



Test bay equipment



The EPRO Test bay equipment features the following devices:

Standard current transformer / Standard voltage transformer

Standard transformers are used for the following applications:

- to measure ratio errors in current and voltage transformers during series and prototype testing on test rigs and in laboratories for manufacturers, users and universities.
- as a standard with which to measure and compare ratio errors on current and voltage transformers for official calibration and certification.
- to measure the no-load operation and short-circuit losses of transformers.

Our accredited calibration lab can issue a calibration certificate if needed. 

All products in the EPRO Test bay equipment range meet the special requirements of the Physikalisch-Technische Bundesanstalt (PTB).





Test transformers

Test transformers are designed to generate high alternating voltages for testing and measuring purposes. The low voltage winding is usually driven by an infinitely variable control transformer between zero and the highest value so that a specific power output is available over a defined period of time. The time the transformer is switched on depends on the application and can range from one minute to continuous operation. Because these components are practically partial discharge-free up to test voltage, they are especially suitable for measuring partial discharge.

High current transformer

These transformers are mainly used as excitation transformers for current transformer testing systems. Thanks to the similar configuration and the same connections as type NCD 2000 – 6000 standard current transformers, they provide a good match to the individual current strengths of the transformer being tested.

All oil-insulated transformers are also available as mobile versions - see separate folder "Mobile Test bay equipment".





NCD 1200



NCD 5000dG - casing with aluminium frame



NCO 72,5

Standard current transformer

Type NCD 200 NCD 20000d und NCD 5000dG

Type NCD transformers are installed inside a laminated paper casing.

Primary and secondary windings are separated and dry-insulated.

The design of the primary and secondary connections, which are located on the front plate, depends on the strength of the current. The individual ratios are achieved using tapping points on the primary and secondary windings.

Type NCO 30, NCO 60, NCO 72,5 und NCO 100

Type NCO transformers are installed inside an insulation cylinder with metal base plate and laminated paper cover plate.

4 transport rollers are fitted to make it easy to move the unit around the test lab.

Primary and secondary windings are double pole dry-insulated. The insulation consists of cable paper impregnated with transformer oil. The design of the primary connections, which are located on the cover plate, depends on the strength of the current. The secondary connections are incorporated into the base and feature bolted or slide-on terminals.

	NCD 200	NCD 1200	NCD 3000d	NCD 4000d
Primary nominal current*	1 to 200A	1 to 1200A	5 to 3000A	5 to 4000A
Secondary current*	1 and/or 5A	1 and/or 5A	1 and/or 5A	1 and/or 5A
Rated output	max. 15VA	max. 15VA	max. 15VA	max. 15VA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Nominal voltage	max. 3 kV	max. 3 kV	max. 3 kV	max. 3 kV
Test voltage	max. 5 kV	max. 5 kV	max. 5 kV	max. 5 kV
Accuracy in the range: 0.01.....2.0 x I _N	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min
	NCD 5000d	NCD 10000d	NCD 20000d	NCD 5000dG
Primary nominal current*	5 to 5000A	5 to 10000A	5000 to 20000A	1 to 5000A
Secondary current*	1 and/or 5A	1 and/or 5A	1 and/or 5A	1 and/or 5A
Rated output	max. 15VA	max. 15VA	max. 15VA	max. 15 VA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Nominal voltage	max. 3 kV	max. 3kV	max. 3kV	max. 3kV
Test voltage	max. 5 kV	max. 5kV	max. 5kV	max. 5kV
Accuracy in the range: 0.01.....2.0 x I _N	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min
	NCO 30	NCO 60	NCO 72.5	NCO 100
Primary nominal current*	1 to 3000A	1 to 3000A	1 to 3000A	1 to 3000A
Secondary current*	1 and/or 5A	1 and/or 5A	1 and/or 5A	1 and/or 5A
Rated output	max. 15VA	max. 15VA	max. 15VA	max. 15VA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Nominal voltage	30 kV	60 kV	72,5 kV	100 kV
Test voltage	45 kV	90 kV	109 kV	130 kV
Accuracy in the range: 0.01.....2.0 x I _N	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min

* other currents available on request

Double-pole insulated standard voltage transformer

Type NVDD 1, NVDD 3, NVDD 6

Type NVDD 1 transformers are installed inside a laminated paper casing.

Type NVDD 3 and NVDD 6 are installed in a cast resin cylinder with laminated paper cover and metal base plate. These transformers are also supplied with transport rollers. Primary and secondary windings are double pole dry-insulated. The primary and secondary connections, which are located on the front plate, are provided as bolt-type terminals and plugged connections. The individual ratios are achieved using tapping points on the primary and secondary windings.

