

# EGIL

## Circuit breaker analyzer

# Megger<sup>®</sup>



- 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

### 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 breaker control 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.

### 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.

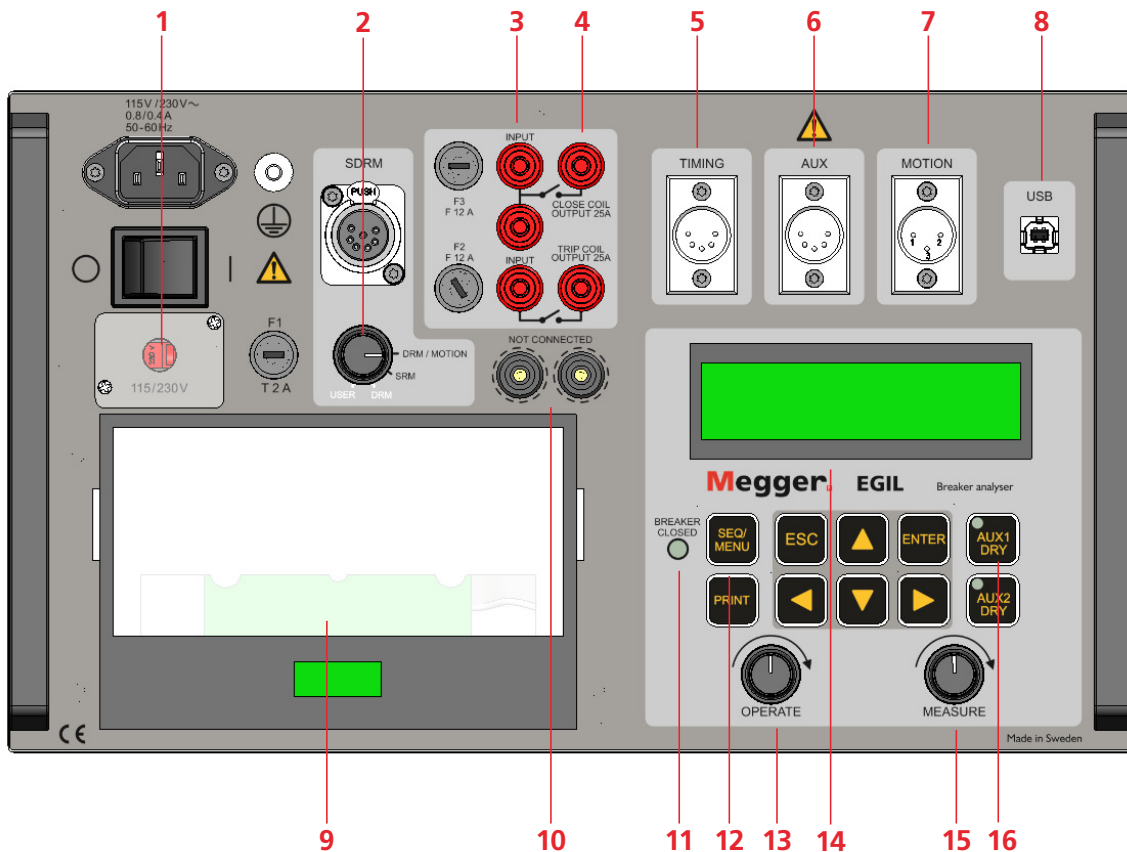
Besides the actual measurement values several parameters according to IEC standards are calculated and shown in the report, e.g. closing and opening time, difference between phases, over-travel, CO and OC time (and others).

## EGIL

### Circuit breaker analyzer

#### FEATURES AND BENEFITS

- Mains voltage changeover switch,** 115/230 V AC.
- SDRM (optional)** Static and dynamic resistance measurement. Interface for the SDRM201 accessory.
- Built-in coil current measurement.** Readings are presented on autoscaled graphs.
- Breaker control unit for coil signals** permits delays to be introduced for coil impulses that differ relative to each other.
- 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.
- Two galvanically isolated timing channels.** Can be used for timing of dry or wet auxiliary contacts.
- Optional analog input channel,** intended for measuring travel (motion) or any other analog voltage.
- USB (optional)** interface for PC. Supports communication with the CABA breaker analysis software.
- Built-in printer** features autoscaling, 114 mm (4,5") wide paper can be changed quickly and easily.
- Galvanically isolated sockets** ensure safe, reliable disconnection of operating coil cables before working in or on the breaker.
- Breaker state indicator.** Egil measures the state (open or closed) of the breaker, whereupon the breaker control unit sets the instrument automatically for the next sequential operation.
- Buttons for sequence** (C, O, C-O, O-C or O-C-O) settings and to run a print out of measurement results.
- Switch used to set the breaker** to the desired state without activating the measurement channels.
- 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.
- MEASURE knob.** Runs a breaker operation sequence, measuring and recording the results.
- AUX 1 & 2 buttons** used for time channels that measure timing of auxiliary contacts. Contact sensing or voltage sensing can be selected.



