

Product Catalog

Smart test devices for reliable electric power systems



Circuit Breaker

Test Equipment



Content

About Us

The brand “DV Power”, with headquarters in Stockholm (Sweden), has since 2000 developed light and ingenious test solutions for transformers, circuit breakers, batteries and electrical safety.

The company was founded by a group of engineers with **extensive** knowledge and experience in the power electronics technology area.

Today, our DV Power products are sold all over the world – in over 110 countries.

We remain committed to extensive research and development. Thanks to our customers who continuously provide us with valuable feedback and diverse case studies, we are able to design even better products that meet their needs.

Our success is solely based on extensive research, development and fast commercial application.

The IBEKO Power AB company is certified according to ISO 9001:2015 and ISO 14001:2015 standards.

About Circuit Breaker Test Equipment

Circuit breakers are important part of the protection systems and their reliability is crucial for the reliability of the entire power system.

Failure to trip or reduced tripping speed is an important Circuit Breaker's failure mode and therefore manufacturers recommend their testing at regular intervals. DV Power has released various portable and handheld models for condition assessment of medium and high voltage Circuit Breakers' during the manufacturing, commissioning and maintenance stages.

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All specifications herein are valid at an ambient temperature of + 25 °C and standard accessories. Specifications are subject to change without notice.



Circuit Breaker Test Equipment

Description	CAT03	CAT31	CAT34	CAT35	CAT36	CAT61	CAT64	CAT64A	CAT65	CAT66	CAT124A	CAT125	CAT126	CAT100	CAT250	CAT500	CAT-H	CAT-P	DIS-H	POB II	SAT II	RMO-A	RMO-C	RMO-G	RMO-H	
Timing Measurement of Circuit Breaker Main and PIR Contacts (IEC 62271-100)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•								
Contact (Static) Resistance Measurement (IEC 62271-1)				•	•				•	•		•	•		•	•						•	•	•	•	
Dynamic Resistance Measurement				•	•				•	•		•	•		•	•										
Motion and Velocity (IEC 62271-100)			•	•	•		•	•	•	•	•	•	•	•	•	•										
Motor Mechanism Charging Time (IEC 62271-100)			•	•	•		•	•	•	•	•	•	•	•	•	•	•	•		•	•					
Coil Resistance (IEC 62271-100)				•	•			•	•	•	•	•	•	•	•	•	•	•			•					
Coil Current (IEC 62271-100)		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•					
Minimum Trip Voltage (IEC 56, ANSI C37.09)															•	•				•	•					
Timing Measurement of Auxiliary Contacts (IEC 62271-100)		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•								
“First Trip” Test				•	•			•	•	•	•	•	•		•	•		•								
Vibration Analysis															•	•										
Disconnecter Motor Drive Analysis																			•							



Circuit Breaker Analyzers & Timers

CAT500 Series

Applications

- Simultaneous timing, static resistance and dynamic resistance measurement on up to 12 main contact chambers under BSG conditions by use of CAT modules
- Performing all tests with one cable connection without the need for rewiring
- Simultaneous timing measurement of up to 12 main contacts (4 breaks per phase) including pre-insertion resistors and 6 auxiliary contacts
- Resistance measurement of the pre-insertion resistors
- Evaluation of synchronization between the circuit breaker poles
- Measurement of the coil currents, voltages and resistance (simultaneously for 3 coils)
- GIS circuit breaker testing under Both sides grounded condition using GIS Test module (3 independent current sources up to 400 A)
- Recording of circuit breaker vibrations
- 3 channels for measurement of displacement and average velocity of the breaker's moving part
- Timing measurement with minimum standard operating voltage
- Anti-pumping relay test
- Measurement of spring-charging motor time, current and voltage
- Minimum trip voltage test
- "First Trip" test

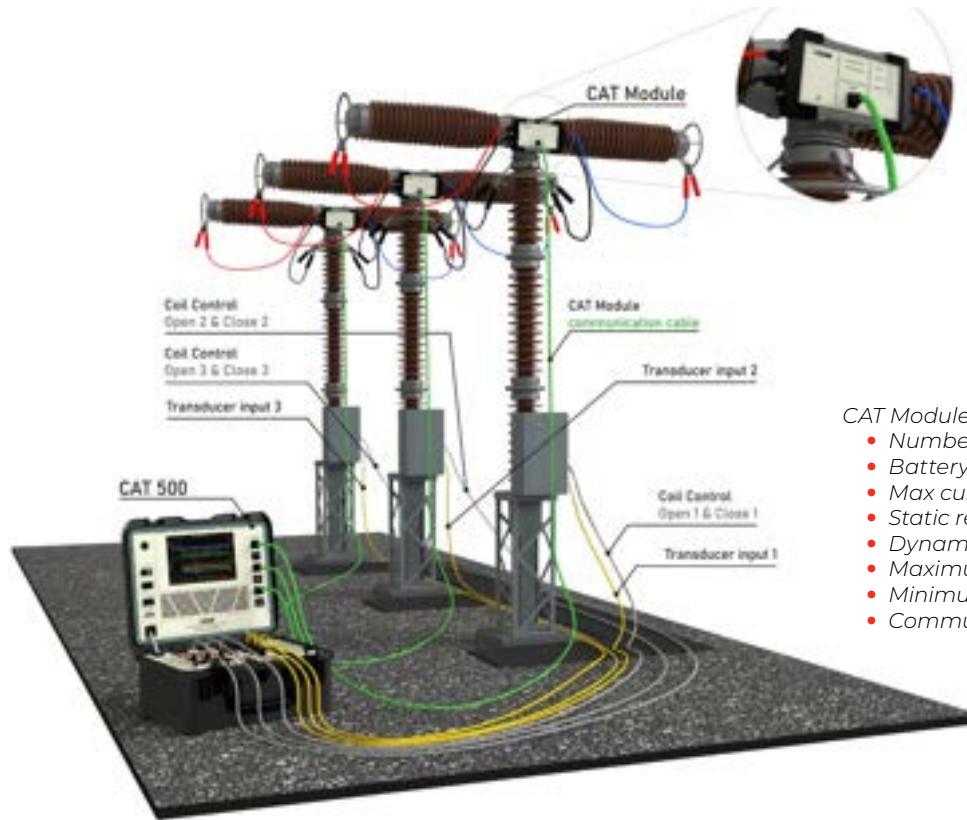
Main Features of CAT500 (CAT500-12-W3)

- Timing measurement under Both Sides Grounded condition for AIS and GIS
- Robust design for field use
- Motion and vibrations measurement
- Built-in micro-ohmmeter (up to 500 A) for single-phase dynamic and static resistance measurement (optional)
- Minimum trip voltage test (optional)
- Built-in printer 112 mm (optional)
- Touch screen color display 10.1 in
- Ethernet communication
- Database of circuit breaker test plans



