# EGIL

## Circuit breaker analyzer


- **Suitable for testing timing and travel on all circuit breakers with single interrupter per phase**
- **Extremely easy-to-use and reliable**
- **Two separate timing channels for measurement of auxiliary contacts**
- **Analog measurement channels for travel transducers or general voltage/current measurements**
- **Static and dynamic resistance measurements along with the SDRM201 optional accessory**

## Description

EGIL™, which incorporates benefits gained from experience with our larger instrument, is intended for circuit breakers with one contact per phase. Smaller and simpler, EGIL is equally versatile – and EGIL's price makes it attractive to small power plants. Moreover, it provides an ideal supplementary instrument for maintenance departments at large power companies.

EGIL is designed to test circuit breakers having one main contact per phase. Its three time channels are connected together on one side. Events at parallel contacts equipped with pre-insertion resistors are recorded and displayed simultaneously. There are two separate time channels for measurement of auxiliary contacts. To simplify on-site hookup, EGIL comes with ready-made multi-cable sets for both main and auxiliary contacts.

Coil currents are measured automatically and presented together with other readings immediately after testing on the display window or via the built-in printer. EGIL is easy to use – a built-in sequencer (program unit) sets the instrument automatically for the next sequential breaker operation.

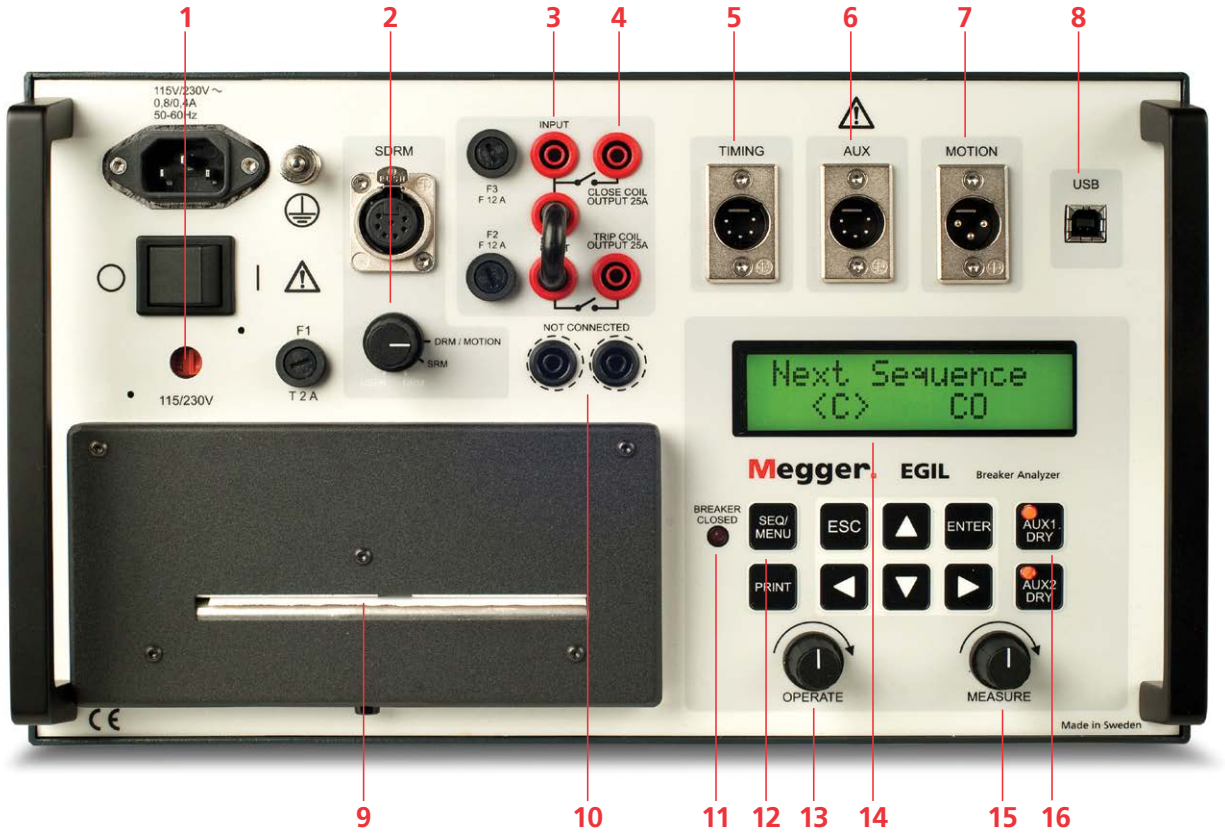
Intended primarily for measuring travel (motion), the optional analog input channel finds many other uses as well. If this channel is not installed, all associated menu commands are hidden.

