

## "Like a Swiss watch"

Insulating oil testing in the laboratory at ABB Sécheron AG

A photograph of a laboratory setup for insulating oil testing. In the foreground, there are three BAUR electronic control units with digital displays and numeric keypads. Behind them, a test cell is visible, featuring two yellow robotic arms holding a transparent container filled with yellow insulating oil. A white bottle of ABB insulating oil stands to the right. The background shows a window with a view of greenery outside.

BAUR references

### Customer:

ABB Sécheron AG in Dättwil in the Swiss Canton of Aargau offers various laboratory services. The laboratory analyses oil samples that are sent in for testing. Where requested, the service also includes on-site sampling or consultation.



### BAUR solution:

BAUR devices are used for breakdown voltage testing and for measuring the dissipation factor as well as the specific resistance and the relative permittivity.

Many network operators in Switzerland and abroad send samples of their transformer insulating oils to ABB Sécheron AG in Dättwil (Switzerland) for testing. Not only do customers want to be sure that they can continue to operate their transformer without the risk of breakdown, they also want to know how long the oil can still be used and whether its condition indicates possible faults in the transformer.

"The BAUR devices are easy to operate and extremely reliable."

Eric Killer

This may initially sound like something akin to "reading tea leaves", but it actually has a sound scientific basis. As Eric Killer from the Dättwil oil laboratory says: "A standard analysis involves conducting seven measurements on the insulating oil. This tells us a lot, even about the operating condition." In addition to the breakdown voltage and dissipation factor, the laboratory team measures the oil colour, the contact surface voltage, the acid and water content, and in the case of mineral oils, the antioxidant content. If the electric and thermal stress that the transformer has been exposed to needs to be evaluated, decomposition gases will also be analysed. Furan analysis can even be used to determine to what extent the paper insulation in the transformer has aged.

The customer determines the order volume, but the breakdown voltage and the dissipation factor are always measured. ABB Sécheron uses devices from BAUR GmbH for this. "The devices are easy to operate and extremely reliable." When Killer joined the laboratory over ten years ago, two BAUR devices were being used for breakdown voltage testing and two were being used to measure the dissipation factor, the specific resistance, and the relative permittivity. Of those devices, one was replaced after more than 20 years of service, while another developed a single fault and was repaired immediately. The accuracy of the measurement results remained unaffected.

### Reliable and precise

What Killer appreciates the most is the precision of the BAUR devices. Measurements taken on one device can be repeated on the other – with the same results. Comparing current measured values with historical data is also straightforward, as the measured values do not drift, thanks to yearly on-site calibration by the BAUR Service team. Killer can therefore reliably identify trends with repeat tests. Even when different people



Eric Killer from ABB Sécheron AG uses BAUR devices to determine the electric strength of the insulating oil as well as the laboratory values that allow conclusions to be drawn regarding the oil condition.

operate the devices, which can lead to deviations, they deliver comparable results. "We obviously can't take this for granted," explains Killer, "however, we trust our BAUR devices." His verdict is that they are "as precise as a Swiss watch."



ABB Sécheron AG in Dättwil in the Swiss Canton of Aargau offers various laboratory services, including the testing of insulating oil.

## BAUR solutions (successor products)

### BAUR DTL C oil tester



The BAUR DTL C oil tester provides precise information for efficient oil management in plants in the electricity industry and other sectors. It measures the dissipation factor, the specific resistance, and the relative permittivity of insulating oils in a fully automatic manner. The device comes with eight different measurement sequences corresponding to the relevant standards (including IEC 61620) for quick, comprehensive analysis results.

#### The key features at a glance:

- Precise dissipation factor measurement ( $\tan \delta$ ) with a level of accuracy of up to  $1 \times 10^{-6}$
- Measurement of the specific resistance  $\rho$  with both polarities up to 100 T $\Omega$ m
- Measurement of the relative permittivity  $\epsilon_r$
- Suitable for mineral, silicone, and ester liquids
- Induction heating of the cell with very precise temperature control for a temperature-independent result
- Temperature measurement in the measuring electrode
- Automatic calibration of the empty cell for fast test sequences
- Automatic emptying of the test cell without disassembly
- User interface in 13 languages
- Optional: PC interface and ITS testing software

**More information:**  
[www.baur.eu/en/dtl-c](http://www.baur.eu/en/dtl-c)



### DTA 100 C oil tester



The BAUR DTA 100 C oil breakdown voltage tester is designed for the fully automatic measurement of the breakdown voltage in liquid insulating materials up to 100 kV in the laboratory during continuous use. As a high-performance device, it provides clear breakdown detection and reliable, reproducible measurement results, even across multiple measurement sequences.

#### The key features at a glance:

- Breakdown measurement for mineral and silicone oils as well as ester liquids
- Switch-off time less than 10  $\mu$ s for reliable results across multiple measurements
- Clear breakdown detection
- Automatic self-test with output voltage test each time you start
- Fully automatic measurement sequence – 18 pre-programmed test standards and 10 user-programmable test sequences
- Built-in sensor for measuring the temperature of the insulating liquid
- User interface in 13 languages
- Optional: PC interface and ITS testing software

**More information:**  
[www.baur.eu/en/dta-100-c](http://www.baur.eu/en/dta-100-c)





## Accredited BAUR calibration laboratory



Accurate measurement results and reliable measuring instruments are essential. This is particularly true with regard to compliance with standards, quality assurance, and the international comparability of results.

The accredited BAUR calibration laboratory meets legal requirements and regulatory standards. So you can rest assured that our measurements comply with the applicable regulations.

### The advantages of accredited calibration:

- **Competitive advantage:** Regular external assessments and re-accreditations help you achieve a high level of quality. This helps you gain trust and credibility with your customers.
- **Everything from a single source:** When you send your BAUR device for service, you can have your device calibrated at the same time.
- **Technical competence:** At BAUR, we are committed to keeping our technical competence up to date. Accreditation is an official confirmation that the stated measurement accuracy can be achieved and consistently maintained.
- **Compliance:** Calibration authorities that are ISO/IEC 17025-accredited are subject to strict national and international guidelines. This globally recognised standard places requirements on the technical and professional abilities of the laboratory and its quality management system.
- **Traceability:** Our measurements can be traced back to defined references. This ensures the comparability of the measurement results.
- **Worldwide recognition:** BAUR calibration certificates are recognised around the globe.





More information:  
[www.baur.eu/en/calibration](http://www.baur.eu/en/calibration)



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