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.

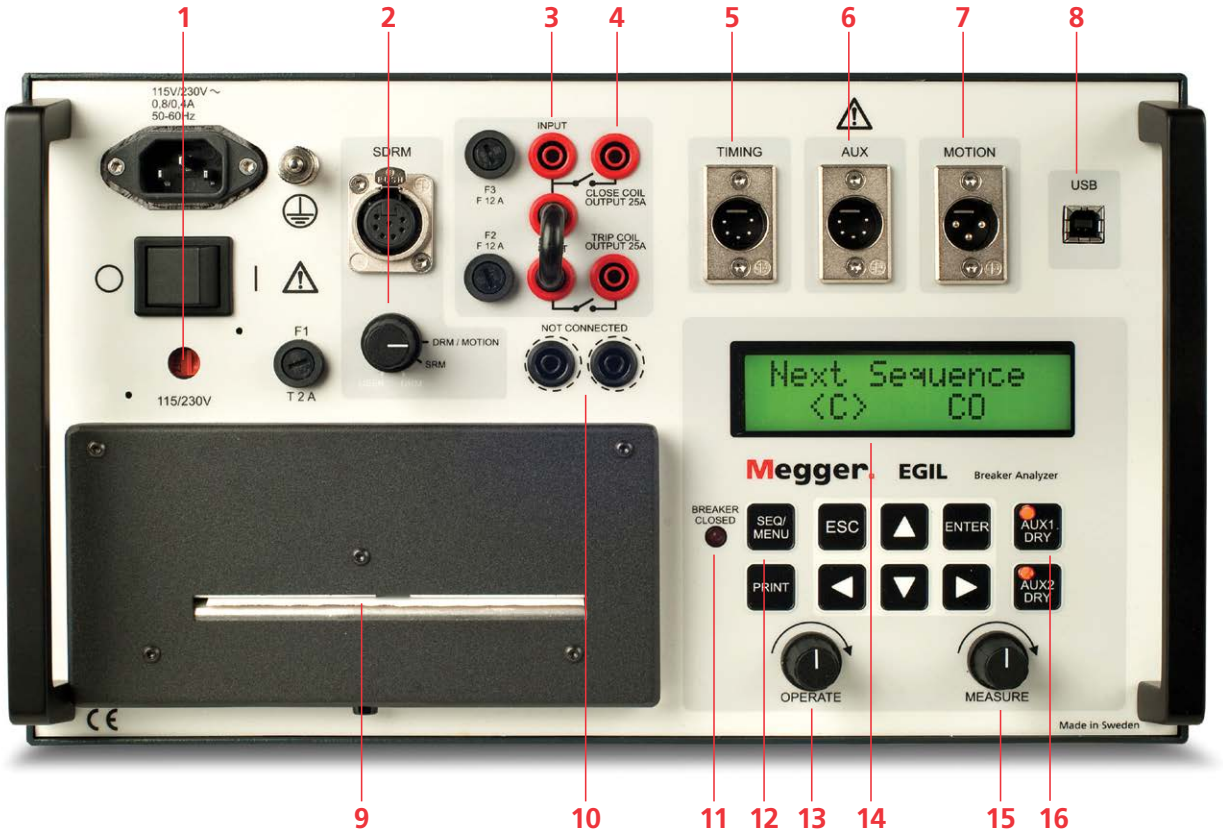
Intended primarily for measuring travel (motion), the optional analog input channel finds many other uses as well. If this channel is not installed, all associated menu commands are hidden.

