



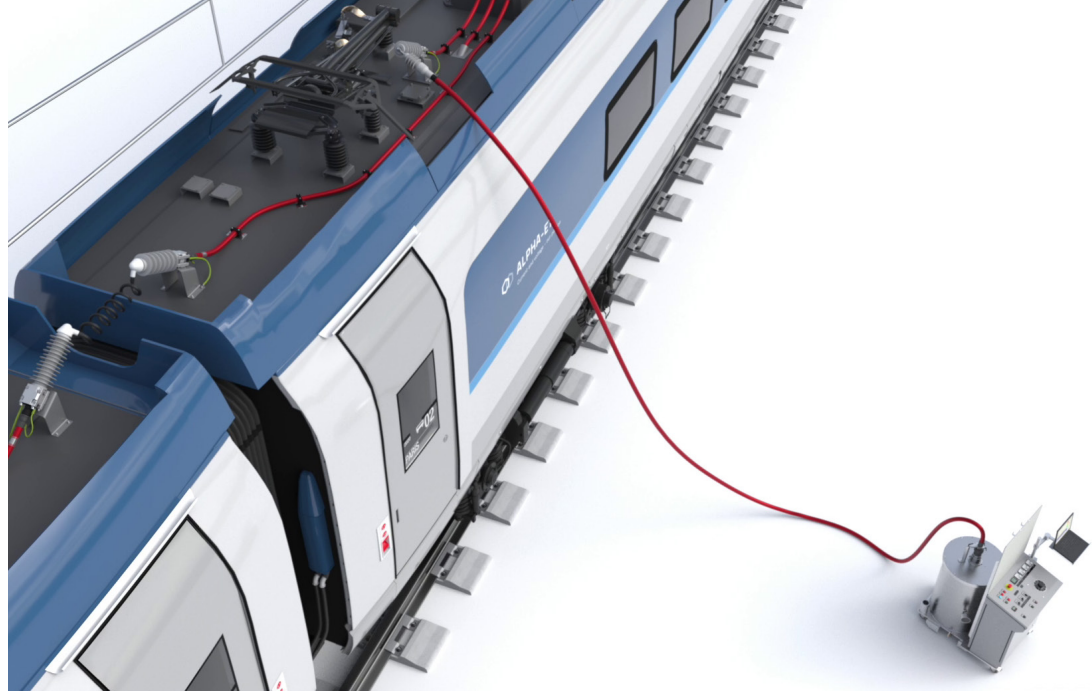
TRACTION

EGT-75 – Portable partial discharge test system



ALPHA-ET

Current and voltage – our passion



General description

General

The patented EGT-75 test device is built to allow a safe partial discharge and high voltage testing of shielded cables after assembling and mounting on the train. It provides the full functionality of a laboratory in production or maintenance environment. The test device is equipped with wheels. It consists of the following components:

- High voltage unit
- Control desk
- Partial discharge (PD) measuring system

High voltage unit

The fully shielded design of the high voltage unit allows performing the partial discharge measurement of assembled cables. The insulation medium is SF₆ at a pressure of 1.5 bar abs. The device is maintenance-free.

The high voltage unit is equipped with a Connex® socket of size 3. The connection to the high voltage cable is made using a test cable.

Control desk

Compensation coils are located in the control desk. Depending on the capacitance of the cable to be tested, various inductivity values can be selected in order to minimize the sup-

ply current. This allows limiting the required power.

The high voltage is measured directly by the PD measurement device using the capacitance value of the built-in coupling capacitor, and displayed together with the PD values. Furthermore, the device is equipped with an additional capacitive voltage divider and with a high-impedance voltmeter. This allows performing the high voltage check independently from the external power supply.

- An interlock circuit to avoid unintentional switch-on at non-zero position of the autotransformer.
- A foot-operated switch to ensure the continuous monitoring of the test by the operator.
- A remote emergency shutdown pushbutton;
- An indicator lamp showing that the high voltage transformer is energized.

