

# On-site Calibration Service for High-Voltage Test Systems

*On-site*

**On-site calibration service**

*Calibration*



According to:  
EN 45000, IEC 60

Partners for Quality  
in  
High Voltage Technology  
Electromagnetic Compatibility  
and World-Wide Service

*On-site*

### IEC 60

Simple and unified calibration methods which apply to complete measuring systems give high-voltage test equipment manufacturers, users and customers the assurance of comparable quality requirements and tests involving such equipment. The underlying standard (IEC 60) describes the scope of measuring system calibration and measurement procedures for:

- Impulse voltage (current)
- AC voltage (current)
- DC voltage (current).

It describes methods for the measurement of these parameters and for the calibration of the systems used, as well as indicating permissible deviations and distribution of results. The standard also recommends calibration intervals as well.

The equivalence of comparative measurement methods endorsed by the standards allows a mobile reference measuring system to be deployed for on-site calibration procedures.

Both components and entire measuring systems can be calibrated with comparative measurements. System calibrations facilitate the determination of the cumulative uncertainties of specific measuring methods.

### EN 45000

The unified certification and evaluation of measurement and calibration laboratories pursuant to EN 45000 strengthens customer confidence in laboratories which comply with the standard and guarantees pan-European equivalence. One of the core elements of this standard is the correlation of the respective instrumentation with national or international standard measures.

A 9400



### Traceable calibration of high-voltage measuring systems

- The market demands it
- The standards specify it
- It documents the quality level

A 9212



### The benefits of on-site calibration

- No assembly, disassembly or transport risks
- No packaging and shipping costs
- Immediate measuring system availability (no assembly, disassembly and transport delays)

A 9441



A 9500



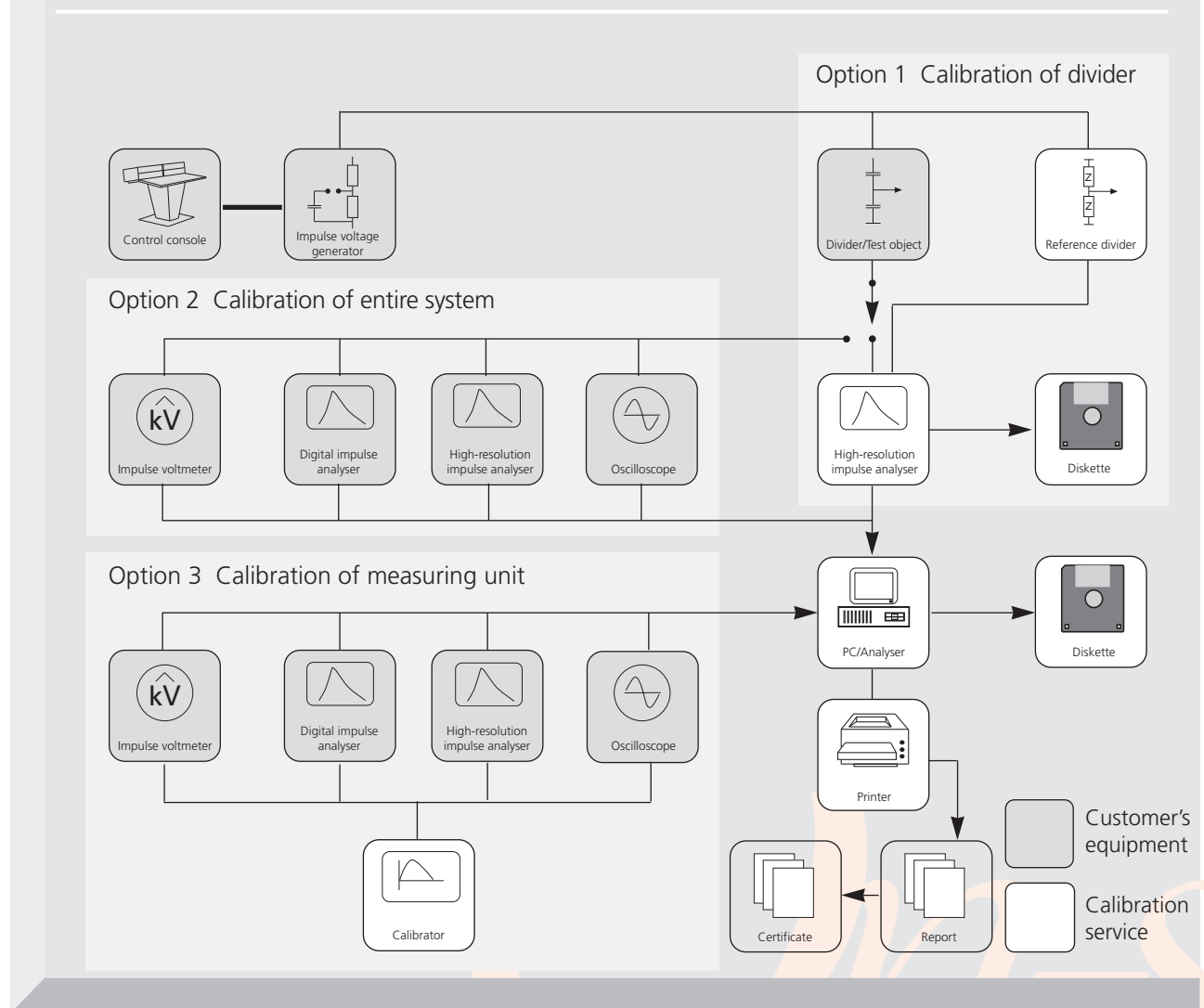
### Benefits of the Haefely-Trench on-site calibration service

