

- **Circuit Breaker timing test set.**
- **Built-in 200 A microhmmeter.**
- **16 timing channels.**
- **Up to 4 trip/close coils control.**
- **Motion and speed analyzer.**
- **Static and dynamic contact resistance measurement.**
- **Suitable for EHV, HV and MV circuit breakers.**
- **Stand alone functionality - no PC connection is required.**
- **Large graphical high brightness sunlight display.**
- **Analysis and result evaluation directly on the display.**
- **Internal memory for up to 250 test results and 64 pre-defined test plans.**
- **Cross trigger for the synchronization of up to 4 CBA 1000.**
- **Circuit Breaker test with two ends connected to ground (BSG option).**
- **TDMS software for test results analysis and reporting.**

A P P L I C A T I O N

The CBA 1000 is a unique tool for the complete test of all circuit breakers.

It is a powerful timing and motion analyzer test set with built-in 200 A pure DC microhmmeter for static and dynamic contact resistance tests.

CBA is a stand alone unit with a large graphical display.

The unit is supplied with TDMS analysis software. TDMS performs test results analysis and creates test reports; it allows also to pre-define test plans. TDMS is also a powerful Test and Data Management software compatible with all ISA Test Sets.

All CBA 1000 circuits have been designed to ensure safe and reliable operations in the noisy environment of HV / MV substations and power plants.

CHARACTERISTICS

Coil operation

- Number of circuits: 2 (1 Open and 1 Close coils); optional 4 (3 Open and 1 Close coils).
- Type of driver: electronic; it ensures superior timing control.
- Driver characteristic: 300 V DC max; 25 A DC max.
- Operating time accuracy: 50 μ s.
- Measurement of the coil current: one per channel; the waveform is displayed on the dedicated channels.



- Coil current ranges: 2.5; 10; 25 A full scale, user selectable.
- In case of 4 coils option, it is possible to select the single or multiple phase opening.
- Coil current measurement accuracy: 0.5% of the reading \pm 0.1% of the selected range.
- Outputs are isolated between them.

Main contact inputs

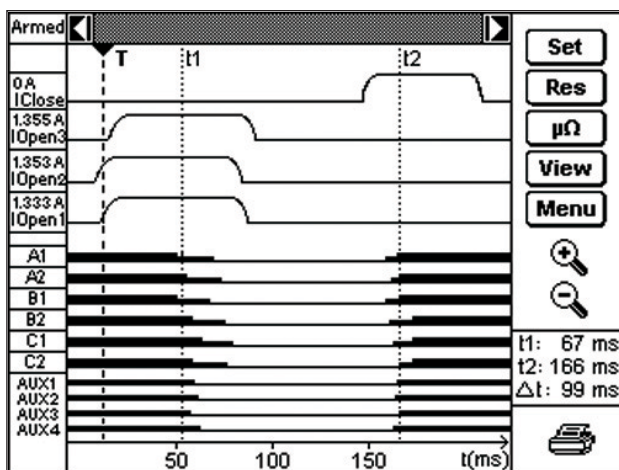
- Number of contact inputs: 6 Main contacts (2 break per phase) plus 6 Resistor contacts (2 break per phase).
- Resistor contact ranges: from 25 Ohm to 10 kOhm.
- Contact test voltage: 24 V. Main contact test current: 50 mA.
- Each input group is isolated with respect to the others.

Event inputs

- Number of auxiliary event inputs: 4, divided in 2 groups of 2 each.
- Capability of testing dry or wet contacts: 24 V; 20 to 300 V. Test current: 2 mA.

Sample rates:

20 kHz – 10 kHz - 2kHz - 200Hz - 100Hz, user selectable.



CBA 1000 test result display

Timing accuracy:

100 μ s \pm 0.025% of the time range.

