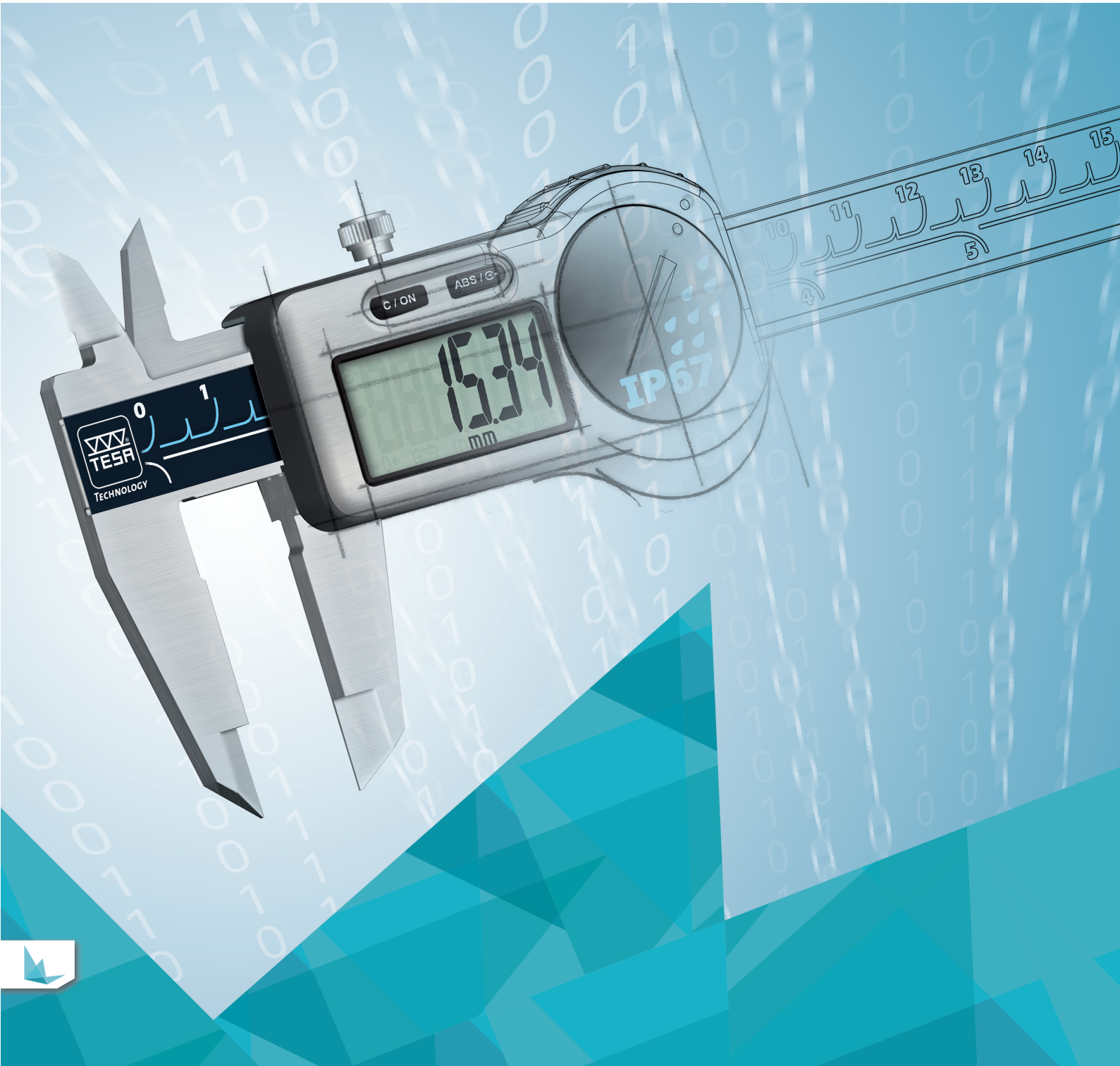
HEXAGON
MANUFACTURING INTELLIGENCE

TESA
TECHNOLOGY

GENERAL CATALOGUE

Precision Measuring Instruments

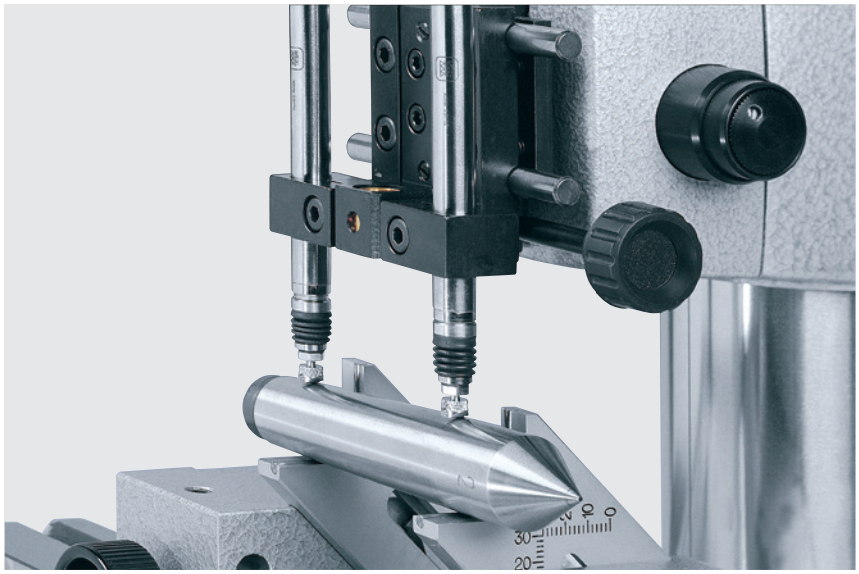
Quality drives productivity



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Bore measurement with a TESA IMICRO internal micrometer



Measurement of difference between two inductive probes



Squareness verification with inductive probe and TWIN-T10 display

Dear Customers and Partners,

This catalogue reflects the image of TESA today. It is a company with solid roots in precision metrology that has been able to follow the trend of the times with cutting-edge technologies. Today, just as yesterday, TESA precision measuring instruments and solutions help customers to improve their quality control and increase their productivity.

Over the years, TESA has become the home for many renowned brands such as Brown&Sharpe, COMPAC, MERCER, ROCH, ETALON and INTERAPID. All these brands have added a great value and have shaped what TESA products today stand for: a unique blend of high excellence metrology tools with strong reputation for quality, reliability and durability.

TESA is today part of Hexagon Manufacturing Intelligence. As a leading, metrology and manufacturing solution specialist, the company's mission is to give customers the confidence to increase production speed and accelerate productivity while enhancing product quality. All the products in the Hexagon Manufacturing Intelligence portfolio support this objective in three areas – sensing, thinking and acting. Sensing: generating large quantities of accurate measurement data. Thinking: transforming that data into actionable information. Acting: applying corrections to the manufacturing process based on this information.

Going beyond the boundaries of traditional gauging tasks, TESA products smoothly integrate into the complete manufacturing solutions offered by Hexagon through advanced connectivity systems and software interfaces. They enable better use of data through integration with analytic systems like statistical process control (SPC) software and can help businesses to embrace Industry 4.0 principles.

We hope that this catalogue will inspire you to find new and better solutions to your measurement challenges.

Stefan Ruh
TESA Managing Director
Hexagon Manufacturing Intelligence

TESA – 75 YEARS OF TECHNOLOGY



1941 2016

Since its foundation 75 years ago, TESA has distinguished itself in the market through its unique expertise in micromechanics, precision machining and dimensional metrology.

With its roots and headquarters in Renens, Switzerland, a region well known for watchmaking, precision engineering and research, TESA has always been dedicated to precision, quality and the sustainability of its products.

Today as part of Hexagon Manufacturing Intelligence, TESA is a modern firm with an international footprint operating globally. Our measuring instruments help customers around the world find solutions for their metrology challenges, improving their quality control and increasing their productivity.

www.tesatechnology.com
www.HexagonMI.com

PASSION FOR PRECISION

Renowned TESA flagship products, like CCMA dial callipers, the UNIMASTER large dimension gauge, TESATAST level indicators, the IMICRO internal micrometer and our 1D probes – just to name a few – have been a standard in workshops for many decades.

With the evolution of digital communication, TESA made the next step and introduced TESA Link Connector (TLC) and wireless module. This allows today's TWIN-CAL calliper to be equipped with a unique TLC, as easily as replacing the battery cap of the device, enabling bidirectional communication between the instrument and the computer. Data can be sent directly to software, turning single data-points into actionable information.





TESA Height Gauges are world market leaders in their class. With their versatility and accuracy, they are in many cases an easy to use and cost-efficient alternative to coordinate measurement machines (CMMs).

TESA is also a manufacturer of tactile and non-contact probing solutions for CMMs. Available through the worldwide sales network of Hexagon Manufacturing Intelligence, these products represent the high end of technical capabilities in sensing.

To maintain the value of our customers' investments, TESA pays exacting attention to customer support services. Our offering includes the core services of calibration, maintenance and repair. An SCS certified calibration lab, qualified for measurement uncertainties down to 0,02 µm, provides certification for measurement tools where accuracy and reliability matters.

Understanding that precision is not only a result of the right tool but also of environmental influences, we offer technical assistance for applications, product selection and installation as well as training from basic metrology up to specialist measurement tasks.

Our product customisation offering will help you to find solutions that go beyond the capabilities of standard tools.



Customer Service and Technical Support organisation TESA
Email us at tesa.service@hexagon.com
Call us on +41 21 611 18 40 – from 7.30 to 17.30 (CET)

QUANTITIES AND UNITS

International System of Units (SI)
F: Système international d'unités (SI)
D: Internationales Einheitensystem (SI)

Derived units (of measurement)
F: Unités dérivées
D: Abgeleitete Einheiten

	SI base unit	
Quantity	Name	Symbol
length	metre	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K
amount of substance	mole	md
luminous intensity	candela	cd

	Unit		Relationship to
Quantity	Name	Symbol	SI base unit
plane angle	radian	rad	1 rad = 1 mm 1 rad = 57,295 779 51°
frequency	hertz	Hz	1 Hz = 1 s^{-1}
force	newton	N	1 N = 1 m kg s^{-2}
pressure	pascal	Pa	1 Pa = 1 m^{-1} kg s^{-2}
power	watt	W	1 W = 1 m^2 kg s^{-3}
electrical potential	volt	V	1 V = 1 m^2 kg s^{-3} A^{-1}

Decimal multiples and submultiples of the base unit "metre"

Unit	Symbol		m	cm	mm	µm	nm
kilometre	km	1^3 m	1000 m		1 000 000 mm		
Metre	**m**	**1 m**	**1 m**	**100 cm**	**1 000 mm**	**1 000 000 µm**	
decimetre	dm	10^{-1} m	0,1 m	10 cm	100 mm	100 000 µm	
centimetre	cm	10^{-2} m	0,01 m	1 cm	10 mm	10 000 µm	
Millimetre	**mm**	**10^{-3} m**	**0,001 m**	**0,1 cm**	**1 mm**	**1 000 µm**	**1 000 000 nm**
tenth millimetre		10^{-4} m	0,000 1 m		0,1 mm	100 µm	100 000 nm
hundredth millimetre		10^{-5} m	0,000 01 m		0,01 mm	10 µm	10 000 nm
Micrometre	**µm**	**10^{-6} m**	**0,000 001 m**		**0,001 mm**	**1 µm**	**1 000 nm**
tenth micrometre		10^{-7} m	0,000 000 1 m		0,000 1 mm	0,1 µm	100 nm
hundredth micrometre		10^{-8} m	0,000 000 01 m		0,000 01 mm	0,01 µm	10 nm
Nanometre	**nm**	**10^{-9} m**	**0,000 000 001 m**		**0,000 001 mm**	**0,001 µm**	**1 nm**

Definition of the metre
F: Définition du mètre – D: Meterdefinition
"The metre is defined as the distance travelled by light in vacuum during a time of 1/299 792 458 of a second."
17th General Conference on Weights and Measures, 1983.

Reference temperature
F: Température de référence
D: Bezugstemperatur
For measuring instruments and workpieces, ISO R1 assesses this temperature is 20°C. The temperature of 20°C is assumed to be valid for any size, material measure, measurement result etc., unless otherwise specified.

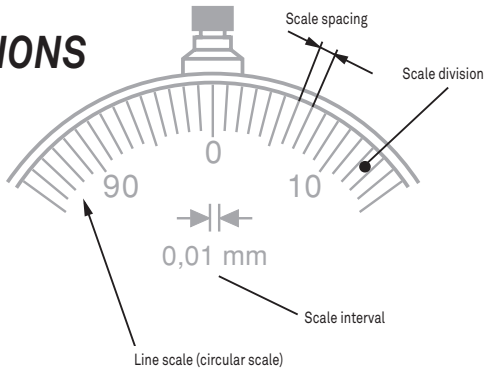
MEASUREMENT TASKS

Inspecting
F: Contrôler – D: Prüfen
Determining whether a test object complies with specified requirements (e.g. as regards both dimensions and form).

Measuring
F: Mesurer – D: Messen
Obtaining a value (e.g. length value) measured by comparison against a master standard (e.g. material measure).

Calibrating
F: Etalonner – D: Kalibrieren
Establishing the actual deviation of a measuring instrument from desired value. This is usually done through measurement operations. The result of a calibration is documented in the form of a calibration certificate and can be used later on for adjustment purposes, for instance.

INDICATION RELATED DEFINITIONS



Indication

F: Indication – D: Anzeige

The indication, which provides the information about the measured value, is directly perceptible by human senses. It may be optical, acoustic or based on any other output feature.
Displaying devices may either have a digital, analogue or any other special indication.
For material measures, the indication matches displayed value.

Note: According to the standards, the terms "analogue" and "digital" are only used to differentiate the methods of measurement. Therefore, they should not be used for the definition of the indications.

Scale indication

F: Indication de l'échelle – D: Skalenanzeige

Scale indication is the readable position of a scale mark.

Line scale

F: Echelle à traits – D: Strichskale

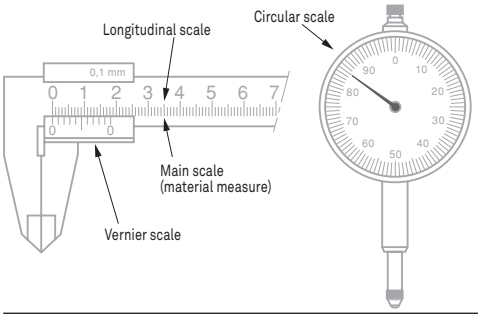
A line scale is the successive number of graduation (scale marks) on a scale.

Scale spacing

F: Longueur d'une division (d'échelle)
D: Teilstrichabstand

Scale spacing is expressed in length units as the distance between two successive scale marks measured along the same line by a marker (e.g. the end of a pointer).

Line scales



Scale division

F: Division d'échelle (échelon) – D: Skalenteil

Part of a scale between two successive scale marks.

Scale interval

F: Echelon, valeur d'une division (d'échelle)
D: Skalenteilungswert

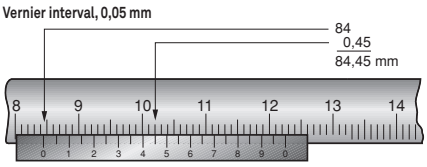
The scale interval is the difference between the values matching two successive scale marks. This characteristic is expressed in the units marked on the scale.

Vernier interval

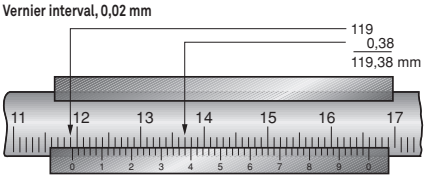
F: Valeur du vernier – D: Noniuswert

The vernier interval is the alteration of the value of a measurand, which in turn changes the indication by one scale division of the vernier scale.

Vernier interval, 0,05 mm



Vernier interval, 0,02 mm



Numerical (digital) indication

F: Indication numérique
D: Ziffernanzeige

The numerical indication is shown in the form of a digit (succession of digits).

Numerical scale

F: Echelle numérique– D: Ziffernskale

A numerical scale is a succession of digits (usually 0 to 9). On a multi-scale, the single numerical scales are arranged side by side in a decimal fraction.

Numerical division

F: Pas (échelon) numérique – D: Ziffernschritt

The numerical division is the difference between two successive digits from their last position on a numerical scale.

Numerical interval

F: Valeur du pas (échelon) numérique
D: Ziffernschrittwert

The numerical interval is the alteration by one numerical value of the indication. This characteristic, which matches the scale interval, is expressed in the units of the measurand.

METROLOGICAL DEFINITIONS

Range of indication

F: Etendue d'indication – D: Anzeigebereich

The range of indication lies between the highest and lowest display values of a measuring instrument.

Measuring range

F: Etendue de mesure – D: Messbereich

The measuring range of an indicating device is the range within which the measured values cannot exceed the maximum permissible errors. For tools having several measuring ranges, these errors may vary from a range to another.
The measuring range may well be contained within the related whole range of indication.

Measuring span

F: Champ de mesure – D: Messspanne

This span equals the difference between both first and last values of the measuring range as specified.

Displacement range

F: Etendue de déplacement – D: Verstellbereich

Measurand related extent within which the measuring range can be moved.

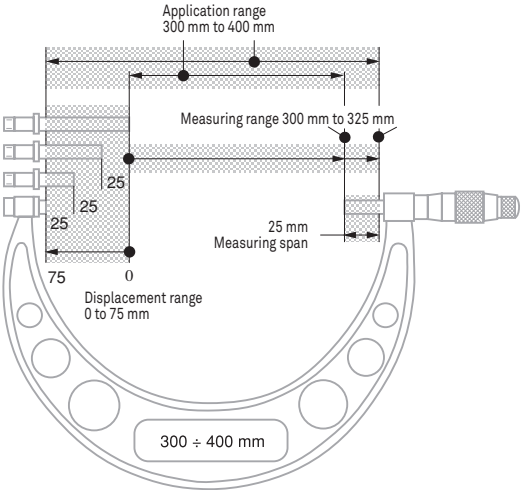
Application range

F: Etendue d'application

D: Anwendungsbereich

The application range is equal to the sum of both displacement and measuring ranges.

Note: The first and last values make each range different from one another.



Measurand

F: Mesurande – D: Messgröße

Physical quantity of a measurement. In other words, the measurand is the length or the angle as measured or to be measured.

Measured value

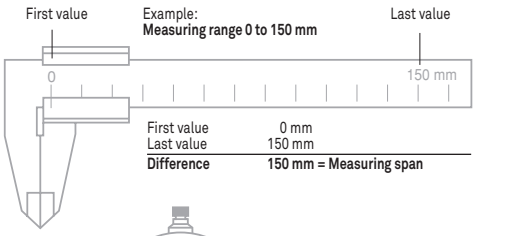
F: Valeur mesurée – D: Messwert

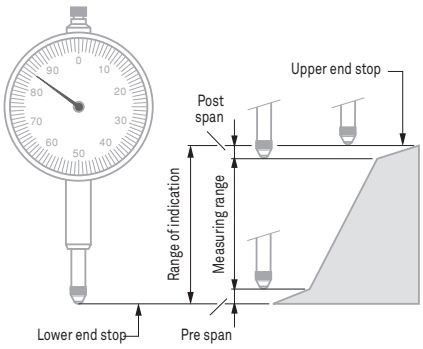
Any measured value expresses the result of a measurement. Therefore, this value is directly associated with the measurand and further allocated to the output feature (e.g. display) of a measuring instrument or device.
A measured value is expressed as the product of both numerical value and unit.
The measured value includes the true value plus the random and systematic errors of the relevant tool.

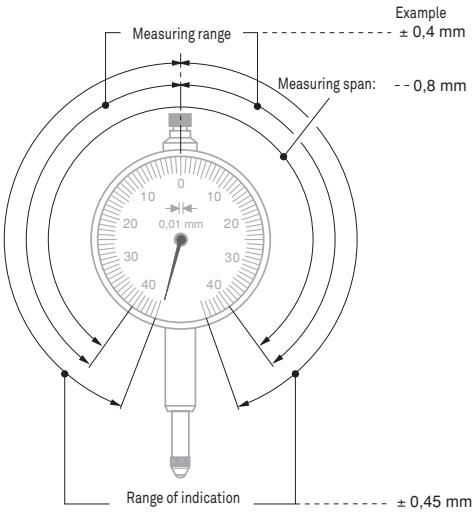
Result of measurement

F: Résultat de mesure – D: Messergebnis

Product of a measured value once corrected on the basis of the known systematic errors.
This result is further increased by the uncertainty of measurement, which includes the random as well as any unknown systematic error.







Permissible limits of a metrological characteristic MPL

F: Limites tolérées d'une charactéristique métrologique MPL

D: Grenzwerte eines Messtechnischen Merkmals MPL

Extreme permissible values of a metrological characteristic of a given measuring equipment, according to specifications or standards of the manufacturer or others.

Maximum permissible errors for a metrological characteristic MPE

F: Erreurs maximales tolérées d'une charactéristique métrologique MPE

D: Grenzwerte für Messabweichungen für ein messtechnisches Merkmal MPE

Extreme values of the permissible error for a metrological characteristic of a given measuring equipment, according to specifications or standards of the manufacturer or others.

Repeatability

F: Fidélité (répétabilité)

D: Wiederholpräzision

Ability of a measuring instrument to repeat the results obtained from the same measurand successively measured in the same direction, also under the same conditions. Repeatability, which delivers important information for the assessment of the uncertainty of measurement, is quantitatively expressed as standard deviation of dispersion values.

Repeatability limit

F: Fidélité (répétabilité) limite

D: Wiederholgrenze

Extreme value for repeatability.

Maximum permissible errors G

F: Erreurs maximales tolérées G

D: Fehlergrenzen G

These errors are assimilated to the "Permissible limits of a metrological characteristic MPL". Being related to both upper and lower highest deviations of a measuring instrument, they are usually symmetrical in practical metrology and, therefore, stated as single value, without any sign.

