

ADMIE TECHNICAL DESCRIPTION

CIRCUIT BREAKER ANALYSIS SYSTEM

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CIRCUIT BREAKER ANALYSIS SYSTEM

1. General Description

The Independent Power Transmission Operator (IPTO or ADMIE) is interested on the purchase of a portable circuit breaker analysis system.

This document describes the minimum requirements that the device should meet, as well as some required features. Where applicable, the probes/devices must be supplied as complete items, with all of the parts (e.g. batteries, cables, probes) required for their immediate operation. Full, illustrated operation manuals must accompany all of the supplied equipment.

A calibration certificate must accompany the device. The device must be covered by warranty for at least two years after its delivery date. Finally, the bidder must ensure that maintenance and repair parts for every supplied item will be available for at least five (5) years after the delivery date of the equipment.

The device must bear CE conformity with reference to the related EU directives.

2. Specifications

The portable device must be capable of performing an extensive series of tests on high voltage circuit breakers. It must be completely autonomous, with integrated electronics for data acquisition and tests without the need of additional equipment. If the device has no onboard LCD/TFT screen and/or requires an external PC to fully function, a suitable rugged laptop computer must be included in the offer.

The device should be at least capable of measuring a circuit breaker's:

- Timing
- Motion (Rotary & Linear)
- Currents (Per Coil)
- Resistance (Static & Dynamic)
- Motor Current (Directly or with shunt)

The device may be using optional modules/parts to achieve the full list of required tests but all modules/parts must comprise of a single all-in-one device capable of performing all of the required tests, with the exception of a high output power supply for the testing of coils and motors, which can be external. All of the transducers required for the required tests must be included in the offer, as well as any required mounting kit and a 10-meter cable per transducer. All required cables for the connection to main and auxiliary contacts, coils, and the motor must be included in the offer.

The following table designates the minimum guaranteed required operational parameters and precision:

COIL CURRENT COMMANDS	At least three
TRAVEL MOTION READINGS	At least two (simultaneously)
TRAVEL LENGTH READING	At least 500 mm
COIL TRIP CURRENT (READING & OUTPUT)	At least 12 A at 220 VDC for ≥ 10 sec
COIL VOLTAGE (READING & OUTPUT)	At least 250 VDC
MOTOR CURRENT (READING & OUTPUT)	At least 12 A at 220 VAC for ≥ 10 sec
MOTOR VOLTAGE (READING & OUTPUT)	At least 250 VAC
SAMPLING RATE	At least up to 15 kHz
TIME MEASUREMENT ACCURACY	At least 0.1 ms \pm 0.05 % up to 10 s At least 1 ms \pm 0.05 % up to 100 s
ANALOG INPUT VOLTAGE READING ACCURACY	At least 0.2 % up to 10 V AC At least 1 % up to 300 V AC
OPERATIONAL TEMPERATURE RANGE WITHOUT DERATING	At least 22 °C \pm 5 °C
OPERATIONAL RELATIVE HUMIDITY RANGE	20% to 80% or better

The device will be used exclusively in substations and locations with strong electrical fields; therefore, noise suppression/immunity features are required. All inputs should be galvanically isolated or suitably protected.

The device must fully comply with the following standards:

- Safety : IEC/EN 61010-1
- EMC : EN 61326-1 (2013)

For both AIS and GIS applications, it is required for the device to be capable of functioning with both sides of the circuit breaker grounded without the need of external modules and/or other devices. Offers including devices that cannot function with both sides of the circuit breaker grounded will be disregarded.

The device must be lightweight and easily portable for transportation and use by a single individual, allowing for effortless on-site measurements. The total weight of the device must not exceed 30 kg (not including cables and/or other accessories). If the main device does not include a high output power supply, the device must not weight more than 15 kg and the external high output power supply no more than 20kg. The input voltage will be 230 VAC / 50 Hz. The high output power supply, if external, must be fully compatible with the main device.

The device must have a built-in data logger with data evaluation capabilities. It feature a USB port for the connection to a personal computer (PC) or for the transfer of the data to a USB stick. These cables must be included in the offer. Appropriate software for the transfer and management of data to the PC must be supplied and, if applicable, its license must not expire indefinitely. The software must be compatible with Microsoft Windows 7 and Microsoft Windows 10 32/64bit operating systems.

3. Packing

The main device must be delivered in a hard case that will provide adequate transportation protection. A printed manual or basic instructions summary must be included in the case, stored inside a waterproof protective bag or sheath. For all connection cables and transducers, adequate cases or bags must be also provided allowing for safe handling and transportation.

4. Training

The bidder is required to undertake a training programme (both theoretical and practical) on the operation of the instrument. The training programme and any seminars will take place at the premises of the company (Agias Annis 70, Aegaleo, Athens, Greece) and should cover all functional and safety aspects of the device.

5. Appendix A

All candidates are required to fill the following form and attach it alongside with their detailed offer:

- 1 Device manufacturer
- 2 Device model / part number
- 3 Coil Current Commands
- 4 Travel Motion Readings
- 5 Travel Length Reading
- 6 Coil Trip Current
- 7 Coil Voltage
- 8 Motor Current
- 9 Motor Voltage
- 10 Sampling Rate
- 11 Time Measurement Accuracy
- 12 Analog Input Voltage Reading Accuracy
- 13 Operational Temperature Range Without Derating
- 14 Operational Relative Humidity Range
- 15 Weight
- 16 Warranty Period