Maximum record length:

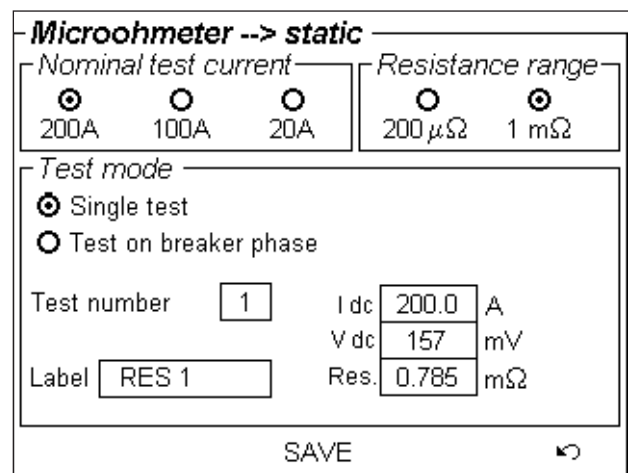
200 s.

Analog inputs

- Number of analog inputs: 4 (6 Optional).
- 2 (4 optional) dedicated to Open and Close coil currents.
- 1 dedicated to Dynamic and Static Resistance Measurement.
- 1 dedicated to travel, velocity, station battery voltage, etc.
 - Input voltage ranges: \pm 5 V; \pm 50 V; \pm 500 V, user selectable.
- The analog inputs are isolated with respect to all other circuits.
- Analog input measurement resolution: 16 bit.

Programmable sequences

The user can select the following Open and Close sequences: Open; Close; Open-Close; Close-Open; Open-Close-Open.



Microhmmeter display

Static and Dynamic resistance measurement (Option)

- DC Test current: 200 A, 100 A, 20 A.
- Resistance measurement range: 1 mOhm; 10 mOhm; 100 mOhm, user selectable.
- Resolution: 1 μ Ohm; 10 μ Ohm; 100 μ Ohm.
- Resistance measurement accuracy: 1% of the reading \pm 0.2% of the range.

Minimum trip Voltage test (Option):

The minimum trip voltage test allows to verify the minimum trip voltage threshold and the voltage drop off of a trip coil.

- Maximum current: 4 A.
- Maximum voltage adjustment: up to 50% of nominal DC Voltage.

Internal or external Printer (Option)

- . Optional internal thermal printer 58 mm wide.
- . Optional external thermal printer Seiko DPV-414, 112 mm wide.

Test set control

- . The control is local, via graphical display, keypad and Pushbutton for menu selection: no PC control is necessary.

Display

Large graphical high brightness sunlight display (viewing area 115 x 88 mm).

Test results are displayed graphically and in table format.

Zoom functions and cursors for test data analysis are directly available on the CBA 1000 display.

Interfaces to PC:

2 available interfaces: USB and RS232;

Memory size:

64 Mbytes (approx. 250 results)

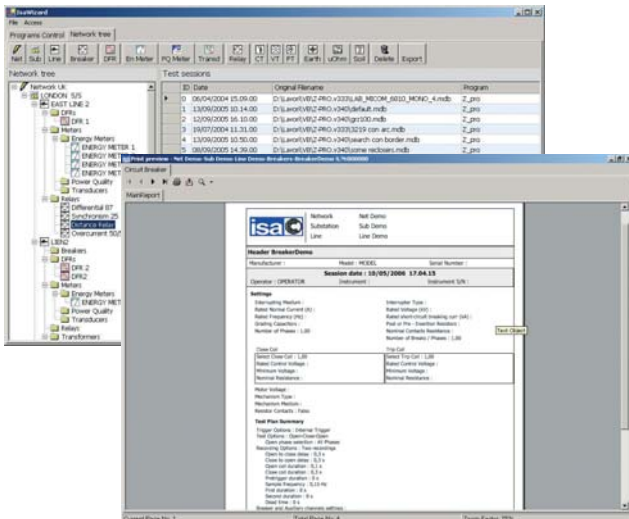
TDMS software

TDMS is a powerful software package providing data management for commissioning and maintenance testing activities.

Circuit breaker data and test results are saved in TDMS database for historical results analysis.

TDMS software has the following main features.