Deviation span of indication

F : Champ d'erreur d'indication

D: Abweichungsspanne

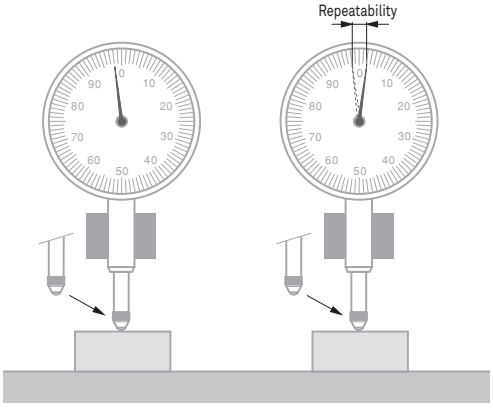
This deviation span matches the distance from the highest to the lowest point of a coordinate as shown on the relevant diagram. The value obtained is either applicable to whole or the local measuring span or measuring range. All required measurements are carried out in one direction (without reversal of the measuring force) – i.e. with upward plunger movement for a dial gauge. For those needed to establish the whole deviation span, they are performed in both directions (with reversal of the measuring force) – i.e. with upward and downward movement of the plunger for a dial gauge.

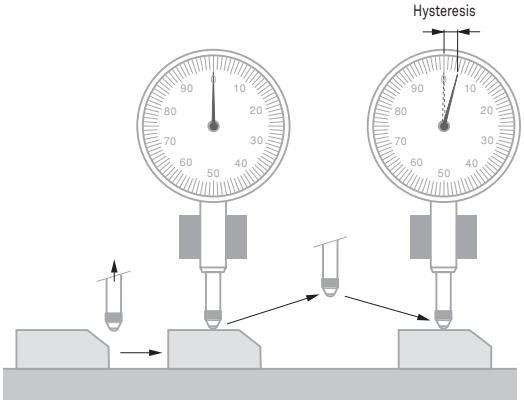
Hysteresis

F: Hystérésis

D: (Messwert-) Umkehrspanne

Hysteresis expresses the difference between various indications of a measuring instrument. This value is achieved through measurements of the increasing/decreasing value of the same measurand, taken under the same conditions. Hysteresis, which is quantitatively stated as standard deviation of value dispersion, can be determined anywhere within the measuring span or range. Its amount can also be obtained from the diagram of the deviation span as a whole.





DECISION RULES FOR PROVING CONFORMITY OR NONCONFORMITY WITH SPECIFICATIONS

Relationship with the uncertainty of measurement

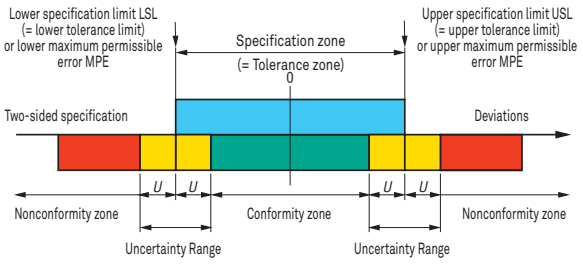
ISO 14253-1, which is a part of "Geometrical Product Specification GPS", provides "Rules for establishing the conformity or nonconformity with specifications". These rules are valid for "Inspection by measurements of workpieces and measuring equipment".

This ISO standard makes allowances for the uncertainty of measurement – or more precisely for the true uncertainty of any measurement whenever the conformity or nonconformity with a given specification must be proved. So, for a workpiece, the specification matches a preset tolerance while being equal to the maximum permissible errors for a metrological characteristic (MPE) for a measuring instrument.

Any given specification is a constant, whereas the measurement uncertainty is a variable which is affected by many components. Therefore, the zone of conformity or nonconformity depends on the size of the effective expanded uncertainty U.

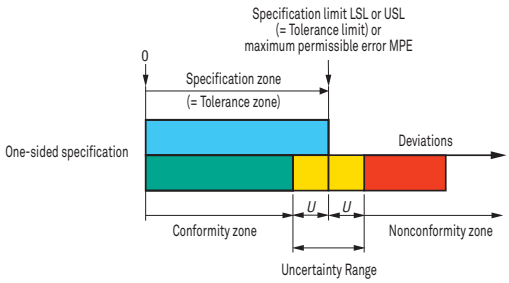
Rule for proving conformity

*Conformity is proved when the **measurement result y is lying within the specification zone, reduced on either side by the expanded uncertainty U**. Consequently, workpieces or measuring instruments can be accepted as far as their conformity with the specification is proved by the manufacturer (supplier).*



Rule for proving nonconformity

*Nonconformity is proved when the **measurement result y is lying beyond the specification zone, increased on either side by the expanded uncertainty U**. In such a case, the relevant measuring instruments can be rejected if the purchaser (customer) gives evidence of its non-conformance.*



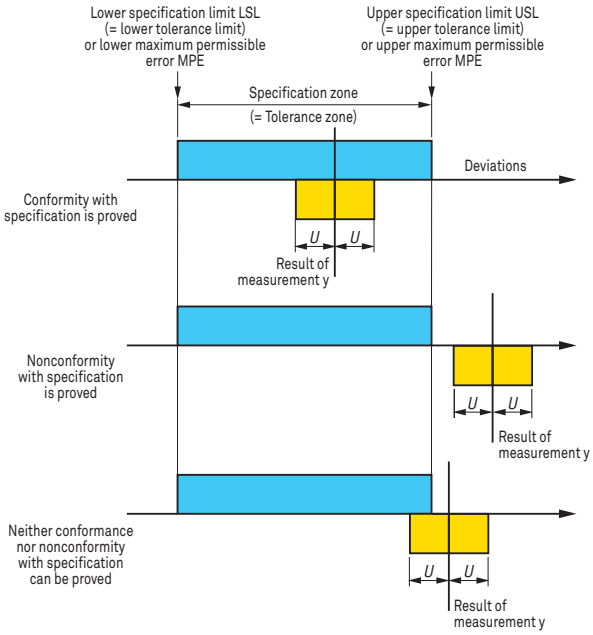
Neither conformity nor nonconformity can be proven

*This often happens when the **measurement result y associated with the expanded uncertainty U includes either of the LSL or USL specification limits.** As a result, workpieces or measuring instruments can neither be automatically accepted nor rejected.*

For such "dead end cases", it is advisable to follow the rule below.

– Repeat all measurements based on a reduced uncertainty, so that conformity or nonconformity can clearly be demonstrated. Usually, proceeding in this way benefits to the party that's able to provide the needed proof.

– Come to a mutual agreement providing the procedure to be applied if such cases arise.

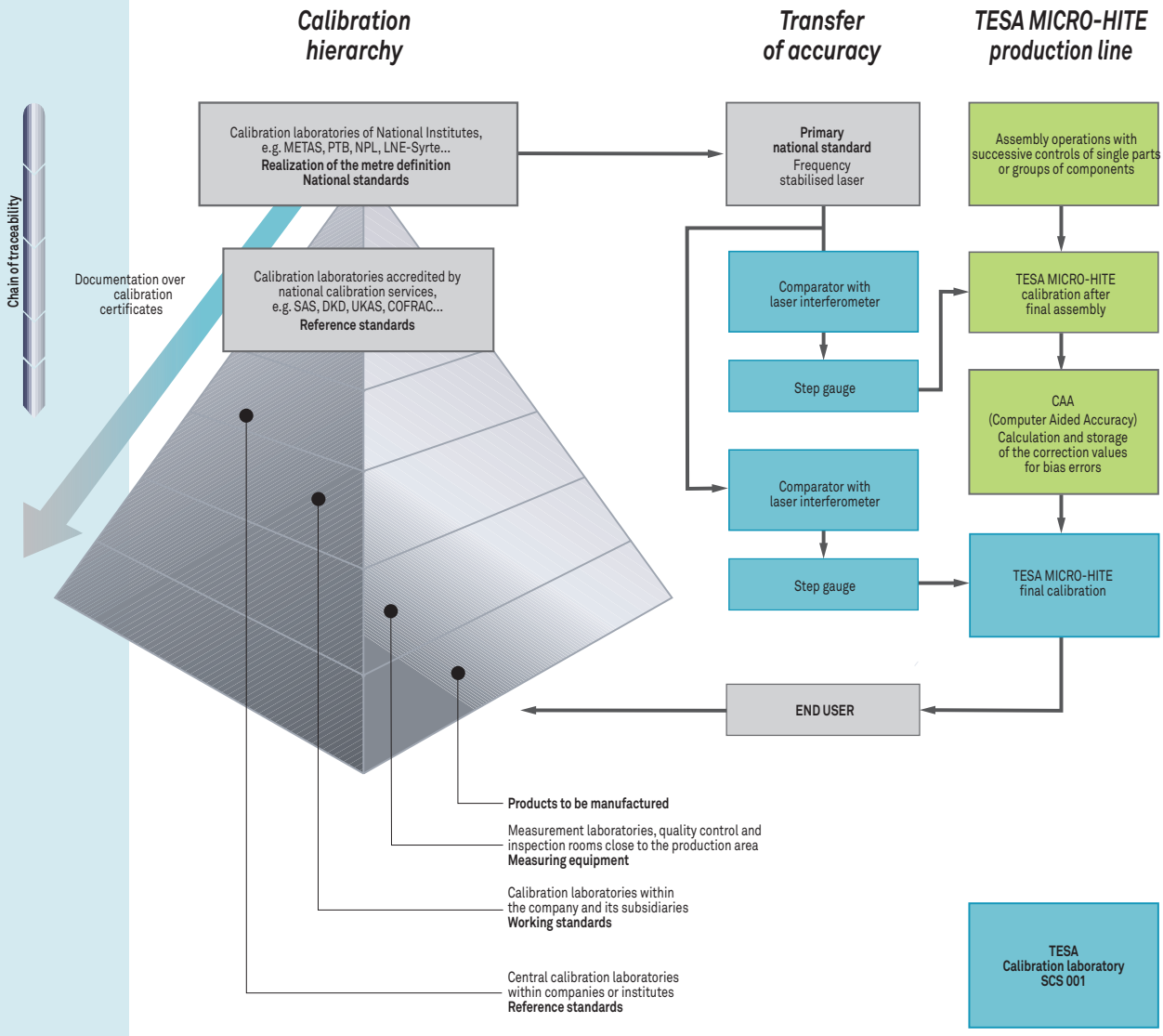


TRACEABILITY TO NATIONAL STANDARDS

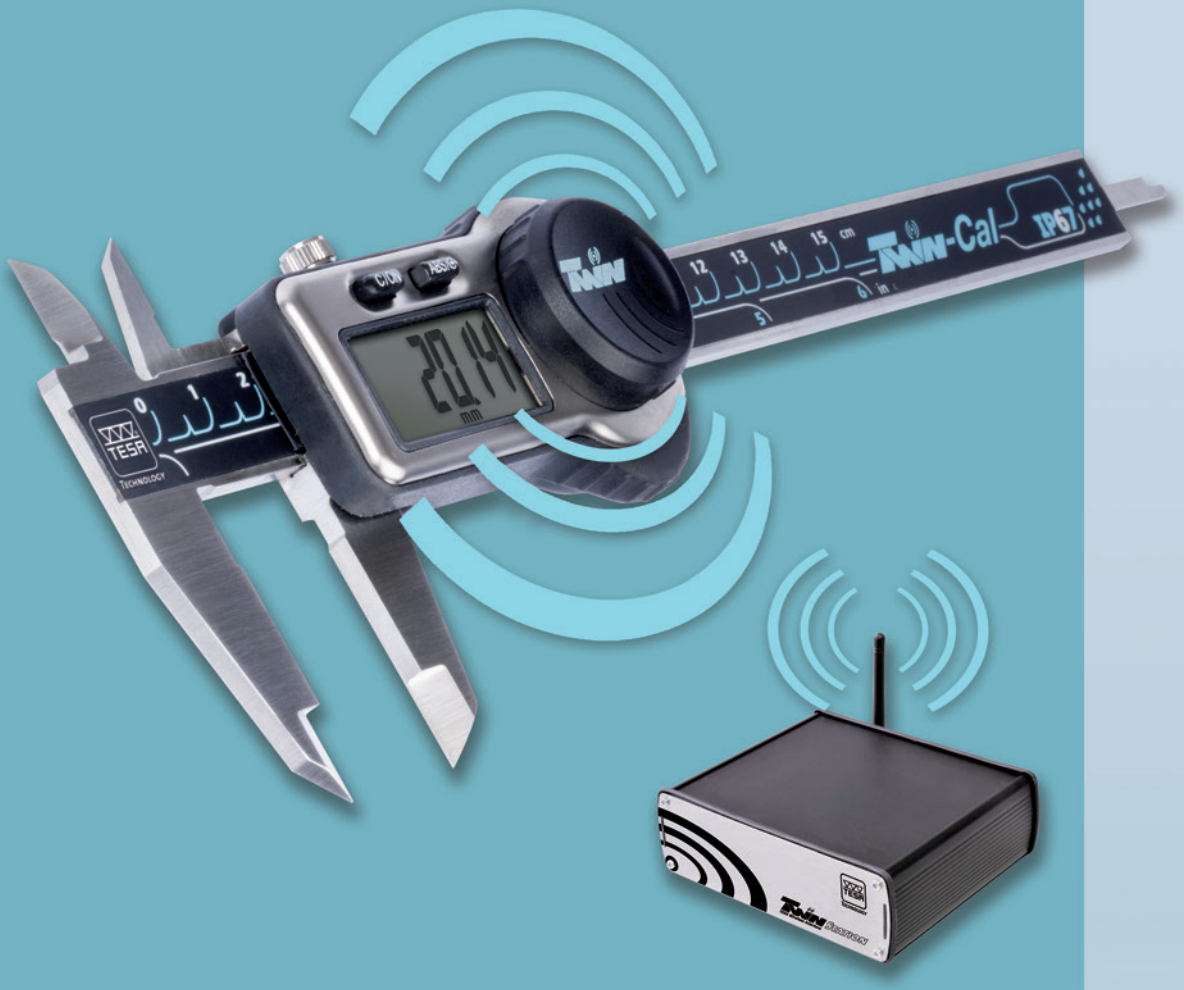
All measuring equipment consistently used on our production site is traceable to national standards or reference fixtures through our quality management system.

Traceability is established by recalibration at regular intervals with documentary evidence as specified in the standards.

The illustration that follows shows the hierarchy of calibrations within the chain of traceability. The example set for the transfer of accuracy to our MICRO-HITE height gauges also shows how they are calibrated. Each feature is supplied with a free SCS calibration certificate issued by our laboratory, which is officially accredited by the Swiss Calibration Service.



Connectivity

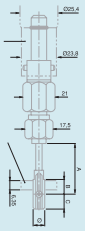


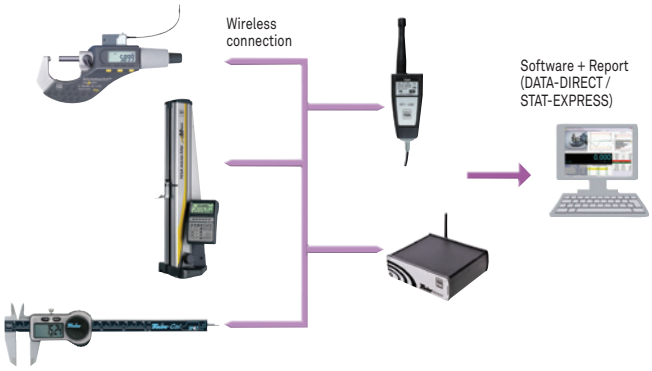


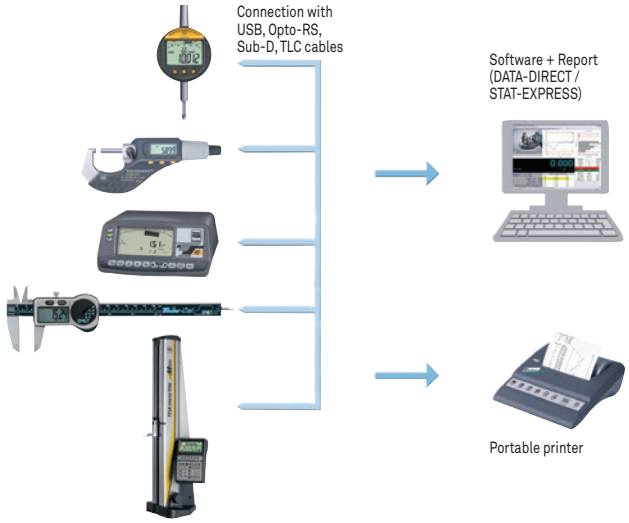


TESA SOFTWARE, CABLES AND LINKS FOR THE TRANSFER OF MEASURING RESULTS.

Inspection, traceability and cost reduction have a growing significance in all industrial sectors. This requires not only high quality metrology instruments, but also software suitable for evaluation and further analysis of the measurements carried out.

PRODUCTION		INSPECTION		EVALUATION	ARCHIVING	
						TESA DATA-DIRECT List of measurements, archiving, customised results calculations, traceability, statistics.
						TESA STAT-EXPRESS Statistical analysis of measurements, control charts, traceability and sharing of results.
						TESA PRINTER SPC Simple statistics, without the need for a PC, documented traceability.
		Measuring instrument		Software or portable printer	Database Electronic file (PDF) Printed report	





TESA offers various types of connection between measuring instruments and a PC as well as software for the management of results so that the production process can be optimised, quality improved and documents for traceability can be created.

DATA-DIRECT Software

DATA-DIRECT software is an easy way to collect and report results in real time from the majority of the measuring instruments in the TESA range that have a data output.

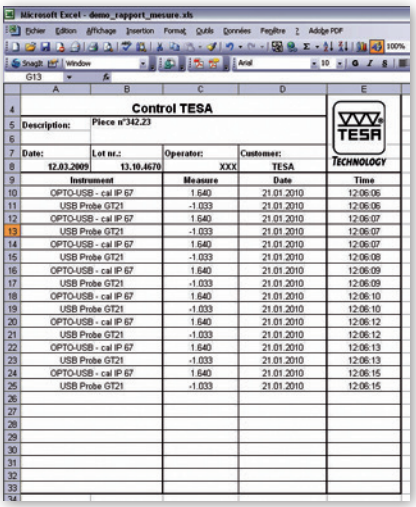
DATA-DIRECT is supplied not only with serial input/output drivers specially configured for TESA's products, but also for those purchased from other manufacturers. It works effectively to give data transfer for your data sheets, database, statistical modules or any other Windows-based applications.

With this user-friendly software you will be able to create your own reports for component inspection.

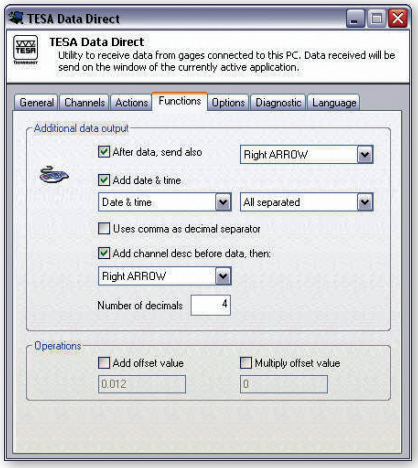
Minimum system requirements to run DATA-DIRECT:

- Pentium 4 or equivalent
- 512 MB RAM (live memory)
- 10 GB HD
- Windows XP, Windows 7 (32 or 64 bits) or Windows 8 (32 or 64 bits)

Please contact your TESA representative or an authorised distributor for a 30-day demo version.



List of measured values within a third party software, e.g. MS Excel



Tab function providing the facility to present the measured values



DATA-DIRECT: main window



Customisable tool bar



Real time display of the measured value in a separate window

		Included in delivery
04981001	DATA-DIRECT Software and dongle	TESA DATA-DIRECT installation CD with licence key (dongle) USB and user instructions (PDF version)

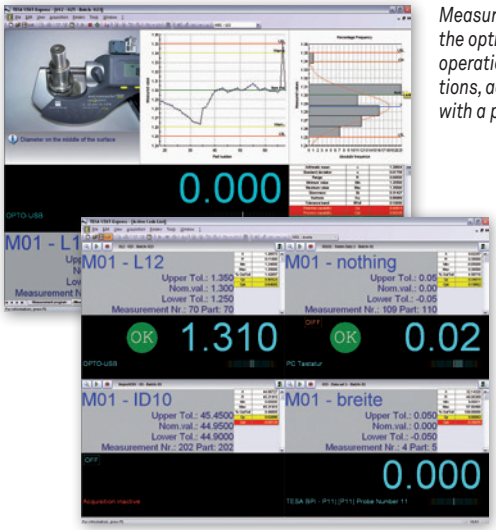
	TESA DATA-DIRECT Software
TESA Instruments compatible with DATA-DIRECT	Opto-RS Cables – Opto-USB Cables – Height gauges (TESA-HITE, MICRO-HITE) – USB probes – Surface roughness gauges RUGOSURF 10 / 20 / 10G / 90G – TPS presetting bench – BPX probe interface – TWIN-STATION wireless probe interface – TESA wireless systems – TLC-TWIN wireless transceiver
Other instruments compatible with DATA-DIRECT	Custom made instruments with RS232 output – Instruments from other makers: Mitutoyo: DMX3 - DMX8 – Steinwald single 6 – Etc.
Functions	Export of results to .csv file – ASCII commands – Real time dispay of measured results on a PC (except for models using the Rf-USB receiver)

STAT-EXPRESS Software

STAT-EXPRESS is a dedicated software package that enables the application of quality assurance into your manufacturing processes. It allows the downloading, reporting, transfer and storage of your quality-oriented control charts.

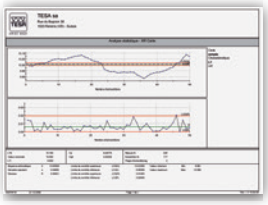
STAT-EXPRESS is compatible with all TESA's products – from calipers through to CMM or Vision machines. As an integrated software tool, STAT-EXPRESS provides the flexibility required for easy data transfer from most of the electronic gauges currently available on the market.