Type NVOD 15, NVOD 30, NVDD 50 und NVOD 60

Type NVOD transformers are installed inside an insulation cylinder with metal base plate and laminated paper cover plate. 4 transport rollers are fitted to make it easy to move the unit around the test lab. Primary and secondary windings are double pole dry-insulated. The insulation consists of cable paper impregnated with transformer oil. The primary connections and secondary connections, which are located on the cover plate, are provided as bolt-type terminals and plugged connections. The individual ratios are achieved using tapping points on the primary winding and/or secondary winding.

Type NVRD 40

The type NVRD 40 high-voltage transformer is vacuum-cast in epoxy resin. It consists of 8 equal coils, which are connected to contact pins on the upper side of the insulated body. By placing different switchover boards over the contacts it is possible to connect the coils in series, series-parallel or parallel. As a result the primary voltage can be switched in the ratio 1 : 2 : 4 : 8. More primary voltages can be set using tapping points of the intermediate transformer, which is connected to the low voltage winding. The secondary voltages are then drawn from the intermediate transformer. The two high-voltage connections consist of threaded bolts with ball knobs.



NVDD 3



NVOD 60



NVRD 40

	NVRD 40
Standard primary voltage	up to 40 kV
Secondary voltage*	100V - 110V - 120V
Rated output	max. 15VA
Frequency	50/60 Hz
Test voltage	1.5 x U _N max.
Accuracy in the range: 0.4.....1.2 x U _N	±0.005%; ±0.5 Min
Weight approx.	205 kg

	NVDD 1	NVDD 3	NVDD 6
Standard primary voltage	up to 1000V	up to 3000V	up to 6000V
Secondary voltage*	100V - 110V - 120V	100V - 110V - 120V	100V - 110V - 120V
Rated output	max. 20VA	max. 20VA	max. 20VA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Winding test voltage	3 kV	4.5 kV	9 kV
Accuracy in the range: 0.4.....1.2 x U _N	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min	±0.005 %; ±0.5 Min
Weight approx.	40 kg	85 kg	160 kg

	NVOD 15	NVOD 30	NVOD 50	NVOD 60
Standard primary voltage	up to 15 kV	up to 30 kV	up to 50 kV	up to 60 kV
Secondary voltage*	100V - 110V - 120V	100V - 110V - 120V	100V - 110V - 120V	100V - 110V - 120V
Rated output	max. 15VA	max. 15VA	max. 15VA	max. 15VA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Winding test voltage	1.5 x U _N max.	1.5 x U _N max.	1.5 x U _N max.	1.5 x U _N max.
Accuracy in the range: 0.4.....1.2 x U _N	±0.010 %; ±1.0 Min	±0.010 %; ±1.0 Min	±0.010 %; ±1.0 Min	±0.010 %; ±1.0 Min
Weight approx.	150 kg	210 kg	300 kg	400 kg

* other voltages available on request



NVOS 72,5



NVOS 200

Single-pole insulated standard voltage transformer

Type NVOS 72,5 ... NVOS 500

Type NVOS transformers are installed inside an insulation cylinder with metal base plate and cover plate. 4 transport rollers are fitted to make it easy to move the unit around the test lab. The primary winding is single-pole insulated, which means that one end of the winding is connected to high-voltage potential while the other is earthed at the terminal block. The insulation consists of cable paper impregnated with transformer oil. The ratio is set by moving changeover bridges on the terminal board.

Primary coil tapped voltage transformers are also available if required.