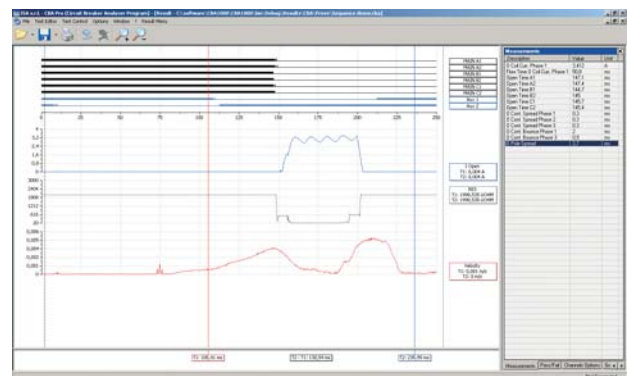
- . Full control of CBA 1000 functions from PC.



Test & data management software

- . Download of test Plans.
- . Download of test results.
- . Test plans and test results can be viewed, edited in the missing descriptions, saved, printed, exported.
- . Possibility of viewing, overlaying and gluing more results, for an easy test result comparison.
- . Possibility to pre-set test plans and to download them into the test set.
- . Two cursors select measurement points and intervals.
- . Zoom in and out feature.
- . Enhanced measurement features for movement - speed - acceleration control.

ISA software updating policy allows all the users to update their software from ISA WEB site (www.isatest.com) without any additional cost.



Test result analysis

Other characteristics

CBA 1000 can operate both from mains (AC or DC) and from internal rechargeable battery:

- . Mains supply:
 - . From 85 to 265 V AC; 50-60 Hz.
 - . From 100 to 350 V DC.
- . Internal battery. Battery characteristics: Type: NiMH.
- . Case: aluminium case, with hinged removable cover and handle.
- . Dimensions: 400(W) * 300(D) * 175(H) mm. Weight: 9 kg basic unit; 10,5 kg with Microhmmeter module.

Standard accessories:

The following accessories are supplied with the unit:

- . Mains cable;
- . User's manual for hardware and software;
- . Serial cable;

- . USB cable;
- . Spare fuses;
- . Software TDMS.

Options available:

The following options are available upon request:

- . **Test cable kit:** The connection cables set includes:
 - . Two (four optional) cables with two conductors each for the connection to the Circuit Breaker coils. Cable length: 4 m;
 - . Three cables with three conductor each for the connection to the main contacts. Cable length: 10 m;
 - . Two cables with three conductors each for the connection to the Event inputs. Cable length: 6 m.
- . Transport Plastic bag.
- . **Additional 2 Open Driving Coils Module.** This module increases to 3 the number of Open Coils.
- . **Built-in 200 A Static / Dynamic resistance module** with 10 m long test cables, cross section 25 sq.mm, terminated with high current clamps.
- . **Minimum trip Voltage test.**
- . **Internal thermal printer:** CBA 1000 has an (optional) built-in thermal printer, 58 mm wide.
- . **BSG1000** is an enhanced safety external module, that allows to test the circuit breaker with both sides connected to ground.
- . **CBA Heavy duty transport case with wheels.**
- . **CBA plastic soft bag.**
- . **Linear transducer:** TLH 150 - 150 mm length.
- . **Linear transducer:** LWG 150 - 150 mm length.
- . **Linear transducer:** TLH 225 - 225 mm length.
- . **Linear transducer:** LWG 225 - 225 mm length.
- . **Linear transducer:** TLH 300 - 300 mm length (IP40).
- . **Linear transducer:** TLH 500 - 500 mm length.
- . **Linear transducer:** LWG 500 - 500 mm length.
- . **Rotary transducer:** IP 6501 - 355° rotation angle.
- . **Universal Transducer mounting kit** for TLH, LWG and IP travel transducers.

APPLICABLE STANDARD

The test set conforms to the EEC directives regarding Electromagnetic Compatibility and Low Voltage instruments.

A) Electromagnetic Compatibility:

Directive no. 89/336/CEE dated may 3, 1989, modified by the directive 92/31/CEE dated may 5, 1992.

B) Low Voltage Directive:

Directive n. 73/23/CEE, modified by the directive 93/68/CEE. Applicable standards, for a class I

instrument, pollution degree 2, Installation category II:

- . CEI EN 61010-1. In particular:
- . Inputs/outputs protection: IP 2X - CEI 70-1.
- . Operating temperature: -10° to 55 °C; storage: -20 °C to 70 °C.
- . Relative humidity: 10 - 80% without condensing.

