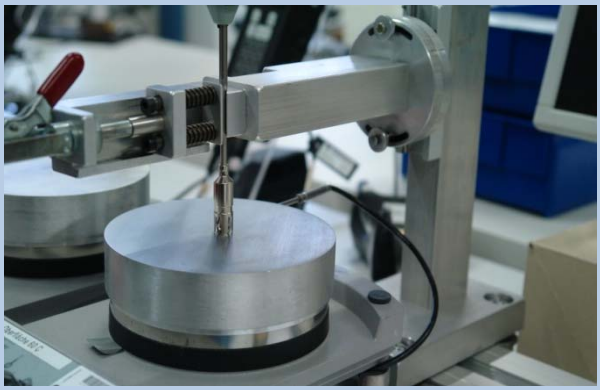
testo industrial services

Calibration equipment



Why calibrate?

Calibration and test equipment management are nowadays essential for the manufacturing quality and efficiency as they help to avoid rejects and rework. Therefore, a variety of standards and regulations, e.g. the ISO 9000 regulations, ISO TS 16949, GMP, HACCP, etc. require a quality assurance system with an integrated test equipment management and a regular calibration of the underlying devices. Product liability laws also determine that quality-related measurements must always be carried out with a suitable and faultless measuring device. Only a systematic monitoring, regular calibration and complete documentation can protect companies from claims for compensation.
Every company is faced with the question if a calibration is performed by an external service provider or if a calibration is carried out by the company itself. If calibrations are done by yourself it is crucial to choose the suitable calibration equipment to maintain precise and reliable measuring values. Testo industrial services - with its experience as DIN EN ISO/IEC 17025 accredited laboratory for many years - help you to choose the appropriate calibration equipment for your measuring instruments. In this brochure you will find calibration equipment, accessories and certificates for the calibration of different parameters, e.g. for temperature, humidity, pressure and velocity devices and probes.

Unique scope of Accreditations (according to DIN EN ISO/IEC 17025)

DAkkS Deutsche Akkreditierungsstelle

The DIN EN ISO/IEC 17025 is an internationally valid standard which helps a company to safeguard the competence of a calibration laboratory. The processes and measurement results of such laboratories are accredited by an officially and internationally recognized and independent organization. The responsible organization in Germany is the “Deutsche Akkreditierungsstelle“ (German Accreditation Body) called DAkkS. Take advantage of our large experience with different calibration equipment and use the possibility to have your references calibrated in our accredited laboratories. Please feel free to contact us for further support!

Calibration certificates

We offer a huge variety of DAkkS and ISO calibrations for equipment and reference measuring instruments by which traceability to the national standards and SI-units are guaranteed. In this brochure you will on the one hand find calibrations at determined standard calibration points, on the other hand we also offer additional and individually selectable calibration points on request. In this way you can ensure a customized solution for your applications and requirements.

Furthermore, Testo industrial services offer industry-specific seminars and calibration trainings where topics such as the measuring uncertainty of the underlying calibration and equipment are dealt with.

ISO Certificate


testo industrial services
Kalibrier-Zertifikat Calibration certificate Muster 0620 0071

DAkkS Certificate


testo industrial services
akkreditiert durch die / accredited by the
Deutsche Akkreditierungsstelle GmbH
als Kalibrierlaboratorium im / as calibration laboratory in the
Deutschen Kalibrierdienst
DKD
Kalibrierschein Calibration certificate
Kalibrierzeichen Calibration mark
EMuster
D-K-15079-01-01
2010-07
Gegenstand Object: Digitalmultimeter
Hersteller Manufacturer: HEWLETT PACKARD
Typ Type: 3458A
Fabrikat/Serien-Nr. Serial number: 2823A 12345
Auftraggeber Customer: Max Mustermann, DE-12345 Musterstadt
Auftragsnummer Order No.: 12345678
Datum der Kalibrierung Date of calibration: 08.07.2010
Datum Date: 08.07.2010
Leiter des Kalibrierlaboratoriums Head of the calibration laboratory: Dipl. Phys. E. Sander
Bearbeiter Person in charge: Stefan Jurgeit

Temperature

The detection of temperature is very important for many processes in the industry, which is why temperature is the most frequently measured parameter. Depending on the application there are various possibilities to perform the measurement. Also during the calibration of the temperature devices the different procedures have to be considered. Immersion probes are usually checked in a calibration bath and dry block calibrators are often used for air probes. Heating plates will be applied for surface probes and infrared measuring instruments are usually calibrated with the help of black bodies.