Circuit Breaker Analyzers & Timers

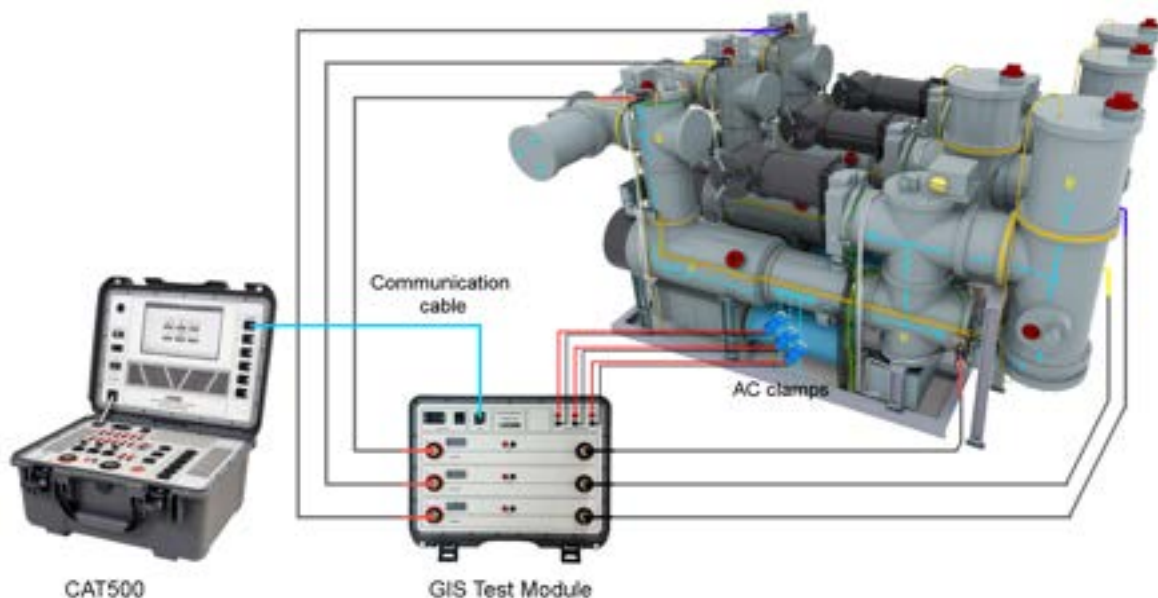
CAT500 connection to Live Tank CB with CAT Modules



CAT Module

- Number of channels: 2
- Battery Li-Po: 2 200 mAh, 7,4 V
- Max current per channel: 100 A DC
- Static resistance range: 0,1 $\mu\Omega$ – 3 000 m Ω
- Dynamic contact res. range: 10 $\mu\Omega$ – 200 m Ω
- Maximum sample rate: 40 kHz
- Minimum resolution: 25 μs
- Communication: digital

CAT500 connection to GIS (Gas Insulated Substation) under BSG (Both Sides Grounded) conditions with GIS Test Module



Both Sides Grounded (BSG) of GIS (Gas Insulated Substation) feature enables timing measurement of GIS contact time without having to remove detachable shunts for grounding of GIS circuit breaker terminals. Method is based on the DC current generation through the parallel connection of the main circuit and grounding path and measurement voltage or current response on the CT secondary during CB operation.

Circuit Breaker Analyzers & Timers

CAT505 Series

Applications

- Simultaneous timing, static resistance and dynamic resistance measurement on up to 12 main contact chambers under BSG conditions by use of CAT modules
- Performing all tests with one cable connection without need for rewiring
- Simultaneous timing measurement of up to 12 main contacts (4 breaks per phase) including pre-insertion resistors and 12 auxiliary contacts
- Evaluation of synchronization between the circuit breaker poles
- GIS circuit breaker testing under Both Sides Grounded conditions using the GIS Test module (3 independent current sources up to 400 A)
- 6 channels for measurement of displacement and average velocity of the breaker's moving part
- "First Trip" test
- Anti-pumping relay test
- Measurement of spring-charging motor time, current and voltage

Main Features of CAT505 (CAT505-12-W3)

- Timing measurement under Both Sides Grounded condition for AIS and GIS
- Robust design for field use
- Accurate measurement in a high voltage environment
- 6 channels for measurement of displacement
- Built-in printer 112 mm (optional)
- Touch screen color display 10.1 in
- Database of circuit breakers test plans



Circuit Breaker Analyzers & Timers

Accessories



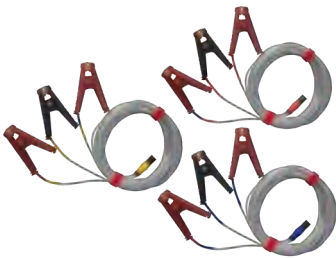
CAT Module



GIS Test Module



Communication cable for CAT module



Main contact cables with SCT clamps



Main contact cables extension



Coil control cable with banana plugs



Current and sense cables (red) with SCT clamps



Current and sense cables (black) with SCT clamps



Analog channels cables with banana plugs



Coil supply cables with banana plugs



Auxiliary contacts cable



Current cables with battery clamps B1



Sense cables with alligator clamps A2



Plastic transport case with wheels



Plastic case for CAT modules

Circuit Breaker Analyzers & Timers

Accessories



Plastic transport case for GIS module



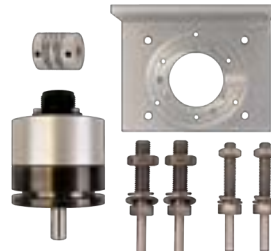
Current clamp 30/300 A with internal battery supply and extension 5 m



Universal transducer mounting kit - extended version



Plastic cable case



Digital rotary transducer with accessories



Linear analog transducer (TLH)



Circuit Breaker Analyzers & Timers

CAT250 Series

Applications

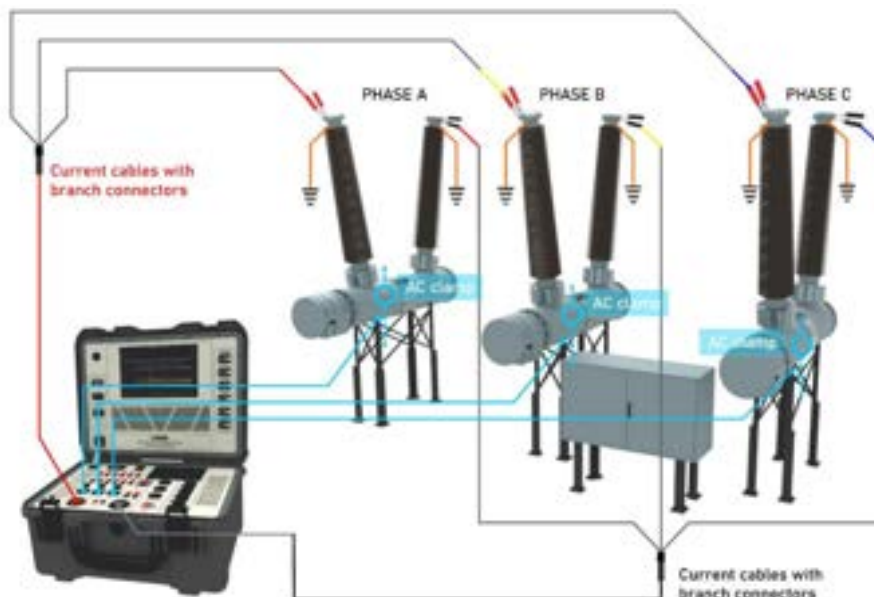
- Simultaneous timing measurement of up to 12 main contacts (4 breaks per phase) including pre-insertion resistors (if present in the circuit breaker) and 6 auxiliary contacts
- Resistance measurement of the pre-insertion resistors (if present in the circuit breaker)
- Evaluation of synchronization between the circuit breaker poles
- Measurement of the coil currents, voltages and resistance (simultaneously for 3 coils – during open or close sequence)
- “First trip” test
- Evaluating the state of the substation's batteries by graphically showing the voltage value
- Measurement of displacement, contact wipe, over-travel, rebound, damping time and average velocity of the breaker's moving parts
- Static resistance measurement
- Recording of circuit breaker vibration fingerprint
- Dynamic resistance measurement
- Measurement of spring-charging motor time, current and voltage (both DC and AC power supply voltage, when used as CAT & SAT test system)

Main Features of CAT250 (CAT250-12-W3)

- Robust design for field use
- Accurate measurement in a high voltage environment
- Touch screen color display 10.1 in
- Both Sides Grounded feature for AIS and Dead tank (optional)
- Built-in micro-ohmmeter (up to 500 A) for dynamic and static resistance measurement (optional)
- Minimum trip voltage test (optional)
- Built-in printer 112 mm (optional)
- Database of circuit breakers test plans
- DV-CB software for detailed analysis of test results