	NVOS 15	NVOS 30	NVOS 50	NVOS 60
Standard primary voltage	up to 15/√3 kV and 15kV	up to 30/√3 kV and 30 kV	up to 50/√3 kV and 50 kV	up to 60/√3 kV and 60kV
Secondary voltage*	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V
Rated output	max. 15VA	max. 15VA	max. 15VA	max. 15VA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Test voltage	1.5 x U _N max.	1.5 x U _N max.	1.5 x U _N max.	1.5 x U _N max.
Accuracy in the range: 0.4.....1.2 x U _N	±0.010 %; ±1.0 Min	±0.010 %; ±1.0 Min	±0.010%; ±1.0 Min	±0.010%; ±1.0 Min
Weight approx.	150 kg	210 kg	300 kg	400 kg
	NVOS 72.5	NVOS 100	NVOS 110	NVOS 200
Standard primary voltage	up to 72,5/√3 kV	up to 110/√3 kV	up to 110 kV	up to 220/√3 kV
Secondary voltage*	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V
Rated output	max. 15VA	max. 15VA	max. 15VA	max. 15VA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Test voltage	1.5 x U _N max.	1.5 x U _N max.	1.5 x U _N max.	1.5 x U _N max.
Accuracy in the range: 0.4.....1.2 x U _N	±0.010 %; ±1.0 Min	±0.010 %; ±1.0 Min	±0.010%; ±1.0 Min	±0.010%; ±1.0 Min
Weight approx.	420 kg	210 kg	480 kg	440 kg
	NVOS 220	NVOS 300	NVOS 400	NVOS 500
Standard primary voltage	up to 220 kV	up to 300/√3 kV	up to 400/√3 kV	up to 500/√3 kV
Secondary voltage*	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V	220/√3V or 110/√3V or 100/√3V and 100V or 110V
Rated output	max. 15VA	max. 15VA	max. 15VA	max. 15VA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Test voltage	1.5 x U _N max.	1.5 x U _N max.	1.5 x U _N max.	1.5 x U _N max.
Accuracy in the range: 0.4.....1.2 x U _N	±0.010 %; ±1.0 Min	±0.020 %; ±1.5 Min	±0.015%; ±1.0 Min	±0.015%; ±1.0 Min
Weight approx.	1000 kg	650 kg	1100 kg	1100 kg

*other voltages available on request

High current transformer

Type HCDT

Type HCDT transformers are 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 connections. 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.



HCDT 6000



HCDT 4000

The following types are designed for specific maximum primary currents:

	HCDT 6000				HCDT 4000			
Primary	2 x 230V oder 2 x 400V				2 x 230V oder 2 x 400V			
Secondary	2 x 78.3A oder 2 x 45A				2 x 43.5A oder 2 x 25A			
	Voltage [V]	Nominal current [A]	Rating [kVA]	Test type	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				50/60 Hz			
Test voltage	3 kV				3 kV			
Weight approx.	1400N				1300N			

Current transformers with leadthroughs (with or without housing) can be supplied for higher currents.



HVOT 100/10



HVOT 200/20KS

Oil insulated test transformers

Type HVOT

HVOTs are single-pole insulated oil-filled units installed inside an insulation cylinder with metal base plate and cover plate. The insulation consists of dried cable paper impregnated with transformer oil. Four transport rollers are essential to facilitate handling of the smaller types in the laboratory, while the larger types are available with a transport chassis.

If required, the low voltage winding can be split into two groups that can then be switched in parallel or series using switchover lugs. This enables more precise regulation at half the rated voltage.

The low voltage connections are incorporated into the base and feature bolted terminals and/or slide-on terminals. One end of the high voltage winding is in the base and is earthed during operation, while the other end is attached permanently to the cover plate. The high voltage connection features a range of connections: choose between a port for a flexible metal hose, a female M12 bolted terminal or a 4 dia. socket. Other designs are also available if required.

Primary coil tapped test transformers are also available if required.

	HVOT 50/5	HVOT 100/5	HVOT 200/5 KS	HVOT 50/10
Nominal voltage	50 kV	100 kV	200 kV	50 kV
Output	5 kVA	5 kVA	5 kVA	10 kVA
Output (1h on / 23h off)	10 kVA	10 kVA	10 kVA	20 kVA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Partial discharge at nominal voltage	< 1pC	< 1pC	< 1pC	< 1pC
Weight approx.	180 kg	220 kg	470 kg	180 kg

	HVOT 200/20 KS	HVOT 150/20	HVOT 300/20 KS	HVOT 250/30
Nominal voltage	200 kV	150 kV	300 kV	250 kV
Output	20 kVA	20 kVA	20 kVA	30 kVA
Output (1h on / 23h off)	40 kVA	40 kVA	40 kVA	60 kVA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Partial discharge at nominal voltage	< 1pC	< 1pC	< 2pC	< 2pC
Weight approx.	980 kg	550 kg	1200 kg	1500 kg

Types ending in „KS“ feature a cascade in 2 or 3 stages.

As a special feature, test transformers can be equipped with the following additional functions:

- Taps on the high voltage side (Type HVOT XXX/XXT)
- Measurement windings of 100V on the high voltage side (Type HVOT XXX/XXm)
- Mobile version for installation in vehicles (Type HVOT XXX/XXmo)
- Mobile version with silicone ribs as protection against impact and high air humidity (Type HVOT XXX/XXFmo).

Of course any combination of the above is also possible, such as a mobile version with measurement windings on the high voltage side (Type HVOT XXX/XXmom).