- Approved, accredited to EN 45000
- DKD certificates
- Competent support by highly qualified personnel
- Clearly defined scope of calibration

# Calibration parameters and options

## Impulse voltage measurements

Waveform	Calibration voltage		$T_1$ ( $\mu\text{s}$ )	$T_2$ ( $\mu\text{s}$ )	$T_c$ ( $\mu\text{s}$ )
	Direct measurement	Linearity measurement <sup>1)</sup>			
Lightning impulse: full wave (LI)	50kV - 500kV	up to 2500kV > 2500kV <sup>2)</sup>	0.84 $\mu\text{s}$ - 1.56 $\mu\text{s}$ <sup>3)</sup>	40 $\mu\text{s}$ - 60 $\mu\text{s}$ <sup>3)</sup>	
Lightning impulse: front chopped (FC)	50kV - 500kV	up to 2500kV > 2500kV <sup>2)</sup>			$T_c$ 0.3 $\mu\text{s}$ to 0.8 $\mu\text{s}$
Lightning impulse: tail chopped (TC)	50kV - 500kV	up to 2500kV > 2500kV <sup>2)</sup>			$T_c$ 2.0 $\mu\text{s}$ to 6.0 $\mu\text{s}$
Switching impulse (SI)	50kV - 500kV	up to 2500kV > 2500kV <sup>2)</sup>	200 $\mu\text{s}$ - 300 $\mu\text{s}$ <sup>3)</sup>	1000 $\mu\text{s}$ - 4000 $\mu\text{s}$ <sup>3)</sup>	
Reference dividers and systems					
Standard measuring dividers and systems					