Timing measurement of Dead tank CB with both sides grounded using CAT250



Circuit Breaker Analyzers & Timers



Circuit Breaker Analyzers & Timers

CAT100 Series

Applications

- Simultaneous timing measurement of up to 6 main (2 breaks per phase) and pre-insertion resistor contacts
- Evaluation of synchronization (simultaneity) between the circuit breaker poles
- Auxiliary contacts timing measurement
- Measurement of displacement, damping time and average velocity of moving parts
- Resistance measurement of the pre-insertion resistors
- Measurement of the coil currents, simultaneously for 2 coils

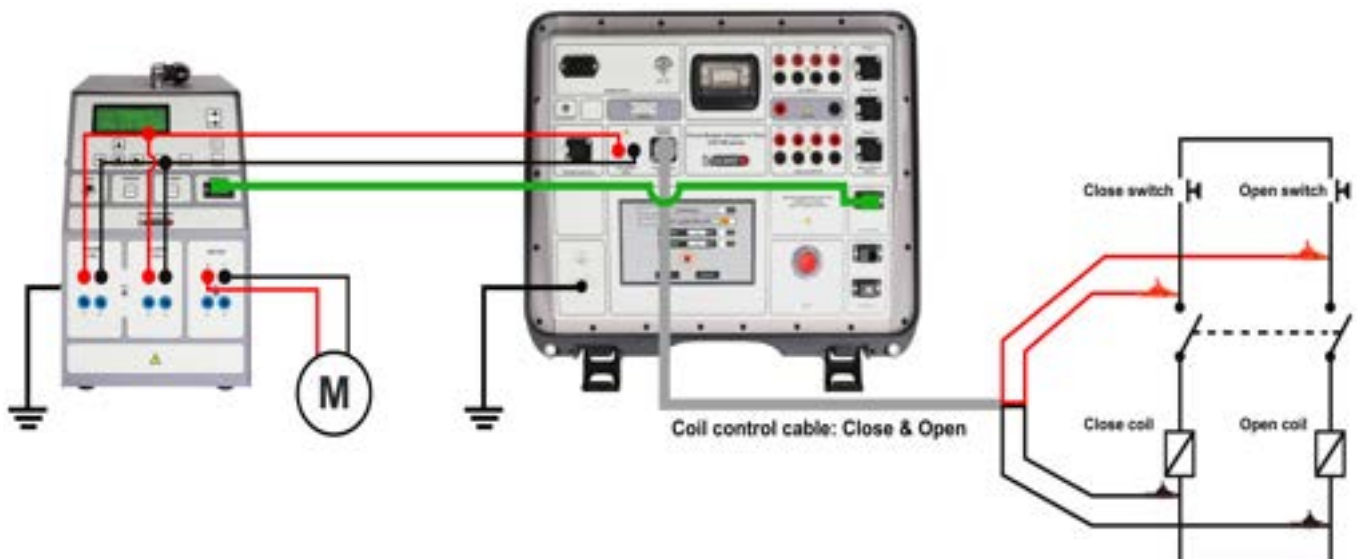
Main Features of CAT100 (CAT100-B6-03)

- Simple and easy to operate
- Robust design for field use
- 6 timing channels (3 x 2) for main and pre-insertion resistor contacts
- 4 timing channels for auxiliary inputs
- 2 coil control and coil current measurement channels
- 4 analog channels for monitoring voltage or current
- On-site analysis of the obtained measurements using the 7 in graphical touch screen color display
- Battery operation for up to 8 hours
- DV-CB software for detailed analysis of test results



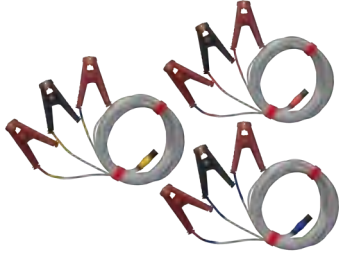
CAT & SAT as a Circuit Breaker Test System

- CAT100 can be coupled with the DV Power Coil Analyzer SAT II Series to create one test system.
- The SAT device can be used as a power supply unit for the measurement of spring-charging motor current and voltage as well as the determination of minimum trip voltage of circuit breaker coils.



Circuit Breaker Analyzers & Timers

Accessories



Main contact cables with SCT clamps



Main contact cables extension



Coil supply cables with banana plugs



Coil control cable with banana plugs



Auxiliary contacts cable



Analog channels cables with banana plugs



Current cables with battery clamps B1



Sense cables with alligator clamps A2



Current clamp 30 / 300 A with internal battery supply and extension 5 m



Digital rotary transducer with accessories



Linear analog transducer (TLH)



Universal transducer mounting kit - extended version



Test shunt 600 A / 60 mV



Plastic cable case

Circuit Breaker Analyzers & Timers

CAT Advanced Series

Applications

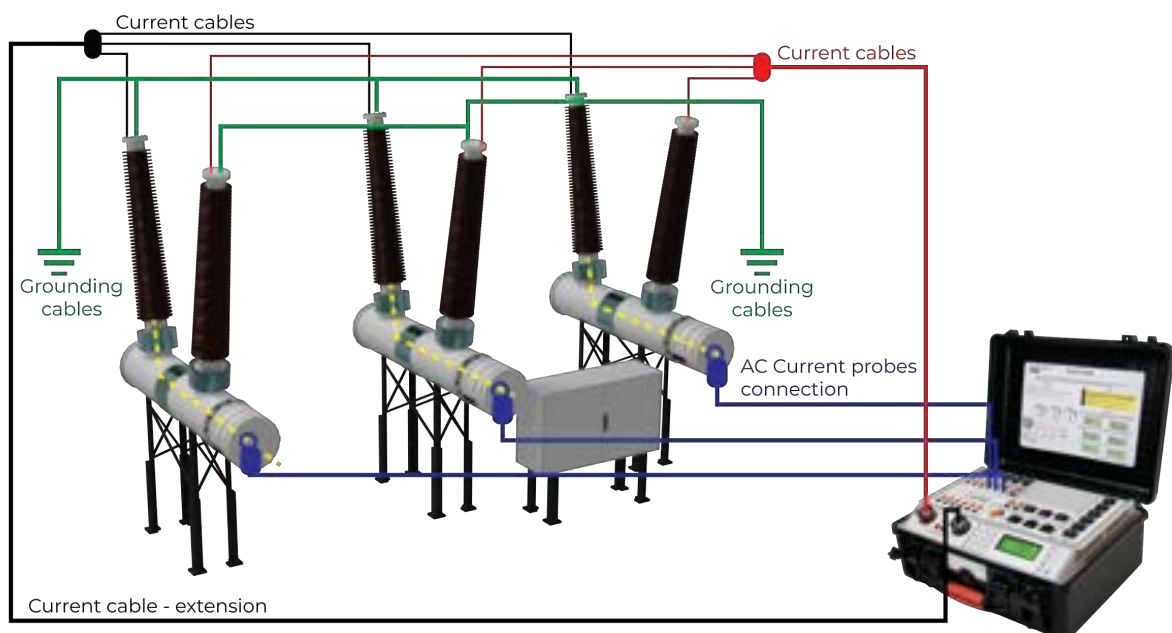
- Simultaneous timing measurement of up to 12 (4 breaks per phase) main and pre-insertion resistor contacts
- Evaluation of synchronization (simultaneity) between the circuit breaker poles
- Auxiliary contacts timing measurement
- "First Trip" test
- Dynamic resistance measurement (single phase)
- Measurement of displacement, damping time and average velocity of moving parts
- Resistance measurement of the pre-insertion resistors
- A measurement of the coil currents, simultaneously for 6 coils
- Contact (static) resistance measurement (single phase)

Main Features of CAT126 (CAT1260-N-03)

- Robust design for field use
- Accurate measurement in high voltage environment
- Both Sides Grounded Feature for AIS and Dead Tank (optional)
- Built-in micro-ohmmeter (up to 500 A)
- 12 timing channels (3 x 4) for main and pre-insertion resistor contacts
- 6 timing channels for auxiliary contacts
- 6 coil control and coil current measurement channels
- 3 motion transducer inputs for analog and digital transducers
- 6 configurable analog channels



Timing measurements on Dead Tank circuit breaker with grounding on both sides



Both Sides Grounded (BSG) of dead tank circuit breaker feature enables timing measurement of dead tank contact time without having to remove grounding cables from one side of circuit breaker. Method is applicable for any type of maintenance grounding system (P-N or P-P-P-N).

