

EPRO Gallspach GmbH

> high standards in high voltage <



TEST BAY EQUIPMENT

Electrotechnical products for power distribution and measurement

TEST BAY EQUIPMENT

EPRO Gallspach GmbH's test bay equipment is used in the industry since decades. The devices are internationally well known for maximum reliability and accuracy and are produced on customers requirements. As the devices are purely inductive, the lifetime is up to 30 years and even more, without any accuracy drift or any changes. The devices are totally maintenance free. International calibration and metrological institutes as PTB Germany, INMETRO Brazil, VMI Vietnam and many others are using these devices as their national standard.

TEST TRANSFORMERS

From 50 kV / 5kVA to 500 kV / 50 kVA

Partial discharge less than 2 pC

Test transformers are used for accuracy measurement on current and voltage transformers, to generate high voltage or high current.

Models from 20kV up to 500kV are available, with output power of 5kVA up to 100kVA. Detailed specifications will be established according to customer's requirements.

For higher voltage over 200 kV, they are designed in a cascade construction, where the lower cascade step can be operated independently. Maximum reliability in the lab over decades is secured by the use of these maintenance free test transformers.

Dry insulated test transformer are available from 20kV-30kV with a max. continuous output of 5kVA. The test transformer are very light weighted devices with a weight of 85-105kg and free from oil and therefore very environmental friendly.



STANDARD CURRENT TRANSFORMERS

Dry insulated from 1A to 20.000 A

Oil insulated up to 200 kV, up to 3.000 A

Max. accuracy +/- 0,005% and +/- 0,5 min with range of 1..200% (at each tapping)

Standard current transformers are used for measurements on high current. The devices are used as measurement standards for measuring and/or for calibration of instrument transformers. The high accuracy of the standard CT plays a major role here.

The guaranteed range is, depending on customer's requirements up to 1-200% of rated current, this means in this range the accuracy of the device is guaranteed. The standard current transformers are designed in such a way that they are passive, i.e. they do not require an external supply.

The standard current transformers are available in dry-insulated and oil-insulated versions. The dry insulated standard CT's have an insulation level of 1,1kV up to 6kV, while the oil-insulated types are available from 30kV to 200kV nominal voltage. The primary current rating varies between 1A and 50.000A, depending on the model.

All products in the EPRO test bay equipment range, meet the special requirements of PTB Germany

STANDARD VOLTAGE TRANSFORMERS

Dry insulated up to 6 kV

Oil insulated from 15 kV to 800/√3 kV

Max. accuracy of +/- 0,005% and +/- 0,5 min (with range of 40..120% (at each tapping))

Standard voltage transformers are used for measurements on high voltage. The devices are used as measurement standards for measuring and/or for calibration of instrument transformers. The high accuracy of the standard VT plays also a major role here.

All devices offer a very wide range of 40-120%. This means in this percentage of rated voltage EPRO can guarantee the maximum accuracy of the devices.

For special tasks, accuracy can be kept in the range of 20-120%

The standard voltage transformers are designed in such a way that they are passive, i.e. they do not require an external supply.

The Standard voltage transformers are available as single pole and double pole execution from 1kV up to 800/√3kV in various models. The smallest models up to 6kV are dry insulated, starting from 15kV the models are oil insulated and the larger models are designed in a cascade execution.

The model NVRD 40 is a special execution, and the most accurate standard VT in the world for 3 to 40 kV.



- **Standard current transformers up to 20kA**
- **Standard voltage transformers up to 800/√3kV**
- **High voltage transformers up to 500kV**
- **High current transformers up to 10 kA**

HIGH CURRENT TRANSFORMERS

High current transformers are used for generation of high current up to 10 kA. The Type HCDT ist installed inside a steel plate casing. The secondary winding is divided into several groups. Different current strengths are produced using series and parallel circuit configurations of the winding groups. The adjustment is made using switchboards between the main connectons. Low currents are set using tapping points. This enables a fixed connection for the high current and mains supply for all circuit configurations. These transformers can also be equipped with transport rollers if required.



HIGH CURRENT MEASURING SOLUTIONS

Typical data are:
 Input voltage: 230V to 400V
 Measured current up to 20.000A in short term use,
 compensating reactors aligned to complete cell.



MOBILE TEST BAY EQUIPMENT

A big variety of EPRO is High Voltage Test Bay Equipment is also available as mobile execution. These devices are especially designed for measurements in the field and the herewith occuring transport. Most of the customers use these devices in special trucks and place them in the field for several tests, the devices are not used as devices staying in the outer conditions for their lifetime.

This execution normally features a silicone coating on the outer shape for transport protection and resistance against humidity, they are specially shock protected for transport and have special lifting hooks for loading and unloading.