HVOT 100/5KUfmo HVOT 50/20 HVOT 300/10KSmo

	HVOT 100/10	HVOT 200/10 KS	HVOT 50/20	HVOT 100/20
Nominal voltage	100 kV	200 kV	50 kV	100 kV
Output	10 kVA	10 kVA	20 kVA	20 kVA
Output (1h on / 23h off)	20 kVA	20 kVA	40 kVA	40 kVA
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Partial discharge at nominal voltage	< 1pC	< 1pC	< 1pC	< 1pC
Weight approx.	220 kg	470 kg	450 kg	480 kg

	HVOT 500/30 KS	HVOT 100/50
Nominal voltage	500 kV	100 kV
Output	30 kVA	50 kVA
Output (1h on / 23h off)	60 kVA	100 kVA
Frequency	50/60 Hz	50/60 Hz
Partial discharge at nominal voltage	< 5pC	< 1pC
Weight approx.	3000 kg	1050 kg



EPRO TMS (Transformer Measurement System)

Following success thanks to experience gained in the manufacture of measurement transformers with the very highest level of accuracy and reliability for more than 20 years, EPRO has developed a revolutionary transformer measurement system (TMS) that offers high voltage laboratories and other manufacturers of transformers to have their equipment tested. The EPRO TMS was developed with the objective of integrating all measurements performed within a laboratory or production bay into one system.

This system has the following advantages:

- The EPRO TMS can test single-phase and three-phase transformers
- Test specifications and parameters for each type of transformer tested are saved to ensure that the same test sequence is used
- Easy to compare the measurement results of each type
- Measurement results are incorporated in a test report
- Measurement times are shortened, reducing costs

The following measurement modules are included in the entry level version:

- Measurement of idling losses
- Measurement of short-circuit losses
- Temperature measurement
- Testing with induced 3-phase withstand alternating voltage
- Testing with applied single-phase withstand alternating voltage

All measurements are performed in accordance with current standards such as IEC 60076-1, -2, -3, -8 and ANSI/IEEE C57.12.90.

Highlights of the EPRO TMS:

- Fully automatic measurements performed to different standards without having to rewrite the test sequence every time
- Complete solution - from measuring tools to documentation of each test
- Modular configuration - enables individual compilation of test sequences
- Open system - enables the use of existing measurement transformers, control transformers and measuring equipment by connecting up a customised measurement box or communication terminal
- Expandable - the EPRO TMS allows additional measurements to be added via interfaces. This ensures uniform operation and documentation.
- User friendly - thanks to the two large screens and intuitive software, all information pertaining to the test sequence, standards and accuracy are displayed and recorded.
- Self-testing - the EPRO measuring boxes for current and voltage transformers are able to check calibration data themselves.
- Easy re-calibration of the measurement boxes - For the calibration of the measurement boxes, you don't need the corresponding transformer, which has a higher calibration interval. So, the shipping to the factory in Gallsbach is very easy and not expensive. Thanks to the modular configuration of the system it is also possible to send customers replacement boxes during calibration to avoid tests being interrupted.
- The very highest accuracy - by using the very latest electronic components, the EPRO measurement system is one of the most accurate measurement systems available on the power measurement market. Using highly accurate EPRO measurement transformers can achieve errors below $\pm 0.1\%$ at very low power factors of 0.05.

If desired, several measurements can be performed by one system, such as:

- Ratio measurement
- Resistance measurement
- Partial discharge measurement
- etc.



large display screen

large touchscreen with important information for the user to configure each test

More laboratory equipment products

The following non-EPRO products are available through EPRO:

- Measuring capacitors
- Peak voltage meters
- Coupling capacitors
- Partial discharge meters
- Test consoles and control panel enclosures

Please contact EPRO for more details.



Test consoles and control panel enclosures with control transformers and display instruments



Partial discharge meter TM



Coupling capacitor CK



Peak voltage meter SM



Measuring capacitor CM



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The EPRO product range:

- Cast resin insulators
- Feed-in transformers
- Toroidal transformers
- Mobile Test bay equipment - see separate folder „Mobile Test bay equipment“
- Measuring and testing transformers in our accredited calibration laboratory
- Optimisation, servicing and repair
- ÖKD calibration laboratory - see separate folder „Calibration laboratory“



Certificates and accreditations

ISO 9001 Quality Management System

EN ISO/ IEC 17025 Confirmation of accreditation as calibration laboratory

GOST Approval for categorising measuring equipment

PTB Monitoring of accuracy of accredited calibration laboratory for current and voltage transformers



EPRO Gallspach GmbH A-4713 Gallspach Austria
T: +43 (0)7248 - 68462-0 F: +43 (0)7248 - 68462-37
www.eipro.at E:eiprooffice@eipro.at