Ordering information:

CODE	MODULE
	CBA 1000
10166	CBA 1000 basic unit supplied with
10015	TDMS - Test & Data Management Software

Option for CBA 1000

CODE	MODULE
15166	Test Cables Kit with transport case
43166	Additional 2 Open Coils Module*
23166	200 A Static / Dynamic Resistance Module (with test cables 10 m terminated with clamps)*
33166	Internal Thermal Printer*, **
14102	External Thermal Printer 4.5"
18166	CBA Heavy Duty Transport Case
19166	CBA Plastic soft bag
34166	Minimum Trip Voltage module*, **
11166	TLH 150 Linear Transducer 150 mm
12166	TLH 225 Linear Transducer 225 mm
36166	TLH 300 Linear Transducer 300 mm
13166	TLH 500 Linear Transducer 500 mm
14166	Rotary transducers: IP 6501 - 355° rotation angle.
26166	LWG 150 Linear Transducer 150 mm
27166	LWG 225 Linear Transducer 225 mm
28166	LWG 500 Linear Transducer 500 mm
16166	Universal Transducers mounting kit
29166	Current Clamp
44166	Flexible Coupling Shaft
22166	BSG1000 One break per phase including: <ul style="list-style-type: none"> . Three BSG Remote Heads Type 1 . One BSG Main Unit . One Cables Kit
21166	BSG1000 Two breaks per phase including: <ul style="list-style-type: none"> . Three BSG Remote Heads Type 2 . One BSG Main Unit . One Cables Kit
17166	Heavy Duty transport case for BSG1000

Options with * have to be specified at order.
Options with ** are exclusive each other.
NOTE: code 33166 Internal thermal printer cannot be ordered together with code 34166 Minimum Trip Voltage Module.

CBA 1000 ACCESSORIES



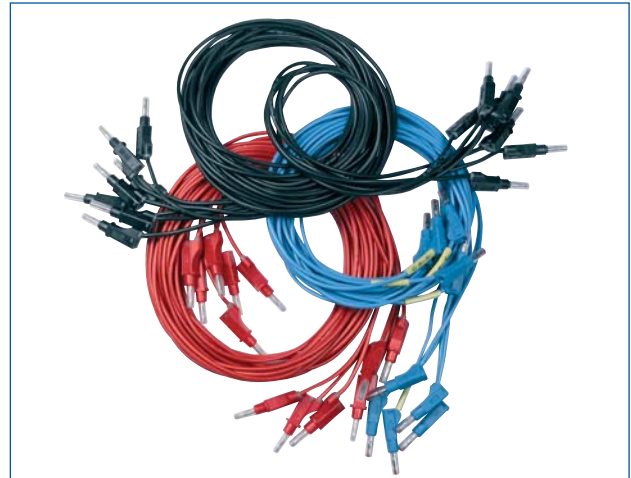
CBA 1000 - Transport Case



CBA 1000 - Transit case for Cable kit



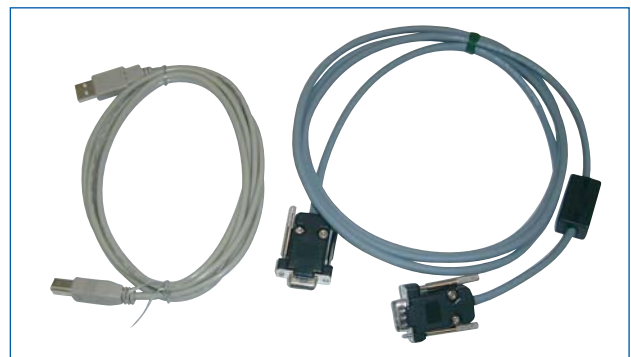
CBA 1000 - Plastic Bag



CBA 1000 - Set of Test Leads



CBA 1000 - Main contacts Cables



CBA 1000 - RS232 and USB Communications Cables



CBA 1000 - Microhmmeter Cable set



CBA 1000 - Transducers Transport Case



CBA 1000 - Microhmmeter measurement Cable



CBA 1000 - Current Clamp



CBA 1000 - TLH Linear Transducers



CBA 1000 - Rotary Transducer



CBA 1000 - Transducers Mounting Kit



CBA 1000 - LWG Linear Transducers