



# CBA 2000

## HV CIRCUIT BREAKER ANALYZER AND MICROHMMETER

- BUILT-IN 200 A MICROHMMETER
- 18 MAIN AND 18 RESISTIVE CONTACT INPUTS
- 12 AUXILIARY TIMING INPUTS
- UP TO 4 TRIP/CLOSE COILS CONTROL
- MOTION AND SPEED ANALYZER
- STATIC AND DYNAMIC CONTACT RESISTANCE MEASUREMENT
- CIRCUIT BREAKER TEST WITH BOTH SIDE CONNECTED TO GROUND (BSG OPTION).
- 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 500 TEST RESULTS AND 64 PRE-DEFINED TEST PLANS

### Application

The CBA2000 is a unique equipment for the complete test of all circuit breakers. It is a powerful timing and motion analyzer equipment with built-in 200 A pure DC microhmmeter for static and dynamic contact resistance tests. CBA2000 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 2000 circuits have been designed to ensure safe and reliable operations in the noisy environment of EHV and HV substations.



## Characteristics

### Coil operation

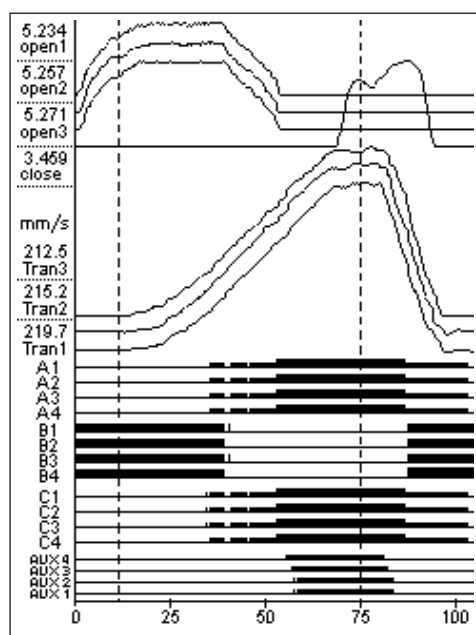
- . Number of circuits: 2 (1 Open and 1 Close coils); optional 4 (3 Open and 1 Close coils).
- . Type of driver: electronic; it ensures superior timing control.
- . Driver characteristic: 300 V DC max; 25 A DC max.
- . Operating time accuracy: 50 μs.
- . Measurement of the coil current: one per channel; 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 ± 0.1% of the selected range.
- . Outputs are isolated between them.

### Main contact inputs

- . Number of contact inputs: 18 Main contacts (6 break per phase) plus 18 Resistor contacts (6 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.
- . Optionally: 8 or 12 divided in 4 or 6 groups of 2 each.
- . Capability of testing dry or wet contacts: 24 V; 20 to 300 V. Test current: 2 mA.



CBA2000 test result display

### Sample rates:

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

### Timing accuracy:

100 μs ± 0.025% of the time range.

### Maximum record length:

200 s.

### Analog inputs

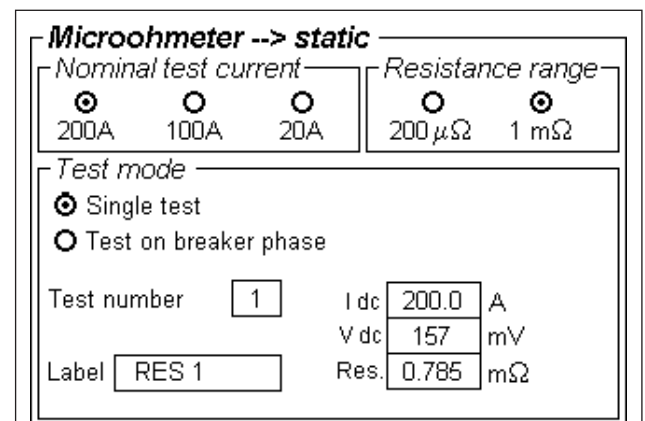
- . Number of analog inputs: 8 (10 Optional).
- . 2 (4 optional) dedicated to Open and Close coil currents.
- . 1 dedicated to Dynamic and Static Resistance Measurement.
- . 3 dedicated to travel, transducers.
- . Input voltage range: ± 10 V.
- . 2 general purpose analog input.
- . Input voltage range: ± 5 V; ± 50 V; ± 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.

- . Sequencer: the user can freely program any desired test sequence.



