The CBA1000 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. 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 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: 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.

Timing accuracy:
100 µs ± 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: ± 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.

Microhmeter 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: 1µOhm; 10 µOhm; 100 µOhm.
- Resistance measurement accuracy: 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 Printer (Option)**

- Optional internal thermal printer 58 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.

- 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.

**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:
  - 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.

- **DET1000** is an enhanced safety external module, that allows to test the circuit breaker with both ends 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:** 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:**

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:**

<table>
<thead>
<tr>
<th>CODE</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>10166</td>
<td>CBA1000 basic unit supplied with TDMS - Test &amp; Data Management Software</td>
</tr>
</tbody>
</table>

**Option for CBA1000**

<table>
<thead>
<tr>
<th>CODE</th>
<th>MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>15166</td>
<td>Test Cables Kit with transport case</td>
</tr>
<tr>
<td>43166</td>
<td>Additional 2 Open Coils Module*</td>
</tr>
<tr>
<td>23166</td>
<td>200 A Static / Dynamic Resistance Module (with test cables 10 m terminated with clamps)*</td>
</tr>
<tr>
<td>33166</td>
<td>Internal Thermal Printer*; **</td>
</tr>
<tr>
<td>18166</td>
<td>CBA Heavy Duty Transport Case</td>
</tr>
<tr>
<td>19166</td>
<td>CBA Plastic soft bag</td>
</tr>
<tr>
<td>21166</td>
<td>DET1000 - both ends connected to ground</td>
</tr>
<tr>
<td>34166</td>
<td>Minimum Trip Voltage module*; **</td>
</tr>
<tr>
<td>11166</td>
<td>TLH 150 Linear Transducer 150 mm</td>
</tr>
<tr>
<td>12166</td>
<td>TLH 225 Linear Transducer 225 mm</td>
</tr>
<tr>
<td>36166</td>
<td>TLH 300 Linear Transducer 300 mm</td>
</tr>
<tr>
<td>13166</td>
<td>TLH 500 Linear Transducer 500 mm</td>
</tr>
<tr>
<td>14166</td>
<td>Rotary transducers: IP 6501 – 355° rotation angle.</td>
</tr>
<tr>
<td>26166</td>
<td>LWG 150 Linear Transducer 150 mm</td>
</tr>
<tr>
<td>27166</td>
<td>LWG 225 Linear Transducer 225 mm</td>
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<tr>
<td>28166</td>
<td>LWG 500 Linear Transducer 500 mm</td>
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<tr>
<td>16166</td>
<td>Universal Transducers mounting kit</td>
</tr>
<tr>
<td>29166</td>
<td>Current Clamp</td>
</tr>
</tbody>
</table>

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.