Programma
EGIL Circuit Breaker Analyzer

- **Measures timing and travel of medium and high voltage breakers**
- **Tests three-phase breakers up to 240kV**
- **Dual-function timing channels for main and pre-insertion resistor contacts**
- **Extremely reliable and easy to use**
- **PC control with CABA Win software**
- **Compact and lightweight**
- **Provided with ready-to-use multi-cable sets**

DESCRIPTION

The Programma EGIL is an automatic timer and motion analyzer for medium- and high-voltage substation circuit breakers. It is intended for use on circuit breakers with one contact per phase. EGIL incorporates features commonly found on more complex test systems, but is designed to be smaller, simpler to use and less expensive than other similar test sets. Its price makes it attractive to smaller utilities and it is an ideal supplementary product for maintenance departments at larger power companies and for testing contractors.

EGIL is designed to test circuit breakers having one main contact per phase. Its three time channels are connected together on one side. Events consisting of parallel contacts equipped with pre-insertion resistors can be 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.

EGIL can also be equipped with an optional serial interface (RS-232C) for communication with a personal computer (PC) and the optional CABA Win™ Circuit Breaker Analysis Software.

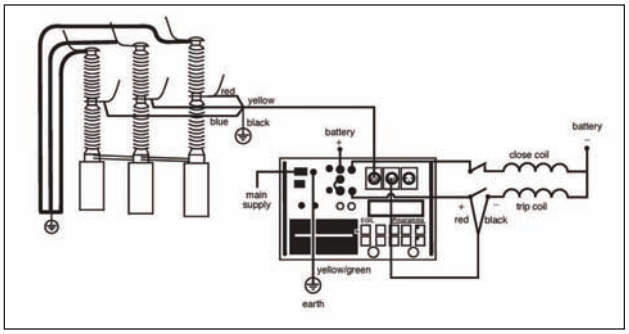
APPLICATIONS

Since the time channels do not have galvanic separation, the EGIL can only test single breakpoint per phase applications.

Besides the actual measurement values, several parameters according to IEC standards are calculated and shown in the report, e.g. closing and opening time, comparison between phases, over-travel, Close/Open and Open/Close time.

Application Example

1. Ground EGIL
2. Connect main contacts
3. Connect auxiliary contacts
4. Connect EGIL sequencer
5. Remove one ground
6. Proceed with test



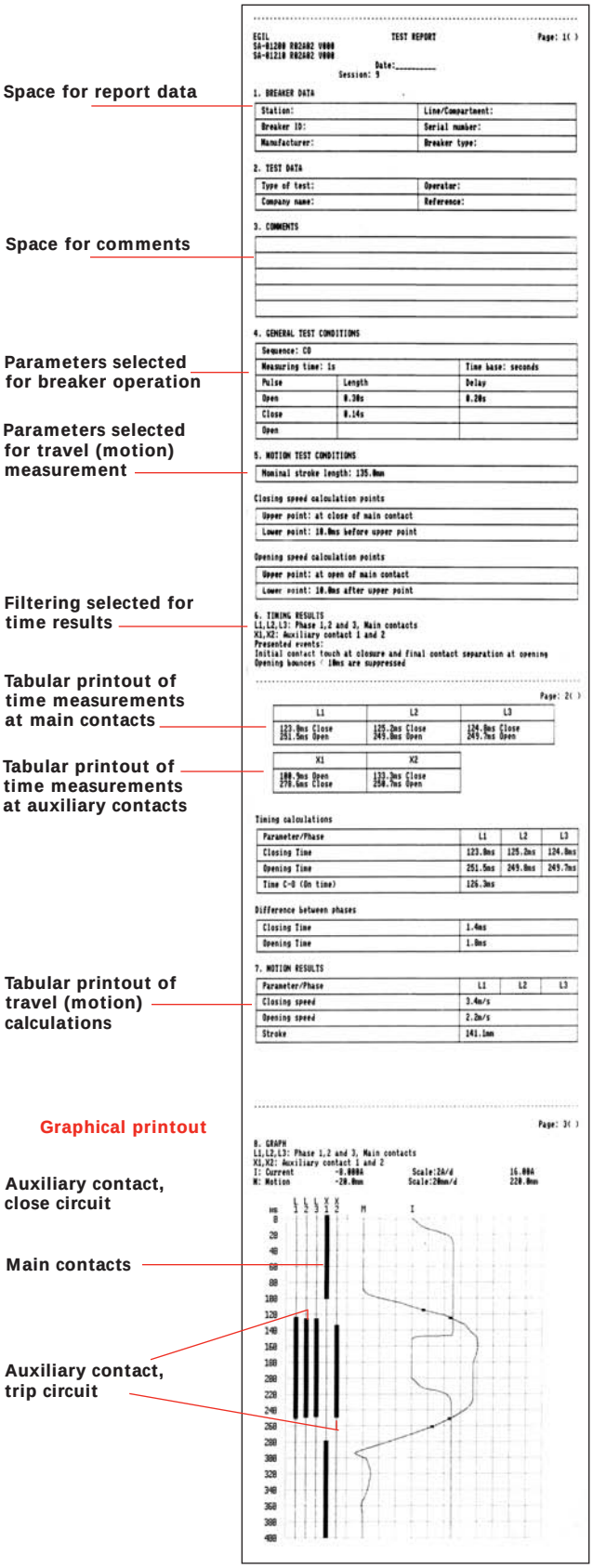
Time measurement connection to a high-voltage breaker.