Thermator

Multifunction temperature calibrator from testo industrial services

In order to cover all of the various methods of a temperature calibration, usually many different calibrators would have to be provided. However, a device which can be operated in all 4 modes is the Thermator, a multifunction temperature calibrator made by testo industrial services. The user of the Thermator can choose between 4 different operating modes (liquid bath, dry block, infrared and surface). Easy and fast handling is ensured by specific inserts, which can be quickly exchanged with the help of the removal tool supplied. Thus, a fast change from one operating mode to another is guaranteed. For the operating modes dry block, infrared and surface the calibration range is from -20°C to +150°C. In the liquid bath mode calibrations can be conducted in the range from -35°C to +160°C. The Thermator is suitable for laboratory use as well as for applications onsite. With a tare weight of approximately 12 kg and the transport trolley the Thermator can be transported easily. Additionally, a new cup insert for the liquid bath mode is available since February 2012, which further facilitates an easy and comfortable change between the operation modes. In this way the silicone oil can be easily taken out along with the cup insert and using the drain pump becomes dispensable. Thus, an even faster and more efficient operation of the calibrator is possible.
The cup insert can also be retrofit and upgraded for instruments that have been purchased with the sensor basket only.*

* Please note that a new adjustment regarding the bath function is required in this case.

Thermator – multifunction temperature calibrator

Your benefits:

- Temperature calibrations in 4 different operating modes (Liquid bath, Dry Block, Infrared, Surface)
- Suitable for onsite applications and in laboratories
- Operating range from -20° C to +150° C and -35° C to +160° C (Li)
- Flexibility due to inserts, new cup insert facilitates faster, more comfortable exchange between the operating modes
- Infrared and surface calibrations in negative temperature range
- Surface: High accuracy due to immediate proximity of test specimen, external working standard and control sensor
- Use of external control sensor allows for accurate set point control
- Programmable ramp funtion
- RS 485 interface, USB interface on request

Technical data

Type		Thermator
Operating range of control sensor temperature at 25°C ambient temperature with water with silicone oil with dry block insert with infrared insert with surface insert	°C	 0…100 -35…160 -20…150 -20…150 -20…150
Accuracy (with external control sensor) * as liquid bath as dry block calibrator as infrared black body source as surface temperature calibrator	K	 +/- 0,1 +/- 0,3 +/- 1 +/- 1,2 to 100°C +/- 1,5 > 100°C
Stability (time, with external control sensor) * as liquid bath as dry block calibrator as infrared black body source as surface temperature calibrator	K	 +/- 0,05 +/- 0,05 +/- 0,3 +/- 0,2
Resolution		between -9,99…99,99 resolution 0,01°C otherwise 0,1°C
Temperature control		with PID controller
Temperature display		4 digit, 7 segment LED 7mm high red = current temperature green = set point temperature
Display unit		°C or °F (optional)
Operating temperature	°C	0...50
Humidity in the operating area		30...95% rH non-condensing
Dimension without handle W x H x D	mm	210 x 425 x 300
Weight	kg	12

***** Exception: liquid bath only possible with internal control sensor

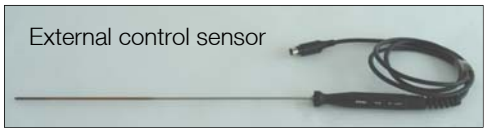
Order information

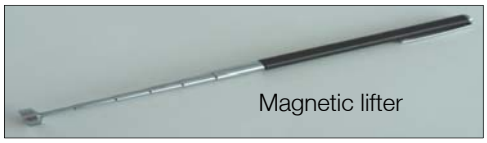
Thermator	Order number
Multifunction temperature calibrator	0519.0901

