

Circuit breaker and current transformer testing

Timing and motion testing



A circuit breaker's timing cycle can be measured using the **TM1600** modular circuit breaker the timing channels record closings and openings of main contacts, resistor contacts

and auxiliary contacts.

For simpler single break / phase circuit breakers, the **EGIL** Timing and motion analyser offers a cost effective solution, able to measure coil current, timing and motion of the circuit breaker.



On commissioning or during routine tests the integrity of circuit breaker vacuum bottles should be tested. **VIDAR** breakdown tester offers a convenient and safe method with test voltages up to 60 kV d.c.

The best method to ascertain whether or not solenoids and protective mechanisms are properly set and not sluggish is to test at the minimum tripping voltage. The **B10E** variable d.c. power supply is ideal for this application.

All of the Megger circuit breaker analysers can utilise **CABA Win** software for operation, recording and reporting on results and data storage.

Contact resistance

Dynamic resistance measurement (DRM) allows the measurement and travel of the arcing and main contacts while the circuit breaker operates. The **DRM1800** module in combination with the **TM1800** can show deterioration of the arcing contact and reduction of the main contact gap. This is especially useful for sealed GIS circuit breakers as maintenance can otherwise be difficult, expensive and time consuming



Circuit breaker contact resistance in a substation can be measured with the **MJÖLNER** high current low resistance ohmmeter. It is available in 200 A and 600 A versions for compliance with IEC 62271-100 and has DualGround™ for operation with both sides of the test piece earthed for safety.

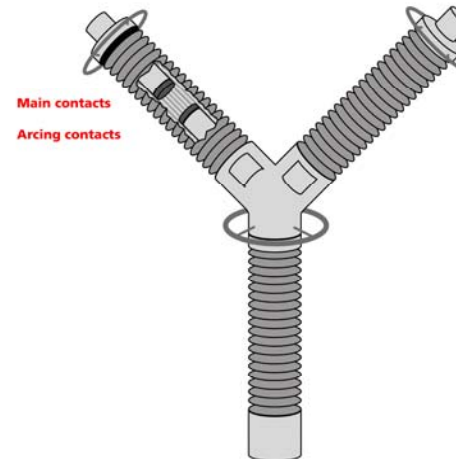
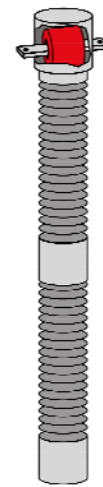
Correct circuit breaker operation is an essential part of a high voltage system. Significant maintenance time is taken to test the protection relays. However, should the circuit breaker fail to operate properly, catastrophic failure could result.

In these high voltage environments the capacitive coupling from live high voltage conductors can induce lethal currents in parallel conductors. DualGround™ testers allow both sides of the test piece to be earthed, providing a safe area for the test personnel to work



The **TM1800** is the modular timing and motion analyser for circuit breaker maintenance. It can test multiple break per phase circuit breakers with a 40 kHz sample rate for vibration testing, It can also be used with the optional **DRM1800** which does a low resistance measurement while the circuit breaker is in operation. Modular based design

- Built in PC with CABA Local software — advanced testing with predefined breaker test plans, on-site measurement view and analysis
- DualGround™ testing using DCM module — increased safety with both sides of breaker grounded
- Fast and easy testing — Select-Connect-Inspect workflow and high level user interface
- Graphical results for quick interpretation — timing and motion measurements, coil currents
- USB and Ethernet communication interface — for quick back up, LAN connection and printer options



The **DLRO600** and **DLRO200** are high current micro ohmmeters for use testing circuit breaker contacts at 600 A and 200 A.



Also available are the **MOM690**, **MOM600** and **MOM200** high current low resistance ohmmeters for testing circuit breaker contacts at 690 A, 600 A and 200 A for compliance with IEC 62271-100



For testing bonds and joints a battery powered low resistance ohmmeter such as the **DLRO10** and **DLRO10X** can be used.

Current transformer

Knee point and excitation tests are key tests to monitor the state of current transformers. **MAGNUS** is a step up transformer for manual ratio and excitation tests to confirm the knee-point.



For the option of automatically testing CTs, **MCT1600** measures a huge number of parameters including demagnetization, CT ratio, knee-point, saturation, polarity and phase deviation results are displayed on with graphical display

Primary testing



For primary current testing of circuit breakers high current and the ability to measure very short current and time cycles The **ODEN AT** is Megger's most versatile modular primary current injection test set and can be used for many applications where a test current in excess of 2000 A is needed. By injection of a primary current through CTs, the **ODEN AT** provides commissioning tests for protection systems. It can also be used for over-current tests on MCCBs and has an optional test probe for convenient in-service maintenance testing

For primary current injection up to 2000 A for use with CTs, and protection systems the **PCITS2000** primary current injection test set is used The **CSU600AT** is a smaller, lighter 600 A primary current injection test set with CTs, and protection systems



The **ODEN** and **CSU** are also available in 'A' versions, which use a separate timer, the optional **TM200**.



For LV circuit breaker applications the **MS2A** is a small, lightweight 600A unit which can test MCCBs up to 125A

The art of circuit breaker and current transformer predictive maintenance and monitoring is dependant on trending a series of measurements and the ability to track the gradual decline in performance of things like response time and contact resistance with time. **PowerDB** database software gives the user the ability to handle the data and make it meaningful