

Circuit Breaker Analyzer & Timer CAT31

- Simple & easy to operate
- 3 timing channels for main and resistive contacts
- 3 timing channels for auxiliary inputs
- Open & Close coils current measurement
- Resistance measurement of pre-insertion resistors
- Results printed on 80 mm thermal printer
- Detailed analysis of test results using DV-Win software



Description

Circuit Breaker Analyzer & Timer CAT31 is a standalone or a PC-controlled digital instrument for condition assessment of the circuit breakers. The timing channels record closing and opening of the main, resistor, and auxiliary contacts. CAT31 records graphs of both the open and close coil currents. The main contact channels can also measure the resistance value of the pre-insertion resistors (if present in the circuit breaker). Test results are printed on the 80 mm thermal printer (optional accessory) in tabulated and graphical form.

The alphanumeric keypad is used for entering the breaker data, the test data and the control functions. CAT31 provides an easy selection of different operational modes: Open (O), Close (C), Open-Close (O-C), Close-Open (C-O), and Open-Close-Open (O-C-O). Multiple operations, such as Open-Close and Open-Close-Open, can be initiated by using a predefined delay time or by sensing a breaker's contact position. External trigger is used to start timing of the breaker when sensing a voltage.

The auxiliary inputs are used to monitor the auxiliary (52a and 52b) contacts. The external trigger input can be used as the third auxiliary input.

The two analog channels measure and record the coil currents simultaneously (OPEN and CLOSE), up to 35 A DC. Results are printed in both diagram and table form on a built-in printer.

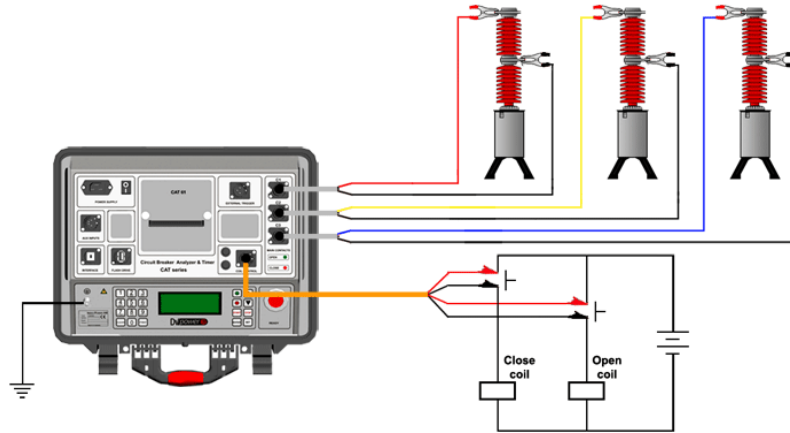
DV-Win software provides acquisition and analysis of the test results, as well as control of all the CAT31 functions from a PC. Graphical presentation of a variety of measurements and timing test results uses cursors and powerful zoom functions for detailed analysis. Colors, grids, scales and positioning of the test data are all controlled by the user. DV-Win supports an automatic unit conversion. (e.g.: cycles to seconds or mm to inches). The test records can be exported in .dwc file format for further analysis.

Application

The list of the instrument application includes:

- A simultaneous measurement of 3 main contacts including pre-insertion resistors (if present in the circuit breaker) and 3 auxiliary contacts,
- A resistance measurement of the pre-insertion resistors (if present in the circuit breaker),
- An evaluation of synchronization between the circuit breaker poles,
- A measurement of the coil currents, simultaneously for both coils

Connecting a test object to the CAT31



Features

Mains power supply input
90 V – 264 V AC; 50 Hz – 60 Hz

Thermal printer (built-in 80 mm wide)
Graphic and numeric printout of contact wave form

External Trigger input
External trigger is used to start timing of the breaker when sensing a voltage.