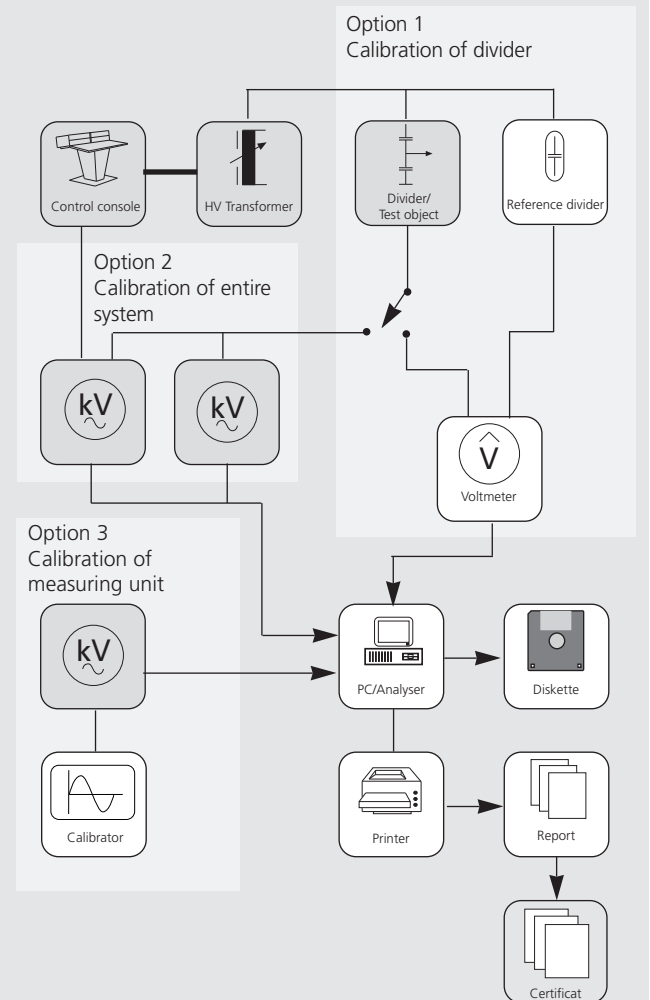
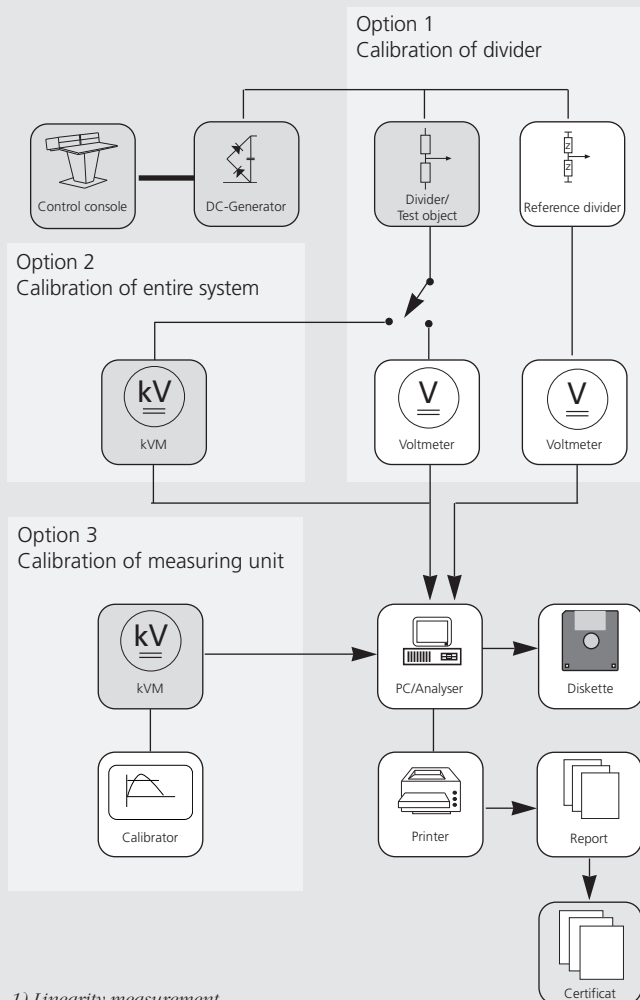


## DC voltage measurements

## AC voltage measurements

Calibration voltage		
	Direct measurement	Linearity measurement <sup>1)</sup>
DC voltage	5kV – 300kV DC	bis 1500kV DC
Reference dividers and systems		
Standard measuring dividers and systems		

Calibration voltage		
	Direct measurement	Linearity measurement <sup>1)</sup>
AC voltage 50/60 Hz	5kV – 200kV	to 1000kV AC
300 Hz	5kV – 60kV	to 300kV
Reference dividers and systems		
Standard measuring dividers and systems		



1) Linearity measurement

Whenever possible, any determination of the linearity of a voltage measurement should be performed versus a reference system with comparative measurements at maximum voltage of the system to be calibrated. Since reference systems are not always rated for the maximum voltage of the system to be calibrated, the comparative measurement is performed up to the maximum voltage of the reference system, complemented by a verification of the linearity of the high-voltage source.