Circuit Breaker Analyzers & Timers

CAT Advanced Models Comparison

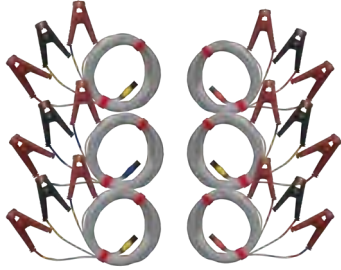


● - Standard ○ - Optional

Model	CAT35	CAT36	CAT64A	CAT65	CAT66	CAT124A	CAT125	CAT126
Main Contacts & Preinsertion Resistors Contacts Timing Channels	3	3	6	6	6	12	12	12
Auxiliary Contacts Timing Channels	6	6	6	6	6	6	6	6
Coil Control	●	●	●	●	●	●	●	●
Coil Current Measurement Channels	6	6	6	6	6	6	6	6
Analog Input Channels	6	6	6	6	6	6	6	6
Transducer Input Channels	3	3	3	3	3	3	3	3
BSG for AIS (Live Tank)	○	○	○	○	○	○	○	○
BSG for Dead Tank	○	○		○	○		○	○
“First Trip” Test	●	●	●	●	●	●	●	●
Micro-Ohmmeter [A]	200	500		200	500		200	500
High Precision Module	○	○		○	○		○	○
Dynamic Resistance Measurement	●	●		●	●		●	●
Weight [kg]	13,2	13,5	10,6	13,2	13,5	10,8	13,5	13,6

Circuit Breaker Analyzers & Timers

Accessories



Main contact cables with SCT clamps



Main contact cables extension



Coil control cable with banana plugs



Coil supply cables with banana plugs



Sense cables with alligator clamps A2



Current cables with battery clamps B1



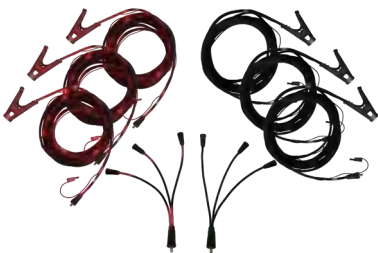
Auxiliary contacts cable



Analog channels cables



Grounding cable



Current and sense cables with SCT clamps and current cable with branch connectors



Current clamp 30/300 A with internal battery supply and extension 5 m



Current clamp 30/300 A power supplied from the instrument with adapter 5 m



Test shunt 600 A/60 mV



Three-phase rotary transducer kit



Universal transducer mounting kit - extended version

Circuit Breaker Analyzers & Timers

Accessories



AC Current clamp 1A/1V and cable 5 m with banana plugs



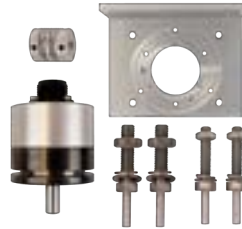
Analog rotary transducer



Linear analog transducer



Double transducer adapter



Digital rotary transducer with accessories



Cable bag



Plastic transport case

Circuit Breaker Analyzers & Timers

CAT Standard Series

Applications

- Simultaneous timing measurement of up to 6 main (2 breaks per phase) and pre-insertion resistor contacts
- Evaluation of synchronization (simultaneity) between the circuit breaker poles
- Auxiliary contacts timing measurement
- Measurement of displacement, damping time and average velocity of moving parts
- Resistance measurement of the pre-insertion resistors
- Measurement of the coil currents, simultaneously for 2 coils

Main Features of CAT64 (CAT6400-B-03)

- Simple and easy to operate
- Battery operation for up to 8 hours
- 6 timing channels (3 x 2) for main and pre-insertion resistor contacts
- 3 timing channels for auxiliary inputs
- 2 coil control and coil current measurement channels
- Option for external triggering of measurement
- 1 motion transducer input for analog and digital transducers
- Internal battery power supply

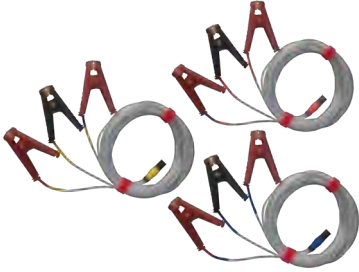


● - Standard ○ - Optional

Model	CAT03	CAT31	CAT34	CAT61	CAT64
Main and Preinsertion Contacts Timing Channels	3	3	3	6	6
Auxiliary Contacts Timing Channels		3	3	3	3
Coil Control		●	●	●	●
Coil Current Measurement Channels		2	2	2	2
External Trigger Channels	2	2	2	2	2
Analog Input Channels			2		2
Transducer Input Channels			1		1
Built-In Thermal Printer	○	○	○	○	○
Built-In Battery	○	○	○	○	○
Weight [kg]	6,2	6,4	6,5	6,7	6,8

Circuit Breaker Analyzers & Timers

Accessories



Main contact cables with SCT clamps



Main contact cables extension



Coil control cable with banana plugs



Auxiliary contact cables



Coil supply cables with banana plugs



Analog channels cables



External trigger cable



Grounding cable



Plastic transport case



Plastic cable case



Cable bag



Current clamp 30/300 A with internal battery supply and extension 5 m

Circuit Breaker Analyzers & Timers Accessories

Accessories



Current clamp 30 / 300 A power supplied from the instrument with adapter 5 m



Small current clamp



Analog rotary transducer



Linear analog transducer



Universal adapter for mounting rotary transducer



Linear to rotary transducer converter



Bellow coupling



Universal transducer mounting kit - extended version



Digital rotary transducer with accessories

Circuit Breaker Analyzers & Timers

CAT-H

Applications

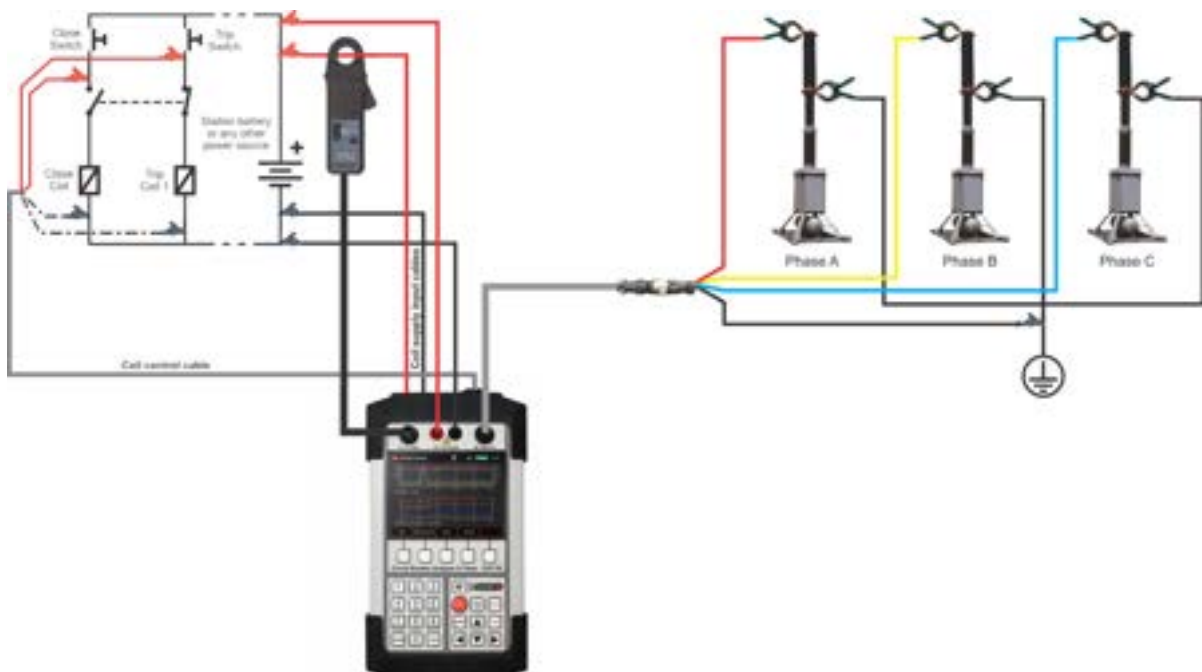
- Main contacts timing measurement
- Resistance and timing measurement of the pre-insertion resistors
- Main contacts bounce time measurement
- OPEN and CLOSE coil current measurement
- Coil resistance measurement
- Auxiliary contact timing measurement
- DC supply voltage measurement
- Actuation of circuit breaker's OPEN and CLOSE coils
- Pre-trigger time measurement

