

EPRO Gallspach GmbH



TRAFO
TEST



***Test Bay Engineering and Automation for Transformers,
Instrument Transformers and Motors.***

TRAFO
TEST

Compact

*Routine Testing for Small and Medium
Transformers as Efficient as it Could be.*

»Fully Automatic, Compact and Tailor Made«

Those were the key points in the development of this unique system. Today's products have to be prepared for future requirements. This system opens the door to the future in your HV test bay.

»User Friendly and Intuitive«

Operation as easy as never before. The software is based on a graphic state of the art man machine interface with a large operation touch screen. The software is intuitive and secure – safety warnings will protect from wrong operation, interactive help is available at each step.

»Usage of Existing Equipment«

With the EPRO system already existing measuring devices (for example Winding Resistance Meters, Turns Ratio Meters, etc.) can be used in the future. These devices can be fully integrated into the EPRO System in case they are offering an interface and a communication protocol.

Be Prepared for the Future Without Big Investments Now

»Open and Retrofittable«

Nobody knows the requirements of the future. More and more tests today treated as type tests may become routine tests in future. With the EPRO TrafoTest Compact hardly all future requirements are retrofittable in a »Plug and Play« style.

»Highly Accurate and Reliable«

The combination of inductive standard transformers and electronic signal processing guarantees highest accuracy at lowest cost of operation. EPRO Standard Transformers offer lifetimes of more than 30 years without loss of accuracy.

»Reduced to the Maximum«

Maximum comfort, maximum flexibility, maximum accuracy at minimum investment, minimum ground space and minimum training time