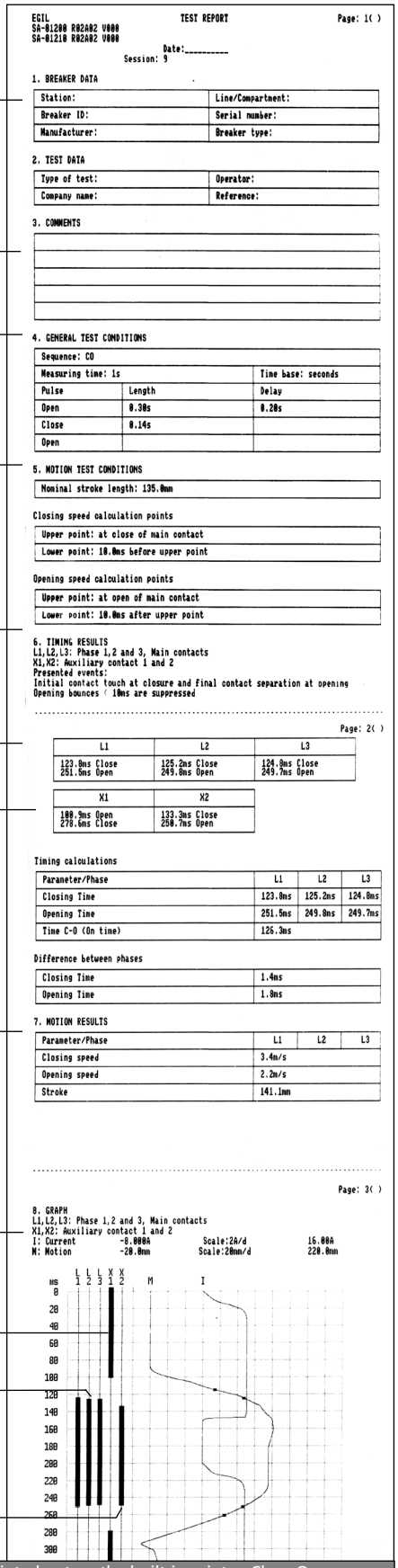
EGIL with the SDRM option together with the SDRM accessory enables static and dynamic resistance measurements.

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")

ACCESSORIES

Time measurement cables, GA-00160

Time measurement cables, GA-00170

Cable set for sequencer, GA-00082

Cables included in items: BM-19090, BM-19092, BM-19093 and BM-19095

Transducer cable GA-00041

Extension cable XLR, GA-00042

Cables included in items: BM-19093 and BM-19095

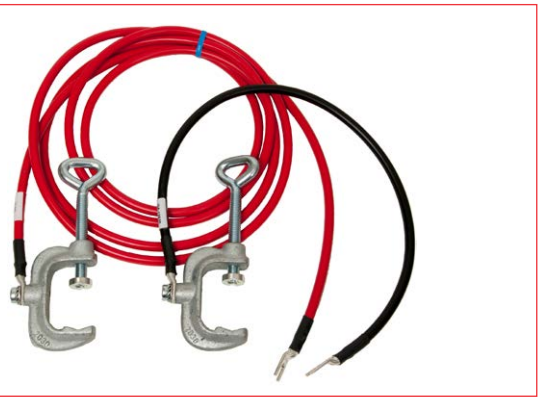
OPTIONAL ACCESSORIES

Extension cable XL, GA-00150

Transducer cable GA-00040

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.

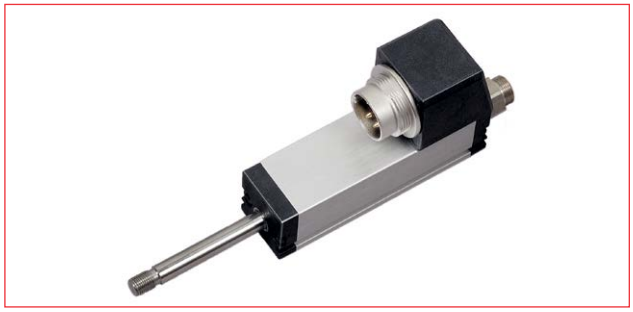
The SDRM Cable



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)

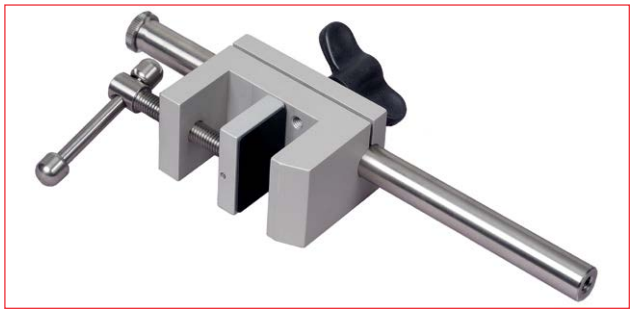
Linear transducer, TLH 225

Linear transducer, LWG 150



Linear transducer, TS 25

Rotary transducer, Novotechnic IP6501 (analog)



Universal support

Switch magnetic base

Rotary transducer mounting kit

Voltage divider, VD401

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

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

Item	Art. No.
CABA Win Circuit breaker analysis software 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 For transducers XB-31010 and XB-39130	XB-51010
Universal transducer mounting kit 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 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 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 For customized analog transducer connection	GA-01000
XLR to 4 mm safety plugs For customized analog transducer connection	GA-00040

Other

Item	Art. No.
VD401 Voltage divider, ratio 400/1 (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