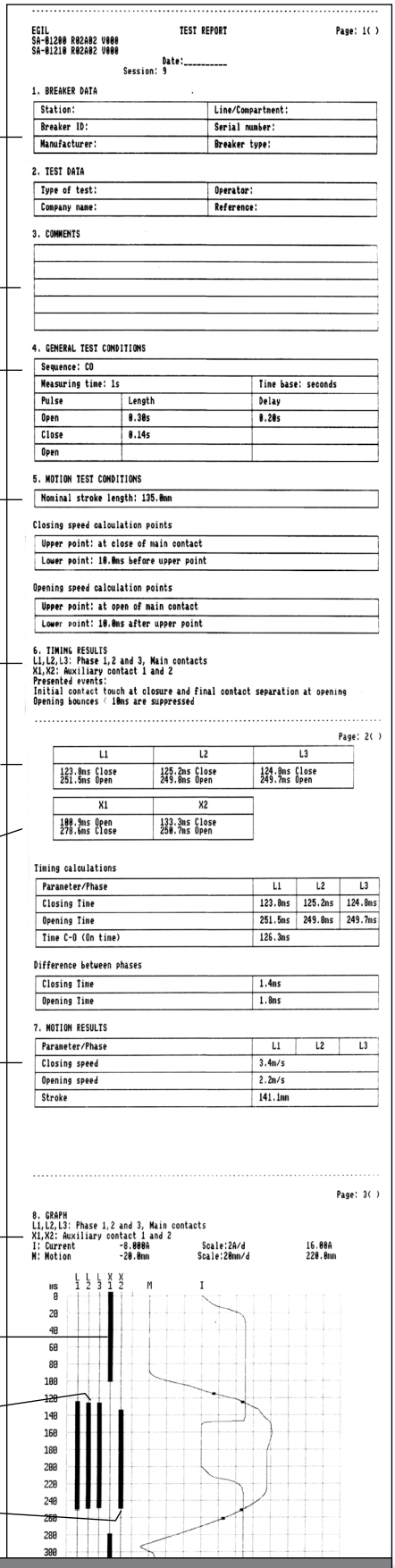
EGIL with the SDRM option together with the SDRM accessory enables static and dynamic resistance measurements.

EGIL can also be equipped with an optional USB interface for communication with a PC and the CABA Win™ Circuit Breaker Analysis Software.

## Features and benefits

1. **Mains voltage changeover switch**, 115/230 V AC.
2. **SDRM (optional)** Static and dynamic resistance mesurement. Interface for the SDRM201 accessory.
3. **Built-in coil current measurement**. Readings are presented on autoscaled graphs.
4. **Sequencer for coil signals** permits delays to be introduced for coil impulses that differ relative to each other.
5. **Three timing channels**. Both main contacts and pre-insertion resistor contacts can be timed on the same channel. Results are presented both graphically and numerically.
6. **Two galvanically isolated timing channels.** Can be used for timing of dry or wet auxiliary contacts.
7. **Optional analog input channel,** intended for measuring travel (motion) or any other analog voltage.
8. **USB (optional)** interface for PC. Supports communication with the CABA breaker analysis software.
9. **Built-in printer** features autoscaling, 114 mm (4,5”) wide paper can be changed quickly and easily.
10. **Galvanically isolated sockets** ensure safe, reliable disconnection of operating coil cables before working in or on the breaker.
11. **Breaker state indicator**. Egil measures the state (open or closed) of the breaker, whereupon the sequencer sets the instrument automatically for the next sequential operation.
12. **Buttons for sequence** (C, O, C-O, O-C or O-C-O) settings and to run a print out of measurement results.
13. **Switch used to set the breaker** to the desired state without activating the measurement channels.
14. **Menu-driven procedures** automatically invoke default settings to eliminate time consuming presetting. All menu lines associated with uninstalled optional equipment are hidden to enhance simplicity. For the basic egil unit you simply connect the multi-cable sets and turn the MEASURE knob.
15. **MEASURE knob**. Runs a breaker operation sequence, measuring and recording the results.
16. **AUX 1 & 2 buttons** used for time channels that measure timing of auxiliary contacts. Contact sensing or voltage sensing can be selected.