Maximum Return on Investment

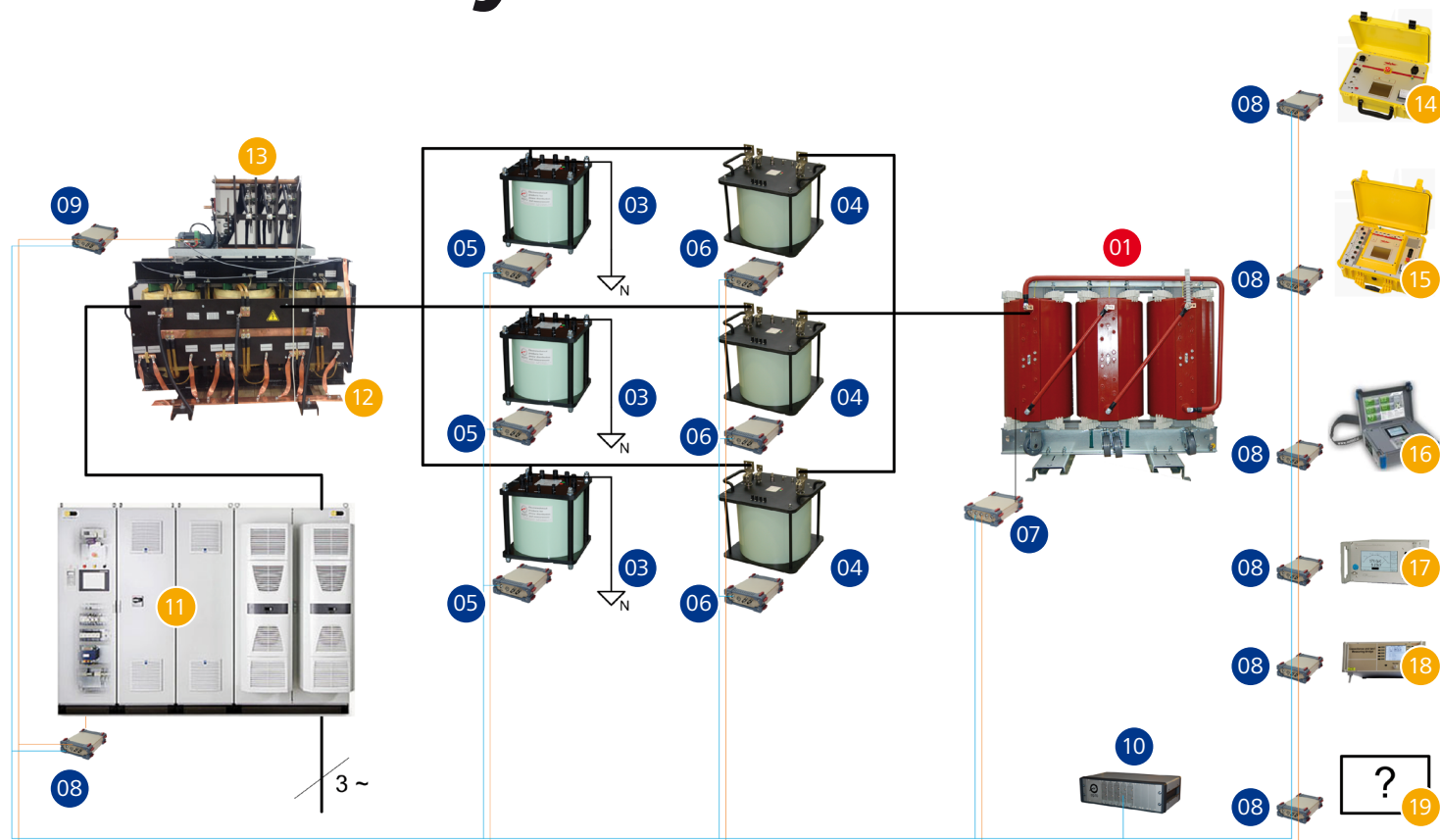
Type Approval by PTB / Germany

»Validation of Accuracy«

The accuracy and measurement output of this system is verified by "Type-Approval" of PTB in Germany. On demand EPRO offers to its customers a full system calibration by PTB or other national metrology institute.



Schematic System Structure



01 Equipment under test

EPRO Equipment:

- 02** Measurement Desk
- 03** Standard Voltage Transformer
- 04** Standard Current Transformer
- 05** Voltage Measuring Boxes
- 06** Current Measuring Boxes
- 07** Temperature Measuring Box
- 08** Communications Boxes
- 09** Accessory Box
- 10** Power Source for Boxes

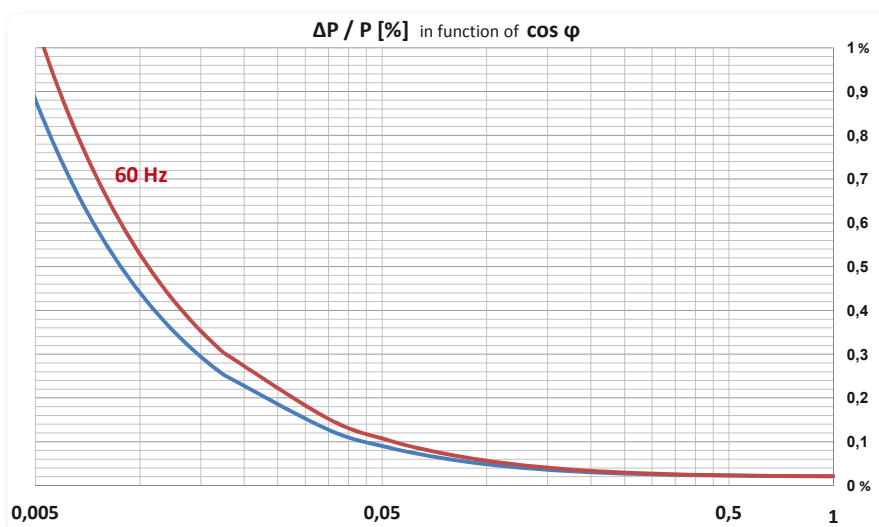
Partners Equipment:

- 11** Electronic Power Source
Frequency Converter
- 12** Step-Up-Transformer
- 13** Tap Changer
- 14** Turn-Ratio Meter
- 15** Winding Resistance Meter
- 16** Insulation Resistance Meter
- 17** Partial Discharge Measuring Device
- 18** C and Tan Delta Measuring
Device
- 19** Other equipment to integrate
(customer specific)



Acuracy and Measurements

	Power Factor	Range	Frequency	Acuracy*
Voltage		5% < Un < 39%		0.05%
		40% < Un < 120%		0.02%
Current		1% < In < 200%		0.01%
Power	1	40% < Un < 120%		0.02%
	0.5			0.02%
	0.05	40% < In < 120%	50 Hz 60 Hz	0.09% 0.10%
	0.01		50 Hz 60 Hz	0.44% 0.53%



Phase Angle

	50 Hz	< 0.4 min
	60 Hz	< 0.5 min

Temperature**

	0 °C < T < 100 °C	0.5 °C
	T > 100 °C	1 °C

* Preliminary values subject to change, please contact EPRO for the latest information.

** These accuracy data are given for Box operating between 0 and 40°C.

All temperature corrections in this range are automatically done by the CBox or Vbox.

System Parts

Measuring Desk

It is the brain of the system, it contains the control and management of all tests and devices.

**ONE operation interface
for the COMPLETE LAB**

EPRO Standard Transformers

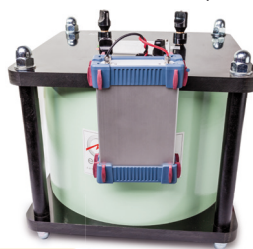
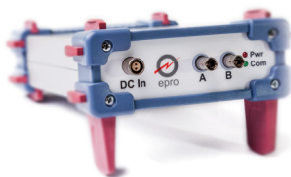
A bright variety of standard transformers can be used to customize the system. Variety starts at 50V and ends at 500kV / $\sqrt{3}$ of voltage and from 1A to 4000A in current.

EPRO Measuring and Communication Boxes

Electronic boxes for processing the analogue measurements to digital form. Beside Voltage and Current measuring boxes it will be distinguished between temperature measurement boxes for processing the data from PT100 probes or Thermoelements, communication boxes for communication with third party equipment and accessory boxes for customer specific operations like tap changer control and others.

Partner and Third Party Equipment

Any Equipment (i.e. power source, low voltage testers, PD equipment,...) can be fully integrated with the EPRO System. EPRO is following an unique network approach to be able to cover customer's requirements in a wide field. Any equipment, new or already existing can be integrated, only requirement is an interface (best RS232) and a communication protocol.



Tests to be Done in Standard Configuration:

- No Load Loss Test
- Load Loss Test
- Induced Overvoltage Test
- Zero Sequence Impedance Test
- Heat Run Test

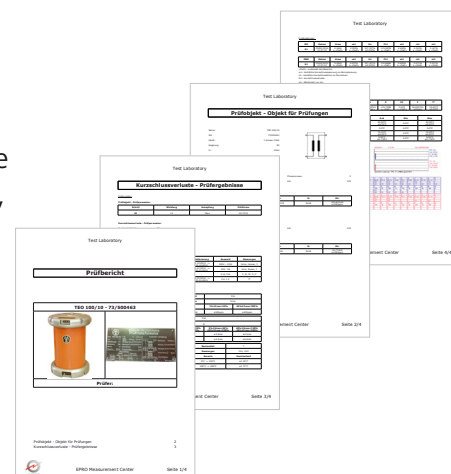
Tests to be Done with Integrated Devices and ComBox:

- Winding Resistance
- Transformer Turn Ratio
- Insulation Resistance
- Tan Delta Test
- Partial Discharge Monitoring
- and others

Test Standards:

All Tests are carried out according the latest IEC and IEEE standards and are applicable for single phase and three phase transformers as well as for Shunt Reactors (see special brochure for Shunt Reactor testing). Due to the highly accurate measuring of voltage and current and the special EPRO measuring system software, all functions of a POWER ANALYZER are already integrated. It is not necessary to invest in an expensive power analyzer device.

