The CBA-32P instrument	
	The CBA-32P is a high performance, software driven data acquisition system, operating under Microsoft Windows. The CBA-32P is designed to perform timing & motion analysis on all types of circuit breakers typically installed in electrical substations going from the distribution level all the way to high voltage levels, up to 800 kV. The timing and motion analysis is done based on the International Standard CEI56. Thanks to its open architecture, the CBA-32P is able to connect to different types of transducers (current, displacement, motion, pressure, etc. …). CBAWin is a highly integrated and specialized software environment that includes all the necessary tools for testing in the field or in the laboratory, for processing, calculations, analysis, interpretations of test results and online help needed by circuit breakers maintenance professionals CBAWin is included with the system free of charge with unlimited updates.

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Sampling time and sampling frequency	• Sampling time: 32 microseconds to 32 milliseconds, on all inputs. • Sampling frequency : 31.25 Hz to 31.250 KHz.
Recording time	• Programmable recording time: 1 millisecond to 17 minutes
Acquisition modes	• By pulse commands to the circuit breaker close and open coils.
Computer Link	• Connection via an Optical fiber link to a computer or notebook running Windows 2000, XP, Vista or Windows7 • Fast transfer of recorded data on operation s (or events) such as Close (C), Open (O), CO, OCO, etc. …
Printing	• B&W or Color printing on standard with a standard printer. • Easy printing of all graphical analysis (superposition, zoom, time scale expansion and amplitude scale expansion, etc. ….

Dimensions and weight	• Robust construction: casing made of reinforced polyethylene with molded-in ribs for extra protection including top and bottom covers.
	• True Portable unit, no extra carrying case required
	• Dimensions (3 cases available)
	  ○ 13”x13.5”x7” (33x35x18cm)
	  ○ 17”x16.5”x10” (43x42x25.4cm)
	  ○ 18”x19”x8.9” (46x48x22.6cm)
	• Weight
	  ○ CBA-32P-8C : 27.5 lbs (12.5kg)
	  ○ CBA-32P-16C : 34.2 lbs (15.5 kg)
	  ○ CBA-32P-24C : 38 lbs (17 kg)

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Inputs and Outputs	
8, 16, 24 or 30 Contacts Inputs for Main & Resistive Contacts (Optical isolation up to 5000 V)	• Each Contact input consists of a measurement circuit that shows the states of the contacts. The classical digital measurement method (2 bits resolution with 3 states) is visualised as: ▪ 0 for OPEN state ▪ 1 for CLOSED state ▪ 0.5 for resistive state • Power supply on Contacts: 40 VDC • Type of connector: 3-pin Neutrik male • All inputs are immune to noise typically present in high voltage environment up to 800 kV.
3 or 6 Digital Inputs for Optical Encoders - for travel measurement (optional)	• Direct input for optical encoder. • Resolution: 8000 Pulses/Revolution • Type of encoder: Incremental • Automatic reset to 0 • Type of connector: 4-pin Neutrik, male • 5 VDC power for the optical encoder (rotary or linear) supplied on the Neutrik connector.
2 Command Outputs paired with 2 Inputs for Open and Close coils currents measurement	• 8 selectable ranges for Open and Close Coil current measurement: 0-20A, 0-10A, 0-5A, 0-1A, -20+20A, -10+10A, -5+5A, -1+1A. • Analog to Digital converters with 12-bits • Maximum input voltage for command contactor: up to 300V • Chassis isolation voltage: 2 KV • Command delay and duration pulses (1 millisecond à 100 seconds) are programmable in steps of 1 millisecond which allows for the creation of an unlimited number of commands of which the most classical are: C, O, CO, O - 300ms - CO, O - t - CO, CO - CO, OC-OC, etc. ... • Type of connector: 4 pins Neutrik female.
5 or 8 Universal Analog Inputs (measurement of voltage, current, pressure, temperature, travel ….)	• 0-10 V Universal inputs able to adapt to different types of transducers (displacement or travel, voltage, current, pressure, humidity. Temperature, etc. …). • Analog to Digital converters with 12-bits resolution • Type of connector: 3 pins Neutrik, male. • 10 VDC power source for displacement transducers (linear or rotary) supplied on the Neutrik connector.