Example of report printed out on the built-in printer. Close-Open operation. Time, coil currents and travel (motion) were measured. (Travel measurement is optional.) The above example is 50% of actual size.

## Application

EGIL is intended primarily for testing high-voltage circuit breakers at medium-level voltages. There must not, however, be more than one break per phase since the time channels are not galvanically isolated. Contact times are recorded for main contacts, pre-insertion resistor contacts and auxiliary contacts. Coil currents are also recorded.

Besides the actual measurement values several parameters according to IEC standards are calculated and shown in the report, e.g. closing and opening time, difference between phases, over-travel, CO and OC time (and others).

## Application example

**IMPORTANT**
**Read the User's manual before using the instrument.**

1. Ground EGIL using the included ground cable. Make certain that the circuit breaker is closed and grounded on both sides.
2. Connect the main contact cable set to EGIL and the circuit breaker.
3. Connect the auxiliary contact cable set to the a- and b-contacts on the operating mechanism.
4. Connect the EGIL sequencer to the close- and trip-coils and to the auxiliary voltage.
5. Remove the breaker's ground connection on one side.
6. You are now ready to proceed with the test. Simply turn the MEASURE rotary switch and read the results.

# Specifications

Specifications are valid at nominal input voltage and an ambient temperature of +25°C, (77°F). Specifications are subject to change without notice.

## Environment

| | |
|---|---|
| *Application field* | The instrument is intended for use in medium-voltage substations and industrial environments. |
| *Temperature* | |
| *Operating* | 0°C to +50°C (32°F to +122°F) |
| *Storage & transport* | -40°C to +70°C (-40°F to +158°F) |
| *Humidity* | 5% – 95% RH, non-condensing |

## CE-marking

| | |
|---|---|
| *EMC* | 2004/108/EC |
| *LVD* | 2006/95/EC |

## General

| | |
|---|---|
| *Mains voltage* | 115/230 V AC (switchable), 50/60 Hz |
| *Power consumption* | 100 VA (max) |
| *Dimensions* | |
| *Instrument* | 360 x 210 x 190 mm (14.2" x 8.3" x 7.5") |
| *Transport case* | 420 x 300 x 230 mm (16.5" x 11.8" x 9.0") |
| *Weight* | 6.3 kg (14 lbs). 10 kg (22 lbs) with accessories and transport case |
| *Display* | LCD |
| *Available languages* | English, German, French, Spanish, Swedish |

## Measurement section

### Time measurement

| | |
|---|---|
| *Measurement time* | 1 to 100 s |
| *Resolution* | 0.1 to 10 ms |
| *Number of channels* | 3 with common ground |
| *Time base inaccuracy* | 0.05% of the reading ± resolution |
| *Status thresholds* | |
| *Closed* | < 10 Ω ±20% |
| *Resistor* | 10 Ω ±20% to 3 kΩ ±20% |
| *Open* | > 3 kΩ ±20% |
| *Open circuit voltage* | 24 V ±20% |
| *Short circuit current* | 100 mA ±20% |

### AUX 1&2

| | |
|---|---|
| *Number of channels* | 2, galvanically isolated |

### Contact-sensing (Dry)

| | |
|---|---|
| *Status thresholds* | |
| *Closed* | < 600 Ω ±30% |
| *Open* | > 600 Ω ±30% |
| *Open circuit voltage* | 20 V ±20% DC |
| *Short circuit current* | 25 mA ±20% |