**All Tests are recorded in ONE integrated test report
and are managed in the corresponding databases**



EPRO Network Approach

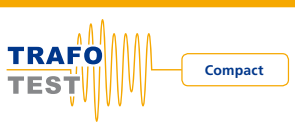


For providing **maximum service** and **convenience** for the customers EPRO is following a unique network approach. This secures competence from power source to PD measurement and from exact U and I measurements to an integrated test report.

EPRO is working with **highly specialized partners** offering best international reputation but is always open to integrate other brands. Customer wishes can be fulfilled in most cases and also already existing equipment can be used for integration.



**Maximum Flexibility and Integration
at Minimum Investment**



EPRO Customer Service

Calibration

Long calibration period for inductive parts combined with a very special calibration service for electronic boxes – ask your EPRO representative for details

Updating the Sytsem

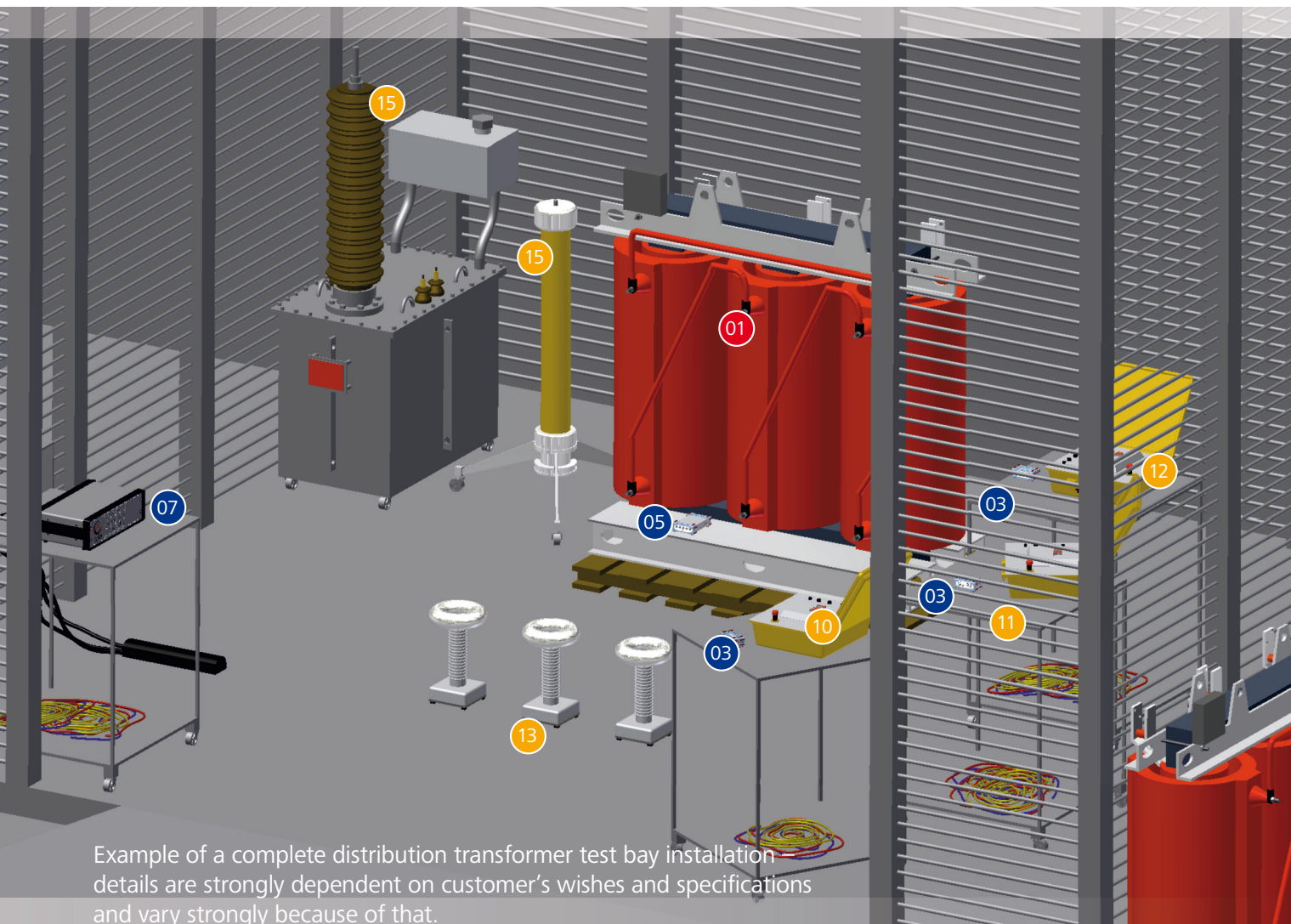
Updates can be done by customer in »Plug&Play-Style« within minutes. No Need of expensive technical support on site.