STAT-EXPRESS offers the ability to create reports including measured values obtained from a single instrument or several handtools, assign tolerances, calculate statistics, print out various measurement reports, compute XR control charts, and much more.



Measuring display with the option of adding operational instructions, accompanied with a photo or drawing

Simultaneous data acquisition from several measurement programmes



XR Control chart

Minimum system requirements to run STAT-EXPRESS:

- Pentium 4 or equivalent
- 512 MB RAM (live memory)
- 10 GB HD
- Windows XP, Windows 7 (32 or 64 bits) or Windows 8 (32 or 64 bits)

Please contact your TESA representative or an authorised distributor for a 30-day demo version.



Detailed measuring report for each feature measured

Detailed measuring report for each part measured, together with serial number

		Included in delivery
04981002	STAT-EXPRESS software and dongle	TESA DATA-DIRECT installation CD with USB licence key (dongle) and user instructions (PDF version)

	STAT-EXPRESS Software
TESA instruments compatible with STAT-EXPRESS	Opto-RS cables – Opto-USB cables – Height gauges (TESA-HITE, MICRO-HITE) – USB probes – Surface roughness gauges: RUGOSURF 10 / 20 / 10G / 90G – TPS presetting bench – BPI Probe interface– BPX probe interface – TWIN-STATION wireless probe interface – TESA wireless systems – TLC-TWIN wireless emitter-receiver
Other instruments compatibles with STAT-EXPRESS	Custom made instruments with RS232 ouput – Instruments from other makers: Mitutoyo: DMX3 - DMX8 – Steinwald single 6 – etc.
Features	DATA-DIRECT included – Export of results to .csv file – Import of .csv files – Table of all measured results – XR control charts – Report by part measured – Report by feature measured – Simultaneous data acquisition – Overall report with statistics – Measuring report in .pdf or .html format etc.– Security protection set for each user

USB Accessories: Adaptor Sub-D 9pm/USB, Multiplexer USB, Foot Switch USB



S47120002



S47120003



04761071

		L, m	Connector (to PC or system)
S47120002	USB-D-Sub 9p/m adapter cable	0,1	USB
S47120003	USB multiplexer with 7 USB 2.0 ports. with external power supply, Max 4x 04761062 and 04761063.		USB
04761071	USB footswitch. For simultaneous data request from DATA-DIRECT or STAT-EXPRESS software of all connected instruments	2	USB

TESA Portable SPC PRINTER

TESA portable intelligent printer designed for the inspection of finished parts or incoming goods – Provides SPC statistics and prints out measurement results with graphical representations.

The TESA SPC PRINTER can be connected not only to TESA measuring instruments, but also to those provided with a DIGIMATIC output – Your TESA SPC PRINTER is capable of recognising the plug in tool and will execute the appropriate configuration automatically.



TESA SPC Printer

- 180 x 180 x 84 mm (W x D x H)
- Paper width: 110 mm. Print mode: 40 signs/line
- RS232 for data inputs (9-pin male, trapezoid connector) DIGIMATIC (Ansley connector, 10-pin) Connector with mini-jack for remote triggering of data transfer
- Mains adapter 100 to 240 Vac, 6,6 Vdc. Optional accessory: 6 V rechargeable battery pack.
- IP40 (IEC 60529)
- EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2

- Memory capacity : 9999 single values for one feature per sample.
- Two operating modes: “Normal” and “Tolerance”.
- Limits of size quickly set on the display of the connected instrument with subsequent transfer to TESA PRINTER SPC.
- Output of statistical values printed out with graphical representations.
- Output of reports with headings to be filled in by the operator.
- Hardcopies printed in preferred language (English, German, French, Italian or Spanish).
- Battery-powered (6 V) printer unit for use on the move (optional).

06430000	SPC PRINTER EU Portable. With memory, SPC, value classification and graphs. RS232 interface
DELIVERED WITH THE FOLLOWING ACCESSORIES:	
04765013	Roll of printer paper, width = 110 mm for TESA SPC Printer
04761054	Mains adapter /battery charger 100 ÷ 240 VAC 50 ÷ 60 Hz, 6,6 Vdc, 750 mAh supplied without cable
04761055	EU Mains cable for 04761054 adapter
OPTIONAL ACCESSORIES:	
04761056	USA Mains cable
04768035	Battery charger 6V, 0,5AH

	"Normal" Mode	"Tolerance" Mode
Lower size limit (min.)	–	●
Upper size limit (max.)	–	●
Tolerance	–	●
Number of values taken:		
number of samples	●	●
< smallest dimension	–	●
> largest dimension	–	●
% out of tolerance	–	●
Lowest value listed	●	●
Highest value listed	●	●
Dispersion R	●	●
Arithmetical mean	●	●
Standard deviation sn, sn-1	●	●
Indication of capacity Cp, Cpk	–	●
Graphical representations: Position of each single value within the tolerance zone (10 classes)	–	●
Graphical representations: Histogrammes	–	●
Display (LED) - Classification of the value measured: Green for pass, yellow for rework,red for reject	–	●

1 x CR2032 3,0 V, 230mAh

12 months. Can be influenced by battery level.

EN 61326-1
EN 61000-4-3
ROHS, according to 2002/95/CE
EMC, according to 2004/108/CE
DEEE, according to 2002/96CE
REACH 1907/2006
ETSI EN 300 440 – 2 (CH et EU)
CFR and FCC 15.249

Wireless Connection for TWIN-STATION Receiver

The ultimate in flexibility and freedom of movement.

TESA TLC-TWIN wireless technology offers the flexibility of a hand tool thanks to bidirectional communication made possible by an instrument equipped with a TLC (TESA Link Connector) also compatible with the:

- TLC-TWIN-emitter/receiver station
- TLC-USB connecting cable
- TLC-Digimatic connecting cable.

*** The sale of the TLC-TWIN is currently restricted to EU countries, Switerland USA and Canada
*** Please contact TESA for further information.

Up to 48 instruments can be managed by the TWIN-STATION receiver over a maximum range of 12 m.

The IP67 degree of protection of an instrument is preserved, even when the TLC-TWIN is connected.

When a visual check that the measured result has been sent to the computer is not possible, an indication on the display of the instrument enables the user to confirm that the result has been sent and received.



TESA IP67 caliper used with a TLC-TWIN



TLC-TWIN Wireless emitter-reciever (04760180)

NO		Operating range, m	Compatible with connector	Diameter, mm	Weight, g
04760180	TESA TLC-TWIN wireless emitter-receiver. Compatible with any instrument fitted with a TLC (TESA Link Connector)	~ 12 (dependent on conditions)	TLC (TESA Link Connector)	Ø 28	~ 10
OPTIONAL ACCESSORIES:					
05030012	TWIN-STATION BPW Probe box				
04981001	DATA-DIRECT software and dongle				
04981002	STAT-EXPRESS software and dongle				

TWIN-STATION Receiver

TWIN-STATION: Receiver for wireless TLC-TWIN emitter-receiver units

Receives input signals from wireless TLC-TWIN emitter-receiver units

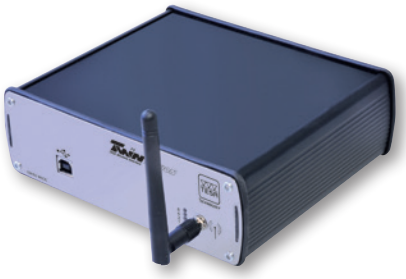
Output signals – digital, RS232

- Direct connection to a PC via the USB port.
- Optimal use for your measuring tasks as up to 48 instruments equipped with TLC-TWIN can be connected to this unit.
- Great reliability.

*** the sale of TWIN-STATION is currently limited to EU countries, Switzerland, USA and Canada
*** Please contact TESA for further details.



TWIN-STATION (front view)



TWIN-STATION (rear view)

NO		Number of instruments with TLC-TWIN	Power supply	Weight, kg
05030012	TWIN-STATION for TLC-TWIN wireless data transmisson	48	Power supply via: - USB port of the PC - connected USB hub - USB hub of the BPX interface	0,85

- Housing case in aluminium
- Power supply via the connection of the USB cable: - directly to the PC (USB Port) to a mains powered USB hub
- IP 40 (IEC 60529) (DIN 40050)
- IEC/EN 61326-1 U.S. 47 CFR part 15, subpart B, Class B digital device
- Data transfer delay from digital serial output (USB): depends on the operating system of the computer.
- RS232
- 55 x 172 x 155 mm (H x W x D)
- USB Cable 1, 80 m
- For a temperature of 20° C and a relative humidity of ≤ 50%: Digital output: ± (0,05 + 0,15% of the measuring range)

Transfer of Results with TESA LINK CONNECTOR TLC

TESA presents its new connectivity concept: the TLC connector that allows freedom of movement, flexibility, and ease of use, all combined.
Once an instrument is equipped with a TLC connector:
1) There is no longer any need to choose between a model with or without data output.
2) There is inbuilt compatibility for both cable and wireless connectivity.
3) A TLC connector can also be used for connection to a USB interface, a DIGIMATIC interface or for wireless connection, using a suitable cable or emitter-receiver unit, see table below:

Instrument equipped with a TLC connector. For example, TESA TWIN-CAL IP67 caliper



Wireless connection	**Cable connection**	
TLC-TWIN Two way wireless emitter-receiver unit	**TLC-USB** Two way communication cable	**TLC-DIGIMATIC** Two way communication cable
		
+	+	+
TWIN-STATION receiver base station for signals from the wireless TLC emitter-receiver unit	Interface with USB port	DIGIMATIC* interface
		
Personal computer		

* Please check with TESA for the list of equipment and instruments compatible with TESA-DIGIMATIC

OPTO AND SUB-D CONNECTION

Standard Opto Connection

Any connecting cable is defined by each of the connectors fitted at either end of the cable principally to suit the computer, and the measuring instrument being used. To achieve highest compatibility levels, TESA uses only standardized and proven connectors.

Examples of instruments with type Opto connector:

TESA-CAL IP67 / IP65 – TESA MICROMASTER – TESA IMICRO – TESA ALESOMETRE – TESA DIGICO 10 / 11 / 205 / 305 / 400 / 500 / 600 / 705 – TESATRONIC TT20 / TT60 / TT80 / TT90 – INTERAPID - Light

NO		L, m	Connection (to instrument)	Connection (to PC or system)
04761062	Opto-USB cable, duplex, bidirectional communication	2	Opto-RS232	Type A USB
04761046	Opto-RS cable, simplex, 2 m, one way communication: from the instrument to the PC	2	Opto-RS232	Sub-D 9p/f Simplex
S47010022	Opto-RS cable, simplex, 5 m, one way communication: from the instrument to the PC	5	Opto-RS232	Sub-D 9p/f Simplex
04761049	Opto-RS cable, duplex, 2 m, bidirectional communication	2	Opto-RS232	Sub-D 9p/f Duplex
S47010024	Opto-RS cable, duplex, 5 m, bidirectional communication	5	Opto-RS232	Sub-D 9p/f Duplex
04761027	Connecting cable without connector	2	Opto-RS232	Without connector



04761062



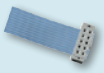
04761046



04761049



04761027

Current systems		Compatible connectors	
	=		
TESA PRINTER SPC		Sub-D 9p/f	Ansley 10p/f
	=		
Computer		USB	Sub-D 9p/f

Standard Sub-D Connection

RS232, Sub-D 9p/m connector connecting cables for the following machines or precision handtools:TESA MICRO-HITE /TESA-HITE / TESA-µHITE / TESA TG / 3D Machines



04761063



04761052



S47120002

NO		L, m	Connector (to instrument)	Connector (to PC or system)
04761063	Sub-D 9p/m to USB cable, 2M	2	Sub-D 9p/m	USB
04761052	Extension cable, Sub-D 9p/f to 9p/m, 2 m	2	Sub-D 9p/m	Sub-D 9p/f
S47010025	Extension cable, Sub-D 9p/f to 9p/m, 10 m	10	Sub-D 9p/m	Sub-D 9p/f
S47120002	Sub-D 9p/m to USB adapter cable	0,1	Sub-D 9p/m	USB

Connecting Cables from the Instrument to a PC or Computer Controlled System



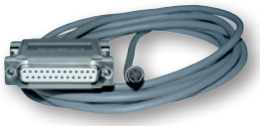
04760181



04760182



Instrument connection: special CLINOBEVEL



04761038



Instrument connection: special DIGICO 12



PC/system connection: Ansley 10p/f



Instrument connection: MiniDIN 8p/m



Instrument connection: Special for DIGICO 1 or 2

NO		L, m	Connection (to instrument)	Connection (to PC or system)
04760181	TESA TLC-USB CABLE for instruments with a TLC connector	2	TLC (TESA Link Connector)	USB
04760182	TLC-DIGIMATIC CABLE for instruments with a TLC connector	2	TLC (TESA Link Connector)	Ansley connector 10 pin/f
04761023	Cable: miniDIN 8p/m to Sub-D 9p/f, 2 m for TT10 and MICRO-HITE manual versions 10/11/12	2	MiniDIN 8p/m	Sub-D 9p/f
04761024	Cable: miniDIN 8p/m to Sub-D 25p/m, 2 m for TT10 and MICRO-HITE manual versions 10/11/12	2	MiniDIN 8p/m	Sub-D 25p/m
04761038	Cable: miniDIN 8p/m to Sub-D 25p/m for DIGICO 1 and 2, with powered display	3	Special connector for DIGICO 1 or 2	Sub-D 25p/f
S47078588	Cable for DIGICO 1 or 2 and TESA SPC printer	2	Special connector for DIGICO 1 or 2	Ansley connector 10 pin/f
04761060	RS232 cable with external power supply	2	Specially for DIGICO 12 and TESA IP65 electronic lever type dial test indicators	Sub-D 9p/f
03969007	RS232 Sub-D 9p/f to Sub-D 9p/f, 3 m cable for TESA-REFLEX MH3D, TESA-SCOPE	3	Specially for DIGICO 12 and TESA IP65 electronic lever type dial test indicators	Sub-D 9p/f
S53300165	USB Cable for CLINOBEVEL 1 L = 1,8 m	1,8	Special connector for CLINOBEVEL 1	USB
S53070174	USB Cable for CLINOBEVEL 2 L = 2,5 m	2,5	Special connector for CLINOBEVEL 2	Sub-D 9p/f

Hand / Foot Switches, Adapters, Battery Chargers, Power Cables



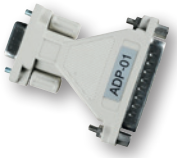
04768001



04768000



04761054



04761017



S47001891

NO		L, mm	Connection (to instrument)	Connection (to PC or system)
04768000	Hand switch for triggering data transfer. Jack plug, 1,8 m – to TESA SPC PRINTER – to TESATRONIC (TT) display units	1,8	–	Jack plug
04768001	Foot switch for triggering data transfer. Jack plug, 1,8 m – to TESA SPC PRINTER – to TESATRONIC (TT) display units	1,8	–	Jack plug
04761017	Adapter ADP-01 Sub-D 9pf to Sub-D 25pm		–	–
S47001891	DIGIMATIC adapter for 04761046 cable Sub-D 9p/m to Ansley 10p/f	0,2	–	Sub-D 9p/f or Ansley 10p/f
04761054	Mains adapter /battery charger 100 ÷ 240 VAC, 50 ÷ 60 Hz, 6,6 Vdc, 750 mAh, supplied without cable	2	DC-Jack	–
04761055	EU mains cable for 04761054	1,5	–	–
04761056	USA mains cable for 04761054	1,5	–	–
04761037	Mains cable 230V for DIGICO 1 or 2	2	Special connector for DIGICO 1 or 2	–
04761057	Mains cable 110V for DIGICO 1 or 2	2	Special connector for DIGICO 1 or 2	Sub-D 9p/f

Connecting Cables for RUGOSURF to PC or Printer

Connecting cables for RUGOSURF roughness gauges



04760099





058213



06960062 version 3



056109

04760099	Cable RUGOSURF 20 to PC
06960062	Cable RUGOSURF 10G and RUGOSURF 90G to PC (connector v3)
058213	Connecting cable RUGOSURF 20 to dot matrix printer
056109	Connecting cable RUGOSURF 10G and RUGOSURF 90G to dot matrix printer

Calipers





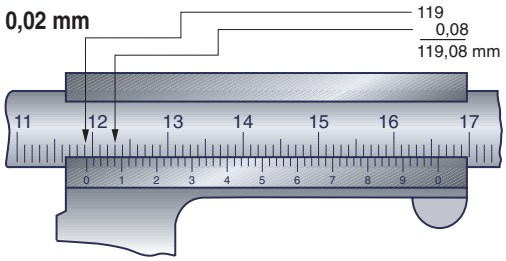
THE ESSENTIALS

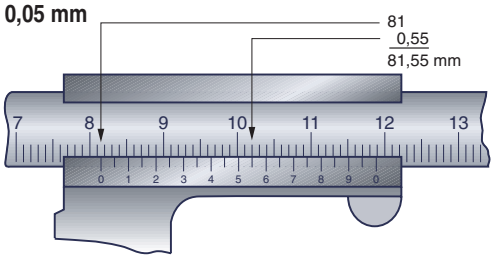
Calipers are the most popular length measuring instruments used worldwide. Owing to their simple construction, ease of handling and quick operation, they are a favourite for dimensional measurement. The wide variety of models available with specialised measuring faces make them universal hand-held tools.

All TESA, ETALON, INTERAPID branded calipers are recognised for their superior quality – and guarantee you precise measurement.
The flawless guide of the slider on the beam ensures silky-smooth operation whilst also preventing the measuring jaws from tilting.

The choice of material, subjected to precisely defined heat treatment as well as a robust design result in further distinctive advantages such as wear and corrosion resistance.

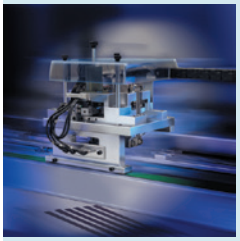
For quick and easy reading of measured values – one of the essential conditions for the assurance of your measurements – we offer conventional vernier models as well as dial models for easy reading and digital models for error-free reading.





		0,1 mm 0,05 mm		0,02 mm		0,01 mm
Chosen Length L mm		µm		µm		µm
50		50		20		20
100		50		20		20
150		50		30		30
300		50		30		30
400		60		30		30
500		70		30		30
600		80		30		30
700		90		40		40
800		100		40		40
900		110		40		40
1000		120		40		40
1200		140		50		
1400		160		50		
1600		180		60		
1800		200		60		
2000		220		60		

The max. permissible errors (G) are expressed by the equation given below, where the values should be rounded down to two decimal fractions (0,01 mm). These errors apply for measurements taken under the same measuring force. For all other measurements, including those performed with use of the depth foot, the values obtained have to be increased by 20 µm.
Calipers with dial or vernier reading to 0,1 or 0,05 mm :
$G = (20 + l / 10\ mm)\ \mu m \geq 50\ \mu m$
Calipers with analogue indication (scale or vernier reading to 0,02 mm) or digital indication :
$G = (22 + l / 50\ mm)\ \mu m$



ISO 13385-1

0,01 mm / 0.0005 in

LCD, 11 mm

Fixed zero

mm / in conversion

≤ 100 mm: 20 µm
>100 mm: 30 µm

10 µm

Scale with incremental divisions, inductive

2,5 m/s

TLC Connectivity

Stainless steel

Lithium battery, 3V, CR2032

12.000 hours

Standby mode after 10 minutes, instrument retains the zero position. Automatic shut off after 2 hours, instrument retains the zero in ABS mode, but the zero must be reset if the instrument is in DIFF mode.

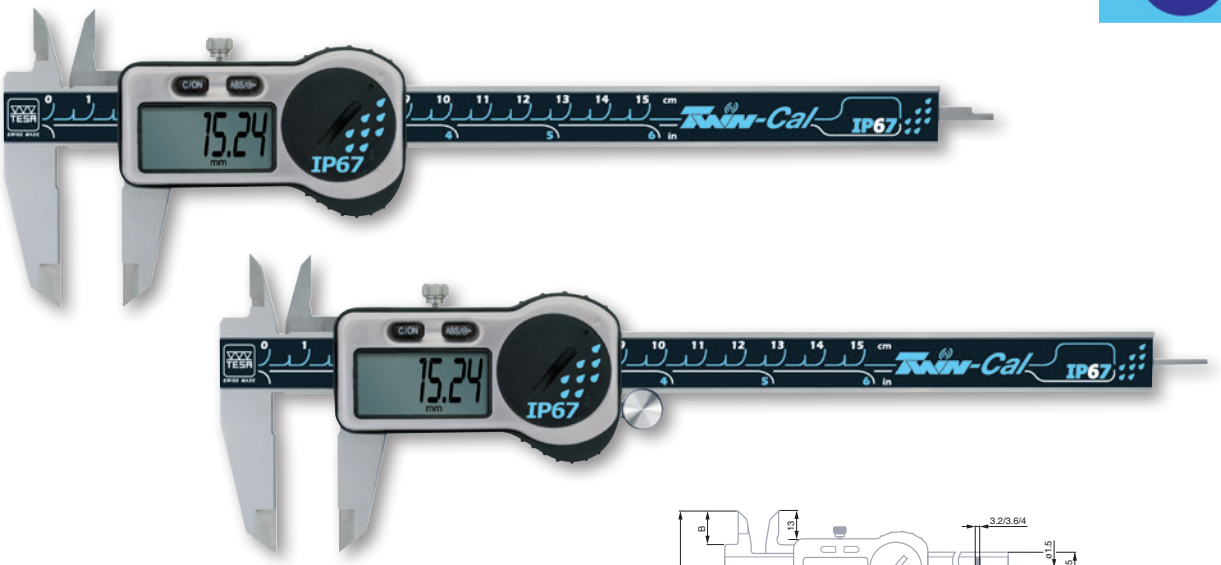
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2002/96/CE

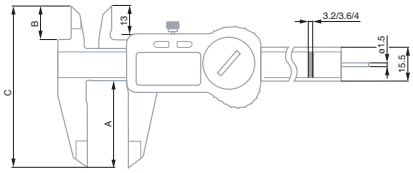
Inspection report and declaration of conformity

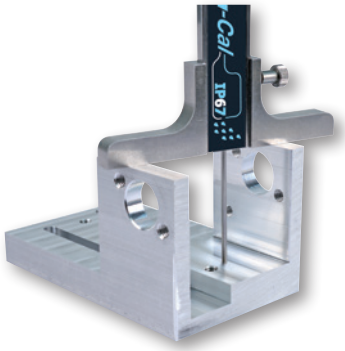
TWIN-CAL IP67

Welcome to the new generation of TESA electronic calipers, with the highest degree of protection ever offered.