Main Features of CAT-H (CATH000-N-00)

- Compact and ergonomic design
- Graphical test results for quick interpretation
- Offline testing of circuit breakers
- Coil control (built-in) for OPEN and CLOSE coil
- Touch screen color display 5.7 in
- Over 30 000 test results internal storage
- Internal battery power supply (user-replaceable)
- Battery operation for up to 8 hours
- Dimensions: 310 mm x 170 mm x 58 mm (12.21 in x 6.69 in x 2.28 in)
- Weight: 1,6 kg (3.5 lbs)



CAT-H connection to live tank circuit breaker with one breaking element per phase



Circuit Breaker Analyzers & Timers

CAT-P

Applications

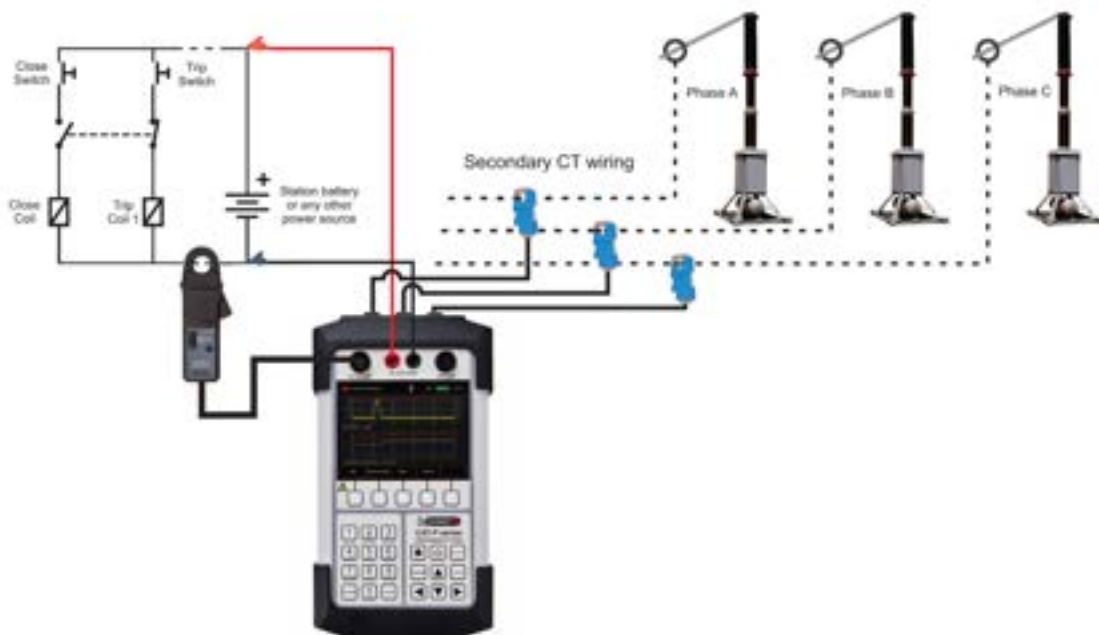
- "First trip" test
- Main contacts timing measurement
- Resistance and timing measurement of the pre-insertion resistors
- Main contacts bounce time measurement
- Pre-trigger time measurement
- OPEN and CLOSE coil current measurement
- Coil resistance measurement
- Auxiliary contact timing measurement
- DC supply voltage measurement
- Actuation of circuit breaker's OPEN and CLOSE coils via Coil Control Module

Main Features of CAT-P (CATP000-N-00)

- Compact and ergonomic design
- Graphical test results for quick interpretation
- Offline and online (First trip test) testing of circuit breakers
- Coil control (via external module) for OPEN and CLOSE coil
- Touch screen color display 5.7 in
- Over 30 000 test results internal storage
- Internal battery power supply (user-replaceable)
- Battery operation for up to 8 hours
- Dimensions: 310 mm x 170 mm x 58 mm (12.21 in x 6.69 in x 2.28 in)
- Weight: 1,4 kg (3.1 lbs)



Online testing: CAT-P connection to live tank circuit breaker with one breaking element per phase



Circuit Breaker Analyzers & Timers Accessories

Accessories



Main contacts cable set



Coil control cable with banana plugs



Voltage sense cable set



Coil supply cable set



Main contacts connection and ground cable



Dolphin clips



Test probe with grip jaws



Coil control module



AC current clamp



Small current clamp



Handle strap with resistive touch pen



Plastic transport case



Plastic transport case for accessories



Cable bag



Current clamp 30 / 300 A power supplied from the instrument with adapter 5 m

Micro-Ohmmeters

RMO-H Series

Applications

- Resistance measurement according to IEC 62271-1
- Medium voltage circuit breaker testing using Kelvin probes
- Bus bar joints, cable splices, welding joints resistance checking (PASS / FAIL criteria)
- Battery cells connection in the battery string
- 2-way connection for high voltage circuit breaker testing:
 - Short cables for direct measurement on terminals (from crane basket) - RMO-H1/H2/H3 models
 - Long cables for traditional measurement method (from ground) - RMO-H21/H22/H23

Main Features of RMO-H Series (RMOH300-N-00)

- Test currents: 1 A – 300 A DC
- Typical accuracy: $\pm (0,1 \% \text{ rdg} + 0,1 \% \text{ F.S.})$
- High-capacity battery (2 types available):
 - Li-Po 8 800 mAh, up to 3,8 V DC (RMO-H1/H2/H3)
 - Li-Hv 4 400 mAh, up to 7,6 V DC (RMO-H21/H22/H23)
- Measuring range: $0,1 \mu\Omega - 3\,000 \text{ m}\Omega$
- 10 000 test results storage
- Bluetooth communication with DV-CB software
- Dimensions: 198 mm x 255 mm x 380 mm (8.9 in x 4.5 in x 1.9 in)
- Weight: 0,95 kg (2.1 lbs)



● - Standard ○ - Optional

Model	RMO-H1	RMO-H2	RMO-H3	RMO-H21	RMO-H22	RMO-H23
Maximum Test Current [A]	100	200	300	100	200	300
Continuous Test	No	No	No	No	No	No
R _{max} (Pass / Fail) feature	●	●	●	●	●	●
Both Sides Grounded	Yes	Yes	Yes	Yes	Yes	Yes
Cables length [m]	1,3	1,3	1,3	5	5	5
Output voltage [V]	3,8	3,8	3,8	7,6	7,6	7,6

Micro-Ohmmeters

Accessories



Current and sense cables with TTA clamps



Current and sense cables with Kelvin probes



Current and sense cables with Kelvin probes with extended measuring tip (12 cm)



Current and sense cables with sliding arm Kelvin's clamps



Power supply adapter



Test shunt 150 A / 150 mV



Test shunt 250 A / 60 mV



Grounding cable



Cable bag



Plastic cable case

Micro-Ohmmeters

RMO-C Series

Applications

- Circuit breaker resistance measurement according to IEC 62271-1
- Dead-tank circuit breakers testing (DTR test mode)
- Bus bar joints, cable splices, welding joints resistance checking (PASS / FAIL criteria)
- Generator circuit breakers testing
- GIS connections quality check
- Resistance change monitoring (CONTIN mode)
- Testing in Both Sides Grounded conditions (BSG)