Microhmmeter display

### Static and Dynamic resistance measurement (Option)

- . DC Test current: 200 A, 100A, 20 A.
- . Contact resistance range: 200 μOhm; 1.000 mOhm; 10.00 mOhm; 100.0 mOhm, user selectable.
- . Resistance measurement accuracy (range 100 mOhm): ± 1% of the reading ± 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 112mm 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 2000 display.

### Interfaces to PC:

2 available interface: USB and RS232;

### Flash drive interface:

It allows to download test results and settings to a commercial flash drive memory - USB 2.0 compliant.

### Memory size:

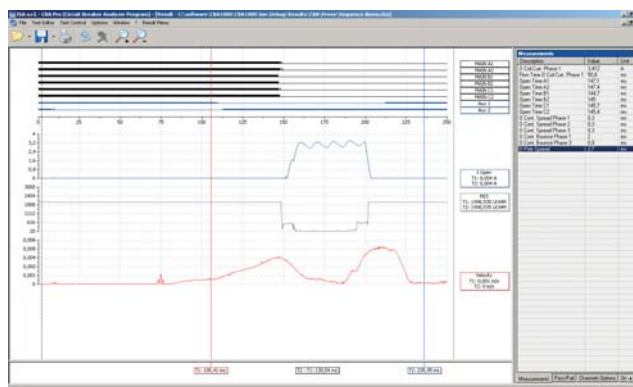
128 Mbytes: 500 results

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.
- . 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 for free their software from ISA WEB site without any additional cost.



### Test result analysis

### Other characteristics

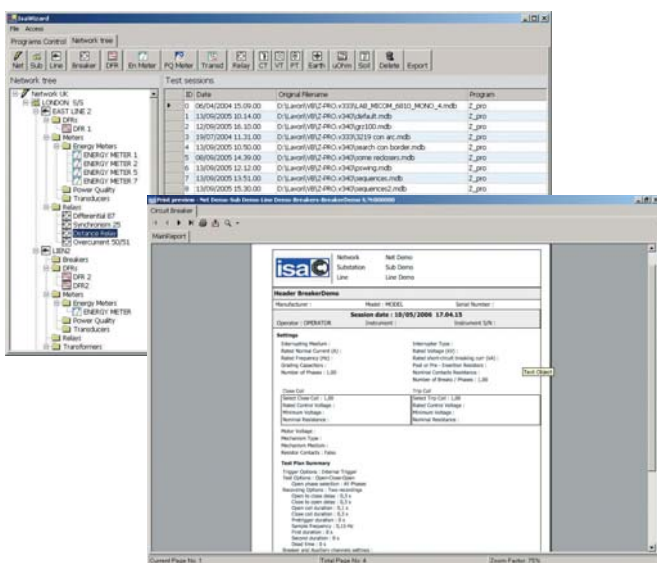
CBA 2000 can operate both from mains ( AC or DC ) and from internal rechargeable battery:

- . 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: 490(W) \* 370(D) \* 240(H) mm.
- . Weight: 13 kg basic unit; 15 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.



Test & data management software

### TDMS software

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

**Options available:**

The following options are available upon request:

- . **Test cable kit:** The connection cables set includes:
  - . Four (eight optional) cables for the connection to the Circuit Breaker coils. Cable length: 4 m; cross section 2,5 sq. mm; colours: two black; two red.
  - . Nine cables for the connection to the main contacts. Cable length: 10 m;
  - . Six cables for the connection to the Event inputs. Cable length: 10 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:** CBA1000 has an (optional) built-in thermal printer, 58 mm wide.
- . **External thermal printer** Seiko DPV- 414
- . **BSG** is an enhanced safety external module, that allows to test the circuit breaker with both side 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 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 - 95% without condensing.

**Ordering information:**

CODE	MODEL
	CBA2000
10266	CBA2000 basic unit supplied with
10015	TDMS - Test & Data Management Software

**Option for CBA2000**

CODE	MODEL
15266	Test Cables Kit with transport case
11266	Additional 2 Open Coils Module*
14266	200 A Static / Dynamic Resistance Module (with test cables 10 m terminated with clamps)*
20266	Internal Thermal Printer*; **
14102	External Thermal Printer SEIKO DPV-414
18166	CBA Heavy Duty Transport Case
19166	CBA Plastic soft bag
90266	BSG - both side connected to ground
12266	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

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.

The document is subject to change without notice



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