BALTO COMPACT 4000
DC High Current Circuit Breaker Tester

- **New – Portable DC High Current Circuit Breaker Tester – for testing DC High Speed Circuit Breakers**
- **Ergonomic compact 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) and IEC 60077-2 (Rolling Stock)**
- **Adjustable parameters of the Circuit Breaker Trip Current**
- **USB and 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 Ids, and when comparing results to the circuit breaker OEM specification.

The solution is the Megger Balto Compact. Designed with the user in mind this innovative mobile Megger Balto system is useable for up to 4000 A 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 Compact system based on the requirements of the DC high speed circuit-breakers' manufacturers and from various railway networks managers and users.

Special attention was given to the weight and size of this compact version which resulted in an ergonomic design and permits usage in small spaces.

The Megger Balto Compact is based on the Megger BALTO MODULAR which is scalable up to 40000 A. However, it is not expandable and limited to a test current of max. 4000 A

Each Megger Balto Compact system consists of a….

- Control Unit
  - Operator terminal
  - Power supply batteries boosted by ultra-caps and a charger
- Current Generator – the power source or power unit – 1 unit only and limited to 4000 A
- Cable Set – Connection to the test piece

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

In addition the system also provides….

- Auto diagnostic – Control and calibration of current measurement
- Current increase management
- Accurate display of measurements

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The Megger Balto Compact 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 - Ids.
  - Automatic test with current increase slope according to IEC 61992-2 (Traction Power Substations) and IEC 60077-2 (Rolling Stock) for accurate testing of Ids.
  - Graphical display of measurement results.
- **Manual mode**
  - Measurement of the DC high speed circuit-breakers opening time
  - Test of the DC protection
  - Calibration of 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:	120 VAC 60 Hz
	230 VAC 50 Hz
Power consumption	120 VAC 60 Hz - 7.20 A
	230 VAC 50 Hz - 3.50 A
Power supply voltage	Batteries and ULTRA-caps 12 VDC – 15.7 VDC
Power cord	CEE 7/7 Plug to IEC 60320 C13, 2 m, 10 A, 250 VAC
Dimensions	700 x 730 x 510 mm (30" x 24.7" x 20")
Weight	76.0 kg (168 lbs)

Max. No. of Current Generators 1 (not extensible.)

Max Current	4000 A
Duration of injection	2-5 sec
Accuracy of results	1.5%

Main Unit

- Energy compartments
  - Batteries and Ultra caps
  - Charger: 1 - 20 A/DC
- Max. energy
  - Approx. 1.5 kWh
- Output voltage
  - 15.7 VDC

Control unit

- Functionality
  - HMI (Human machine Interface) and CPU
- Screen Type
  - TFT touchscreen
    Diagonal 14.5 cm (5.7 ")
    Resolution 640 x 480 pixels
- Software
  - Primary injection testing and calibration.
- Optional
  - Secondary injection testing.
- On-screen keyboard
  - QWERTY, AZERTY
- Reporting
  - PDF (standard), CVS (standard), XLS (optional).
- Communication
  - Ethernet 100 base-Tx and USB 2.0

BALTO COMPACT 4000
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- Emergency stop
  - Stops all injections immediately.
- Interfaces languages
  - English, French, Dutch, German, Spanish, Italian, Chinese, Czech.
- Dimensions
  - 700 x 660 x 270 mm (30" x 26" x 10.6")
- Weight
  - 48.0 kg (106 lbs)
- Optional
  - Module for secondary injection.

Secondary injection

- Outputs
  - voltage outputs : -60 mV/+60 mV...-10 V/+10 V
  - current outputs : -20 mA...+20 mA and +4 mA...+20 mA
- Inputs
  - Trip contact DC protection Relay
  - Trip contact (spare)
- Curves
  - Standard
  - User defined

Emergency Stop Device

- Disconnects power units from energy compartment

Current Generator

- Maximum output voltage
  - 4.7 VDC
- Maximum current
  - 4000 A
- Dimensions
  - 700 x 660 x 145 mm (30" x 26" x 5.7")
- Weight
  - 28.0 kg (62 lbs)

Measures characteristics

Measure of the effective trip current Ids

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 EN61326-1:2013)

Connections

Power supply cable: Standard

Output connections:

- High current flex cables, BALTO Compact Cable Set 1 - Power Supply Cables 4000 A; Power supply cable set - 240 mm^2; Length 2m Flex Conn Single
- Earth cable: 16 mm2

Operating temperature	0 C° … +55 C° 32 F° …+131 F°
Storage temperature	-20 C°...+65 C° -13 F°…+149 F°
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	2000 m
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
Optional:	Module for secondary injection - Protective Relay Test

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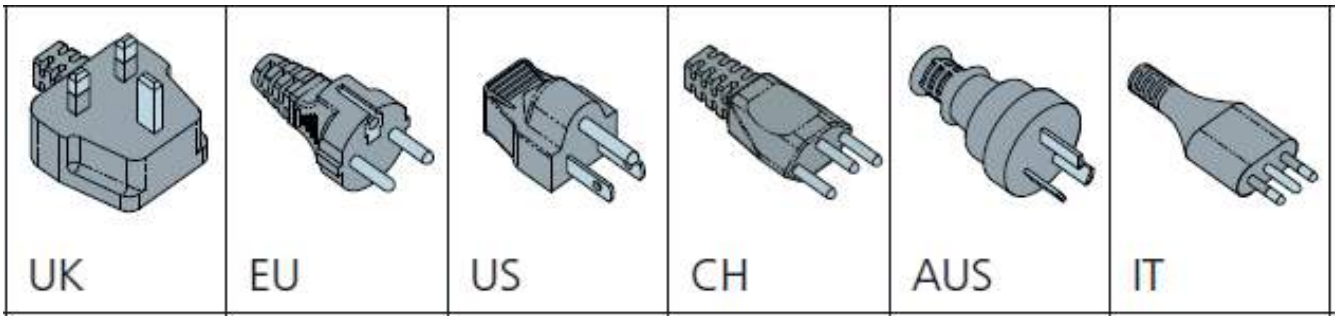
Megger Balto Compact 4000
(Includes – Megger Balto Compact and 2 m cables - excl. BALTO Win):

ORDERING INFORMATION	
BALTO Compact 4000	**1013-636**
BALTO COMPACT 4000 - BALTO Controller, BALTO Battery Pack 4000 A, BALTO Compact Cable Set 1 – Standard Cable; Length 2 m Flex Conn Single, Protection Relay Test available with Licence Key (purchased separately) - excl. BALTO Win	

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



Region	Description	Part Number
UK	Power Cords with UK Plug BS1363	**1008-017**
US	Power Cords with US Plug NEMA 15-5P	**1008-016**
CH	Power Cords with Switzerland Plug SEV1011	**1013-843**
CN/AUS	Power Cords with China/Australia Plug AS3112	**1009-623**
IT	Power Cords with Italy Plug CEI23-16	**1013-844**

Accessories:

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

BALTO Compact Cable set 1 - Standard Cable	**1013-637**
BALTO Compact Cable Set 1 - Power Supply Cables 4000 A; Power supply cable set - 240 mm^2; Length 2 m Flex Conn Single	

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