### Voltage sensing (Wet)

| | |
|---|---|
| *Status thresholds* | |
| *Open indication* | < 8 V (polarity insensitive) |
| *Close indication* | > 13 V (polarity insensitive) |
| *Working voltage* | 250 V AC/DC |

### Current measurement

| | |
|---|---|
| *Range* | ±25 A per channel |
| *Resolution* | 25 mA |
| *Inaccuracy* | 1% of the reading ±100 mA |
| *Working voltage* | 250 V AC/DC |

## Breaker operation

| | |
|---|---|
| *Sequences* | C, O, C-O, O-C, O-C-O |
| *Continuous current* | 5 A |
| *Max current* | 25 A during 300 ms, rest time 1 min |
| *Contact function* | Two independent control functions |
| *Contact characteristics* | Non bouncing, closing time max. 0.1 ms |
| *Make/Break capacity* | 25 A, 250 V (AC or DC) per contact function |
| *Start breaker operation* | By rotary switch |
| *Pulse length* | Adjustable in steps of 10 ms |
| *Pulse delay* | Adjustable in steps of 10 ms |
| *Working voltage* | 250 V AC/DC |

## Motion (optional)

| | |
|---|---|
| *Number of channels* | 1 independent |
| *Max cable length* | 10 m (33 ft) |

### Input

| | |
|---|---|
| *Range* | -4 V to +4 V |
| *Resolution* | 2 mV |
| *Inaccuracy* | 1% of the measurement range |
| *Transducer resistance* | 1 kΩ to 5 kΩ |
| *Input impedance* | 150 kΩ |

### Output

| | |
|---|---|
| *Open circuit voltage* | 4,095 V ±4 mV |
| *Short circuit current* | 115 mA |

## Printout

| | |
|---|---|
| *Type of printout* | Graphic and numeric |
| *Printer* | Thermal printer with fixed print head |
| *Graphic resolution* | 8 dots/mm – 203 dpi |
| *Paper width* | 114 mm (4.5") |

## Optional Accessories


The SDRM201 is intended to use for both static and dynamic resistance measurements (SRM and DRM) on high voltage circuit breakers or other low resistive devices

Cable reels, 20 m (65.5 ft), 4 mm stack-able safety plugs

Multicable sets GA-00160 and GA-00170 and cable set GA-00082


The SDRM Cable

Transducer cables GA-00041 and GA-00042

Current cables for SDRM201, the red cable is 3.0 m (9.8 ft) and the black one is 0.5 m (1.6 ft)

Extension cable XLR, GA-01005

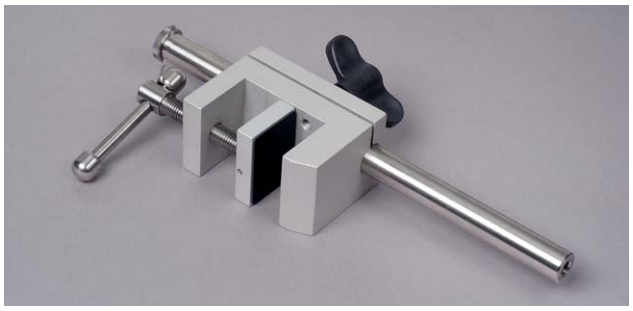
Extension cable XL, GA-00150

Linear transducer, TLH 225

Linear transducer, TS 25

Linear transducer, LWG 150

Rotary transducer, Novotechnic IP6501 (analog)