Accessories	Order number
Transport trolley	0519.0902

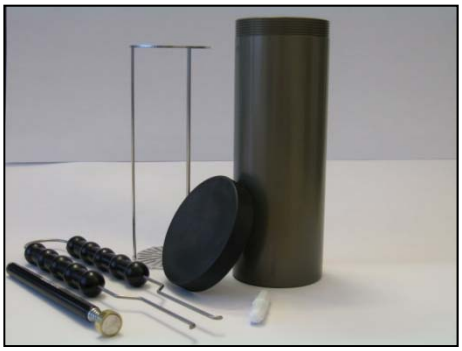
Accessories (as replacement)	Order number
Silicone oil	0519.0903
External control sensor	0519.0904
Sensor basket for liquid bath	0519.0905
Retrofit set for liquid bath with cup insert	On request
Infrared insert	0519.0906
Surface insert	0519.0907
Dry block insert	0519.0908
Magnetic stirrer	0519.0909
Magnetic lifter	0519.0910
Sliding rail / fixation	On request

Scope of delivery
Approx. 1liter – 350 ml silicone oil
1 external control sensor
1 insert basket
4 inserts Cup insert with seal, cover, glass disk, filled with approx. 350 ml oil (IR, SU, 1 dry block insert with 7 standard bore holes (Ø 2 / 3x 3,5 / 2x 4,5 / 6 mm) individual bore holes on request)
2 magnetic stirrers
1 magnetic lifter





Cup insert



Scope of delivery retrofit set

Calibration refrigerated and heating baths from Julabo

These high-precision calibration baths are suitable for calibrations of temperature sensors, measuring instruments and thermometers according to national and international standards at the highest level. They conform to the requirements specified by the DIN ISO 9001. The calibration baths have a temperature chamber with overflow at maximum liquid level. By the help of a pump the calibration liquid is conducted through the chamber into the thermostatic bath. Based on this overflow principle, highest temperature stabilities (up to ± 0,005°C) and homogeneities (better than ± 0,01°C) can be reached.

FK30- SL

FK31-SL

Technical data

Type		FK30-SL	FK31-SL
Working temperature range	°C	-30...200	-30...200
Temperature stability	°C	±0.005	±0.005
Heater capacity	W	2000	2000
Cooling capacity at 20 °C	W	460	460
Pump capacity Flow rate Pressure Suction	 l/min bar bar	 22-26 0,7 0,4	 22-26 0,7 0,4
Filling volume	liters	14	24
Bath opening/-depth W x L /D	cm	Ø = 12 / 17	Ø = 12 / 31
Order number		0519.0838	0519.0840

Refrigerated/ heating circulators from Julabo

There are three device series with different bath sizes and equipment features available. The listed circulate thermostats are able to cool down to -28°C and to heat up to +200°C and are suitable for external temperature applications as well as for temperature applications directly in the baths. These baths comply with the requirements for laboratories accredited according to ISO/IEC 17025 and can be used for ISO and DAkkS calibrations with high accuracy.

F12-MA

F25-MA

MA-4

Technical data

Type		F12-MA	F25-MA	MA-4
Working temperature range	°C	-20...200	-28...200	20...200
Temperature stability	°C	±0.02	±0.02	±0.01
Heater capacity	W	2000	2000	2000
Cooling capacity at 20 °C	W	160	260	-
Pump capacity Flow rate Pressure	 l/min bar	 11-16 0,45	 11-16 0,45	 11-16 0,45
Filling volume	liters	4,5	4,5	4,5
Bath opening/-depth W x L /D	cm	13 x 15/ 13	12 x 14/ 14	13 x 15/ 15
Order number		0519.0832	0519.0831	0519.0833

Accessories for liquid baths

Bath liquids

JULABO *Thermal* bath liquids have been carefully selected and proven in long-term service. The liquids are optimally suitable for temperature applications in the baths and ensure a safe and reliable operation. The selection of the suitable bath liquid is relevant for optimal temperature results. Viscosity, oxidation behaviour and heat conductivity of these thermal liquids are especially designed for the operation with JULABO baths.

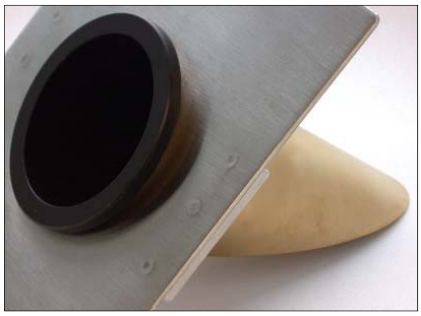
Thermal H5

Technical data

Accessories bath liquids		Thermal H5	Thermal H20S	Thermal HY
Working temperature range	°C	-50…+105	0…+220	-80…+55
Quantity	liters	5	5	5
Order number		0519.0834	0519.0835	0519.0838

Further liquids (ranges) on request.