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 breaker control unit 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.

Space for your report data

Space for your comments

Parameters you have selected for breaker operation

Parameters you have selected for travel (motion) measurement

Filtering you have selected for time results

Tabular printout of time measurements at main contacts

Tabular printout of time measurements at auxiliary contacts

Tabular printout of travel (motion) calculations

Graphical printout

Auxiliary contact, close circuit

Main contacts

Auxiliary contact, trip circuit

TEST REPORT Page: 1( )

EGIL SA-R1200 RR2AB2 V000  
SA-R1210 RR2AB2 V000

Date: \_\_\_\_\_  
Session: 9

**1. BREAKER DATA**

Station:	Line/Compartment:
Breaker ID:	Serial number:
Manufacturer:	Breaker type:

**2. TEST DATA**

Type of test:	Operator:
Company name:	Reference:

**3. COMMENTS**

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**4. GENERAL TEST CONDITIONS**

Sequence: CO

Measuring time: 1s	Time base: seconds	
Pulse	Length	Delay
Open	0.30s	0.20s
Close	0.14s	
Open		

**5. MOTION TEST CONDITIONS**

Nominal stroke length: 135.0mm

**Closing speed calculation points**

Upper point: at close of main contact
Lower point: 10.0ms before upper point

**Opening speed calculation points**

Upper point: at open of main contact
Lower point: 10.0ms after upper point

**6. TIMING RESULTS**

L1, L2, L3: Phase 1, 2 and 3, Main contacts  
X1, X2: Auxiliary contact 1 and 2

Presented events:  
Initial contact touch at closure and final contact separation at opening  
Opening bounces / 10ms are suppressed

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	L1	L2	L3
	123.0ms Close	125.2ms Close	124.0ms Close
	251.5ms Open	249.0ms Open	249.7ms Open

	X1	X2
	180.0ms Open	193.0ms Close
	270.0ms Close	250.7ms Open

**Timing calculations**

Parameter/Phase	L1	L2	L3
Closing Time	123.0ms	125.2ms	124.0ms
Opening Time	251.5ms	249.0ms	249.7ms
Time C-O (On time)	126.3ms		

**Difference between phases**

Closing Time	1.4ms
Opening Time	1.0ms

**7. MOTION RESULTS**

Parameter/Phase	L1	L2	L3
Closing speed	3.4m/s		
Opening speed	2.2m/s		
Stroke	141.1mm		

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**8. GRAPH**

L1, L2, L3: Phase 1, 2 and 3, Main contacts  
X1, X2: Auxiliary contact 1 and 2

I: Current -9.000A Scale:20A/d 15.00A  
M: Motion -20.0mm Scale:20mm/d 220.0mm

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.

#### 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

**LVD** 2006/95/EC

**EMC** 2014/30/EU

**RoHS** 2011/65/EU

#### General

**Mains voltage** 115/230 V AC (switchable), 50/60 Hz

**Power consumption** 100 VA (max)

#### Dimensions

**Instrument** 354 x 210 x 181 mm (13.9" x 8.3" x 7.1")

**Transport case** 528 x 368 x 190 mm (20.8" x 14.5" x 7.5")

#### Weight

**Instrument** 5.9 kg (13.0 lbs)

**Transport case** 3.4 kg (7.5 lbs)

#### Display

**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")

## EGIL

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#### ACCESSORIES



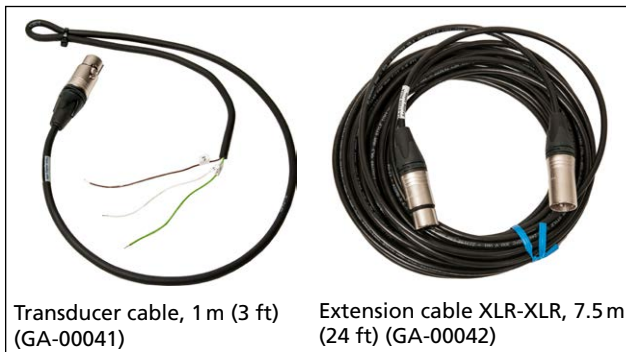
Time measurement cables, 5 m (16 ft) (GA-00160)