The TWIN-CAL IP67 are all equipped with TLC (TESA Link Connector), the unique integral data output facility, providing the opportunity to upgrade your caliper at any time.









NO	mm	in	Drive system / Thumb Roller	A mm	B mm	C mm	g	Depth rod
00530319	150	6	–	40	16	74	150	Square
00530320	150	6	–	40	16	74	150	Round
00530321	150	6	With	40	16	74	150	Round
00530322	200	8	With	50	20	90	200	Square
00530323	300	12	With	64	22	106	280	Square

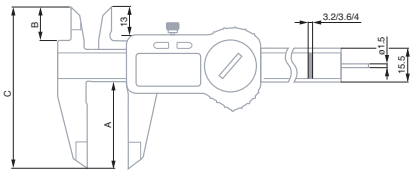
OPTIONAL ACCESSORIES:

00560013	Depth foot for calipers up to 150 mm
01961000	Lithium battery, 3V, CR2032
04760180	TESA TLC-TWIN wireless emitter-receiver Compatible with any instrument fitted with a TLC – TESA Link Connector
04760181	TESA TLC-USB cable for instruments with a TLC connector
04760182	TLC-DIGIMATIC cable for instruments with a TLC connector

TWIN-CAL IP40

The new TWIN-CAL calipers are all supplied with a built in data output port. Simply plug the TESA TLC connector into the TWIN-CAL and the other end into a PC and all your measurement results will be captured and stored for optimal SPC monitoring.









NO	mm	in	Drive system / Thumb roller	A mm	B mm	C mm	g	Depth rod
00530094	150	6	With	40	16	74	150	Round
00530097	150	6	–	40	16	74	150	Square
00530095	200	8	With	50	20	90	200	Square
00530096	300	12	With	64	22	106	280	Square

OPTIONAL ACCESSORIES:

00560013	Depth foot for calipers up to 150 mm
01961000	Lithium battery, 3V, CR2032
04760180	TESA TLC-TWIN wireless emitter-receiver Compatible with any instrument fitted with a TLC – TESA Link Connector
04760181	TESA TLC-USB cable for instruments with a TLC connector
04760182	TLC-DIGIMATIC cable for instruments with a TLC connector

- ISO 13385-1
- 0,01 mm / 0.0005 in
- LCD, 11 mm
- Fixed zero
- mm/in conversion
- ≤ 100 mm: 20 µm >100 mm: 30 µm
- 10 µm
- Scale with incremental divisions, inductive
- 2,5 m/s
- TLC connectivity
- Stainless steel
- 3V Lithium battery, CR2032
- 12.000 hours
- Standby mode after 10 minutes, instrument retains zero. Automatic shut off after 2 hours. The instrument retains zero in ABS mode, but if the instrument is in DIFF mode, the zero must be reset.
- 1907/2006/CE 2004/108/CE 2002/96/CE
- Inspection report with declaration of conformity

ISO 13385-1

0,01 mm / 0.0005 in

LCD, 11 mm

Fixed zero

mm / in conversion

≤ 100 mm = 20 µm
>100 mm = 30 µm

10 µm

Scale with incremental divisions, capacitive

2,5 m/s

Stainless steel

3V Lithium battery, CR2032

1.5 to 2 years

Standby mode after 10 minutes, instrument retains zero. Automatic shut off after 2 hours. The instrument retains zero in ABS mode, but if the instrument is in DIFF mode, the zero must be reset.

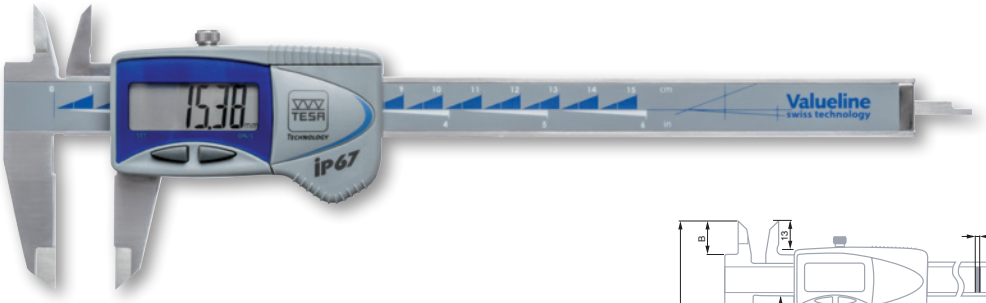
1907/2006/CE
2004/108/CE
2002/96/CE

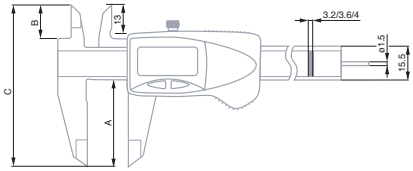
Inspection report with declaration of conformity

TESA VALUELINE IP67

TESA Valueline is designed to meet customer demand for affordable products that don't compromise on the expertise associated with TESA.

With TESA technology at their core, these products are of guaranteed quality.





NO	mm	in	Drive system/ thumb roller	A mm	B mm	C mm	g	Depth rod
00539390	150	6	–	40	16	74	150	Square
00539391	150	6	–	40	16	74	150	Round
00539392	200	8	With	50	20	90	200	Square
00539393	300	12	With	64	22	106	280	Square

OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
00560013	Depth foot for calipers up to 150 mm

DIAL CALIPERS

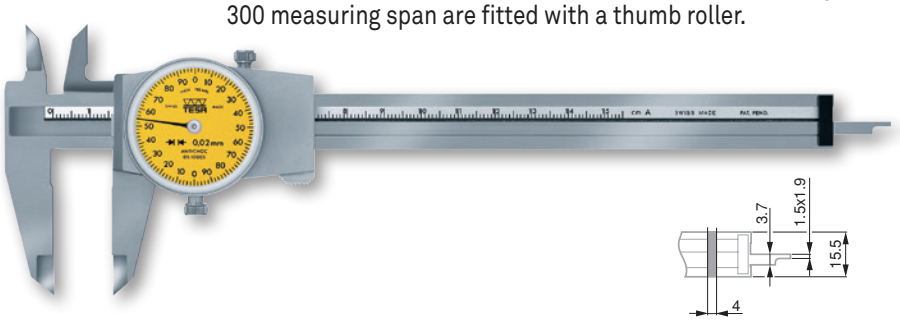
The dial caliper is the favourite instrument of many professionals working in mechanics, as it is an ideal tool for the workshop.

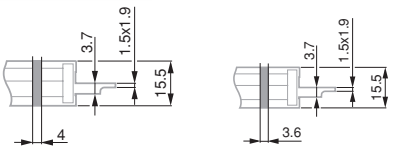
All dial calipers use the original shockproof technology developed and patented in 1970 by TESA, pioneer of this technology. Thanks to the shockproof system inserted between the mobile measuring element and the mechanism of the dial pointer, this patent guarantees reliable measurements even in case of a shock to the instrument.

- DIN 862 (Style 1AR)
- ≤ 100 mm = 20 µm >100 mm = 30 µm
- Gear mechanism made of hardened ground steel
- Hardened stainless steel
- Inspection report with a declaration of conformity
- 32 mm diameter rotating dial with lock
- Slider with locking screw
- Patented shockproof design

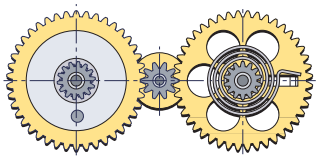
Models TESA CCMA-M

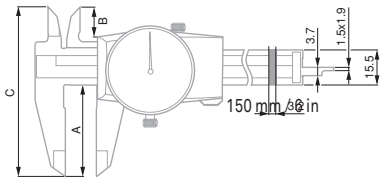
Easy-to-read dial calipers – Slider with metal dial housing – Models with a 200 or 300 measuring span are fitted with a thumb roller.





300 mm / 12 in 200 mm / 8 in





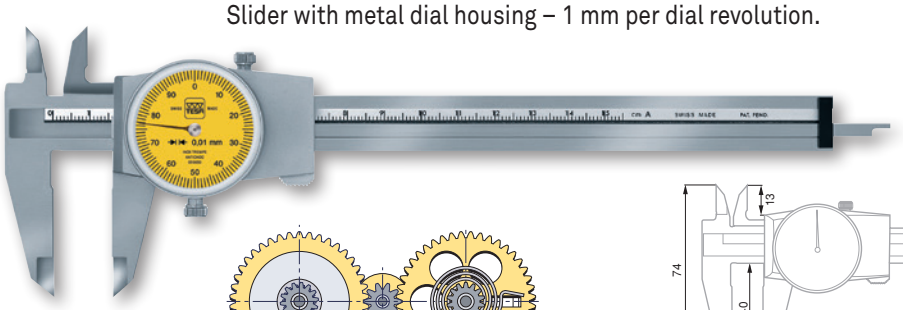
NO				Thumb roller	A mm	B mm	C mm
00510008	0 ÷ 150 mm	0,02 mm	2 mm	–	40	13	74
00520002	0 ÷ 6 in	0.001 in	0.1 in	–	40	13	74
00510045	0 ÷ 200 mm	0,02 mm	2 mm	●	50	18,6	89,5
00510046	0 ÷ 300 mm	0,02 mm	2 mm	●	64	20,6	105,5

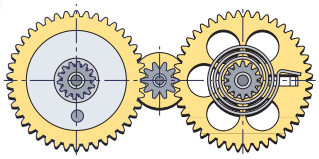
OPTIONAL ACCESSORY:

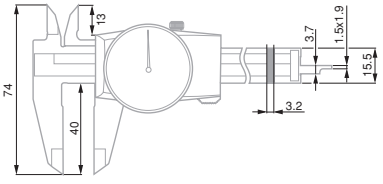
00560013 Depth foot for calipers up to 150 mm

Model TESA CCMA-M, 0,01 mm

Slider with metal dial housing – 1 mm per dial revolution.







NO			
	mm	mm	mm
00510050	0 ÷ 150 mm	0,01	1 mm

OPTIONAL ACCESSORY:

00560013 Depth foot for calipers up to 150 mm

- DIN 862 (Style 1AR)
- ≤ 100 mm = 20 µm >100 mm = 30 µm
- Gear mechanism made of hardened ground steel
- Hardened stainless steel
- Inspection report with a declaration of conformity
- 32 mm diameter rotating dial with lock
- Slider with locking screw
- Patented shockproof design

DIN 862 (Style 1AR)

≤ 100 mm = 20 µm
>100 mm = 30 µm

Gear mechanism made of hardened, ground steel

Hardened stainless steel

Inspection report with a declaration of conformity

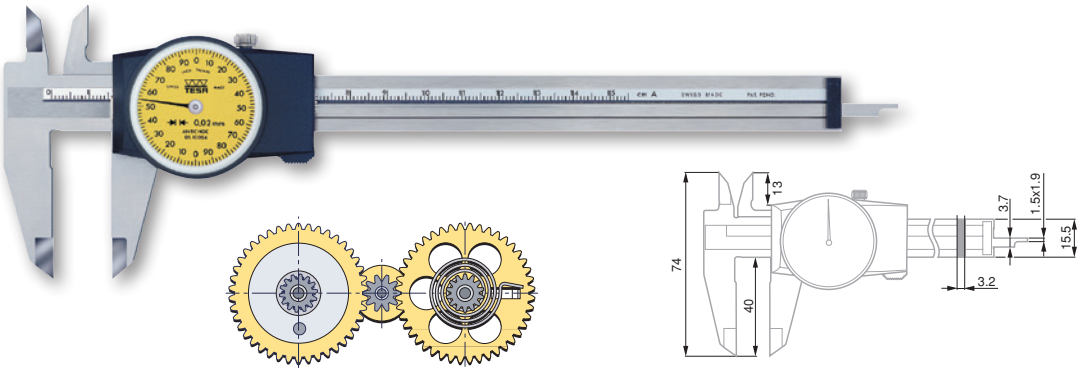
32 mm diameter rotating dial with lock

Slider with plastic dial housing and locking screw

Patented shockproof design

TESA CCMA-P Models

Quick and easy to read – Slider with plastic dial housing.



NO				
00510004	0 ÷ 150 mm	0,02 mm	2 mm	Without thumb wheel
00520001	0 ÷ 6 in	0.001 in	0.1 in	Without thumb wheel
OPTIONAL ACCESSORY:				
00560013	Depth foot for calipers up to 150 mm			

DIN 862 (Style 1AR)

≤ 100 mm = 20 µm
>100 mm = 30 µm

Gear mechanism made of hardened, ground steel

Hardened stainless steel

Inspection report with a declaration of conformity

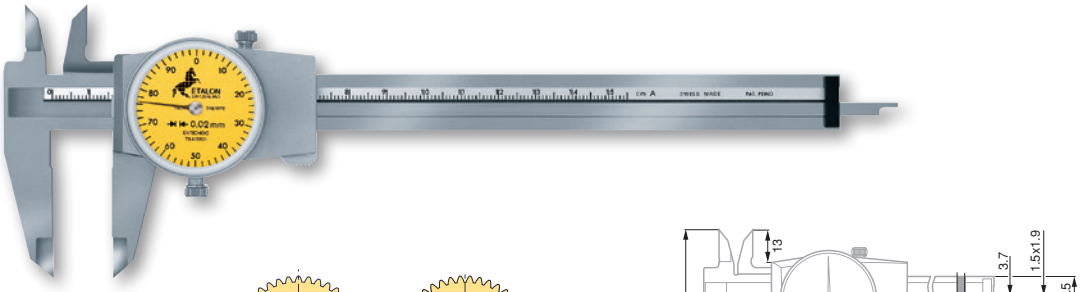
32 mm diameter rotating dial with lock

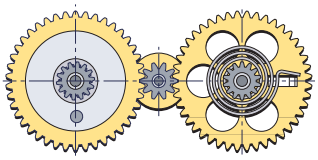
Slider with locking screw

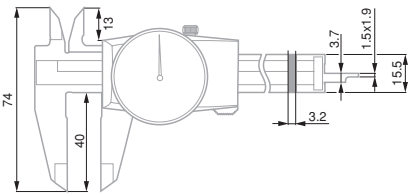
Patented shockproof design

ETALON 125 Model

Slider with metal dial housing – 1 mm travel per dial revolution.







NO				
075115821	0 ÷ 150 mm	0,02 mm	1 mm	Without thumb wheel
OPTIONAL ACCESSORY:				
00560013	Depth foot for calipers up to 150 mm			

ACCESSORIES FOR CALIPERS

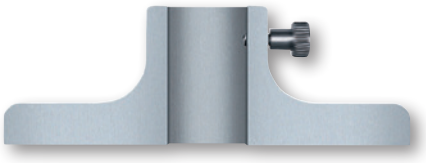
Accessories for standard calipers

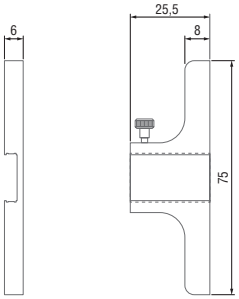
Hardened stainless steel

Ground measuring face

Depth Measuring Foot

For use with TESA or ETALON universal calipers with a measuring span of 0 to 150 mm / 0 to 6 inch.





NO		mm
00560013	Depth foot for calipers up to 150 mm	75 x 6

Magnetic Magnifying Glass

2 permanent magnets

Can be mounted on calipers and other such instruments for easier reading of vernier scales.



NO	
0051610365	Magnetic magnifying glass, 3x magnification

DIN 862 (Style 1AN-2) NF E 11-091

Maximum permissable errors, in accordance with standard

Hardened stainless steel

Inspection report with a declaration of conformity

Satin-chrome scale background; main scale slightly set back for protection against wear

VERNIER CALIPERS

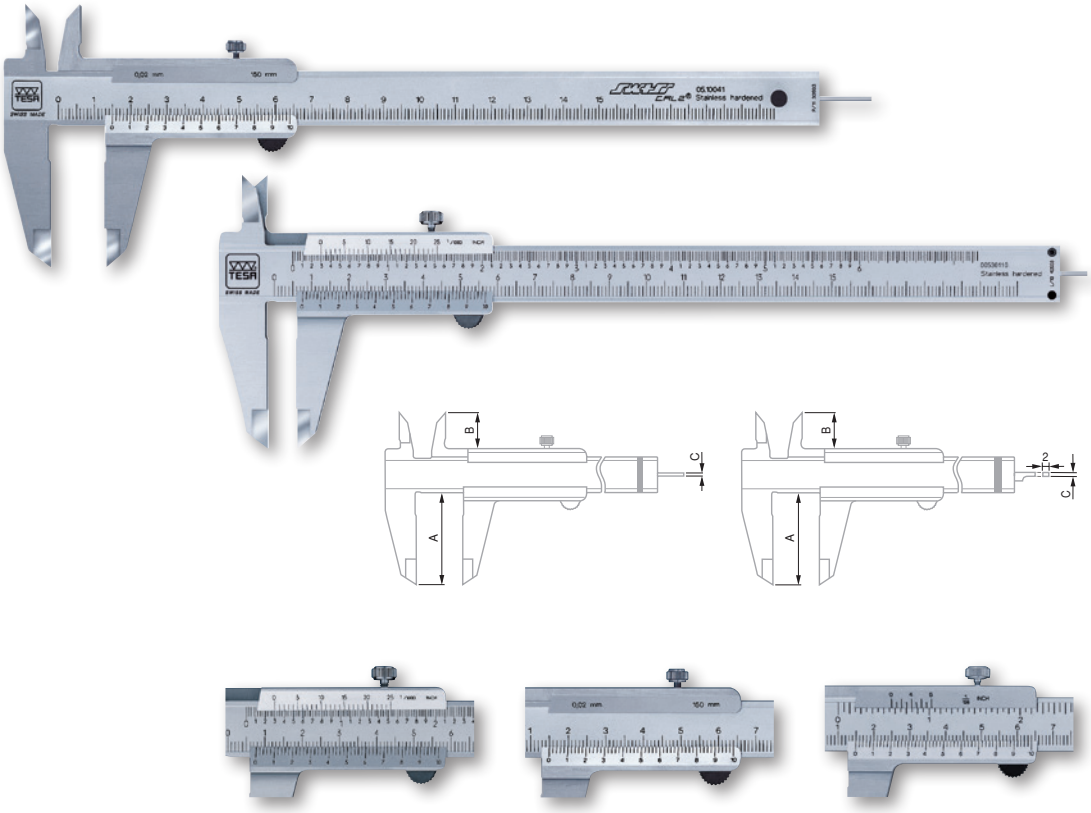
The simplest calipers to use with engraved scales for reading very fine divisions on measurements.

Standard Models

Calipers offering great value for money:

– Fitted with a locking screw.

– With rectangular or round depth rod.



		mm	in	mm	in	A mm	B mm	C mm
00510041	SWISSCAL 2	0 ÷ 150	–	0,02	–	40	15,5	Ø 1,5
00510047	Standard	0 ÷ 150	–	0,05	–	40	15,5	Ø 1,5
00530103	Standard	0 ÷ 150	0 ÷ 6	0,05	1/128	40	15,5	Ø 1,5
00530104	Standard	0 ÷ 200	0 ÷ 8	0,05	1/128	50	18	1,5 x 2
00530105	Standard	0 ÷ 300	0 ÷ 12	0,05	1/128	64	22	–
00530110	Standard	0 ÷ 150	0 ÷ 6	0,02	0.001	40	15,5	Ø 1,5
00530111	Standard	0 ÷ 200	0 ÷ 8	0,02	0.001	50	18	1,5 x 2
00530112	Standard	0 ÷ 300	0 ÷ 12	0,02	0.001	64	22	–
00530120	Self-locking model	0 ÷ 150	0 ÷ 6	0,05	1/128	40	15,5	1,5 x 2
00530121	Self-locking model	0 ÷ 150	0 ÷ 6	0,02	0.001	40	15,5	1,5 x 2
00530130	Self-locking model with parallax-free readout	0 ÷ 150	0 ÷ 6	0,05	1/128	40	15,5	1,5 x 2
00530131	Self-locking model with parallax-free readout	0 ÷ 150	0 ÷ 6	0,02	0.001	40	15,5	1,5 x 2

OPTIONAL ACCESSORIES:

00560013	Depth foot for calipers up to 150 mm
0051610365	Magnetic magnifying glass, 3x magnification

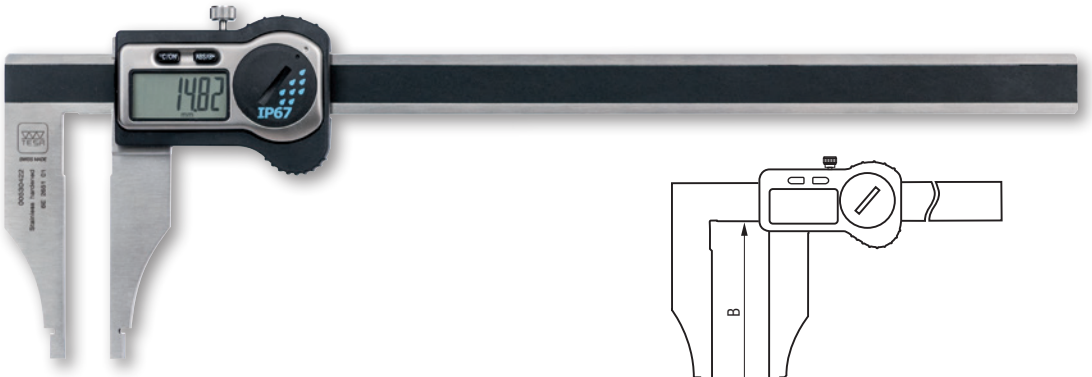
WORKSHOP DIGITAL CALIPERS

Large-dimension calipers are equipped with a very precise measuring system and flawless guide of the slider on the beam. This know-how makes them the most accurate calipers available on the market.