FEATURES AND BENEFITS

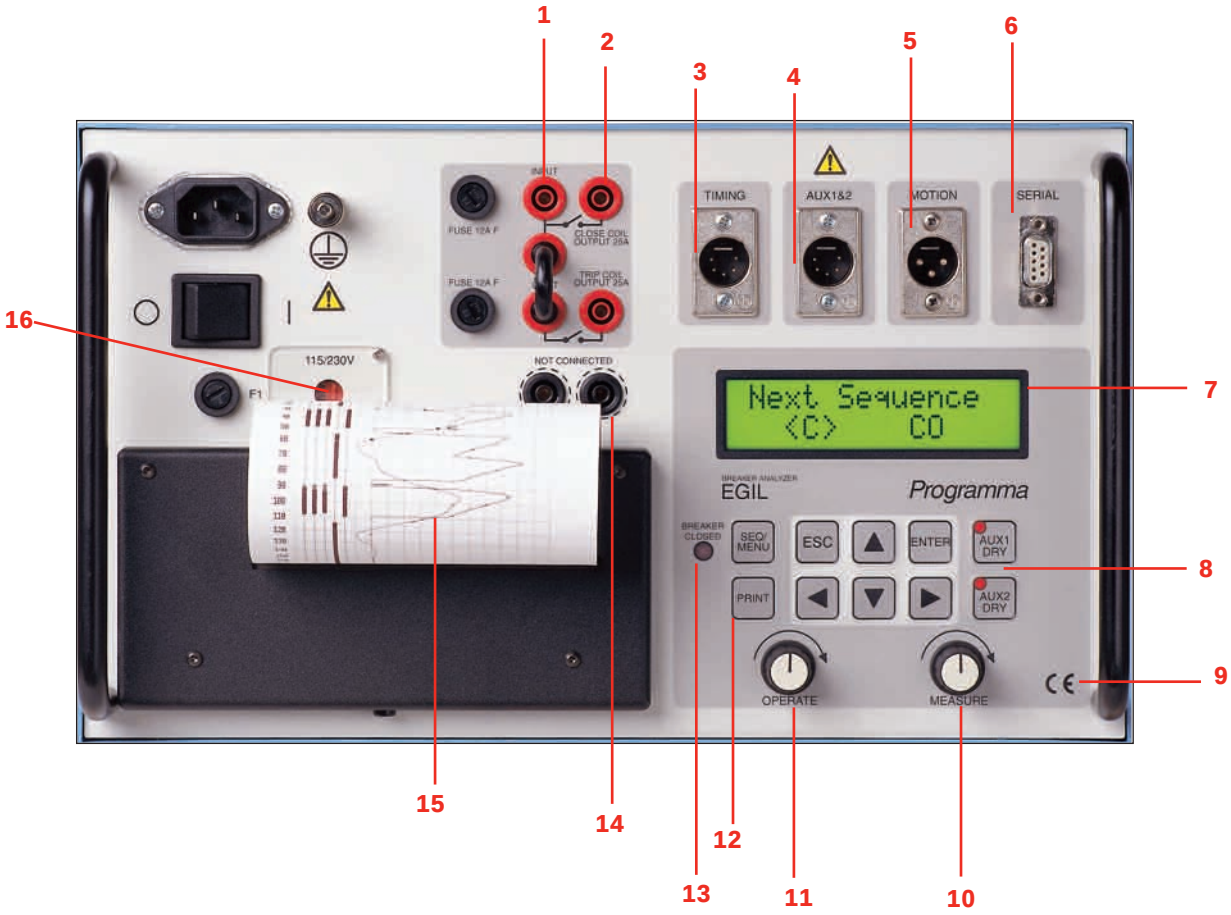
- Pre-programmed with standard circuit breaker operation modes (Close, Open, Open/Close, Close/Open, Open/Close/Open) for ease of use.
- EGIL automatically measures or calculates circuit breaker timing characteristics such as opening and closing time.
- Simple menu-driven operating procedure makes setup and operation extremely easy for the test technician.
- Monitors the state (open or closed) of the circuit breaker and automatically determines the appropriate tests that can be performed next, simplifying the operation.
- Dual-function timing channels allow detection of both main and pre-insertion resistor contacts. Results are shown graphically on the standard printout.
- User-programmable coil signal duration and delay times allow proper sequencing of each breaker operation combination (Close/Open, Open/Close or Open/Close/Open).
- Optional analog input channel allows connection of transducers for monitoring travel (motion) of the circuit breaker to determine breaker velocity and stroke.
- Built-in thermal printer either automatically or on-demand prints the results of each breaker operation for viewing in high detail.
- EGIL monitors close and trip coil currents and presents them graphically on the standard printout. Monitoring for auxiliary contacts (wet or dry) is also provided.
- Ready-made cable sets are provided which allow quick and easy connection to the circuit breaker.
- EGIL is provided with a heavy duty transport storage case with space for protection of the test set, test leads and other accessories.
- Optional CABA Win Breaker Analysis Software is available for operating EGIL from a computer for even simpler operation and permanent electronic storage of test results.