2) As agreed with the customer

3) If the customer cannot supply a standard impulse, the scope of calibration shall be subject to mutual agreement.

Physikalisch-Technische Bundesanstalt (PTB)  
Braunschweig und Berlin  
Deutscher Kalibrierdienst (DKD)  
vertreten im

## Deutschen AkkreditierungsRat



### Akkreditierung

Die **Physikalisch-Technische Bundesanstalt (PTB)** akkreditiert hiermit  
das Kalibrierlaboratorium für  
elektrische Meßgrößen / Hochspannungsmesseinrichtungen  
bei  
Haefely Trench AG  
Lehenmattstraße 353  
CH 4028 Basel (Schweiz)

als Kalibrierlaboratorium nach DIN EN 45001 für Kalibrierungen in folgenden Bereichen:

Gleichspannung, Wechselspannung  
Hochspannung, Impulsspannungen nach IEC 60-2

Die Anlage ist Bestandteil der Urkunde und besteht aus 2 Seiten.  
DAR-Registrierennummer: DKD-K-17701

Braunschweig, den 18.03.1997





Im Auftrag  
Dir. u. Prof. Dr. H. Bachmair  
Abteilungsleiter in der PTB

Prof. Dr. V. Kose  
Vizepräsident der PTB


Siehe Hinweise auf der Rückseite

## DEUTSCHER KALIBRIERDIENST **DKD**

Kalibrierlaboratorium für elektrische Messgrößen / Hochspannungsmesseinrichtungen  
*Calibration laboratory for electrical measurands / high voltage Measuring Systems*

AKKREDITIERT DURCH DIE  
**PHYSIKALISCH-TECHNISCHE BUNDESANSTALT (PTB)** 

**Haefely Trench AG, Schweiz**  
Lehenmattstrasse 353  
CH - 4028 Basel

**HAEFELY TRENCH**   
HIGH VOLTAGE TECHNOLOGY

XXX
DKD-K-17701
97-03

Kalibrierschein  
*Calibration Certificate*

Kalibrierzeichen  
*Calibration mark*

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**Gegenstand**  
*Object* Hochspannungsteiler für volle, im Rücken abgeschnittene Blitzstossspannung

**Hersteller**  
*Manufacturer* Haefely Trench AG, Basel

**Typ**  
*Type* RCR 1600

**Fabrikat/Serien-Nr.**  
*Serial number* 540 455

**Auftraggeber**  
*Customer* Müller, Meyer und Schulze KG  
D - 80205 Taufkirchen




**Auftragsnummer**  
*Order No.* WO 701 001

**Anzahl der Seiten des Kalibrierscheines**  
*Number of pages of the certificate* 3

**Datum der Kalibrierung**  
*Date of calibration* 20.03.97

Dieser Kalibrierschein dokumentiert die Rückführung auf nationale Normale zur Darstellung der Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI).  
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Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.  
*This calibration certificate documents the traceability to national standards, which realize the units of measurement according to the international System of Units (SI). The Deutscher Kalibrierdienst is signatory to the multilateral agreement of the European cooperation for Accreditation of Laboratories (EAL) for the mutual recognition of calibration certificates. The user is obliged to have the object recalibrated at appropriate intervals.*

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<b>Stempel</b> <i>Seal</i>	<b>Datum</b> <i>Date</i>	<b>Leiter des Kalibrierlaboratoriums</b> <i>Head of the calibration laboratory</i>	<b>Bearbeiter</b> <i>Person in charge</i>
	23.03.97	 Dr. V. Karius	 M. Pfannkuch

Haefely Trench AG, Lehenmattstrasse 353, P.O. Box, CH-4028 Basel/Schweizland  
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## Conditions at site



# On-site

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