Infrared calibration insert



Technical data

Accessories		Infrared calibration insert
Temperature range	°C	-20…+80
Order number		0519.0805

Temperature block calibrators from WIKA

WIKA temperature block calibrators enable a simple and economic calibration of electrical and mechanical thermometers. They work with temperature-controlled metal blocks and interchangeable inserts. Thermometers with different diameters can be adapted to the calibrator using customized bore holes in the insert. The device concept combines a stable heat source with a precise Pt100 temperature measurement. For this reason temperature probes can be calibrated more efficiently. The calibrators are easy to handle and can be used either in the laboratory or for onsite calibrations.

CTD 9100-165/ -450/ -650

CTD 9300-165/ -650

Technical data

Type		CTD 9100 -165	CTD 9100 -450	CTD 9100 -650	CTD 9300 -165	CTD 9300 -650
Temperature range	°C	-30…+165	+40…+450	+40…+650	-30…+165	+40…+650
Stability	°C	±0,05	from 0,05	from 0,05	±0,01…±0,02	±0,03…±0,09
Accuracy	°C	from 0,15	from 0,3	from 0,3	from 0,1	from 0,3
Block holes	mm	Ø 28	Ø 60	Ø 28	Ø 28	Ø 28
Block depth	mm	150	150	150	150	150
Interface		RS 485	RS 485	RS 485	RS 232	RS 232
Dimensions (W x H x D)	mm	215 x 305 x 425	150 x 270 x 425	150 x 270 x 400	160 x 320 x 420	160 x 320 x 420
Weight	kg	11	7,5	8	10	10
Order number		0519.0806	0519.0807	0519.0808	0519.0810	0519.0811

Order information

Accessories	For type	Order number
Robust transport case	CTD-Series	0519.0814
Inserts and bore holes	CTD-Series	0519.9999

Scope of delivery
1 insert (6,5 mm)
Removal tool
Operating instructions

! Please order the inserts of the calibrator individually (Indication of the diameter: 0,5mm + diameter of the probe; diameter from 1,5 to max. 22mm in 0,5 mm steps)

Surface temperature

In principle a surface temperature can be measured in two different ways. One possibility is to use a contact surface probe (e.g. a cross-band or mushroom cap probe) and the other possibility is to measure contactless with pyrometers.
For contactless calibrations (infrared) the Thermator from Testo industrial services is ideally suited (you will find further information on page 2 and page 3 in this brochure).

Surface heating plate from IKA

IKA heating plates with an aluminium surface can be accurately and safely heated. It is also possible to connect a contact thermometer for the high-precision temperature control to ensure a reliable measurement. They are suitable for surface measuring probes from +50...310°C

RCT basic IKAMAG

Fixation

Technical data

Type		Surface heating plate for contact surface probes
Measuring range	C°	+50…+310
Measuring surface	mm	150
Order number		0519.0804

Order information

Accessoires	Order number
Aluminium surface plate	0519.2000
Fixation	on request
Rail (different lengths available)	on request

Humidity

One of the most difficult parameters that are measured in the industry is the relative humidity. This value describes the amount of water contained in the air. The value is called “relative” because the amount depends on the respective temperature. The warmer the air, the more water can be contained in it.

Huminator

Mobile humidity generator from testo industrial services

Using the HUMINATOR you can quickly and easily calibrate humidity measuring instruments, probes and data loggers from various manufacturers. The HUMINATOR provides a good performance because a special front panel makes a calibration of 4 humidity probes at the same time possible. It is also possible to calibrate various data loggers. A temporal programmable function allows for an automation of the calibration, as 3 humidity-/temperature values can be automatically approached one after another. With the help of a peltier element the integrated temperature controller stabilizes the temperature in the range from +15°C…+40°C. Relative humidity is quickly generated in the range from 5…95% rH.