Auxiliary inputs
Used for timing of dry or wet auxiliary contacts

Main contacts inputs
Used for timing of main and pre-insertion resistor contacts, and for resistance measurement of pre-insertion resistors

PC communication
USB interface

Breaker state indicator
The state of circuit breaker is indicated

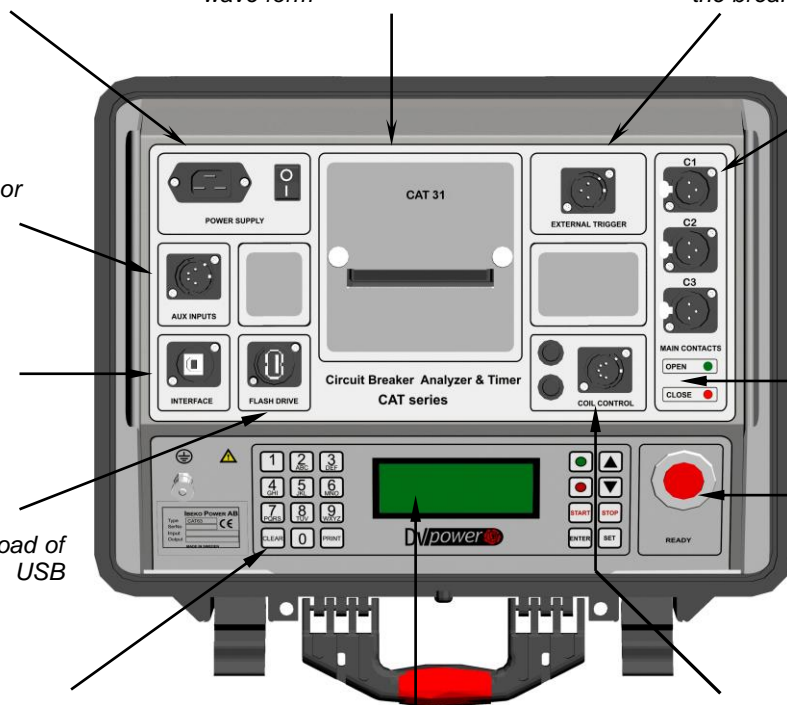
Flash drive
Used for direct download of test results on a USB memory stick

READY button
Prepares the instrument for start of the test

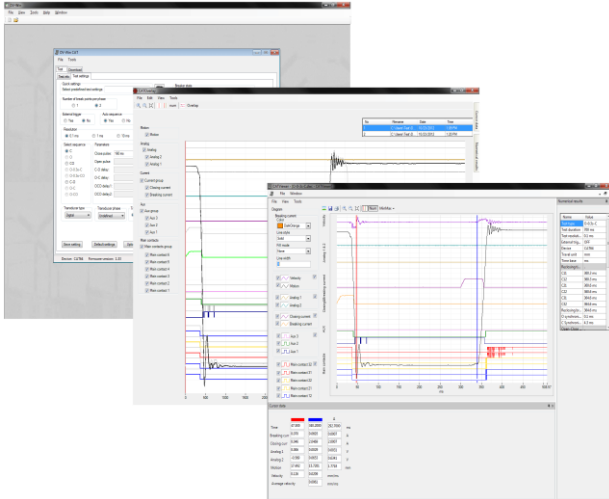
Alphanumeric keypad
Used for entering Breaker data, Test data and Control functions

LCD Screen
20 Characters by 4 Lines; LCD display with backlight, viewable in bright sunlight.

Coil Control inputs
Used for operating of circuit breaker's OPEN and CLOSE coil



DV-Win software



DV-Win software provides the following features:

- Full control of the CAT functions from a PC.
- Downloading the test results from the instrument.
- Acquisition and analysis of the test results.
- The test results can be viewed, edited, saved, printed and exported.
- Viewing and overlaying several graphs, for an easy test result comparison.
- Selecting the measurement points and intervals using the two cursors.
- Zoom and pan graph feature.
- Specific test sequence setup.
- Customized configuration of the test result graphs.
- Creation of the predefined test plans for an easy and quick field testing.