Installation & Training

To be done by EPRO expert on site in any case. A detailed operator's training is always included in the package.

Spare Parts

All major parts are always on stock and can be delivered within hours but the system itself is maintenance free and does not feature wear parts.



Example of a complete distribution transformer test bay installation details are strongly dependent on customer's wishes and specifications and vary strongly because of that.

01 Equipment Under Test

EPRO Equipment:

- 02** Measurement Desk
- 03** Communication Box
- 04** Voltage and Current Measuring Boxes
- 05** Temperature Measuring Box
- 06** Standard Voltage and Standard Current Transformers

07 Power Rack (Power Supply for Boxes)

08 Accessory Box

Partners equipment:

- 09** Electronic Power Source (EPS)
- 10** Insulation Resistance Meter
- 11** Turns Ratio Meter
- 12** Winding Resistance Meter

13 Partial Discharge Measuring Device

14 Step-Up-Transformer

15 Hipot Transformer and Capacitor

16 Tap Changer

17 Printer

18 Command for PLC of Power Source

19 Safety Switches

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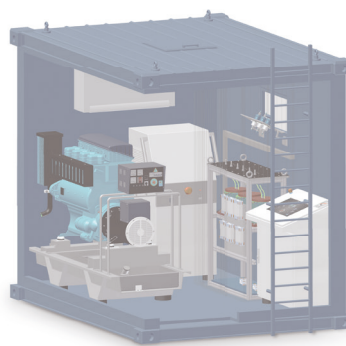
Routine Testing for Small and Medium Transformers
as Efficient as it Could be.



EPRO - Trafo Test // Premium



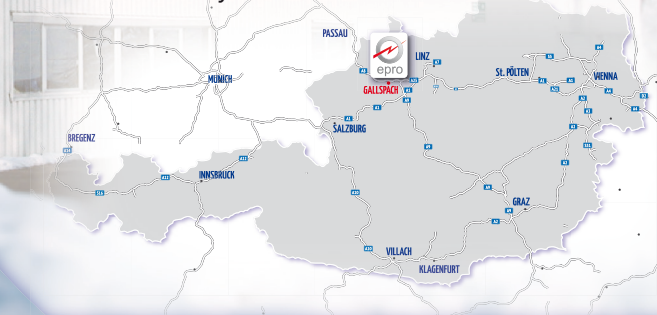
EPRO - Trafo Test // Compact



EPRO - Trafo Test // Mobile

Certificates and Approvals:

- ISO 9001 Quality Management System
- Accredited Calibration Authority according to EN ISO / IEC 17025
- GOST Pattern Approval Certificate of Measuring Instruments
- PTB On-Site Verification of the Accuracy of a Current and Voltage Measuring System of an Accredited Calibration Laboratory



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Electrotechnical Products for Power Distribution and Measurement