Huminator- mobile humidity generator

Calibration of a data logger

Trolley

Technical data

Type		Humidity generator – Huminator
Temperature range	°C	+15…+40
Humidity range	% rH	5…95
Accuracy of probe	°C	±0,2
Accuracy of probe	% rH	±1 (10…85 at 25°C)
Spatial distribution	°C	±0,5
Spatial distribution	% rH	±2 (10…85 at + 25°C)
Stability	°C	±0,2 (10…85 at +25°C)
Stability	% rH	±1 (10…85 at +25°C)
Dimensions (D x W x H)	mm	350 x 470 x 200
Weight	kg	14,5
Interface		RS 232
Order number		0519.0801

Order information

Accessories	Order number
Transport case (plastic)	0519.0820
RS 232 interface cable	0519.0821
Additional drying container incl. drying reagent	0519.0822
Additional drying reagent	0519.0823
Front plate (without bore holes)	0519.0888
Front plate (with standard bore holes)	0519.0889
Front plate (with individual bore holes)	0519.0890
Refill bottle	0519.0891
O-ring seal (seal for front plate)	0519.0892
Adapter for testo 177-H1	0519.0824
Adapter flexible 5-12 mm	0519.0825
Adapter 21 mm	0519.0826
Adapter 12 mm	0519.0827

Pressure

In many industrial sectors the parameter pressure is of high importance. During a pressure measurement a current pressure is compared with a reference pressure. In the pressure measurement technology there are 4 different pressure types (absolute-/ over-/ negative and differential pressure). With the Pneumator it is possible to measure various pressure types and to calibrate pressure instruments with highest precision.

Pneumator

Mobile pressure calibrator and measuring instrument from Testo industrial services

The precision of measuring technique is becoming increasingly significant; especially where the accuracy of measuring devices is being tested: at the calibration! However, not all pressure or differential pressure calibrations can be conducted in a laboratory – for instance dismounting of the test object is often not possible. The Pneumator fulfils both requirements: it can be used not only for stationary applications (in a laboratory), but also as a mobile calibrator. In addition to this, it also serves as a precision measuring instrument for onsite measurements, combining highest accuracy with reliable battery operation.

Pneumator – mobile pressure calibrator

Your benefits:

- Use as calibrator or measuring instrument
- Highest accuracy even in the lower Pa range
- Long-term battery operation for mobile applications
- High zero point stability due to automatic adjustment
- Fast provision of differential and relative pressures in calibration mode
- Programmable pressure sequences
- Wide selection of pressure, volume flow and flow velocity units

Technical data

Type		Pneumator
Measuring range/ pressure range	hPa	4 types (1, 10, 100, 1000)
Measurement principle		inductive differential pressure measurement
Operating modes		Calibration (manually or with programmed sequences), measuring (pressure, velocity, volume flow), zeroing, venting, Pressure-Tightness test
Measurement inaccuracy		0,3% of scale. ± 1 Digit (measurement range 1 hPa) 0,1% of scale ± 1 Digit (measurement range 10, 100, 1000 hPa)
Linearity		0,2% of scale ± 1 Digit (measurement range 1 hPa) 0,1% of scale ± 1 Digit (measurement range 10, 100, 1000 hPa)
Hysteresis		0,1% of scale max.
Temperature drift int. Reference sensor		Zero point: 0,03% of scale/K (0% by zero point adjustment) Span: 0,03% of scale/K
Resolution Pneumator 1 hPa Pneumator 10 hPa Pneumator 100 hPa Pneumator 1000 hPa		 0,01 Pa 0,001 hPa or 0,1 Pa 0,01 hPa or 1 Pa 0,1 hPa or 10 Pa
Zero point adjustment		automatic (at settable intervals), manual (ZERO button)
Long-term stability		0,5% of scale per year (max.)
Working temperature range	°C	+10...+40
Storage temperature range	°C	-10...+70
Usable pressure and measurement range	%	-10...110
Specified pressure and measurement range	%	0...100
Overpressure protection		When exposed to overpressures higher than 125% of range, the internal reference sensor is separated from pressure and vented
Pressure units		Pa, kPa, hPa, bar, mbar, psi, inH2O, inHg, mmHg, Torr
Velocity/volume flow units		m/s, km/h, fpm, mph, m3/h, l/s, lpm, cfm
Media		Air, non-aggressive, non-corrosive gases
Pressure connection	mm	6,6 x 11 (hoses D=6 mm).