Main Features of RMO500C (RMO500C-N-03)

- Test currents: 5 A – 500 A DC
- Continuous current capability @200 A DC, 10 min @300 A DC
- Measuring range: 0,1 $\mu\Omega$ – 999,9 m Ω (expandable to 6 Ω)
- Typical accuracy: \pm (0,1 % rdg + 0,1 % F.S.)
- Best resolution: 0,01 $\mu\Omega$
- High output voltage: 8,2 V at 300 A DC, 8,6 V @200 A DC
- Standalone / PC-controlled (DV-CB software)



● - Standard ○ - Optional

Model	RMO200C	RMO300C	RMO500C
Maximum Test Current [A]	200	300	500
Output Voltage at I_{max} [V]*	8,6	8,2	6,1
Continuous Test	●	●	●
Dead Tank Resistance (DTR) test mode	●	●	●
R_{max} (Pass / Fail) feature	●	●	●
Both Sides Grounded	○	○	○
Thermal printer	No	No	No
High Precision Module	○	○	○

* For power supply 230 V AC

Micro-Ohmmeters

Accessories



Current cables with battery clamps B3



Current cables with battery clamps B1



Current cables with alligator clamps A3



Heavy duty sense cables with alligator clamps A2



Sense cables with alligator clamps A2



Extension sense cables



Grounding cable



Heavy duty sense cables with C clamps



Cable bag



Plastic cable case



Current clamp 30/300 A power supplied from the instrument with adapter 5 m



Remote control unit



Test shunt 250 A/60 mV

Micro-Ohmmeters

RMO-G Series

Applications

- Circuit breaker resistance measurement according to IEC 62271-1
- Dead-tank circuit breakers testing (DTR test mode)
- Bus bar joints, cable splices, welding joints resistance checking (PASS / FAIL criteria)
- Testing in Both Sides Grounded conditions (BSG)
- Generator circuit breakers testing (HIGH PRECISION module)
- GIS connections quality check (HIGH PRECISION module)
- Resistance change monitoring (CONTIN mode)
- Testing from remote locations (REMOTE CONTROL)

Main Features of RMO800G (RMO800G-N-03)

- Test currents: 10 A – 800 A DC
- Measuring range: 0,1 $\mu\Omega$ – 499,9 m Ω
- Typical accuracy: \pm (0,1 % rdg + 0,1 % F.S.)
- Best resolution: 0,1 $\mu\Omega$ (0,01 $\mu\Omega$ with built-in High Precision module)
- Current clamps input for BSG (Both Sides Grounded)
- Remote control input
- Built-in thermal printer (optional)
- Standalone / PC-controlled (DV-CB software)



• - Standard ○ - Optional

Model	RMO100G	RMO200G	RMO300G	RMO400G	RMO500G	RMO600G	RMO800G
Maximum Test Current [A]	100	200	300	400	500	600	800
Output Voltage at I_{max} [V]*	7,15	6,8	7,0	6,7	6,0	5,9	4,7
Continuous Test	•	•	•	•	•	•	•
Dead Tank Resistance (DTR) test mode	•	•	•	•	•	•	•
R_{max} (Pass / Fail) feature	•	•	•	•	•	•	•
Both Sides Grounded	○	○	○	○	○	○	○
Thermal printer	○	○	○	○	○	○	○
High Precision Module	○	○	○	○	○	○	○

* For power supply 230 V AC

Micro-Ohmmeters

Accessories



Current cables with battery clamps B3



Current cables with battery clamps B1



Current cables with alligator clamps A3



Heavy duty sense cables with alligator clamps A2



Sense cables with alligator clamps A2



Extension sense cables



Grounding cable



Heavy duty sense cables with C clamps



Cable bag



Plastic cable case



Bluetooth communication module



Current clamp 30/300 A power supplied from the instrument with adapter 5 m



Remote control unit



Test shunt 250 A/60 mV

Micro-Ohmmeters

RMO-A Series

Applications

- Circuit breaker resistance measurement according to IEC 62271-1
- Dead-tank circuit breakers testing (DTR test mode)
- Bus bar joints, cable splices, welding joints resistance checking (PASS / FAIL criteria)
- Generator circuit breakers testing (HIGH PRECISION module)
- GIS connections quality check (HIGH PRECISION module)
- Resistance change monitoring (CONTIN mode)

Main Features of RMO600A (RMO600A-N-02)

- Test currents: 5 A – 600 A DC
- Measuring range: 0,1 $\mu\Omega$ – 999,9 m Ω (expandable to 6 Ω)
- Typical accuracy: \pm (0,1 % rdg + 0,1 % F.S.)
- Best resolution: 0,1 $\mu\Omega$ (0,01 $\mu\Omega$ with built-in High Precision module)
- High output voltage: 5,9 V at 600 A DC
- Built-in thermal printer (optional)
- Standalone / PC-controlled (DV-CB software)



● - Standard ○ - Optional

Model	RMO100A	RMO200A	RMO300A	RMO400A	RMO500A	RMO600A
Maximum Test Current [A]	100	200	300	400	500	600
Output Voltage at I_{max} [V]*	7,25	7,1	7,0	6,6	6,0	5,9
Continuous Test	●	●	●	●	●	●
Dead Tank Resistance (DTR) test mode	●	●	●	●	●	●
R_{max} (Pass/Fail) feature	●	●	●	●	●	●
Both Sides Grounded	No	No	No	No	No	No
Thermal printer	○	○	○	○	○	○
High Precision Module	○	○	○	○	○	○

*For power supply 230 V AC

Micro-Ohmmeters

Accessories



Current cables with battery clamps B3



Current cables with battery clamps B1



Current cables with alligator clamps A3



Heavy duty sense cables with alligator clamps A2



Sense cables with alligator clamps A2



Extension sense cables



Grounding cable



Heavy duty sense cables with C clamps



Transport bag for instrument in metal housing



Cable bag



Plastic cable case



Bluetooth communication module



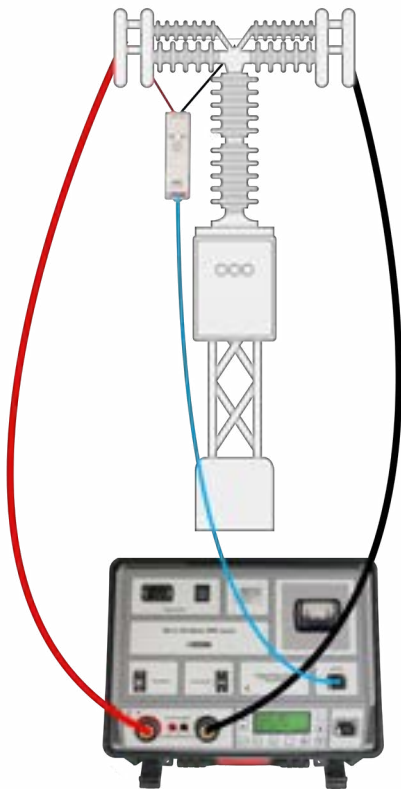
Test shunt 250 A / 60 mV

Micro-Ohmmeters

Remote Control Unit and Test Probes

In order to remotely perform the measurements, the RMO-C and RMO-G devices can be provided with the RMO Remote Control Unit or with the RMO Remote Control test probes (with trigger button). This optional feature is used in applications with increased safety requirements. It also significantly speeds up the entire test procedure since operator can start the test by pressing the trigger button available on the probes.

Remote control connection principle



High Precision Module (built-in)

The high precision module is newly developed built-in addition to our RMO-A, RMO-C and RMO-G microohmmeters. It provides an increased precision and offers a highly accurate contact resistance measurement in the range from $1 \mu\Omega$ to $99,99 \mu\Omega$, with $0,01 \mu\Omega$ resolution.