Time measurement cables, 2 m (6.5 ft) (GA-00170)

Cable set for breaker control unit (GA-00082)

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



Transducer cable, 1 m (3 ft) (GA-00041)

Extension cable XLR-XLR, 7.5 m (24 ft) (GA-00042)

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



Standard transport case (GD-00195)

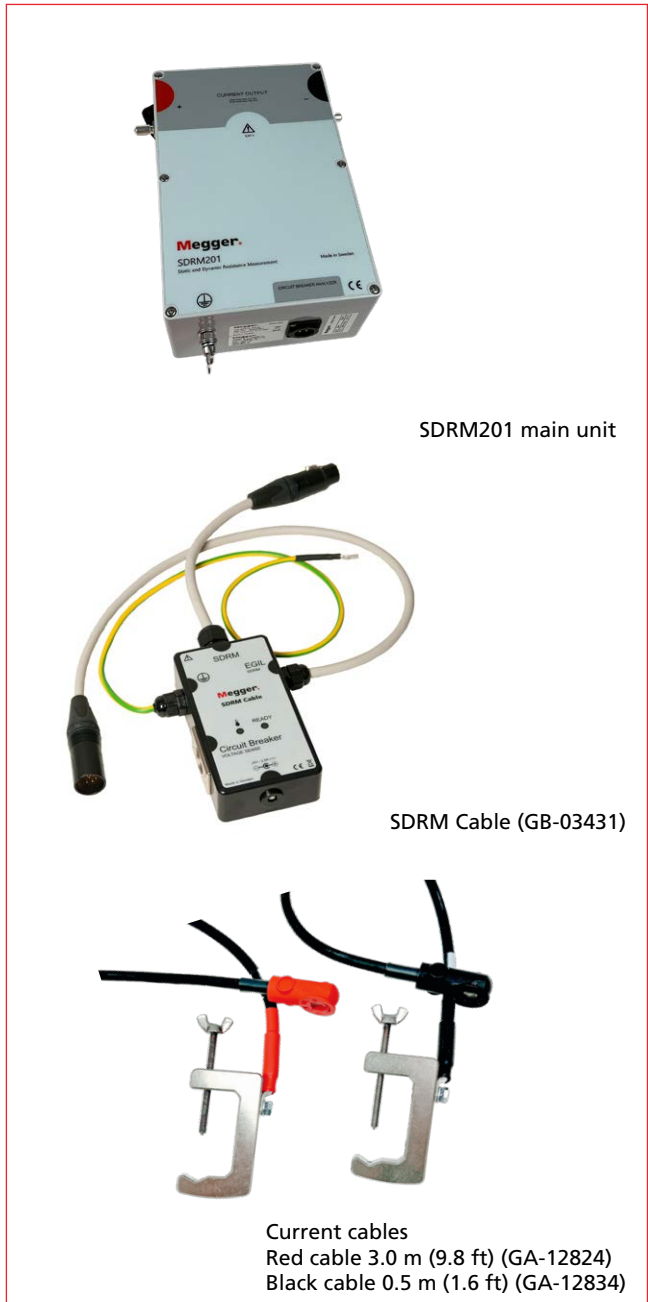
#### OPTIONAL ACCESSORIES



Extension cable, 10 m (33 ft) (GA-00150)

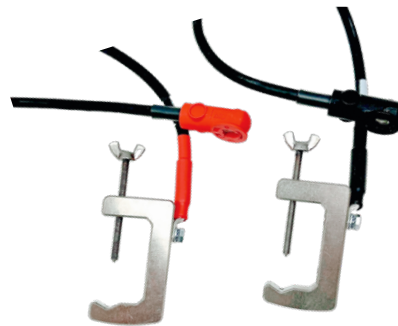


Transducer cable, 1 m (3.3 ft) (GA-00040)



SDRM201 main unit

SDRM Cable (GB-03431)



Current cables  
Red cable 3.0 m (9.8 ft) (GA-12824)  
Black cable 0.5 m (1.6 ft) (GA-12834)

The SDRM201 kit (CG-90250), is intended to use for both static and dynamic resistance measurements (SRM and DRM) on high voltage circuit breakers or other low resistive devices.