The range of IP67 calipers guarantees the highest level of protection against the penetration of dust and liquids. The TLC (TESA Link Connector) system built into all the TwinCal calipers provides the connection of these instruments to a PC for the easy acquistion of measurement data. The unique display housing, protected by a steel plate surrounded with a rubber seal guarantees durability and offers fine sensitivity during measurement.

TWIN-CAL IP67 – Models with Rounded Measuring Faces for Internal Dimensions

- Complete IP67 protection against the penetration of dust and liquids, even when the cable is connected.
- Unique TWIN connectivity concept allowing for upgrade across the range.



NO	mm	in	A mm	B mm
00530421	200	8	5	80
00530422	250	10	5	80
00530423	300	12	5	90
00530424	500	20	10	150
00530425	600	24	10	150
00530426	800	32	10	150
00530427	1000	39	10	150

OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
04760180	TESA TLC-TWIN wireless emitter-receiver Compatible with any instrument fitted with a TLC – TESA Link Connector
04760181	TESA TLC-USB cable for instruments with a TLC connector
04760182	TLC-DIGIMATIC cable for instruments with a TLC connector

- ISO 13385-1
- 0,01 mm / 0.0005 in
- LCD, 11 mm
- Fixed zero
- mm / in conversion
- L ≤ 100 mm: 30 µm 100 < L ≤ 600 mm: 40 µm 600 < L ≤ 1000 mm: 50 µm
- 10 µm
- Scale with incremental divisions, inductive
- 2,5 m/s
- TLC Connectivity
- Stainless steel
- 3V Lithium battery, CR2032
- 12.000 hours
- Standby mode after 10 minutes, instrument retains the zero position. Automatic shut off after 2 hours, instrument retains the zero in ABS mode, but the zero must be reset if the instrument is in DIFF mode.
- 1907/2006/CE 2004/108/CE 2002/96/CE
- Inspection report with declaration of conformity

ISO 13385-1

0,01 mm / 0.0005 in

LCD, 11 mm

Fixed zero

mm / in conversion

L ≤ 100 mm: 30 µm
100 < L ≤ 600 mm: 40 µm
600 < L ≤ 1000 mm: 50 µm

10 µm

Scale with incremental divisions, inductive

2,5 m/s

TLC Connectivity

Stainless steel

3V Lithium battery, CR2032

12.000 hours

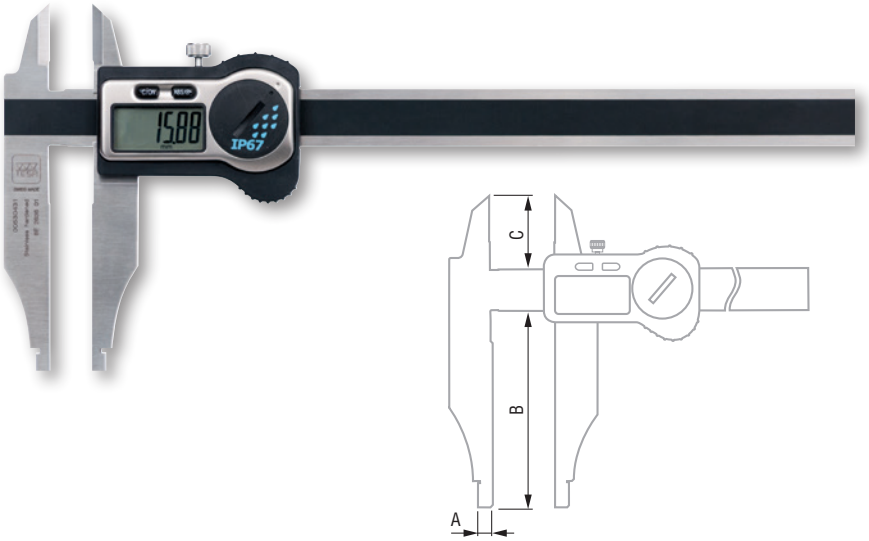
Standby mode after 10 minutes, instrument retains the zero position. Automatic shut off after 2 hours, instrument retains the zero in ABS mode, but the zero must be reset if the instrument is in DIFF mode.

1907/2006/CE
2004/108/CE
2002/96/CE

Inspection report with declaration of conformity

TWIN-CAL IP67 – Models with Rounded Measuring Faces for Internal Dimensions and Knife-edge Jaws for External Dimensions

- Complete IP67 protection against the penetration of dust and liquids, even when the cable is connected
- Unique TWIN connectivity concept allowing for upgrade across the range.



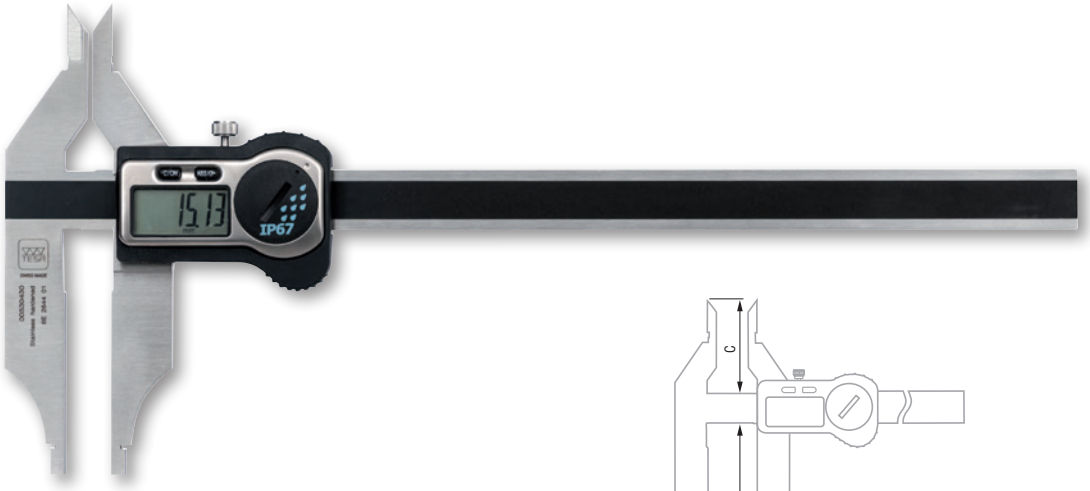
NO	mm	in	A mm	B mm	C mm
00530431	200	8	5	80	30
00530432	250	10	5	80	37
00530433	300	12	5	90	37
00530434	500	20	10	150	60
00530435	600	24	10	150	60
00530436	800	32	10	150	56
00530437	1000	39	10	150	56

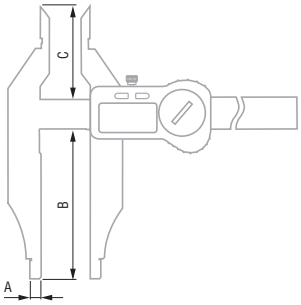
OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
04760180	TESA TLC-TWIN wireless emitter-receiver Compatible with any instrument fitted with a TLC – TESA Link Connector
04760181	TESA TLC-USB cable for instruments with a TLC connector
04760182	TLC-DIGIMATIC cable for instruments with a TLC connector

TWIN-CAL IP67 – Models with Rounded Measuring Faces for Internal Dimensions and Knife-edge Jaws for Internal Dimensions

- Complete IP67 protection against the penetration of dust and liquids, even when the cable is connected
- Unique TWIN connectivity concept allowing for upgrade across the range.





NO	mm	in	A mm	B mm	C mm
00530430	250	10	5	80	54

OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
04760180	TESA TLC-TWIN wireless emitter-receiver Compatible with any instrument fitted with a TLC – TESA Link Connector
04760181	TESA TLC-USB cable for instruments with a TLC connector
04760182	TLC-DIGIMATIC cable for instruments with a TLC connector

- ISO 13385-1
- 0,01 mm / 0.0005 in
- LCD, 11 mm
- Fixed zero
- mm / in conversion
- L ≤ 100 mm: 30 µm
100 < L ≤ 250 mm: 40 µm
- 10 µm
- Scale with incremental divisions, inductive
- 2,5 m/s
- TLC Connectivity
- Stainless steel
- 3V Lithium battery, CR2032
- 12.000 hours
- Standby mode after 10 minutes, instrument retains the zero position. Automatic shut off after 2 hours, instrument retains the zero in ABS mode, but the zero must be reset if the instrument is in DIFF mode.
- 1907/2006/CE
2004/108/CE
2002/96/CE
- Inspection report with declaration of conformity

DIN 862 (Style EN-2) NF E 11-091

Maximum permissable errors in accordance with standard

Hardened stainless steel

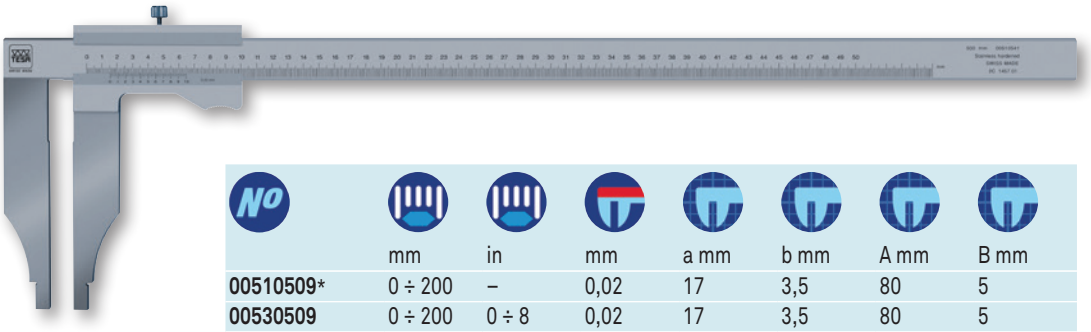
Inspection report with a declaration of conformity

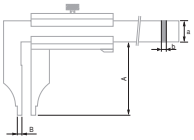
Satin-chrome scale background: main scale set back slightly for protection against wear.

VERNIER CALIPERS

The simplest calipers to use with engraved scales for reading very fine divisions on measurements.

Models with Rounded Measuring Faces for Internal Dimensions (Without Fine Adjust Device)





NO							
	mm	in	mm	a mm	b mm	A mm	B mm
00510509*	0 ÷ 200	–	0,02	17	3,5	80	5
00530509	0 ÷ 200	0 ÷ 8	0,02	17	3,5	80	5
00510506	0 ÷ 200	–	0,05	17	3,5	80	5
00510511	0 ÷ 250	–	0,02	20	4	90	5
00510512	0 ÷ 250	–	0,05	20	4	90	5
00510521	0 ÷ 300	–	0,02	20	4	90	5
00530521	0 ÷ 300	0 ÷ 12	0,02	20	4	90	5
00510522	0 ÷ 300	–	0,05	20	4	90	5
00510531	0 ÷ 400	–	0,02	24,5	5	125	10
00530531	0 ÷ 400	0 ÷ 15	0,02	24,5	5	125	10
00510541	0 ÷ 500	–	0,02	28	6	150	10
00510542	0 ÷ 500	–	0,05	28	6	150	10
00510551	0 ÷ 600	–	0,02	28	6	150	10

OPTIONAL ACCESSORY:

0051610365 Magnetic magnifying glass, 3x magnification

* Supplied with a flexible stainless steel rule, 200 mm long, part code 0951750181

DIN 862 (Style EN-2F) NF E 11-091

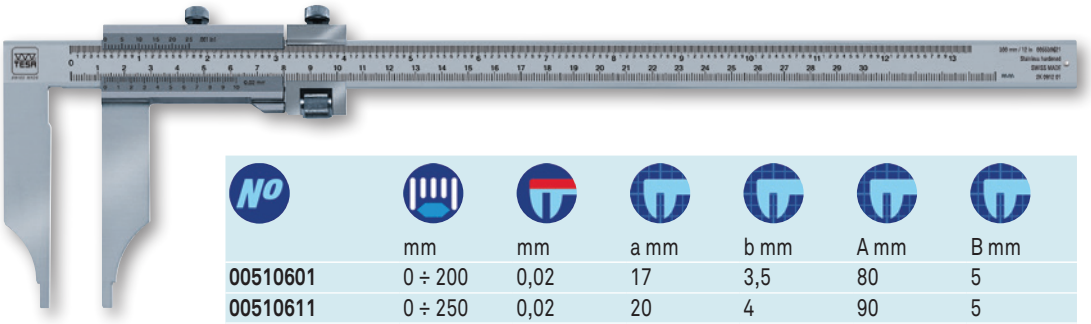
Maximum permissable errors in accordance with standard

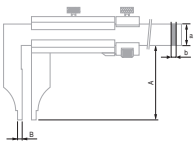
Hardened stainless steel

Inspection report with a declaration of conformity

Satin-chrome scale background; main scale set back slightly for protection against wear

Models with Rounded Measuring Faces for Internal Dimensions (With Fine Adjust Device)



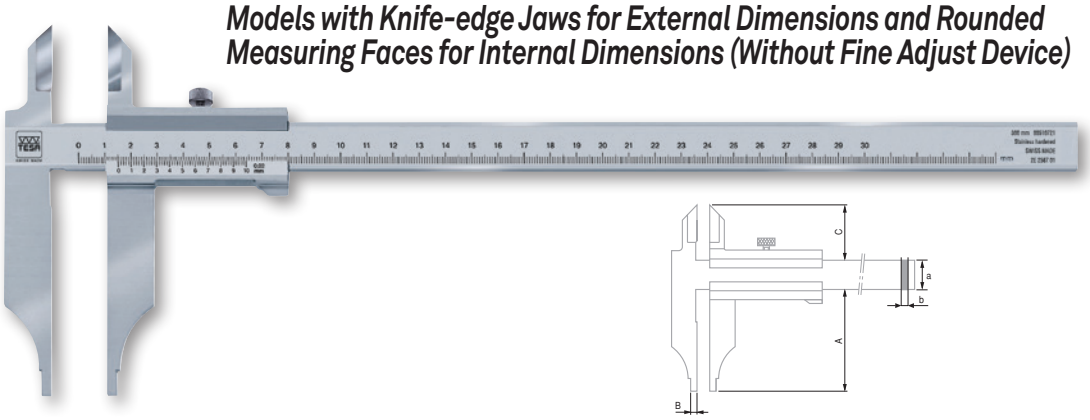


NO						
	mm	mm	a mm	b mm	A mm	B mm
00510601	0 ÷ 200	0,02	17	3,5	80	5
00510611	0 ÷ 250	0,02	20	4	90	5
00510621	0 ÷ 300	0,02	20	4	90	5
00510641	0 ÷ 500	0,02	28	6	150	10
00510651	0 ÷ 600	0,02	28	6	150	10
00510661	0 ÷ 800	0,02	32	8	150	10
00510671	0 ÷ 1000	0,02	32	8	150	10
00510681	0 ÷ 1500	0,02	40	8	300	15
00510691	0 ÷ 2000	0,02	40	8	300	15

OPTIONAL ACCESSORY:

0051610365 Magnetic magnifying glass, 3x magnification

Models with Knife-edge Jaws for External Dimensions and Rounded Measuring Faces for Internal Dimensions (Without Fine Adjust Device)



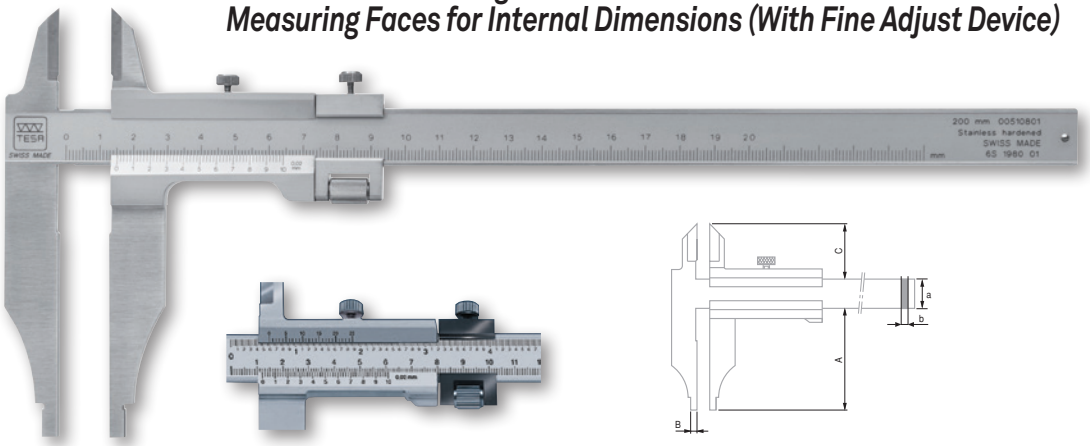
- DIN 862 (Style BN-2) NF E 11-091
- Maximum permissible errors, in accordance with standard
- Hardened stainless steel
- Inspection report with a declaration of conformity
- Satin-chrome scale background: main scale set back slightly for protection against wear

NO								
	mm	in	mm	a mm	b mm	A mm	B mm	C mm
00510701	0 ÷ 200	–	0,02	17	3,5	80	5	30
00530701	0 ÷ 200	0 ÷ 8	0,02	17	3,5	80	5	30
00510711	0 ÷ 250	–	0,02	20	4	80	5	38
00510721	0 ÷ 300	–	0,02	20	4	90	5	38
00530721	0 ÷ 300	0 ÷ 12	0,02	20	4	90	5	38
00510722	0 ÷ 300	–	0,05	20	4	90	5	38
00510741	0 ÷ 500	–	0,02	28	6	150	10	60
00530741	0 ÷ 500	0 ÷ 20	0,02	28	6	150	10	60
00510751	0 ÷ 600	–	0,02	28	6	150	10	60

OPTIONAL ACCESSORY:

0051610365 Magnetic magnifying glass, 3x magnification

Models with Knife-edge Jaws for External Dimensions and Rounded Measuring Faces for Internal Dimensions (With Fine Adjust Device)



- DIN 862 (Style BN-2) NF E 11-091
- Maximum permissible errors in accordance with standard
- Hardened stainless steel
- Inspection report with a declaration of conformity
- Satin-chrome scale background: main scale set back slightly for protection against wear

NO								
	mm	in	mm	a mm	b mm	A mm	B mm	C mm
00510801	0 ÷ 200	–	0,02	17	3,5	80	5	30
00510821	0 ÷ 300	–	0,02	20	4	90	5	38
00530821	0 ÷ 300	0 ÷ 11	0,02	20	4	90	5	38
00510841	0 ÷ 500	–	0,02	28	6	150	10	60
00530841	0 ÷ 500	0 ÷ 20	0,02	28	6	150	10	60
00510861	0 ÷ 800	–	0,02	32	8	150	10	56
00510871	0 ÷ 1000	–	0,02	32	8	150	10	56

OPTIONAL ACCESSORY:

0051610365 Magnetic magnifying glass, 3x magnification

ISO 13385-1

0,01 mm / 0.0005 in

LCD, 11 mm

Fixed zero

mm / in conversion

L ≤ 100 mm: 30 µm
100 < L ≤ 600 mm: 40 µm 600 < L ≤ 1000 mm: 50 µm

10 µm

Scale with incremental divisions, inductive

2,5 m/s

TLC Connectivity

Stainless steel

3V lithium battery, CR2032

12.000 hours

Standby mode after 10 minutes, instrument retains the zero position. Automatic shut off after 2 hours, instrument retains the zero in ABS mode, but the zero must be reset if the instrument is in DIFF mode.

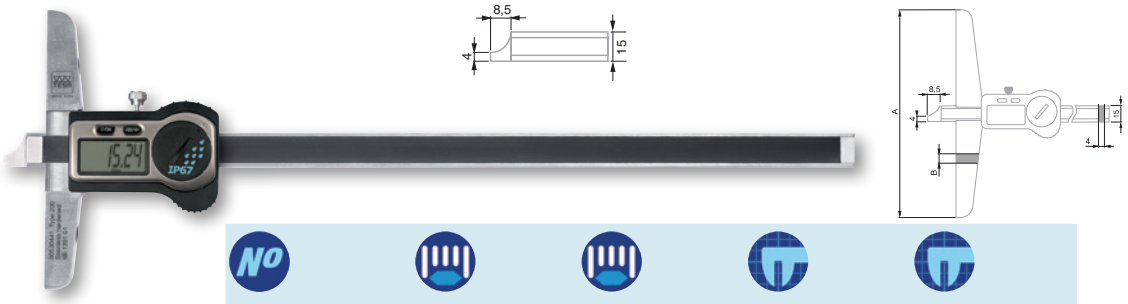
1907/2006/CE
2004/108/CE
2002/96/CE

Inspection report with declaration of conformity

DIGITAL DEPTH CALIPERS

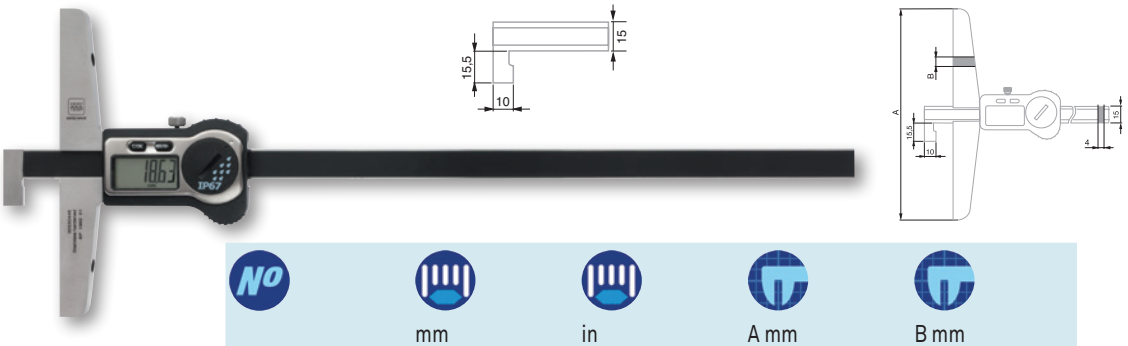
The range of IP67 calipers gurantees the highest level of protection against the penetration of dust and liquids. The TLC (TESA Link Connector) system built into all the TWIN-CAL calipers provides the connection of these instruments to a PC for the easy acquistion of measurement data. The unique display housing, protected by a steel plate surrounded with a rubber seal guarantees durability and offers fine sensitivity during measurement.

