALTO Modular Current Generator 4000A, 2x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 12000

1013-642

BALTO Modular 12000 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 12000A, 3x BALTO Modular Current Generator 4000A, 3x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 12000-20

1013-645

BALTO Modular 12000-20 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 20000A, 3x BALTO Modular Current Generator 4000A, 3x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 16000-20

1013-646

BALTO Modular 16000-20 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 20000A, 4x BALTO Modular Current Generator 4000A, 4x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 20000

1013-647

BALTO Modular 20000 - BALTO Modular Controller, BALTO Modular Trolley and Battery Pack 20000A, 5x BALTO Modular Current Generator 4000A, 5x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Stretcher, BALTO Lifting Tool, BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 24000-40

1013-648

BALTO Modular 24000-40 - 2x BALTO Modular Controller, 2x BALTO Modular Trolley and Battery Pack 20000A, 6x BALTO Modular Current Generator 4000A, 6x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Master-Slave, 2x BALTO Stretcher, 2x BALTO Lifting Tool, 2x BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 32000-40

1013-649

BALTO Modular 32000-40 - 2x BALTO Modular Controller, 2x BALTO Modular Trolley and Battery Pack 20000A, 8x BALTO Modular Current Generator 4000A, 8x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Master-Slave, 2x BALTO Stretcher, 2x BALTO Lifting Tool, 2x BALTO Mounting kit Power Modules - excl. BALTO Win

BALTO Modular 40000

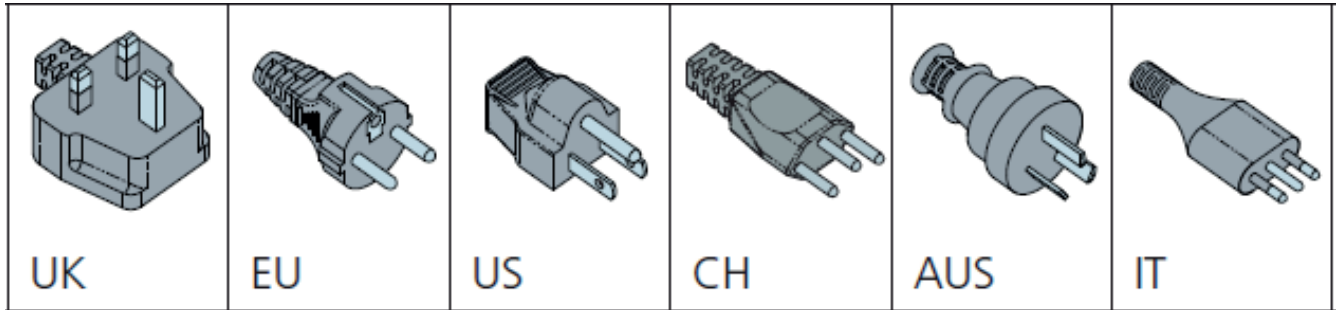
1013-650

BALTO Modular 40000 - 2x BALTO Modular Controller, 2x BALTO Modular Trolley and Battery Pack 20000A, 10x BALTO Modular Current Generator 4000A, 10x BALTO Modular Cable Set 1 - Standard Cable, Protection Relay Test available with Licence Key (purchased separately), BALTO Master-Slave, 2x BALTO Stretcher, 2x BALTO Lifting Tool, 2x BALTO Mounting kit Power Modules - excl. BALTO Win

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Important - Select Region for country specific power cord – All Balto Modular products include the EU plug type as standard.



Region	Description	Part Number
UK	Power Cords with UK Plug BS1363	1013-660
US	Power Cords with US Plug NEMA 15-5P	1013-662
CH	Power Cords with Switzerland Plug SEV1011	1013-663
CN/AUS	Power Cords with China/Australia Plug AS3112	1013-664
IT	Power Cords with Italy Plug CEI23-16	1013-665

For **BALTO Modular 24000-40**, **32000-40** and **40000** 2x power cords are required.

Accessories

BALTO Protection Relay Test Software License	1013-658
Licence Key to activate the Protection Relay Test Software	

BALTO Modular Current Generator 4000A	1013-651
BALTO Modular Current Generator 4000A - with BALTO Modular Cable Set 1 - Power Supply Cables 4000A; Power supply cable set - 240 mm ² ; Length 2m Flex Conn Single	

BALTO Modular Cable set 1 - Standard Cable	1013-652
BALTO Modular Cable Set 1 - Power Supply Cables 4000A; Power supply cable set - 240 mm ² ; Length 2m Flex Conn Single	

BALTO Extension cable set 1	1013-653
BALTO Modular and Compact Extension Cable Set 1 - Power Supply Cables 4000A; Power supply cable set - 2 x 240 mm ² ; Length 1m	
Important note: the maximum current a BALTO Modular Current Generator can generate may decrease when extending the standard 2m cables	

Description	Part number
BALTO Win Software	1013-654
BALTO Breaker Clamp	1013-655
BALTO Calibration tool	1013-656
BALTO 1 year extra warranty	1013-657

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