Universal support

Switch magnetic base

Rotary transducer mounting kit


Voltage divider, VD401

# Ordering information

| Item | | Art. No. |
|---|---|---|
| **EGIL Basic unit** | | BM-19090 |
| Incl: | | |
| Time measurement cables | GA-00160, GA-00170 | |
| Cable set for sequencer | GA-00082 | |
| Transport case | GD-00190 | |
| **EGIL with USB port** | | BM-19092 |
| Incl: | | |
| CABA Win | BL-8206X | |
| Time measurement cables | GA-00160, GA-00170 | |
| Cable set for sequencer | GA-00082 | |
| Transport case | GD-00190 | |
| **Egil with analog input channel and USB port** | | BM-19093 |
| Incl: | | |
| CABA Win | BL-8206X | |
| Time measurement cables | GA-00160, GA-00170 | |
| Cable set for sequencer | GA-00082 | |
| Transducer cable XLR-open 1 m (3.2 ft) | GA-00041 | |
| Transducer cable XLR-XLR 7.5 m (24.6 ft) | GA-00042 | |
| Transport case | GD-00190 | |
| **Egil with SDRM option and USB port** | | BM-19095 |
| Incl: | | |
| CABA Win | BL-8206X | |
| Time measurement cables | GA-00160, GA-00170 | |
| Cable set for sequencer | GA-00082 | |
| Transducer cable XLR-open 1 m (3.2 ft) | GA-00041 | |
| Transducer cable XLR-XLR 7.5 m (24.6 ft) | GA-00042 | |
| Transport case | GD-00190 | |

### Upgrade

Upgrade of EGIL can be done, please contact your nearest distributor for part number and price.

## Optional accessories

| | |
|---|---|
| **CABA Win**<br>Circuit breaker analysis software<br>Incl. USB cable | BL-8206X |
| **SDRM201** | CG-90250 |
| **Extension cables for SDRM201** | |
| 10 m (33 ft) extension | GA-12810 |
| 7.5 m (24.6 ft) extension | GA-12815 |
| **Transducers – Linear** | |
| TLH 500 | XB-30020 |
| LWG 225 | XB-30117 |
| TS 150 | XB-30030 |
| TS 25 | XB-30033 |
| **Transducers – Rotary** | |
| Novotechnic IP6501 | XB-31010 |
| Flex coupling for IP6501 | XB-39030 |

| Item | Art. No. |
|---|---|
| **Transducer mounting kits** | |
| **Universal kits** | |
| Rotary transducer mounting kit<br>For transducers XB-31010 and XB-39130 | XB-51010 |
| Universal transducer mounting kit<br>for linear and rotary transducers | XB-51020 |
| **Ready-to-use-kits – Rotary** | |
| Incl. transducer XB-31010, mounting kit XB-51010 | XB-71010 |
| **Transducer mounting accessories** | |
| Universal support | XB-39029 |
| Switch magnetic base | XB-39013 |
| **Cables** | |
| **Cable reel**<br>20 m (65.5 ft), 4 mm stackable safety plugs | |
| Black | GA-00840 |
| Red | GA-00842 |
| Yellow | GA-00844 |
| Green | GA-00845 |
| Blue | GA-00846 |
| **Cable sets**<br>The cable sets consist of 8 cables with clamps and 4 mm stackable safety plugs | |
| 8 x 5 m, (16.4 ft) | GA-00231 |
| 8 x 10 m, (32.8 ft) | GA-00241 |
| 8 x 15 m, (49.2 ft) | GA-00251 |
| **Extension cables, XLR female to male** | |
| For analog input, 10 m (32.8 ft) | GA-01005 |
| For time measurement of main contacts, 10 m (32.8 ft) | GA-00150 |
| **Open analog cable**<br>For customized analog transducer connection | GA-01000 |
| **XLR to 4 mm safety plugs**<br>For customized analog transducer connection | GA-00040 |

## Other

| | |
|---|---|
| **VD401**<br>Voltage divider, ratio 400/1<br>(for TM1600 and EGIL with analog channel) | BL-90070 |
| **Thermopaper**, 114 mm, 30 m | GC-00030 |
| **Cable organizer**, Hook and loop fastener, 10 pcs | AA-00100 |

**Postal address**
**Megger Sweden AB**
**Box 724**
**SE-182 17 DANDERYD**
**SWEDEN**

**Visiting address**
**Megger Sweden AB**
**Rinkebyvägen 19**
**SE-182 36 DANDERYD**
**SWEDEN**

**T +46 8 510 195 00**
**F +46 8 510 195 95**

**seinfo@megger.com**
**www.megger.com**



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