Our RMO-A, RMO-G and RMO-C devices with this built-in High Precision Module may be used for applications on very small resistance measurements of noninductive test objects.

This requirement is usually met at resistance inspections of generator circuit breakers, welding joints, GIS testing, etc.

DTR Test – A New Test Mode for Dead Tank CB Testing

Presence of current transformers (CT) on the dead tank circuit breakers may introduce errors during the contact resistance measurement due to CT magnetizing process. For this reason, it is necessary to saturate a CT prior to starting a measurement.

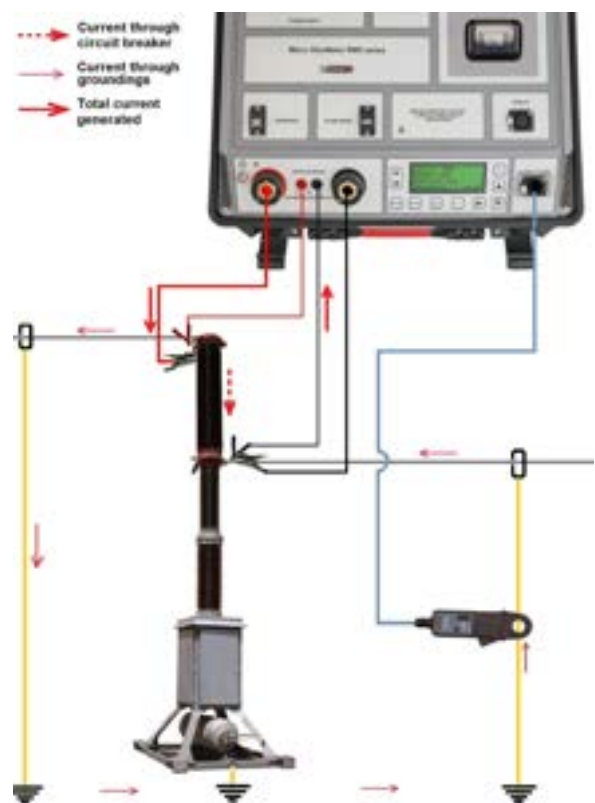
DTR test menu is specially designed for resistance measurement of the dead tank circuit breakers and it is implemented in all our portable microohmmeters – RMO-A, RMO-G and RMO-C series. All calculations for detecting the saturated condition of CTs are done by internal algorithm. The process of setting the measurement parameters and conducting a test in this mode is very simple and does not differ much from a live tank circuit breaker testing.

Both Sides Grounded Feature

In order to provide a complete protection from the induced voltages during the HV circuit breaker contact resistance measurement, it is necessary to ground the circuit breaker at both sides.

The RMO-H devices as well as the RMO-C and RMO-G series instruments have the possibility to perform measurements with both sides of a test object grounded. This will ensure the operator's safety and protect the instrument as well.

Both Sides Grounded connection principle



Power Supplies & Coil Analyzers

SAT II Series

Applications

- Stable power supply for opening and closing coils and spring-charging motor during circuit breaker and switchgear testing
- Coil current and coil resistance measurement as per IEC 62271-100
- Minimum trip voltage test of the circuit breaker's coils as per IEC 56 & ANSI C37.09
- Motor current and operating mechanism charging time as per IEC 62271-100
- Temperature measurement on auxiliary and control equipment
- Power supply or a temporary battery charger (AC & DC motor outputs)

Main Features of SAT40A II Series (SAT40AX-NX-2)

- Typical accuracy: $\pm (0,25 \% \text{ rdg} + 0,25 \% \text{ F.S.})$
- Two powerful motor outputs 10 V – 250 V DC / AC, up to 40 A inrush current
- Four separate opening and closing coil outputs:
 - 10 V – 300 V DC
 - 10 V – 250 V AC
- Ripple-free DC voltage (ripple less than 1 %)
- Temperature sensor input
- DV-CB software (control of CAT & SAT devices as one test system)
- Compatible with other vendor's circuit breaker analyzers



POB II Series

Applications

- Stable power supply for opening and closing coils and spring-charging motor during circuit breaker and switchgear testing
- Minimum trip voltage test of the circuit breaker's coils as per IEC 56 & ANSI C37.09
- Motor current and operating mechanism charging time as per IEC 62271-100
- Power supply or a temporary battery charger (DC motor outputs)

Main Features of POB40AD II Series (POB40AD-NX-2)

- Typical accuracy: $\pm (0,25 \% \text{ rdg} + 0,25 \% \text{ F.S.})$
- Powerful DC motor output 10 V – 250 V DC, up to 40 A inrush current
- Four separate opening and closing coil outputs:
 - 10 V – 300 V DC
 - 10 V – 250 V AC
- Ripple-free DC voltage (ripple less than 1 %)
- Connector for external triggering
- Compatible with other vendor's circuit breaker analyzers

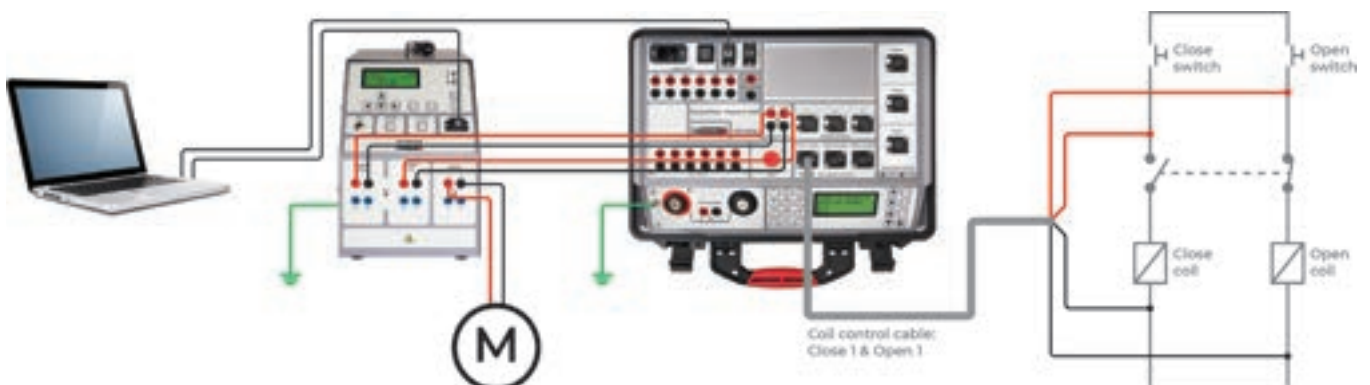


Power Supplies & Coil Analyzers

Mains Power Supply Voltage [V]	Motor Output Load Voltage [V]	Maximum Current [A]	Maximum Load Interval [s]
230	110 DC	30	30
		24	110
		15	Continuous
	220 DC	16	30
		14	110
		8	Continuous
	110* AC	20	30
		14	110
		11	Continuous
	220* AC	13	30
		10	10
		8	Continuous
115	48 DC	30	30
		24	110
		15	Continuous
	110 DC	18	30
		15	110
		12	Continuous
	220 DC	9	30
		8	110
		6	Continuous
	110* AC	15	30
		12	110
		10	Continuous
	220* AC	10	30
		7	110
		5	Continuous