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Linear transducer,  
TLH 225 (XB-30017)



Linear transducer,  
LWG 225 (XB-30117)



Linear transducer,  
TS 25 (XB-30033)



Rotary transducer, Novotechnic  
IP6501 (XB-31010)



Universal support (XB-39029)



Switch magnetic base  
(XB-39013)



Rotary transducer mounting kit  
(XB-51010)



Voltage divider, VD401  
(BL-90070)



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



Flight case (GD-00190)

## ORDERING INFORMATION

Item	Part No.	Item	Part No.
<b>EGIL Basic unit</b>	BM-19090	<b>Transducers – Linear</b>	
Incl:		TLH 225	XB-30017
Cables timing measurement	GA-00160, GA-00170	LWG 225	XB-30117
Extension cable timing	GA-00150	TS 150	XB-30030
Cable set for breaker control unit	GA-00082	TS 25	XB-30033
Transport case	GD-00195		
<b>EGIL with USB port</b>	BM-19092	<b>Transducers – Rotary</b>	
Incl:		Novotechnic IP6501, analog	XB-31010
CABA Win	BL-8206X	Flex coupling for IP6501	XB-39030
Cables timing measurement	GA-00160, GA-00170		
Extension cable timing	GA-00150	<b>Transducer mounting kits</b>	
Cable set for breaker control unit	GA-00082	Universal kits	
Transport case	GD-00195	Rotary transducer mounting kit	
		For transducers XB-31010 and XB-39130	XB-51010
<b>EGIL with analog input channel and USB port</b>	BM-19093	Universal transducer mounting kit	
Incl:		for linear and rotary transducers	XB-51020
CABA Win	BL-8206X		
Cables timing measurement	GA-00160, GA-00170	<b>Ready-to-use-kits – Rotary</b>	
Extension cable timing	GA-00150	Incl. transducer XB-31010, mounting kit XB-51010	XB-71010
Cable set for breaker control unit	GA-00082		
Transducer cable XLR-open	GA-00041	<b>Transducer mounting accessories</b>	
Transducer cable XLR-XLR	GA-00042	Universal support	XB-39029
Transport case	GD-00195	Switch magnetic base	XB-39013
<b>EGIL with SDRM option and USB port</b>	BM-19095	<b>Cables</b>	
Incl:		Cable reel	
CABA Win	BL-8206X	20 m (65.5 ft), 4 mm stackable safety plugs	
Cables timing measurement	GA-00160, GA-00170	Black	GA-00840
Extension cable timing	GA-00150	Red	GA-00842
Cable set for breaker control unit	GA-00082	Yellow	GA-00844
Transducer cable XLR-open	GA-00041	Green	GA-00845
Transducer cable XLR-XLR	GA-00042	Blue	GA-00846
Transport case	GD-00195		
		<b>Cable sets</b>	
<b>Upgrade</b>		The cable sets consist of 8 cables with clamps and 4 mm stackable safety plugs	
Upgrade of EGIL can be done, please contact your nearest distributor for part number and price.		8 x 5 m, (16.4 ft)	GA-00231
<b>Optional accessories</b>		8 x 10 m, (32.8 ft)	GA-00241
Here is a selection of accessories. For a more complete presentation of available accessories see our catalog: Circuit breaker testing accessories.		8 x 15 m, (49.2 ft)	GA-00251
		<b>Extension cables, XLR female to male</b>	
<b>CABA Win</b>		For analog input, 10 m (32.8 ft)	GA-01005
Circuit breaker analysis software		For time measurement of main contacts, 10 m (32.8 ft)	GA-00150
Incl. USB cable	BL-8206X		
<b>SDRM201</b>	CG-90250	<b>Open analog cable</b>	
Incl:		For customized analog transducer connection	GA-01000
SDRM201 unit		<b>XLR to 4 mm safety plugs</b>	
SDRM Cable		For customized analog transducer connection	GA-00040
Current cables	GA-12824, GA-12834		
<b>Extension cables for SDRM201</b>		<b>VD401</b>	
10 m (33 ft) extension	GA-12812	Voltage divider, ratio 400/1	
		(for TM1600 and EGIL with analog channel)	BL-90070
<b>Flight case</b>		<b>Thermopaper</b>	
Dimensions:		14 mm, 30 m	GC-00100
(470 x 380 x 196 mm)		<b>Cable organizer</b>	
(18.5" x 15.0" x 7.7")		Hook and loop fastener, 10 pcs	AA-00100
Weight: 5.8 kg (12.8 lb)	GD-00190		

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

T +46 8 510 195 00  
 E seinfo@megger.com

**EGIL\_DS\_en\_V10a**

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