TWIN-CAL IP67 – Models with Short Cut Measuring Face



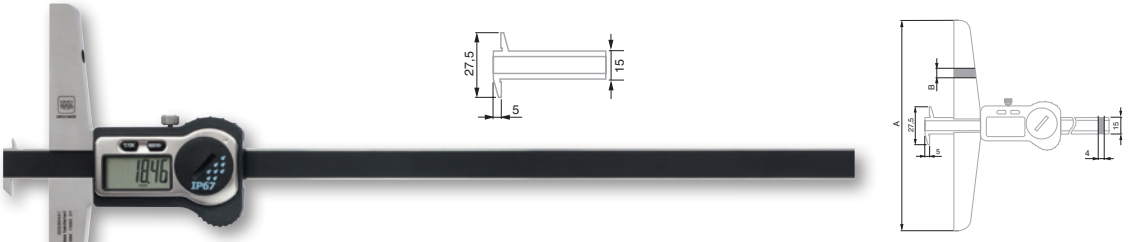
NO	mm	in	A mm	B mm
00530441	200	8	100	8
00530442	250	10	100	8
00530443	300	12	150	8
00530444	500	20	150	8

TWIN-CAL IP67 – Models with One Fixed Measuring Jaw



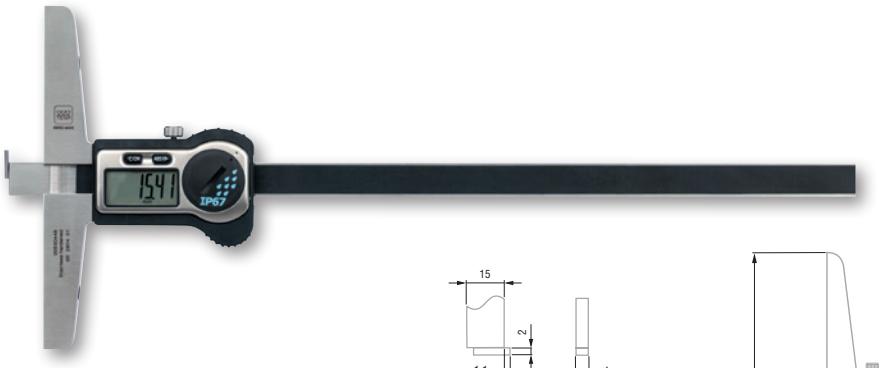
NO	mm	in	A mm	B mm
00530445	300	12	150	8
00530446	500	20	150	8

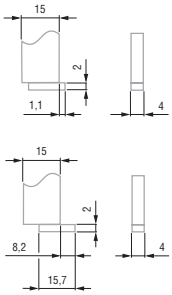
TWIN-CAL IP67 – Models with Two Fixed Measuring Jaws

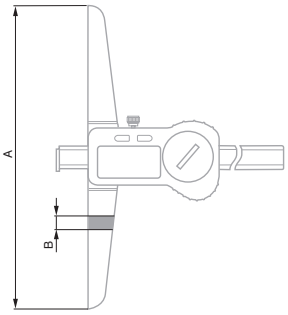


NO	mm	in	A mm	B mm
00530447	300	12	150	8

TWIN-CAL IP67 – Models with Rotary Stop Plate







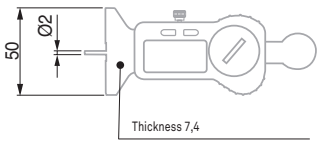
NO	mm	in	A mm	B mm
00530448	250	10	150	8,5
00530449	350	14	150	8,5
00530450	500	20	150	8,5

OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
04760180	TESA TLC-TWIN wireless emitter-receiver Compatible with any instrument fitted with a TLC – TESA Link Connector
04760181	TESA TLC-USB cable for instruments with a TLC connector
04760182	TLC-DIGIMATIC cable for instruments with a TLC connector
00560103	Removable bridge 200 mm
00560104	Removable bridge 300 mm
00560105	Removable bridge 400 mm

TWIN-CAL IP67 – Small Sized Model with Steel Measuring Tip





NO	mm	in
00530451	25	1

OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
04760180	TESA TLC-TWIN wireless emitter-receiver Compatible with any instrument fitted with a TLC – TESA Link Connector
04760181	TESA TLC-USB cable for instruments with a TLC connector
04760182	TLC-DIGIMATIC cable for instruments with a TLC connector

- ISO 13385-1
- 0,01 mm / 0.0005 in
- LCD, 11 mm
- Fixed zero
- Metric / in conversion
- L ≤ 100 mm: 30 µm 100 < L ≤ 600 mm: 40 µm 600 < L ≤ 1000 mm: 50 µm
- 10 µm
- Scale with incremental divisions, inductive
- 2,5 m/s
- TLC Connectivity
- Stainless steel
- 3V lithium battery, CR2032
- 12.000 hours
- Standby mode after 10 minutes, instrument retains the zero position. Automatic shut off after 2 hours, instrument retains the zero in ABS mode, but the zero must be reset if the instrument is in DIFF mode.
- 1907/2006/CE 2004/108/CE 2002/96/CE
- Inspection report with declaration of conformity

DIN 862 (Style C-2) NF E 11-096

Maximum permissible errors: in accordance with standard

Hardened stainless steel

Inspection report with a declaration of conformity

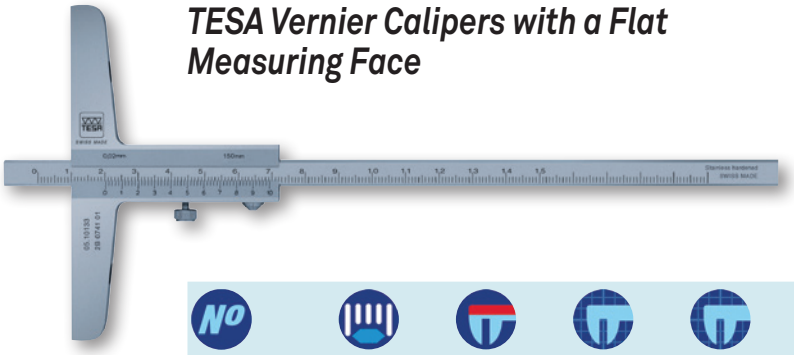
Satin-chrome scale background; main scale set back slightly for protection against wear

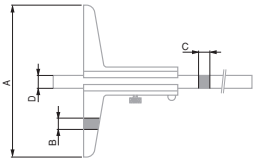
VERNIER DEPTH CALIPERS

Depth calipers with:

– Flat measuring face
– Convertible models, short cut measuring face or steel tip
– Rotary stop plate
– Convertible models, short cut measuring face or fixed hook

TESA Vernier Calipers with a Flat Measuring Face





NO	mm	mm	A mm	B mm	C mm	D mm
00510133	0 ÷ 150	0,02	100	7,5	3	8
00510134	0 ÷ 150	0,05	100	7,5	3	8
00510143	0 ÷ 250	0,02	100	7,5	3	8
00510163	0 ÷ 500	0,02	100	8,5	4	12
00510173	0 ÷ 600	0,02	150	8,5	4	12

DIN 862 (Style C-2) NF E 11-096

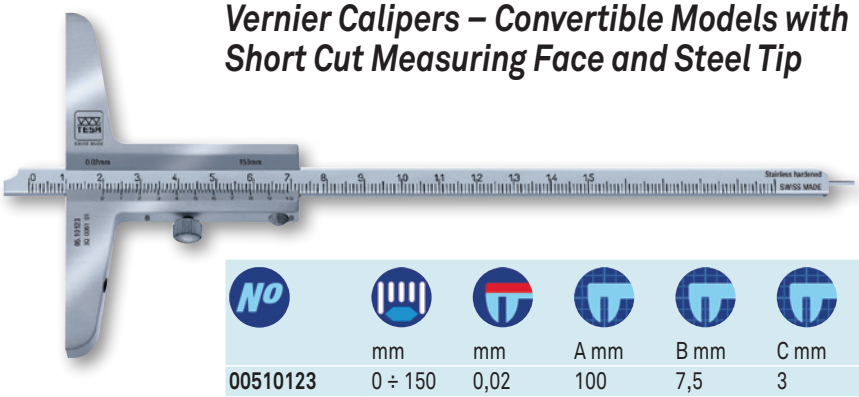
Maximum permissible errors: in accordance with standard

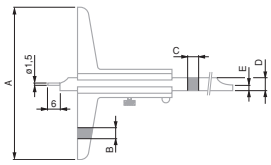
Hardened stainless steel

Inspection report with a declaration of conformity

Satin-chrome scale background; main scale set back slightly for protection against wear

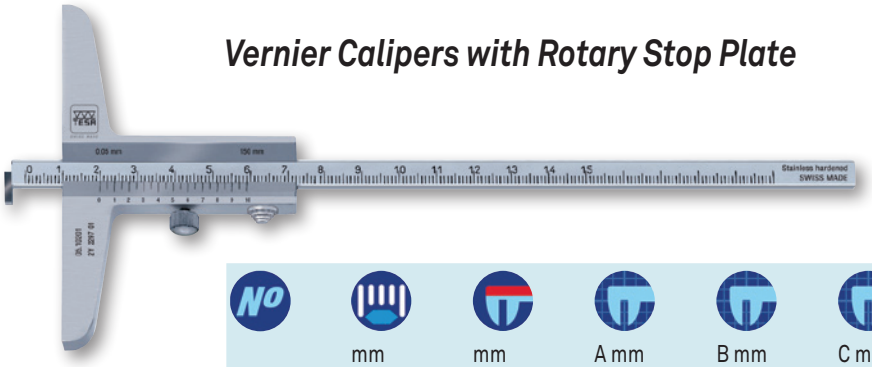
Vernier Calipers – Convertible Models with Short Cut Measuring Face and Steel Tip



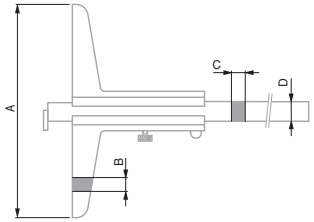


NO	mm	mm	A mm	B mm	C mm	D mm	E mm
00510123	0 ÷ 150	0,02	100	7,5	3	8	3,5
00510124	0 ÷ 150	0,05	100	7,5	3	8	3,5
00510125	0 ÷ 250	0,02	100	7,5	3	8	4

Vernier Calipers with Rotary Stop Plate



- DIN 862 (Style C-2) NF E 11-096
- Maximum permissible errors: in accordance with standard
- Hardened stainless steel
- Inspection report with a declaration of conformity
- Satin-chrome scale background; main scale set back slightly for protection against wear

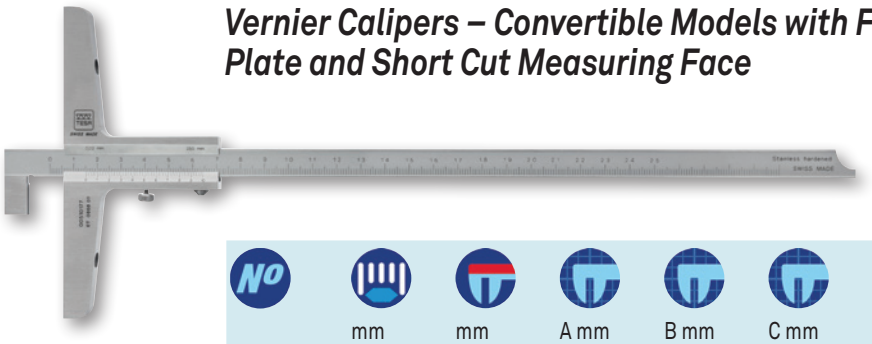


NO	mm	mm	A mm	B mm	C mm	D mm
00510201	0 ÷ 150	0,05	130	8,5	4	12
00510202	0 ÷ 150	0,02	130	8,5	4	12
00510212	0 ÷ 250	0,02	130	8,5	4	12
00510222	0 ÷ 500	0,02	130	8,5	4	12

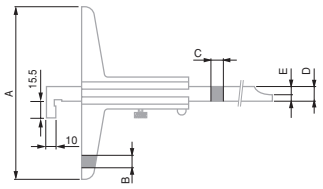
OPTIONAL ACCESSORIES:

0051610365	Magnetic magnifying glass, 3x magnification
00560103	Removable bridge 200 mm
00560104	Removable bridge 300 mm
00560105	Removable bridge 400 mm

Vernier Calipers – Convertible Models with Fixed Stop Plate and Short Cut Measuring Face



- DIN 862 (Style C-2) NF E 11-096
- Maximum permissible errors, in accordance with standard
- Hardened stainless steel
- Inspection report with a declaration of conformity
- Satin-chrome scale background: main scale set back slightly for protection against wear



NO	mm	mm	A mm	B mm	C mm	D mm	E mm
00510175	0 ÷ 150	0,02	100	7,5	3	8	3,5
00510177	0 ÷ 250	0,02	130	8,5	4	12	4
00510179	0 ÷ 300	0,02	150	8,5	4	12	4
00510181	0 ÷ 500	0,02	150	8,5	4	12	4

OPTIONAL ACCESSORIES:

0051610365	Magnetic magnifying glass, 3x magnification
00560103	Removable bridge 200 mm
00560104	Removable bridge 300 mm
00560105	Removable bridge 400 mm

Removable Bridges



Each bridge is delivered with the appropriate fixing screws

NO	mm	µm	mm	A mm	B mm	C mm
00560103	± 0,005	8	0,02	200	11,5	10
00560104	± 0,005	10	0,02	300	16	16
00560105	± 0,005	10	0,03	400	16	16

ISO 13385-1

0,01 mm / 0.0005 in

LCD, 11 mm

Fixed zero

mm / in conversion

L ≤ 100 mm: 30 µm
100 < L ≤ 600 mm: 40 µm
600 < L ≤ 1000 mm: 50 µm

10 µm

Scale with incremental divisions, inductive

2,5 m/s

TLC Connectivity

Stainless steel

3V Lithium battery, CR2032

12.000 hours

Standby mode after 10 minutes, instrument retains the zero position. Automatic shut off after 2 hours, instrument retains the zero in ABS mode, but the zero must be reset if the instrument is in DIFF mode.

1907/2006/CE
2004/108/CE
2002/96/CE

Inspection report with declaration of conformity

SCALE UNITS

The IP67 scale units assure the highest degree of protection against the penetration of dust and liquids.

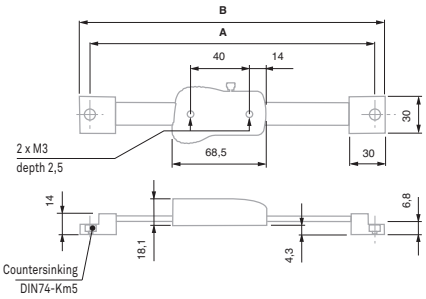
The integral TLC (TESA Link Connector) connectivity system common to the all the TWIN-CAL range allows the connection of all these instruments to a PC for easy data acquisition.

The unique display module, protected by a steel plate surrounded by rubber seal guarantees optimal durability and sensitivity during measurement.

TWIN-CAL IP67 Horizontal Scale Unit

- Complete IP67 protection against the penetration of dust and liquids, even when the cable is connected
- Unique TWIN connectivity concept allowing for upgrade across the range





NO	mm	in	A mm	B mm
00530471	150	6	265	278
00530473	300	12	415	428
00530474	600	24	725	738
00530475	1000	40	1135	1148

OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
04760180	TESA TLC-TWIN wireless emitter-receiver Compatible with any instrument fitted with a TLC – TESA Link Connector
04760181	TESA TLC-USB cable for instruments with a TLC connector
04760182	TLC-DIGIMATIC cable for instruments with a TLC connector

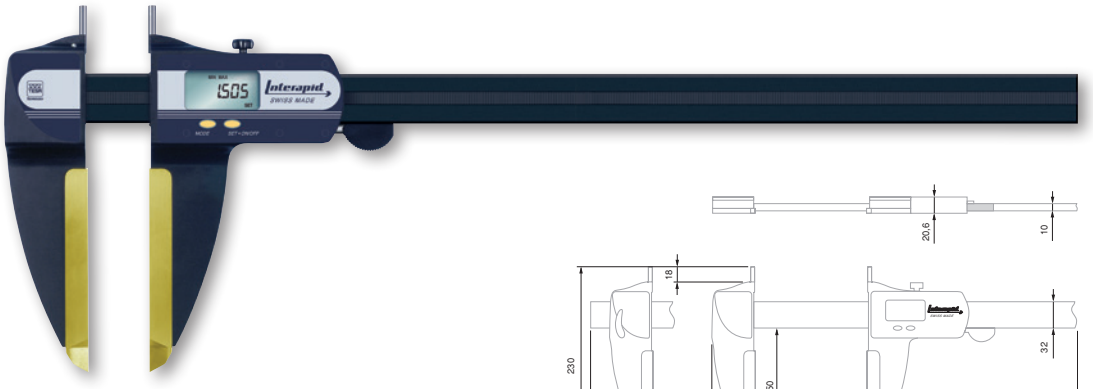
DIGITAL CALIPERS

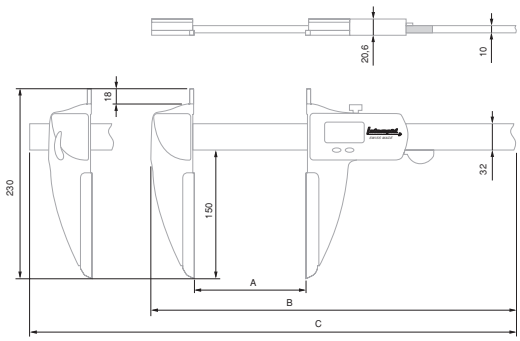
For measurements up to 3000 mm.

INTERAPID Light

Measuring functions

- Zero setting
- Metric/Inch conversion
- Hold function for displayed value
- OPTO-RS data transfer, mono- and bi-directional
- Two adjustable points of origin (Ref I / Ref II)
- PRESET function
- MIN/MAX mode
- Two limit values for classification





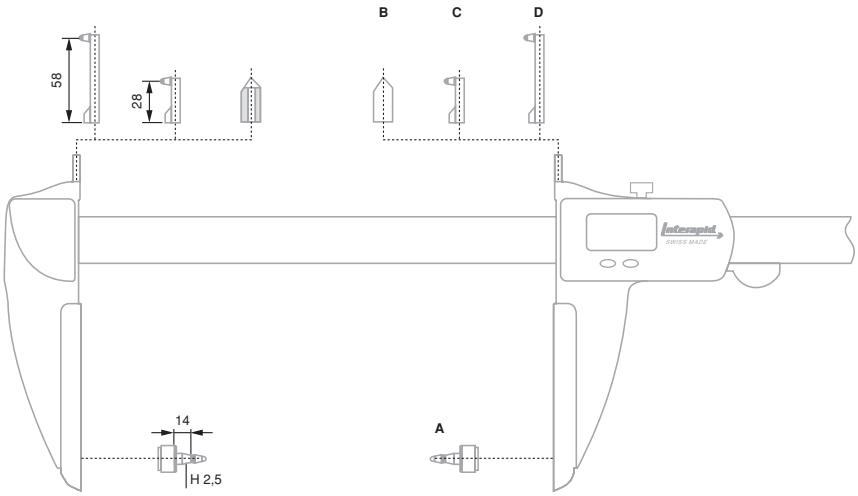
NO	A mm	µm	µm	B Fixed	C Mobile	kg
00590061	330	30	20	618	–	1,1
00590062	630	40	20	918	–	1,3
00590063	1025	60	20	–	1306	1,6
00590064	1525	150	20	–	1806	2
00590065	2040	250	30	–	2306	2,3
00590066	2545	350	30	–	2806	2,6
00590067	3050	450	40	–	3306	3

OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
00560095	Insert-holder, M2,5 thread
00560096	60°conical steel pin in hardened steel
00560097	Holder for dial gauge inserts L = 28 mm
00560098	Holder for dial gauge inserts L = 58 mm
00560099	Wooden case for INTERAPID Light 300 mm
00560100	Wooden case for INTERAPID Light 600 mm
00560101	Wooden case for INTERAPID Light 1000 mm
00560102	Wooden case for INTERAPID Light 1500 mm

- DIN 862 and factory standard
- 0,01 mm / 0.0005 in
- LCD, 8,5 mm
- Fixed zero
- mm / in conversion
- Scale with incremental divisions, inductive
- › 1,5 m/s
- Hardened steel jaws for external dimensions. Also with TiN coating, thickness to 7 mm. Tungsten carbide inserts for internal dimensions, 5 mm dia. Beam with light alloy hollow section, supported by hardened stainless steel rods.
- 3V lithium battery, CR2032
- ≈ 1,5 a (≈ 3300 h / a)
- IP40 (IEC 60529)
- EN 50081-1 EN 50082-1
- Inspection report for models up to 1500 mm
- Display lock
- RS232 Opto-coupled, mono- and bi-directional

Accessories for INTERAPID Light



NO		A
00560095	Insert-holder, M2,5 thread for measuring inserts	A
00560096	60° conical steel pin in hardened steel for measuring centre distances >10 mm	B
00560097	Holder for dial gauge inserts used for groove measurement, L = 28 mm	C
00560098	Holder for dial gauge inserts used for groove measurement, L = 58 mm	D
00560099	Wooden case for INTERAPID Light 300 mm	
00560100	Wooden case for INTERAPID Light 600 mm	
00560101	Wooden case for INTERAPID Light 1000 mm	
00560102	Wooden case for INTERAPID Light 1500 mm	