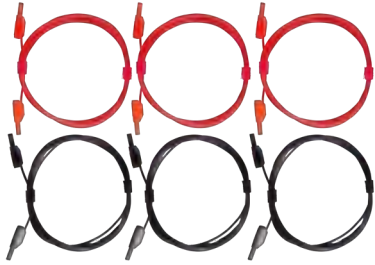
* available for SAT only

CAT and SAT connection principle



Power Supplies & Coil Analyzers

Accessories



Cable set 6 x 2 m with banana plugs



Mains power cable EU 16 A



External trigger cable set



Temperature sensor with cable



Grounding cable



Transport bag



Cable bag

Handheld Disconnector Analyzer

DIS-H

Applications

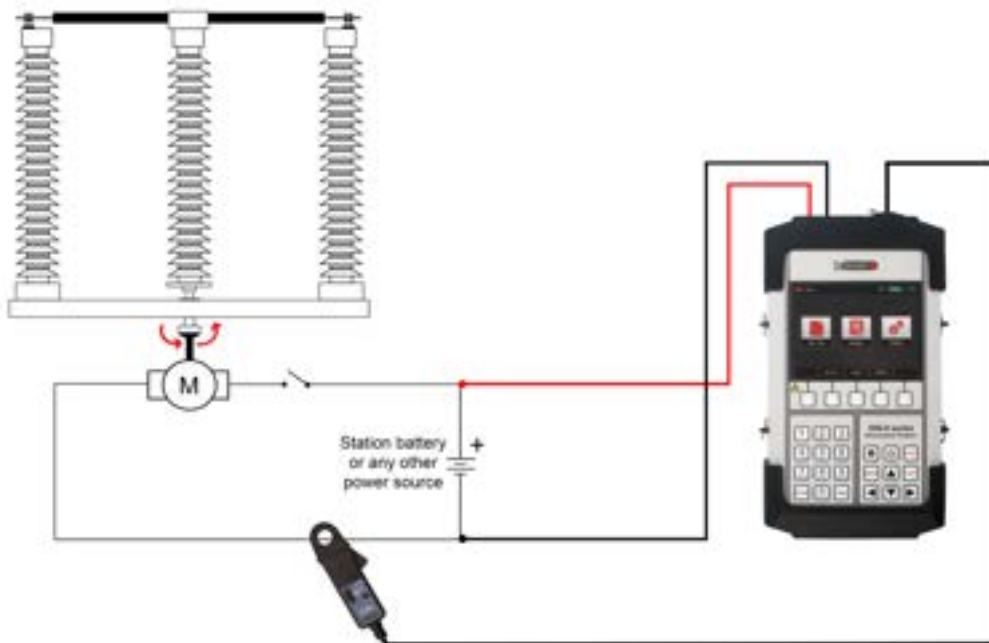
- Offline testing of disconnectors
- Motor current, voltage and power consumption measurement
- Measurement of the motors operating time
- Motor testing of disconnectors and earthing switches
- Graphical and numerical representation of the disconnecting motor drive parameters

Main Features of DIS-H (DISH000-N-00)

- Compact and ergonomic design
- Timing accuracy is 0,05 % of the reading \pm resolution
- Touch screen color display 5.7 in
- Easily mountable to the disconnector's cubicle using the included magnets
- Overlay analysis of up to 4 graphical results using the standalone instrument
- Internal battery power supply (user-replaceable)
- Battery operation for up to 8 hours
- Dimensions: 310 mm x 170 mm x 58 mm (12.21 in x 6.69 in x 2.28 in)
- Weight: 1,5 kg (3.3 lbs)



DIS-H connection to the motor drive of the disconnector



Handheld Disconnecter Analyzer

Accessories



Voltage sense cable set



Test probe with grip jaws



Current clamp 30 / 300 A power supplied from the instrument with adapter 5 m



Small current clamp 10 / 100 A with internal battery power supply



Plastic transport case



Handle strap with resistive touch pen



Cable bag

Ground Grid Tester

GGT Series

Applications

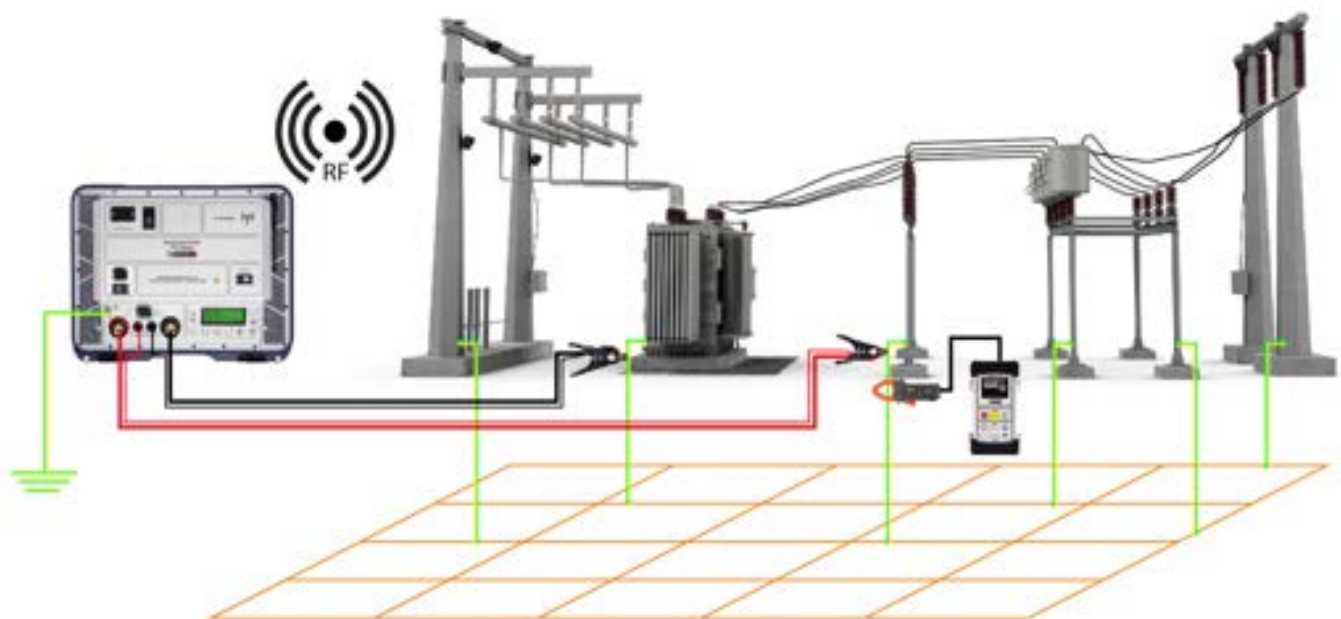
- Ground grid integrity testing according to IEEE Std. 80-2013
- Standalone or wireless control of the test by GGT-M remote module
- Grounding current flow inspection with use of current clamps on GGT-M remote module ("down current" measurement)
- Contact resistance measurement of HV switchgears according to IEC 62271-1:2017 (current up to 300 A DC)
- Testing in both sides grounded (BSG) conditions (separate current clamp input for BSG)
- Contact resistance measurement of dead tank circuit breakers (DTR test mode)
- Resistance change monitoring for checking quality of connections or welding joints (CONTIN mode)
- Railway joints and aircraft electrical systems bonding tests

Main Features of GGT300 (GGT300-N0-03)

- Test current range: 5 – 300 A DC
- Resistance range: 0,1 $\mu\Omega$ – 999,9 m Ω
- Typical accuracy: \pm (0,1 % rdg + 0,1 % F.S.)
- Wireless communication between GGT series and GGT-M remote module
- Current clamp inputs for grounding current inspection



Ground grid integrity test using a high current DC source



Ground Grid Tester

Accessories



Current cables and heavy duty sense cables



Grounding cable



GGT-M remote module



Plastic cable case



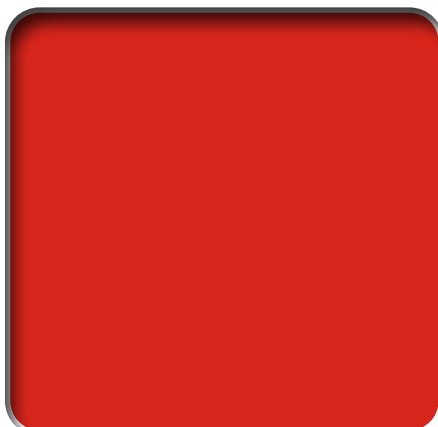
Test shunt



Current clamp 30 / 300 A

Remote control with GGT-M module





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