IN HOUSE CALIBRATION

Since 2010 we are accredited calibration authority for voltage and current transformers (accuracy measurement). We offer calibration / accuracy measurement for our test bay equipment, as well as for external customers.

ERPO calibration service is fully fulfilled under the standard **EN ISO IEC 17025** and fully traceable to the Austrian metrologic institute BEV and german metrologic institute PTB.

Due to the mutual recognition agreement (ILAC) the calibration certificates are worldwide valid.

Worldwide valid calibration certificates due to ILAC



Scope of accreditation- Accuracy measurement

Measurement subject	Measuring range	Measurement conditions or measurement sequence	Uncertainty related to the measured value (best possible)	Remarks
Voltage Transformer	Voltage error: 0% to ≤ 2% Phase displacement: 0' to ≤ 60'	Primary: 50V to 500000/√3 V Secondary: 100V to 110 V 100/√3 V to 220/√3 V Frequency: 50 Hz and 60 Hz	50V to 40 kV Voltage error: ±0,006 % Phase displacement δ: ± 0,4 ' ≥ 40 kV to 500/√3kV Voltage error: ±0,011 % Phase displacement δ: ± 0,5 '	Please see remark below
Current Transformer	Voltage error: 0% to ≤ 2% Phase displacement: 0' to ≤ 60'	Primary: 1A to 3000A Secondary 1A to 5 A Rating factor: RF 1.2 ... 2.0 Frequency: 50 Hz and 60 Hz	Current error: ±0,006 % Phase displacement δ: ± 0,4 '	Please see remark below

Remark for voltage and current transformer:
 The given extended measurement uncertainty corresponds to the double standard deviation (k=2) what means for a normal distribution a degree of confidence of approximately 95%. The standard deviation was determined in accordance to document EA-4/02.



Datasheets

Selection of the common STANDARD VOLTAGE TRANSFORMERS

STANDARD VOLTAGE TRANSFORMERS, DRY INSULATED

Model	Execution	Max. Primary Voltage	Range	Accuracy	appr. Weight
NVDD 1	dry insulated, double pole	1 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	50 kg
NVDD 3	dry insulated, double pole	3 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	100 kg
NVDS 1	dry insulated, single pole	1 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	50 kg
NVDS 3	dry insulated, single pole	3 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	90 kg
NVDS 6	dry insulated, single pole	6 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	120 kg

STANDARD VOLTAGE TRANSFORMERS, CAST RESIN INSULATED

Model	Execution	Max. Primary Voltage	Range	Accuracy	appr. Weight
NVRD 40	cast resin insulated, double pole	40 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	210 kg

STANDARD VOLTAGE TRANSFORMERS, OIL INSULATED, SINGLE POLE

Model	Execution	Max. Primary Voltage	Range	Accuracy	appr. Weight
NVOS 15	oil insulated, single pole	15 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	150 kg
NVOS 30	oil insulated, single pole	30 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	215 kg
NVOS 50	oil insulated, single pole	50 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	215 kg
NVOS 60	oil insulated, single pole	60 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	400 kg
NVOS 72,5	oil insulated, single pole	72,5 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	425 kg
NVOS 100	oil insulated, single pole	110/√3 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	220 kg
NVOS 110	oil insulated, single pole	110 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	480 kg
NVOS 205	oil insulated, single pole	220/√3 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	550 kg
NVOS 350	oil insulated, single pole	350/√3 kV	40 - 120 % x Un	0,005%; 0,5min (+/-)	700 kg
NVOS 200	oil insulated, single pole, cascade	220/√3 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	410 kg
NVOS 220	oil insulated, single pole, cascade	200 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	1000 kg
NVOS 300	oil insulated, single pole, cascade	330/√3 kV	40 - 120 % x Un	0,015%; 1,0 min (+/-)	650 kg
NVOS 408	oil insulated, single pole,	400/√3 kV	40 - 120 % x Un	0,005%; 0,5 min (+/-)	1400 kg
NVOS 500	oil insulated, single pole, cascade	500/√3 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	1100 kg
NVOS 700	oil insulated, single pole, cascade	700/√3 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	1400 kg
NVOS 800	oil insulated, single pole, cascade	800/√3 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	2870 kg

STANDARD VOLTAGE TRANSFORMERS, OIL INSULATED, DOUBLE POLE

Model	Execution	Max. Primary Voltage	Range	Accuracy	appr. Weight
NVOD 15	oil insulated, double pole	15 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	140 kg
NVOD 30	oil insulated, double pole	30 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	160 kg
NVOD 50	oil insulated, double pole	50 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	300 kg
NVOD 60	oil insulated, double pole	60 kV	40 - 120 % x Un	0,010%; 1,0 min (+/-)	400 kg