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3 or 6 Wet Contact Inputs (digital 2 states)	• Response time : 5 microseconds in turn or on 40 microseconds in turn off • Input voltage : Range from 0 to 300 V AC/DC • Activation mode : 50 V DC
Static and Dynamic Micro Ohmeter (optional)	• Ranges : From 10 micro ohms to 3 milli ohms • Accuracy : +/- 1 micro ohms • Testing current : 140 A – 700 A • Voltage : 10 V DC • Supply voltage : 110 – 120 VAC or 220 – 240 VAC, 50/60 Hz • Any voltage environments (up to 800 kV)
First Trip Monitoring (optional)	• Input current : Typical : 1 to 5 A Max 50 A • Output voltage : 0-10 V DC • Response time : 10 microseconds • No external power required (power supplied by the CBA-32P)

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Software	Ease of use, Power and Flexibility
CBAWin : Test analysis, interpretation of time, motion and vibration measurement under Windows **Extensive Library of test plans for more than 200 circuit breakers from 17 manufacturers**	Once the test cables connected to the circuit breaker and the instrument connected to a computer, even the non-experienced operator can immediately run all his tests simply by choosing his type of circuit breaker from the existing test plans library. With the numerous design tools included in CBAWin, the experienced operator can enrich the library with test plans as well as creating or modifying acquisition modes, mathematical processing, graphical or tabular reports. Following is a description of the general characteristics of CBAWin which are the result of 18 years of evolution and continued improvements in the circuit breakers test field. ○ Integrated library consisting of test plans for more than 200 circuit breaker (17 different manufacturers: ABB, AREVA (Alstom), ASEA, GE, Mitsubishi, Westinghouse, Siemens, Schneider, S&S, etc.) ○ Complete computer control of the CBA-32P during the tests. ○ Fast transfer of recorded data to the computer. ○ Instantaneous mathematical processing of received data for immediate analysis on the computer. ○ Data Export with immediate visualisation under Microsoft Word or Excel or export in XML. ○ Unlimited free update.
Basic Functions	• Easy execution (with a click of the computer mouse) of classical tests such as: C, O, CO, O-300ms - CO, O - t - CO, CO - CO, OC-OC, etc., ... • Easy standard test data input: time of test, operator name, HV substation number, circuit breaker manufacturer, serial number, inventory number, number of operations, etc. … • Classical calculations such as: opening time, closure time, current maximum values, short circuit duration, isolation time, contacts speed, total contacts travel, over-travel, bounce, etc. … • Instantaneous graphical visualisation of standard timing (synchronisation) report on the computer • Instantaneous visualisation of test results in multilingual tabular forms with pass / fail result indicators on the computer screen.

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	• Easy official report generation under Word for commissioning or official maintenance tests • Instantaneous analysis of tests in progress with the help the graphical tools such as scale expansion in X or Y, precise point by point Examine, Zoom of a defined zone, signals superposition. • Comparative analysis of signals or portions of signals from identical tests or different tests executed on same date or different dates is very useful for trends analysis. • Batch tests very useful for new circuit breakers certification
Advanced Functions	• Test plans designer • Test designer(up to 30 test per test plan) • Multilingual tabular report designer • General information Screen Designer • Graphical reports Designer • Specialised Mathematical processing Designer: more than 100 mathematical functions are available and deal with time and motion as well as vibration (developed by Hydro-Quebec) processing. These functions constitute a precious aid to the operators because they make the analysis and interpretation of the synchronization and/or vibration test results a very easy task. • Tabular reports designer. • Batch tests designer

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International Standards, Certifications and Accreditation	• International Standards:
	  ○ Conducted emission EN 55011 : 1991, CLASS A
	  ○ Radiated emission EN 55011 : 1991, CLASS A
	  ○ RF Immunity EN 61000-4-3 :1997 & ENV 50204 : 1996, 10 V/m
	  ○ Conducted Immunity EN 61000-4-6 : 1996, 10 V
	  ○ Electrostatic Discharges EN 61000-4-2 : 1995, 8 kV/4 kV contact
	  ○ Electrical Fast Transients EN 61000-4-4 : 1995, 2 kV
	• Zensol is certified ISO 9001
	• Accreditations: Hydro-Quebec 800 KV(HQ), Appalachian Electric Power (APCO a division of American Electric Power AEP) – USA, CFE-Comision Federal de Electricidad (Mexico), RTE (France) …

Optimal Conditions of use	• Environmental : 0°C to 50°C (32°F to 132°F) • Noisy environment in High Voltage area up to 800 kV • Humidity : 0-95% Non Condensing • Storage temperature : -20°C to 70°C (-4°F to 158°F) • Power supply : 110-120 VAC or 220-240 VAC, 50/60 Hz
Accessories included	Each CBA-32P is supplied with: • CBA-Win Software with unlimited free upgrades • Adapter for RS-232 / fiber optic data link (57 600 baud) with 10 ft fiber optic cable • Complete set of I/O cables including contact cables, displacement cables, ground cable, and command cable • 2 year warranty • Complete set of manuals including operator's guide, installation, setup and analysis manual and tabular report designer manual • Unlimited free manuals downloads • Certificate of calibration and test reports
Other optional accessories	• Extension cables (several lengths available) • ARCTIC Cables -50°C to 80°C (-58°F to 176°F) • Displacement linear and/or rotary and/or optical transducers • Kit-ZLB linear transducer mechanical adapter

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	• Kit-ZLR motion converter for rotary transducers • Kit-ZMS universal magnetic mechanical adapter • Large choice of mechanical adapters for various breakers

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