Supply		24 V DC/ 1A internal accumulator, charges automatically upon net supply Minimum use: 8h
Interface		USB
Dimensions without handle (H x W x D)	mm	102,6 x 257x 271
Weight	kg	4,6

Order information

Pneumator	Order number
Pneumator (1 hPa)	0519.0816
Pneumator (10 hPa)	0519.0817
Pneumator (100 hPa)	0519.0818
Pneumator (1000 hPa)	0519.0819

Accessories	Order number
Transport case	0519.0849
ISO calibration certificate, 5 measuring points	0520.0025
DAkkS calibration certificate max. 11 measuring points	0520.0215

Scope of delivery
1 wide-range mains unit
1m silicone hose

Pressure measuring systems from WIKA

Product quality, reliability and cost-effectiveness are often directly or indirectly dependent on accurate pressure measurements. However, the period and type of exposure have a specific influence on the reliability of a pressure device. Certainty that the measured pressure value complies with the actual pressure and that the deviation of the pressure device is within the tolerance can only be guaranteed by a regular calibration. The process calibrator CPH6000 from WIKA is especially suitable for calibrations because of its high accuracy.

Process calibrator CPH6000

CPH6000

Technical data

Type		CPH6000
Measuring range	mbar bar	from 0 ... 250 to 0 ... 6.000 (depending on reference pressure sensor CPT 6000)
Accuracy	%	0,025 (Depending on reference pressure sensor CPT 6000)
Function range		min-/max-memory, min-/max-alarm, tare, offset correction
Signal input		0 / 4…20 mA, 0… 1 / 5 / 10 V (of device under test)
Digital interface		RS 232, USB via adapter cable
Order number		0519.0878

Order information

Accessories	Type	Order number
Pressure sensor 0…0,25 bar	CPT 6000	0519.0879
Pressure sensor 0…10 bar	CPT 6000	0519.0880
Pressure sensor 0…25 bar	CPT 6000	0519.0881
Pressure sensor 0…250 bar	CPT 6000	0519.0882
Pressure pump -0,95...+35bar, pneumatic	CPP 30	0519.0883
Pressure pump 0…1000 bar, hydraulic	CPP 1000-L	0519.0880
Transport case		on request

Further measuring ranges/ accessories on request.

Velocity

The basic requirement for calibrating velocity measuring instruments and probes is a defined air flow. For this purpose different wind tunnels are used e.g. small, portable tunnels as well as large, highly accurate tunnels for calibrations in the laboratory.

Mini wind tunnel

The Testo mini wind tunnel is used for regular checks on velocity probes and measuring instruments in your company. All Testo velocity probes can be checked by the mini wind tunnel (except vane probes with a diameter of 100mm).

3 speed levels can be set: 2,5 m/s; 5m/s und 10m/s

Technical data

Type		Testo mini-wind tunnel
Measuring range	m/s	2,5 / 5 / 10
Nozzle diameter	mm	Ø 100
Dimensions (W x H x L)	mm	190 x 310 x 610
Order number		0554.0450

Westenberg wind tunnels

Westenberg Engineering, headquartered in Cologne, Germany, is a leading provider for wind tunnels of any size mainly used for the calibration of velocity probes. Westenberg Engineering is specialized for manufacturing wind tunnels for highly accurate calibrations in wide measuring ranges which is why their wind tunnels are used worldwide especially by National institutes.

Westi Box

Technical data

Type		WK 818035-E
Nozzle diameter	mm	180
Length measuring sect. effective	mm	215
Width measuring sect. effective	mm	160
Contraction relation		4
Velocity	m/s	0,3…30
Intensity of turbulance	%	<1
Connection ventilator		400 V / 16 A
Motor power (DC motor)	Kw	0,75
Dimensions W x H x L	mm	about 620 x 1670 x 2450
Rpm deviation	%	lower than 0,1 of indicated
Order number		0519.0897

Further wind tunnels on enquiry

Reference Type		Westi Box
Measuring rage	m/s	0,8…45 (1,2% accuracy of full scale)
Measuring range 4 differential pressure probes	Pa	25/ 100/ 400/ 1600 (0,4% accuracy of full scale)
Measuring range barometrical pressure probe	mbar	0…1600 (0,5% accuracy of full scale)
Measuring range rel. humidity	% rH	5…98 (2,5% rH accuracy)
Measuring range temperature probe	°C	-40…60 (0,2°C accuracy)
Sample rate	kS/s	48
Dimensions W x H x L	mm	364 x 150 x 391
Order number		on request

hiplabo — testo — industrial services

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