Transducer cables GA-00041 and GA-00042

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



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.)



1. Built-in coil current measurement. Readings are presented on autoscaled graphs.
2. Trip and close coil output signals may be independently programmed with duration and delay times required for particular breaker tests.
3. 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.
4. Two galvanically isolated timing channels. Can be used for timing of dry or wet auxiliary contacts.
5. Optional analog input channel is intended for measuring travel (motion) or any other analog voltage.
6. Optional serial (RS-232C) interface for a computer (PC). Supports communication with the CABA breaker analysis software.
7. 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 multicable sets and turn the MEASURE knob.
8. AUX 1 & 2 buttons used for time channels that measure timing of auxiliary contacts. Contact sensing or voltage-sensing can be selected.
9. Designed and tested to meet CE safety standards.
10. Switch used to start a preset sequence of breaker operations for which measurements are conducted simultaneously.
11. Switch used to set the breaker to the desired state without activating the measurement channels.
12. Fast-select buttons for frequently used functions such as selecting a sequence of operations (C, O, C-O, O-C or O-C-O) and printing results.
13. Breaker state indicator. EGIL DETECTS the state (open or closed) of the breaker, whereupon the sequencer sets the instrument automatically for the next logical operation.
14. Galvanically isolated sockets ensure safe, reliable disconnection of operating coil cables before working in or on the breaker.
15. Built-in printer allows easy and quick replacement of paper. Printouts can be auto-scaled or manually adjusted via the instrument menu for more detailed analysis.
16. Input voltage changeover switch, 115/230 V AC.

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 up to 130 kV.

Temperature

Operating:	0°C to +50°C (32°F to +124°F)
Storage & transport:	-40°C to +70°C (-40°F to +158°F)
Humidity:	5% – 95% RH, non-condensing

CE-marking

LVD	Low Voltage Directive 73/3/EEC am. by 93/68/EEC
EMC	EMC Directive 89/336/EEC am. by 91/263/EEC, 92/31/EEC and 93/68/EEC

General

Power supply voltage	115/230 V AC (switchable), 50/60 Hz
Power consumption	100 VA (max)
Protection	Thermal cut-outs, automatic overload protection

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, French, German, Spanish, Swedish

Time measurement

Measurement time	1 to 100 s
Resolution	0.1 to 10 ms
Number of channels	3 with common ground
Time base accuracy	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	
Closed	<8 V (polarity insensitive)
Open	>13 V (polarity insensitive)
Working voltage	250 V AC/DC

Current measurement

Range	±25 A per channel, sum of currents is measured
Resolution	25 mA
Accuracy	1% of the reading ±100 mA
Working voltage	250 V AC/DC

Breaker Operation

Sequences	Close, Open, Close/Open, Open/Close, Open/Close/Open
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
Accuracy	1% of the measurement range
Transducer resistance	1 kΩ to 5 kΩ
Input impedance	150 kΩ

Output

Open circuit voltage	4,092 V ±4 mV
Short circuit voltage	115 mA

Serial Interface for PC (optional)

Type	V24, RS232C
Format	8 bits, 1 stop bit, no parity
Speed	1200 - 19200 baud
Flow Control	Xon/Xoff

Printout

Type	Graphic and numeric
Printer	Thermal, with fixed print head
Resolution	8 dots/mm - 203 dpi
Paper width	114 mm (4.5")

ORDERING INFORMATION

Item	Cat. No.
Basic unit complete with: Time measurement cables, GA-00160, GA-00170 Cable set for sequencer, GA-00082 Transport case, GD-00190	BM-19090
With analog input channel and serial PC interface complete with: 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 Serial cable RS-232C Transport case, GD-00190	BM-19093
CABA Win	BL-8204X
CABA Win upgrade	CG-8010X

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