Selection of the common STANDARD CURRENT TRANSFORMERS

STANDARD CURRENT TRANSFORMERS, DRY INSULATED

Model	Execution	Max. Primary Current	Insulation Level	Range	Accuracy	appr. Weight
NCD 100	dry insulated	100 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	21 kg
NCD 200	dry insulated	200 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	45 kg
NCD 1200	dry insulated	1200 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	35 kg
NCD 2000	dry insulated	2000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	90 kg
NCD 2000d	dry insulated, loop-in execution	2000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	50 kg
NCD 3000d	dry insulated, loop-in execution	3000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	35 kg
NCD 4000d	dry insulated, loop-in execution	4000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	50 kg
NCD 5000d	dry insulated, loop-in execution	5000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	50 kg
NCD 10000d	dry insulated, loop-in execution	10000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	70 kg
NCD 12000d	dry insulated, loop-in execution	12000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	70 kg
NCD 20000d	dry insulated, loop-in execution	20000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	200 kg
NCD 5000dG	dry insulated, loop-in execution, in housing	5000 A	3 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	130 kg

STANDARD CURRENT TRANSFORMERS, OIL INSULATED

Model	Execution	Max. Primary Current	Insulation Level	Range	Accuracy	appr. Weight
NCO 15	oil insulated	5000 A	15 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	130 kg
NCO 30	oil insulated	5000 A	30 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	200 kg
NCO 60	oil insulated	5000 A	60 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	200 kg
NCO 72,5	oil insulated	5000 A	72,5 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	350 kg
NCO 100	oil insulated	5000 A	100 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	350 kg
NCO 200 P	oil insulated	5000 A	200 kV	1 - 200 % x Un	0,005%; 0,5min (+/-)	300 kg



Datasheets

Selection of the common TEST TRANSFORMERS

TEST TRANSFORMERS, STANDARD EXECUTION

model	execution	max. secondary voltage	output power continuous	output power short term (1hr)	PD level	appr. weight
HVOT 50/5	oil insulated	50 kV	5 kVA	10 kVA	< 1 pC	180 kg
HVOT 50/10	oil insulated	50 kV	10 kVA	20 kVA	< 1 pC	180 kg
HVOT 50/20	oil insulated	50 kV	20 kVA	40 kVA	< 1 pC	450 kg
HVOT 100/5	oil insulated	100 kV	5 kVA	10 kVA	< 1 pC	220 kg
HVOT 100/10	oil insulated	100 kV	10 kVA	20 kVA	< 1 pC	220 kg
HVOT 100/20	oil insulated	100 kV	20 kVA	40 kVA	< 1 pC	480 kg
HVOT 100/50	oil insulated	100 kV	50 kVA	100 kVA	< 1 pC	1050 kg
HVOT 150/20	oil insulated	150 kV	20 kVA	40 kVA	< 1 pC	220 kg
HVOT 250/25	oil insulated	250 kV	25 kVA	50 kVA	< 2 pC	700 kg

TEST TRANSFORMERS, CASCADE EXECUTION

model	execution	max. secondary voltage	output power continuous	output power short term (1hr)	PD level	Appr. weight
HVOT 200/10KS	oil insulated, cascade execution	200 kV	10 kVA	20 kVA	< 2 pC	430 kg
HVOT 300/20KS	oil insulated, cascade execution	300 kV	20 kVA	40 kVA	< 2 pC	1110 kg
HVOT 500/25KS	oil insulated, cascade execution	500 kV	25 kVA	50 kVA	< 5 pC	1400 kg
HVOT 500/30KS	oil insulated, cascade execution	500 kV	30 kVA	60 kVA	< 5 pC	3000 kg

TEST TRANSFORMERS, DRY EXECUTION

Model	Execution	Max. Primary Voltage	Output Continuous	Output short term	PD Level	Appr. Weight
HVDT 20/5	dry insulated	20 kV	5 kVA	10 kVA	/	85 kg
HVDT 30/5	dry insulated	30 kV	5 kVA	10 kVA	/	105 kg

Latest development for test transformers

Standard measuring windings can have large errors as soon as they are under any kind of load. Our latest developed measuring winding guarantees a correct HV measurement over full range with active, capacitive or inductive loads and even with very high current THD, like they occur in applied voltage tests.

The measuring winding is build complete inside the housing and only possible with limited models (HVOT) furthermore, a measurement is currently only possible with one frequency without reconnection.