Accessories

Included

- DV-Win PC software
- Ground cable
- USB cable

Recommended

- Main contacts cables set 5 m with alligator clamps
- External trigger cable 5 m with banana plugs*
- Coil control cable 5 m with banana plugs*
- Auxiliary contacts cable 5 m with banana plugs*
- Cable bag

Optional

- Built-in 80 mm thermal printer
- Thermal paper roll
- Coil control cable 10 m with banana plugs
- Auxiliary contact cable 10 m with banana plugs
- External trigger cable 10 m with banana plugs



Main contacts cables set 5 m with alligator clamps*

External trigger cable 5 m with banana plugs*

Coil control cable 5 m with banana plugs*

Auxiliary contacts cable 5 m with banana plugs*

*The above cables are also available in several lengths and terminations.

*The above linear analog transducers are available in several lengths.

Please contact DV Power for more information.

Technical Data

Main contact inputs

- Number of contact inputs: 3
- Each channel detects Main and Pre-insertion resistor contacts.
 - Closed $\leq 10 \Omega$,
 - Resistor contacts range 10Ω to $10 \text{ k}\Omega$,
 - Open $\geq 10 \text{ k}\Omega$
 - Open circuit voltage: 20 V DC
 - Short circuit current 50 mA
- Each channel measures resistance of pre-insertion resistors

Time measurement

Time measurement resolution:

- 0,1 ms for 2 s test duration;
 - 1 ms for 20 s test duration;
 - 10 ms for 200 s test duration;
- Time accuracy 0,05% of the reading \pm resolution

Coil driver

- Number of channels: 2 (Open and Close coil)
- Two separate outputs for coil triggering
- Driver characteristics: 300 V DC max, 35 A DC max
- Electronic drivers provide superior timing control
- Overcurrent and overvoltage protection

External trigger

- Trigger input voltage: 10 V – 300 V AC/DC

Mains power supply

- Connection according to IEC/EN60320-1; UL498, CSA 22.2
- Mains supply: 90 V - 264 V AC
- Frequency: 50/60 Hz
- Input power: 250 VA
- Fuse 2 A / 250 V, Fast blow, but not user replaceable

Environmental conditions

- Operating temperature: $-10 \text{ }^\circ\text{C}$ - $+55 \text{ }^\circ\text{C}$ / $14 \text{ }^\circ\text{F}$ - $+131 \text{ }^\circ\text{F}$
 - Storage & transportation: $-40 \text{ }^\circ\text{C}$ - $+70 \text{ }^\circ\text{C}$ / $-40 \text{ }^\circ\text{F}$ - $+158 \text{ }^\circ\text{F}$
- Humidity 5 % - 95 % relative humidity, non condensing

Auxiliary inputs

- Number of channels: 3, galvanically isolated (external trigger input can be used as a third auxiliary input)
- User selectable: dry or wet
 - Contact sensing (dry):
 - Open circuit voltage 24 V DC,
 - Short circuit current 5 mA
 - Voltage sensing (wet):
 - Working voltage 300V DC, 250V AC
 - Low activation mode $\pm 5\text{V}$
 - High activation mode $\pm 10\text{V}$
- Overcurrent and overvoltage protection

Breaker operation

- Close (C),
 - Open (O),
 - Close-Open (C-O),
 - Open-Close (O-C),
 - Open-Close-Open (O-C-O)
- The user can select any desired test sequence

Current measurement

- Current measurement for Open and Close coil, 2 channels, Hall-Effect sensor
- Range $\pm 35\text{A}$ DC to 5 kHz
- Accuracy $\pm (0,5 \text{ \% rdg} + 0,1 \text{ \% FS})$
- Graphic presentation: currents waveform is displayed with a resolution of 0,1 ms

Printer (optional)

- Thermal printer
- Graphic and numeric printout
- Paper width 80 mm

Dimensions and weight

- Dimensions: 405 mm x 170 mm x 335 mm
15,9 in x 6,7 in x 13,1 in
- Weight: 7 kg / 15,4 lb

Applicable standards

- Installation/overvoltage: category II
- Pollution: degree 2
- Safety: LVD 2006/95/EC (CE Conform)
EN 61010-1
- EMC: Directive 2004/108/EC (CE Conform)
Standard EN 61326-1:2006
- CAN/CSA-C22.2 No. 61010-1, 2nd edition, including Amendment1

*All specifications herein are valid at ambient temperature of $+25 \text{ }^\circ\text{C}$ and recommended accessories.
Specifications are subject to change without notice.*