CALIPERS WITH SPECIAL DESIGN

Calipers designated for specific measuring tasks including:

- Models with extra long jaws
- Models with hook jaws for measuring grooves
- Models for measuring throat depth

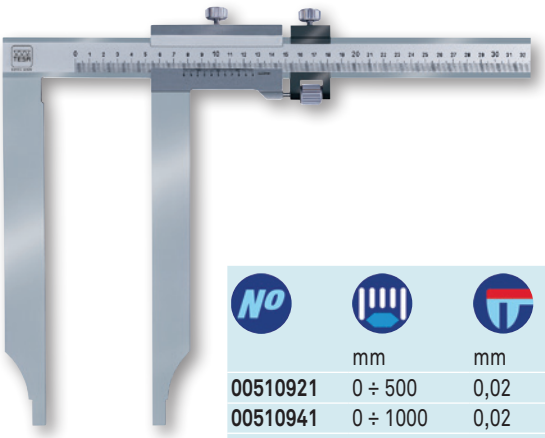
Factory standard

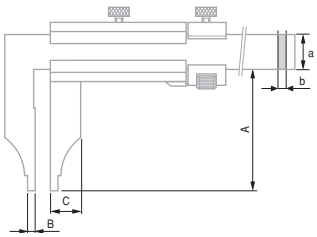
Hardened stainless steel

Inspection report with a declaration of conformity

Satin-chrome scale background; main scale set back slightly for protection against wear

With Extra Long Jaws and Fine Adjust Device



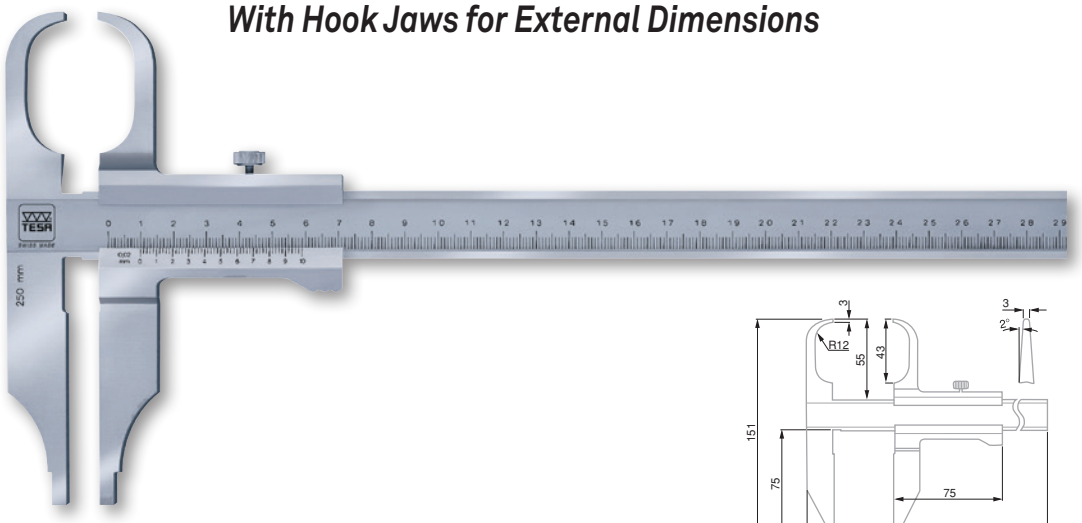


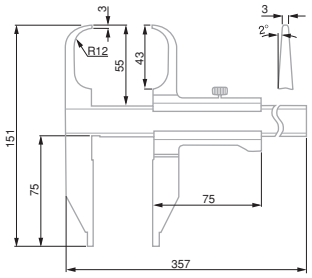
NO							
	mm	mm	a mm	b mm	A mm	B mm	C mm
00510921	0 ÷ 500	0,02	28	6	250	10	30
00510941	0 ÷ 1000	0,02	32	8	300	10	30

OPTIONAL ACCESSORY:

0051610365 Magnetic magnifying glass, 3x magnification

With Hook Jaws for External Dimensions





NF E 11-096

Hardened stainless steel

inspection report with declaration of conformity

Satin-chrome scale background; main scale set back slightly for protection against wear

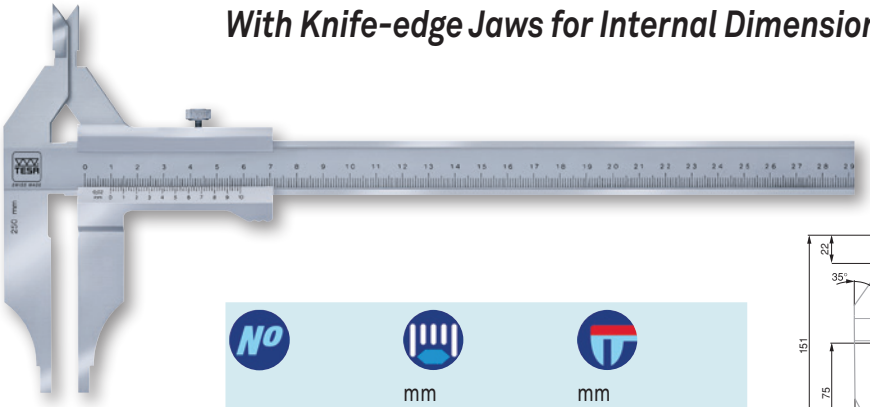
NO		
	mm	mm
00510911	0 ÷ 250	0,02

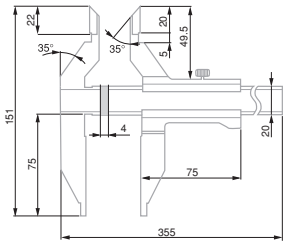
OPTIONAL ACCESSORY:

0051610365 Magnetic magnifying glass, 3x magnification

With Knife-edge Jaws for Internal Dimensions

DIN 862 (Style DN-2) NF E 11-091
Hardened stainless steel
Inspection report with a declaration of conformity
Satin-chrome scale background: main scale set back slightly for protection against wear



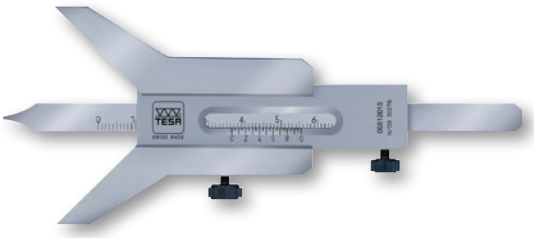


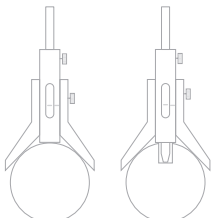
NO	mm	mm
00510915	0 ÷ 250	0,02

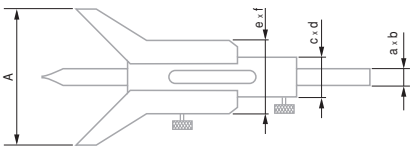
With Vee Bridge

Made to measure groove and slot depths on cylindrical shafts.

NF E 11-096
Hardened stainless steel
Inspection report with a declaration of conformity
Satin-chrome scale background; main scale set back slightly for protection against wear





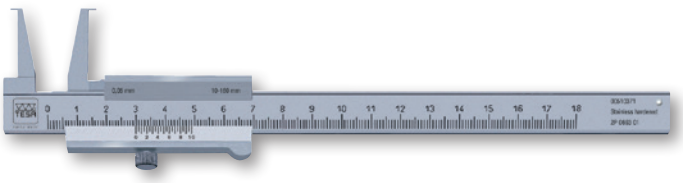


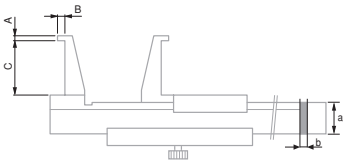
NO	mm	mm	a mm	b mm	c mm	d mm	e mm	f mm	A mm
00512015	5 ÷ 80	0,05	8	2	18	5	32	10	60
00512016	6 ÷ 120	0,05	8	2	18	5	34	10	90
00512017	7 ÷ 160	0,05	10	2	21,5	5	42	10	120

For Turned Grooves

Specially designed for measuring groove or slot diameters, e.g. on safety rings.

Factory standard
Hardened stainless steel
Inspection report with a declaration of conformity
Satin-chrome scale background: main scale set back slightly for protection against wear





NO	mm	mm	a mm	b mm	A mm	B mm	C mm
00510371	10 ÷ 160	0,05	16	3	0,9	3	25
00510375	20 ÷ 160	0,05	16	3	2	5	40
00510383	26 ÷ 200	0,02	16	3	3	7	60
00510387	30 ÷ 250	0,02	20	4	4	8,5	80
00510393	35 ÷ 300	0,02	20	4	5	10	100

TESA TECHNOLOGY

External Micrometers

PRECISION MEASUREMENT

Precision measurement requires the use of micrometers. In 1848, the first measuring tool of this type was patented by the French inventor Jean Laurent Palmer as "calibre à vis et à vernier circulaire" (screw caliper with a circular vernier). Today, we continue to make external micrometers with these typical features. The introduction of the micrometer to the mechanical world came about due to the visit of the two American engineers, Joseph R. Brown and Lucian Sharpe to the Paris Exhibition in 1867. At that time, their attention was drawn to Palmer's invention, which greatly interested them. After some improvements of Palmer's design, the product was manufactured on a large scale and marketed successfully by the two partners. History repeated itself years later as TESA SA decided to manufacture external micrometers, making them the first products produced by the company.

Whether for internal or external measurement, TESA micrometers are distinguishable for their construction and quality. All our models respect the ABBE principle with the exception of the models with large mearing anvils for the measurement of gear teeth for example.

Max. permissible errors

Measuring range mm	Maximum permissible errors* µm	Number of interference fringes or rings	µm
0 ÷ 25	4	6	2
25 ÷ 50	4	6	2
50 ÷ 75	5	10	3
75 ÷ 100	5	10	3
100 ÷ 125	6		3
125 ÷ 150	6		3
150 ÷ 175	7		4
175 ÷ 200	7		4
200 ÷ 225	8		4
225 ÷ 250	8		4
250 ÷ 275	9		5
275 ÷ 300	9		5
300 ÷ 325	10		5
325 ÷ 350	10		5
350 ÷ 375	11		6
375 ÷ 400	11		6
400 ÷ 425	12		6
425 ÷ 450	12		6
450 ÷ 475	13		7
475 ÷ 500	13		7

* Including the errors of the measuring element as well as any deviations in the flatness and paralellism of the measuring faces, plus any errors due to the flexing of the frame.

State of the art machining techniques are used for grinding the micrometer spindles, to ensure extreme accuracy and a true reproduction of the thread with negligible pitch deviations. For this reason we can guarantee a very low measuring uncertainty to our instrument users. TESA micrometers are designed to meet the most exacting demands. They are robust and ergonomically designed.

We offer an extensive range of micrometers, from a classic model through to micrometers for special applications, and also micrometer heads, complete sets, accessories and all items needed for calibration. They are available in analogue or digital versions, and also digital versions with results output.

DIN 863 T1

0,001 mm / 0.00005 in

LCD, digit height: 7 mm

Floating zero

Conversion mm/in

Tungsten carbide tipped

3V lithium battery

1 to 2 a (≈ 2000 h/a)

Automatic shut-down after 10 min. Display setting is maintained as long as power supply remains stable.

Protection as per IEC 60529): IP40 (also valid with used RS data output) or IP54

Measuring range 0 to 100: with SCS calibration certificate

Measuring range > 100 mm : with inspection report and declaration of conformity

Display lock (except for model EASY)

RS232 interface, opto-coupled

0,5 mm

Max. 10 N

≤ 100 mm: Ø 6,5 mm
> 100 mm: Ø 8 mm

TESA MICROMASTER Electronic Micrometers with Digital Display

With patented TESA CAPA µ SYSTEM.

- Measuring span of 30 mm.
- Large easy-to-read digital display.
- Models:
  - EASY IP40 with a single function key.
  - IP54 with water spray protection as well as IP54 RS with an RS232 interface.



No	mm	mm	in	in		
06030010	0 ÷ 30	0 ÷ 30	0 ÷ 1.2	0 ÷ 1.2	IP40	–
06030020	0 ÷ 30	0 ÷ 30	0 ÷ 1.2	0 ÷ 1.2	IP54	–
06030021	25 ÷ 50	23 ÷ 53	1 ÷ 2	0.9 ÷ 2.1	IP54	–
06030022	50 ÷ 75	48 ÷ 78	2 ÷ 3	1.9 ÷ 3.1	IP54	–
06030023	75 ÷ 100	74 ÷ 104	3 ÷ 4	2.9 ÷ 4.1	IP54	–
06030030	0 ÷ 30	0 ÷ 30	0 ÷ 1.2	0 ÷ 1.2	IP54	RS232
06030031	25 ÷ 50	23 ÷ 53	1 ÷ 2	0.9 ÷ 2.1	IP54	RS232
06030032	50 ÷ 75	48 ÷ 78	2 ÷ 3	1.9 ÷ 3.1	IP54	RS232
06030033	75 ÷ 100	74 ÷ 104	3 ÷ 4	2.9 ÷ 4.1	IP54	RS232
06030071	100 ÷ 125	98 ÷ 127	4 ÷ 5	3.9 ÷ 5.01	IP54	RS232
06030072	125 ÷ 150	123 ÷ 152	5 ÷ 6	4.9 ÷ 6.01	IP54	RS232
06030073	150 ÷ 175	149 ÷ 178	6 ÷ 7	5.9 ÷ 7.01	IP54	RS232
06030074	175 ÷ 200	174 ÷ 203	7 ÷ 8	6.9 ÷ 8.01	IP54	RS232
06030075	200 ÷ 225	199 ÷ 229	8 ÷ 9	7.9 ÷ 9.01	IP54	RS232
06030076	225 ÷ 250	224 ÷ 254	9 ÷ 10	8.9 ÷ 10.01	IP54	RS232
06030077	250 ÷ 275	250 ÷ 279	10 ÷ 11	9.9 ÷ 11.01	IP54	RS232
06030078	275 ÷ 300	275 ÷ 304	11 ÷ 12	10.9 ÷ 12.01	IP54	RS232

OPTIONAL ACCESSORIES:

01961000	Lithium battery, 3V, CR2032
00160201	TESA micrometer stand with clamp aperture 16 mm
072110123	ETALON micrometer stand with clamp aperture 20 mm
04761062	Opto-USB cable, duplex, bidirectional communication

MICROMASTER IP54 SET

Set consisting of 3 Micrometer external micrometers covering 0 ÷ 75 mm measuring range.



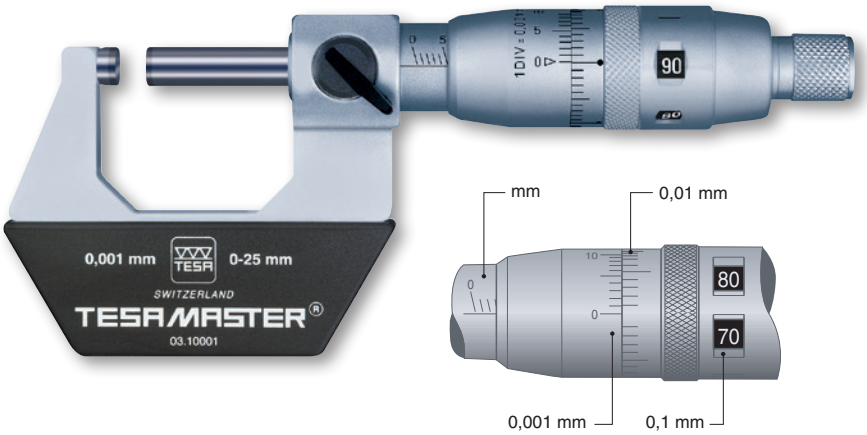
No		
06030029	Set of 3 MICROMASTER IP54 with RS232 output	0 ÷ 75

CONSISTING OF:

06030030	MICROMASTER RS IP54 digital micrometer, 0 ÷ 30 mm, 0,001 mm resolution, IP54 rating and RS232 output.
06030031	MICROMASTER RS IP54 digital micrometer, 25 ÷ 50 mm, 0,001 mm resolution, IP54 rating and RS232 output.
06030032	MICROMASTER RS IP54 digital micrometer, 50 ÷ 75 mm, 0,001 mm resolution, IP54 rating and RS232 output.
02119021	Etalon setting standard, 50 mm

TESAMASTER High Precision Micrometers with Digital Counter Reading to 0,1 mm

Analogue indication of full millimetres, hundredths and fractions of hundredths. Accurate, parallax-free reading on the vernier down to 0,001 mm.

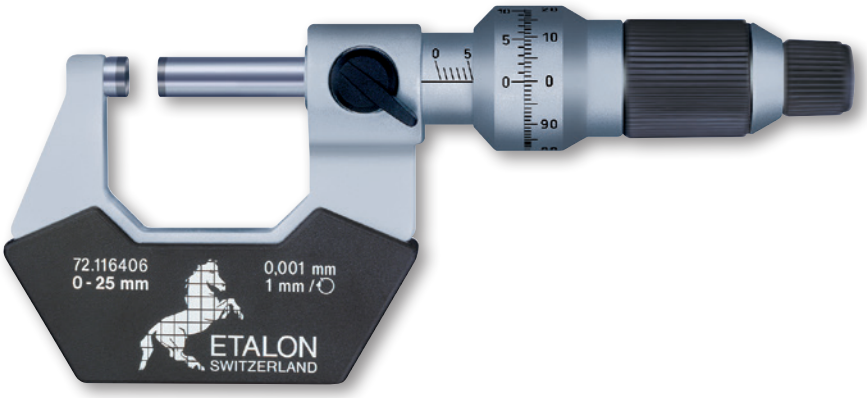


	mm	µm	µm
00310001	0 ÷ 25	2	1
00310002	25 ÷ 50	2	1,5
00310003	50 ÷ 75	3	1,5
00310004	75 ÷ 100	3	1,5
00310005	100 ÷ 125	4	2
00310006	125 ÷ 150	4	2,5
00310007	150 ÷ 175	5	3
00310008	175 ÷ 200	5	3

- DIN 863 T1 NF E 11-095
- Scale division: 0,1 mm or 0.005 in
- Tungsten carbide
- Measuring range 0 to 100 mm with inspection report and declaration of conformity
- Measuring range > 100 mm with a declaration of conformity
- 0,5 mm
- Max. 10 N
- ≤ 100 mm: Ø 6,5 mm > 100 mm: Ø 8 mm
- Vernier reading to 0,001 mm or 0.0001 in

ETALON MICRORAPID 226 with 1 mm Revolution

High precision micrometers – Fast, accurate reading – No reading error of the millimetre fractions – Barrel with scale to 1 mm – Thimble with 100 graduations and vernier reading to 0,001 mm.



	mm	µm	µm
072116406	0 ÷ 25	2	1
072116407	25 ÷ 50	2	1,5
072116408	50 ÷ 75	3	1,5
072116409	75 ÷ 100	3	1,5

- DIN 863 T1 NF E 11-095
- Tungsten carbide tipped
- Inspection report with a declaration of conformity
- 1 mm
- Max. 10 N
- Ø 6,5 mm
- Parallax-free vernier reading to 0,001 mm

DIN 863 T1
NF E 11-095

Tungsten carbide tipped

Measuring range 0 to 100 mm with inspection report and declaration of conformity

Measuring range smaller than 100 mm with a declaration of conformity

0.5 mm

Max. 10 N

≤ 100 mm: Ø 6,5 mm
> 100 ≤ 300 mm: Ø 8 mm

TESA ISOMASTER Standard Models with Analogue Indication

Slanted full millimetres on the barrel are set apart from the straight half millimetres to virtually eliminate reading errors.

The knurled sleeve needs only to be reversed to render the friction drive built into the thimble inactive.



NO	mm	mm
00110101	0 ÷ 25	0,01
00110102	25 ÷ 50	0,01
00110103	50 ÷ 75	0,01
00110104	75 ÷ 100	0,01
00110105	100 ÷ 125	0,01
00110106	125 ÷ 150	0,01
00110107	150 ÷ 175	0,01
00110108	175 ÷ 200	0,01
00110109	200 ÷ 225	0,01
00110110	225 ÷ 250	0,01
00110111	250 ÷ 275	0,01
00110112	275 ÷ 300	0,01

Set of 4 TESA ISOMASTER Micrometers

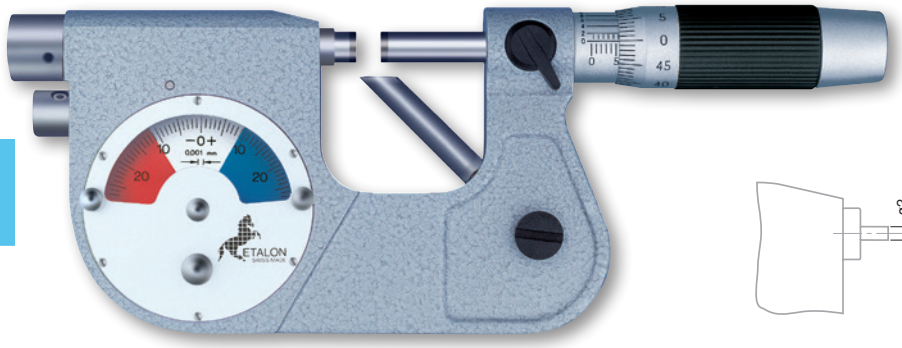
The models covering application range 0 to 100 mm provide the quality that you need at competitive prices.