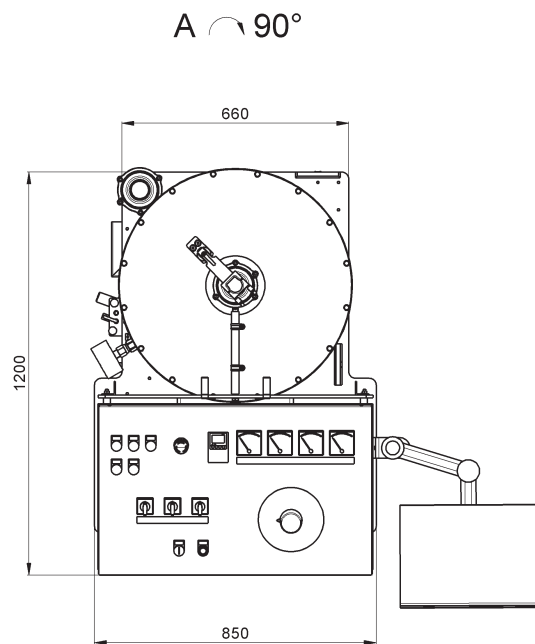
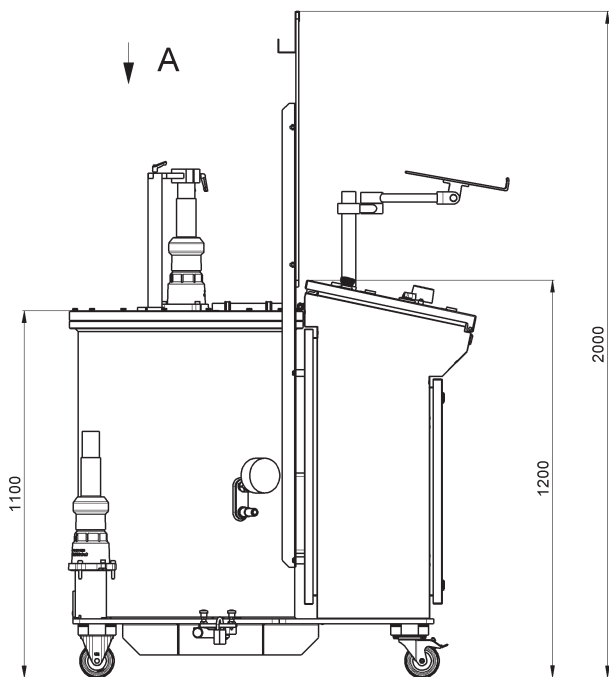
The following safety functions are included:

- Lockable main power switch;
- Lockable earth rod;
- Relays to protect the high voltage device in the cases of overcurrent, overvoltage, overtemperature or low gas pressure.
- An automatic breakdown detection device in order to reduce any electrical breakdown duration to a minimum.

Benefits EGT 75

- Patented system;
- The complete equipment is basically maintenance-free.
- Safe and easy-to-handle partial discharge and high voltage test;
- Depending on the total cable capacitance, it is possible to test a complete train.

Technical data



Type		EGT 75
Maximum test voltage	kV	75
Frequency	Hz	50 ¹⁾
Maximum total cable capacitance; withstand test 75kV @ 50Hz	nF	10
Maximum total cable capacitance; PD test 44 kV @ 50Hz	nF	17 ²⁾
Power supply		400 V 16 A 2 Phases ¹⁾
Partial discharge measurement circuit Coupling capacitor	nF	3
Auxiliary high voltage measurement tap Accuracy of voltage measurement		class 3
Typical test cycle (up/hold/down/recover)		2 min / 1 min / 2 min / 25 min
HV cable connection system		Connex® size 3
High voltage insulation system medium gas pressure		SF ₆ 1.5 - 1.8 bar abs

¹⁾ Other values on request

²⁾ 17 nF correspond to the capacitance of a 26/45 kV cable with a conductor of 50 mm² and a length around 100 m.

Highlights

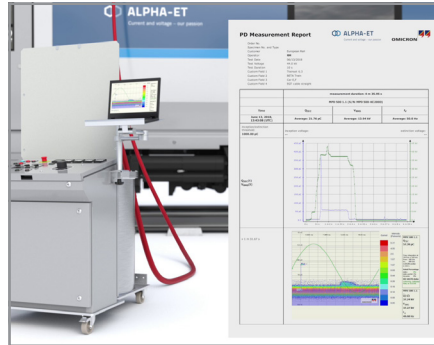


Test of a complete train

The patented EGT-75 can be used for acceptance tests of the high-voltage cables of a complete train. Therefore, in June 2018, a train with eight cables and four non-insulated jumpers (98m of High-Voltage cable - 50 mm²) was tested at an ALPHA customer in Germany. It was possible to obtain a qualified evaluation of the tested cables. And it was possible to detect a cable with high PD level (60pC) among the others.

Due to the test performed, a cable with the potential for failure was detected before releasing the train into operation.

This test can also be applied for preventive maintenance of high voltage cables.



Background noise

The background is one of the most important subject concerning partial discharge tests. This level needs to be low to enable the test.

The EGT-75 was already tested in factory environment in the USA and in Switzerland.

Furthermore, in train depots in Switzerland, Germany, China and South Korea. Due to its shielded construction and filters, the background noise results are more than satisfactory.

For environments where the background noise is not on an acceptable level, the EGT-75 has still an option to ground the equipment directly at the building, avoiding noise coming from the ground of the power system.



References

- SBB, Switzerland
- Hyundai Rotem, South Korea
- Leoni, USA
- Bombardier-Sifang, China
- Bombardier Germany



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ALPHA Elektrotechnik AG

Schlossstrasse 13
2560 Nidau / Switzerland

☎ +41 32 3328700
📠 +41 32 3312679
✉ mail@alpha-et.ch
🌐 www.alpha-et.ch

Member of PFIFFNER Group

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TRACTION



DISCONNECTORS