Selection of the common HIGH CURRENT TRANSFORMERS

HIGH CURRENT TRANSFORMERS

HCDT 6000					HCDT 4000						
Primary		2x 230V or 2x 400 V		2x 78.3A or 2x 45A		Primary		2x 230V or 2x 400 V		2x 43.5A or 2x 25A	
Secondary	Voltage[V]	Nominal Current [A]	Rating [kVA]	Test type	Secondary	Voltage[V]	Nominal Current [A]	Rating [kVA]	Test type		
	6	6000	36	15 min		5	4000	20	30 min		
	12	3000	36	15 min		10	2000	20	30 min		
	12	2000	24	60 min		20	1000	20	30 min		
	24	1500	36	15 min		40	200	8	DB		
	24	1000	24	60 min		80	100	8	DB		
	48	750	36	15 min		160	50	8	DB		
	48	500	24	60 min							
	150	20	3	DB							
Frequency	50/60 Hz				Frequency	50/60 Hz					
Test Voltage	3 kV				Test Voltage	3 kV					
Weight approx.	140 kg				Weight approx.	130 kg					

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- Calculation
- Winding
- Production
- Vacuum casting
- Final testing
- Calibration



EPRO product portfolio overview

EPRO MEASUREMENT SYSTEMS for TRANSFORMERS

TRAFOTEST PREMIUM & COMPACT:

TRAFOTEST is a fully automatic transformer test system. It has a type approval of PTB Germany as full system and can be calibrated according to EN ISO / IEC 17025. The standard version of the system is able to process the 5 main tests according to IEC and IEEE norms as:

- Load loss test
- No load loss test
- Induced overvoltage test
- Zero sequence impedance test
- Heat run (temperature rise test)

Plus to this, it can be upgraded modular to a complete transformer test center for all needed tests, for example:

- Winding resistance test
- Transformer turns ratio test
- C and tan delta test
- Insulation resistance test
- Sound level test
- And many more



TRAFOTEST COIL:

TRAFOTEST COIL is used for pre-testing transformer coils after finishing of the casting process.

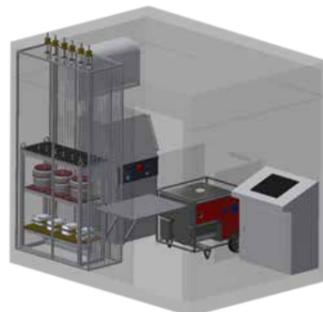
As the design of coils is getting smaller and smaller, the technical borders of insulation gets closer and therefore a pre-testing secures good coils in further production steps.



TRAFOTEST MOBILE:

A mobile and totally independent measuring system for small and medium distribution transformers in a container, what can be mounted on a (light duty) truck.

This is the new and revolutionary possibility to measure the losses of small to medium distribution transformers in the field.



EPRO MEASUREMENT SYSTEMS for INSULATION MATERIALS

Insulation Test PREMIUM

The INSULATION TEST PREMIUM is the worlds first integrated testing solution for insulation materials.

The most important test for R&D process is the measurement of capacitance and tan delta, the most important tests for production monitoring is the breakdown voltage detection.

EPRO offers special tailored systems, for R&D and/or production monitoring.



Insulation Test TAN DELTA

The ITTD- Insulation Test Tan Delta- measures the loss factor of solid insulation materials and resins under controlled temperature and pressure.



Insulation Test EASY TD

The EASY TD is an unique and very compact, versatile device for C and tan delta testing of various test objects like transformers, capacitors, stators of electric motors, cables and many more.



Insulation Test ENDURANCE

With the ENDURANCE test system it's possible to speed up the aging of solid insulation materials. The test transformer is the centerpiece of the system, with an adjustable voltage (depending on used transformer) and a frequency up to 1000 Hz.



CAST RESIN PRODUCTS

We are operating a high tech fully automatic casting plant for epoxy resin vacuum casting. The main products are insulators for the cable industry, like cable end plugs and muffles. We offer the full service, from product development, to the finished end product. Our service for casting „by hand“ is gladly used by customers who require special cast resin parts, with special resins, in small quantities.



TOROIDAL CORE CURRENT TRANSFORMERS

We offer a bright variety of toroidal core current transformers. All devices are calculated according to customers specifications.



FEED IN TRANSFORMER

Audio frequency feed in transformers, used in ripple control systems for example, are a main part of EPRO production program since decades. We offer in this product segment, for medium voltage applications: parallel couplings, serial couplings and audio frequency suppressors.



EPRO Gallspach GmbH

> high standards in high voltage <

EPRO Gallspach GmbH is one of the quality leaders in the sector:

Electrical technology for energy distribution and measurement.

Flexibility and customer orientation is what distinguish our company.

High standards in high voltage

You will not find massproducts in our product portfolio. Our high accuracy, innovative and customized systems are used in laboratories, institutes and HV test bays all over the world.

Family business with a long tradition

The company was established in 1957 as Austrian subsidiary of German Messwandlerbau GmbH. A management buy-out took place in 1994 and EPRO GALLSPACH GMBH was founded. EPRO Gallspach GmbH stands for highest accuracy measurement systems and products for power distribution in high voltage, with a high durability.

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