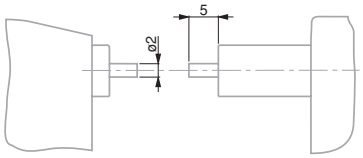


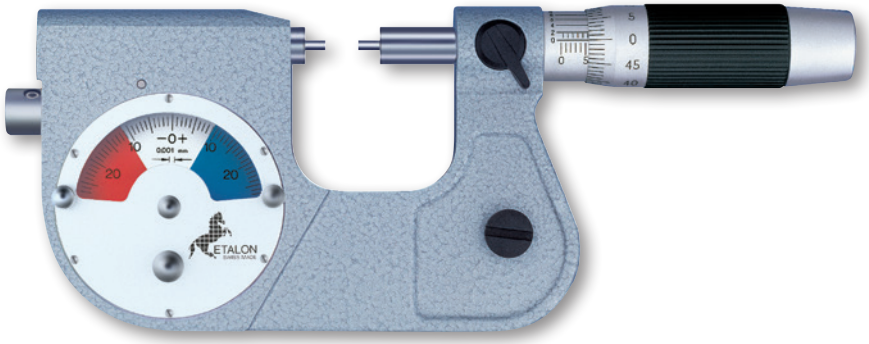
NO		mm
00110113	Set of 4 ISOMASTER micrometers	0 ÷ 100
CONSISTING OF:		
00110101	ISOMASTER AA external micrometer with vernier scale, 0 ÷ 25 mm and resolution to 0,01 mm	
00110102	ISOMASTER AA external micrometer with vernier scale, 25 ÷ 50 mm and resolution to 0,01 mm	
00110103	ISOMASTER AA external micrometer with vernier scale, 50 ÷ 75 mm and resolution to 0,01 mm	
00110104	ISOMASTER AA external micrometer with vernier scale, 75 ÷ 100 mm and resolution to 0,01 mm	

MICRO-ETALON 225 - Precision Micrometers with a Dial Indicator

Feature a mobile anvil along with a built-in dial indicator. Ideal for comparative measurements on small part series. The nominal dimension is set on the micrometer while deviations are read on the dial indicator. Retractable anvil by means of a push-button. Rotating dial for fine adjustment, also with adjustable tolerance markers.







- DIN 863 T3 (Style D13)
- Micrometer: max. perm. error of 2 µm. Dial indicator: 1 µm.
- Dial indicator: repeatability limit of 0.5 µm
- Tungsten carbide tipped
- 0,5 mm
- Anvil: 4,5 to 5,5 N
- 6,5 mm dia. Model with small measuring faces: 2 mm dia., 5 mm long
- Micrometer with vernier reading to 0,002 mm. Dial indicator: 0,001 mm.
- Dial indicator: ± 0,025 mm

NO		
	mm	
072108669	0 ÷ 25	Standard inserts
072108691	25 ÷ 50	Standard inserts
072108722	0 ÷ 20	Pointed inserts
OPTIONAL ACCESSORY:		
072110978	Protective cover for dial indicator	

Protective Cover for Micro-Etalon 225

Made in transparent plastic – Can be mounted on the bezel – Protects the indicator against dust particles and liquids – Prevents both tolerance markers from being accidentally displaced.



NO	
072110978	Protective cover for dial indicator

DIN 863 T3 (Style D14) NF E 11-090

Meas. element: max. perm. error of 2 µm

Mobile anvil: repeatability limit of 0,5 µm.

Tungsten carbide tipped

Adjustable part support (except model with small measuring faces).

0,5 mm

Anvil: 2 up to 8 N, adjustable

6,5 mm or 2 mm dia. and length of 5 mm for models with small measuring faces.

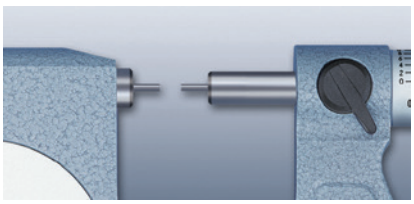
Vernier reading to 0,002 mm

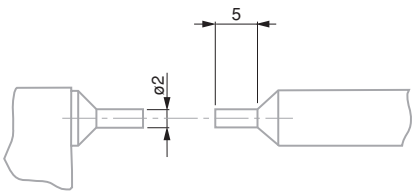
ETALON MICROSPEL 280

These micrometers have a mobile anvil along with an 8 mm diameter clamping bore for mounting a sensor with linear action such as a TESA GT 21/22 electronic probe. Specially designed for batch inspection of small precision made parts.









NO	mm	
072110816	0 ÷ 25	Standard inserts
072110853	0 ÷ 20	Pointed inserts

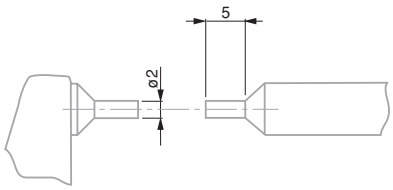
Electronic probe and micrometer stand are not part of the delivery scope and must be ordered separately.

MICROMASTER Micrometer with Small Measuring Faces

For measuring grooves, feather grooves, splines and other difficult to reach locations – Small measuring faces specially made to check small precision workpieces.



NO	mm	in
06030034	0 ÷ 30	0 ÷ 1.2
OPTIONAL ACCESSORY:		
01961000	Lithium battery 3V, CR2032	

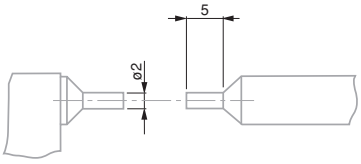


- DIN 863 T3 (Style D3)
- 0,001 mm / 0.00005 in
- Conversion mm/in
- Fixed measuring faces: tungsten carbide.
- Degree of protection (IEC 60529): IP54 or IP40 with use of the digital output
- Measuring range 0 to 100: with a SCS calibration certificate.
- RS232 interface, opto-coupled.
- For additional technical data: see standard.
- Max. 10 N

TESAMASTER AD Micrometer with Small Measuring Faces



NO	mm
00311301	0 ÷ 25



- DIN 863 T3 (Style D3) NF E 11-090
- Scale division 0,1 mm
- Fixed measuring faces: tungsten carbide
- Inspection report with a declaration of conformity
- Max. 10 N
- Vernier reading to 0,001 mm

DIN 863 T3 (Style D3) NF E 11-090

Fixed measuring faces: tungsten carbide

Inspection report with a declaration of conformity

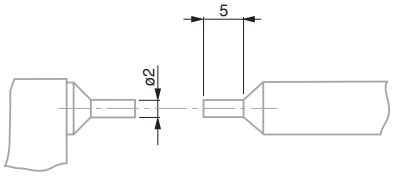
Max. 10 N

0,01 mm

ISOMASTER AD Micrometer with Small Measuring Faces



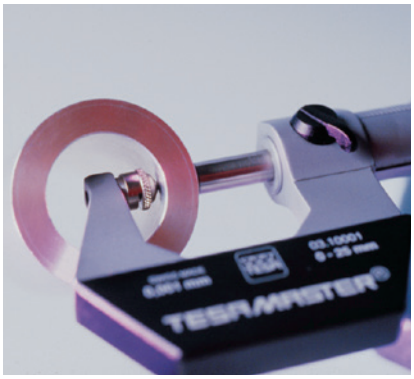
NO	mm
00210101	0 ÷ 25



Steel ball tip, hardened and lapped. Dull-chrome brass retainer

Spherical Element for External Micrometers

Holder with a ball tip to fit measuring faces Ø 6,5 mm– Used to measure tubing wall thickness or components with concave surfaces etc.



NO	Ø mm
072103522	5

MICROMASTER Micrometer with Two Spherical Measuring Faces

Rounded measuring faces on both anvil and spindle for measuring concave surfaces on components, e.g. ball-bearing guides or wall thickness.



NO	mm	in
06030081	0 ÷ 25	0 ÷ 1

- DIN 863 T3 (Style D1)
- 0,001 mm / 0.00005 in
- Tungsten carbide
- Inspection report with a declaration of conformity
- RS232
- Additional technical data: see standard.
- Max. 10 N
- Spherical: 3,5 mm radius.

MICROMASTER Micrometer with One Spherical Measuring Face

For the measurement of wall thickness of tubing and other similar tasks.



NO	mm	in
06030079	0 ÷ 30	0 ÷ 1.2

- DIN 863 T3 (Style D1)
- 0,001 mm or 0.00005 in
- Anvil in tungsten carbide. Micrometric spindle in tungsten carbide
- Inspection report with a declaration of conformity
- RS232
- Other technical data see standard.
- Max. 10 N
- Anvil with a 3,5 mm spherical face (MICROMASTER) or 3,25 mm (ETALON). Spindle with a flat measuring face.

DIN 863 T3 (Style D1) NF E 11-090

Titanium carbide coated for model No. 00112106. Hardened steel for other models.

Inspection report with a declaration of conformity

0,5 mm

Max. 10 N

Radius of spherical faces: to 3,25 mm

0,01 mm

ISOMASTER AAS
Micrometer with Two Spherical Measuring Faces

Rounded measuring faces for checking concave surfaces such as ball-bearing guides and wall thickness.



NO	mm
00110901	0 ÷ 25

DIN 863 T3 (Style D 10)

0,001 mm / 0.00005 in

Conversion mm/in

Tungsten carbide

Inspection report with a declaration of conformity

RS232

Additional technical data: see standard.

0,75 mm for 3-flute test pieces or 0,559 mm for 5-flute test pieces.

Max. 10 N

Angle of the prism aperture: 60° for 3-flute test pieces or 108° for 5-flute test pieces.

MICROMASTER Micrometers with Prismatic Measuring Faces

Measure test pieces with an odd number of grooves such as milling cutters, taps, drills and spline shafts as well as polygons. Determine roundness errors on cylindrical surfaces. The angle of the prism aperture is designed for workpieces having 3 or 5 flutes.



NO	mm	in	
06030087	1 ÷ 7	0.04 ÷ 0.27	3 flute test pieces (60°)
06030088	5 ÷ 20	0.20 ÷ 0.80	3 flute test pieces (60°)
06030089	20 ÷ 35	0.80 ÷ 1.38	3 flute test pieces (60°)
06030090	35 ÷ 50	1.38 ÷ 1.97	3 flute test pieces (60°)
06030091	50 ÷ 65	1.97 ÷ 2.56	3 flute test pieces (60°)
06030092	65 ÷ 80	2.56 ÷ 3.15	3 flute test pieces (60°)
06030093	1 ÷ 7	0.04 ÷ 0.27	5 flute test pieces (108°)
06030094	5 ÷ 25	0.20 ÷ 0.98	5 flute test pieces (108°)
06030095	25 ÷ 45	0.98 ÷ 1.77	5 flute test pieces (108°)
06030096	45 ÷ 65	1.77 ÷ 2.56	5 flute test pieces (108°)
06030097	65 ÷ 85	2.56 ÷ 3.35	5 flute test pieces (108°)

ISOMASTER AS
Micrometers with Prismatic Measuring Faces

The micrometer ISOMASTER AS is used for measuring test pieces with an odd number of grooves such as milling cutters, taps, drills and spline shafts as well as poliygons. It can also determine roundness errors on cylindrical workpieces.

The aperture angle of the prism is designed for workpiees having 3 or 5 flutes or their multiples.

DIN 863 T3 (Style D 10) NF E 11-090

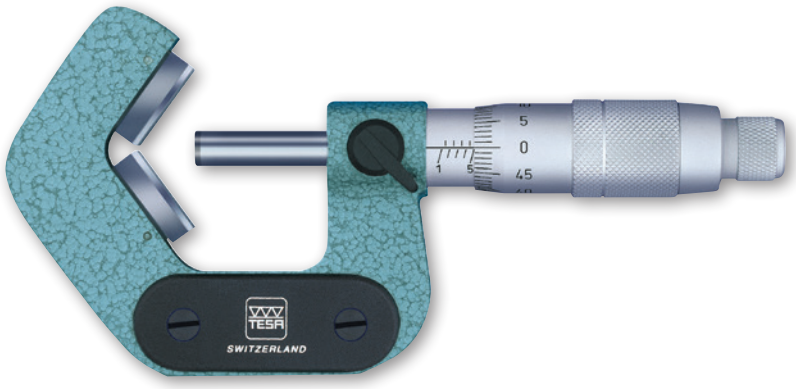
Tungsten carbide tipped

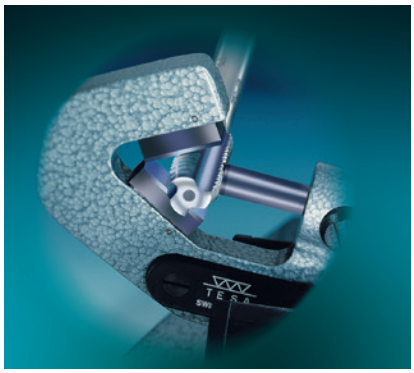
0,75 mm for 3-flute test pieces or 0,559 mm for 5-flute test pieces

Max. 10 N

Angle of the prism aperture: 60° for 3-flute test pieces or 108° for 5-flute test pieces.

0,01 mm





NO		
	mm	
00410001	1 ÷ 7	3 flute test pieces (60°)
00410002	5 ÷ 20	3 flute test pieces (60°)
00410003	20 ÷ 35	3 flute test pieces (60°)
00410004	35 ÷ 50	3 flute test pieces (60°)
00410005	50 ÷ 65	3 flute test pieces (60°)
00410102	5 ÷ 25	5 flute test pieces (108°)

Cylindrical Setting Standards for Micrometers

Alloyed steel, hardend

With a protective cap from the nominal size of 20 mm. Effective diameter engraved on the front face.

NO	//	d	∅
	µm	µm	
00440001	0,5	–	5
00440002	0,7	1	20
00440003	0,7	1	25
00440004	1	1	35
00440005	1,2	1,5	45
00440006	1,2	1,5	50
00440007	1,5	1,5	65



DIN 863 T3 (Style D7)

0,001 mm / 0.00005 in

Conversion mm/in

Hardened steel

Suitable from module 0,5 onwards

Inspection report with a declaration of conformity

RS232

Additional technical data: see standard.

Max. 10 N

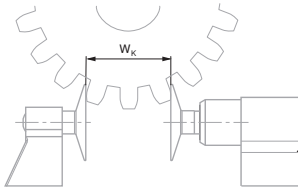
Non-rotating spindle
≤ 85 mm: 25 mm dia.
> 85 ≤ 115 mm: 30 mm dia.

MICROMASTER Micrometers for Gear Pitch Measurement

Flanges with ring-shaped measuring faces for root tangent lengths, Wk on gear pitches, distance between grooves and slots as well as other hard-to-reach locations.

Non-rotating measuring spindle, without spindle lock.





NO	mm	in
06030041	0 ÷ 30	0 ÷ 1.2
06030042	25 ÷ 55	1 ÷ 2.1
06030043	55 ÷ 85	2.1 ÷ 3.35
06030044	85 ÷ 115	3.35 ÷ 4.5

DIN 863 T3 (Style D7) NF E 11-090

Hardened steel

Suitable from module 0,6

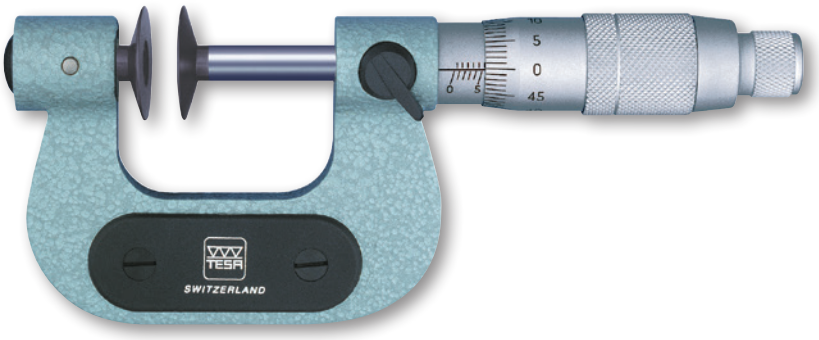
Inspection report with a declaration of conformity

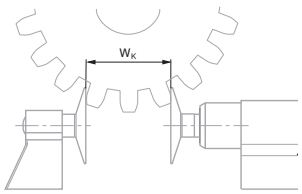
Max. 10 N

≤ 100 mm: 25 mm dia.
> 100 ≤ 150 mm: 32 mm dia

0,01 mm

ISOMASTER AE Micrometers for Gear Tooth / Pitch Measurement





NO	mm
00210201	0 ÷ 25
00210202	25 ÷ 50
00210203	50 ÷ 75
00210204	75 ÷ 100

	Maximum permissible error disregarding a rim of 1 mm during inspection of the measuring faces and having partial contact with the measuring face.	Maximum permissible error with full contact of the measuring face (DIN863-T1)	Flatness	Parallelism	Maximum flexure of the frame
mm	µm	µm	µm	µm	µm
0 ÷ 30	10	4	2	5	2
25 ÷ 55	10	4	2	5	2
55 ÷ 85	11	5	2	5	3
85 ÷ 115	12	5	2	6	4

MICROMASTER with 7 Pairs of Interchangeable Measuring Inserts

Non-rotating spindle, without spindle lock.



NO	mm	in
06030045	0 ÷ 30	0 ÷ 1.2
CONSISTING OF:		
06030099	MICROMASTER single micrometer for use with interchangeable measuring inserts, 0-30 mm	
00269027	Full set of 7 pairs of inserts	

0,001 mm / 0.00005 in

Conversion mm/in

Micrometer element with a max. perm. error of 4 µm

Hardened steel

7,5 mm diameter non-rotating spindle. With a fixing bore for a measuring insert. Adjustable attachment on the anvil for a measuring insert, with lock.

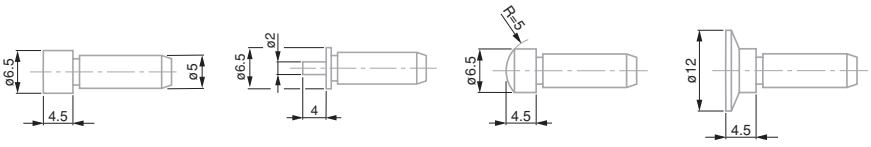
Inspection report with a declaration of conformity

RS232

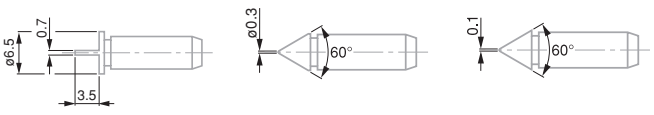
Additional technical data: see standard

Max. 10 N

Full Set of Measuring Inserts for MICROMASTER with Interchangeable Inserts



00269020 00269021 00269022 00269023



00269024 00269025 00269026

NO	
00269027	Full set of 7 pairs of inserts
COMPOSITION OF THE SETS:	
00269020	Pair of flat inserts
00269021	Pair of spline inserts
00269022	Pair of spherical inserts
00269023	Pair of disc inserts
00269024	Pair of blade inserts
00269025	Pair of point inserts
00269026	Pair of knife edge inserts

DIN 863 T3 (Style D18)

0,001 mm / 0.00005 in

Conversion mm/in

Inspection report with a declaration of conformity

RS232

Additional technical data: see appropriate standard

Max. 10 N

30 mm measuring span

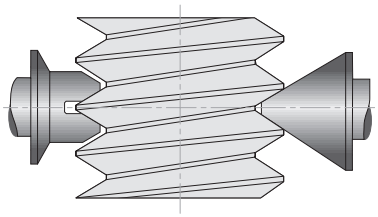
MICROMASTER AC Micrometers for Thread Measurement

Used for pitch diameter inspection. Anvil with adjustable holder for mounting a measuring insert with prismatic faces. Fine screw adjustment and locking device. The spindle has a fixing bore for a cone-shaped measuring insert.



No	mm	in
06030062	0 ÷ 25	0 ÷ 1
06030063	25 ÷ 50	1 ÷ 2
06030064	50 ÷ 75	2 ÷ 3
06030065	75 ÷ 100	3 ÷ 4

Note: Measuring inserts and setting standards must be ordered separately.



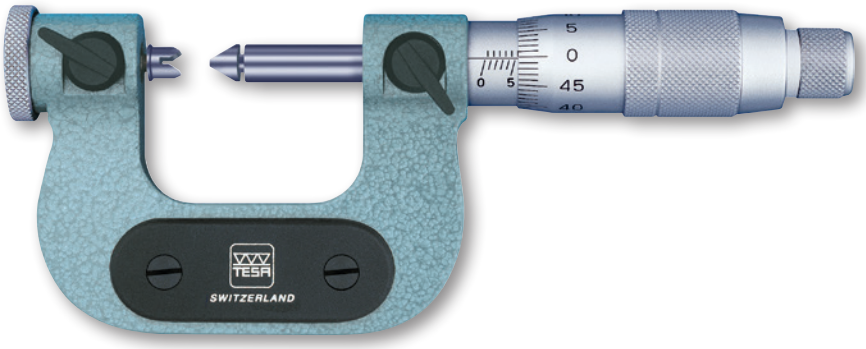
DIN 863 T3 (Style D 18) NF E 11-090

0,5 mm

Max. 10 N

0,01 mm

ISOMASTER AC Micrometers for Thread Measurement Models



No	mm
00210001	0 ÷ 25
00210002	25 ÷ 50
00210003	50 ÷ 75
00210004	75 ÷ 100

Measuring inserts and setting standards must be ordered separately.

Interchangeable Thread Inserts for TESA Micrometers Series AC

With measuring faces specially designed for checking pitch diameters.

Hardened steel

Supplied in sets or pairs

Fixing rod: 3,5 mm dia., 15,5 mm long





For unified inch threads, UN, UNC, UNF.... 60° flank angle

NO	
00250015	Set of inserts 64 ÷ 2.5 in
COMPOSITION OF THE SETS:	
00250000	AC UN,UNC,UNF 64 ÷ 42 in
00250001	AC UN,UNC,UNF 42 ÷ 25 in
00250002	AC UN,UNC,UNF 25 ÷ 17 in
00250003	AC UN,UNC,UNF 17 ÷ 10 in
00250004	AC UN,UNC,UNF 10 ÷ 6.5 in
00250005	AC UN,UNC,UNF 6.5 ÷ 4 in
00250006	AC UN,UNC,UNF 4 ÷ 2.5 in

For Whitworth threads, 55° flank angle

NO	
00250115	Set of inserts, whitworth 60 ÷ 3 in
COMPOSITION OF THE SETS:	
00250100	AC whitworth 60 ÷ 48 in
00250101	AC whitworth 48 ÷ 40 in
00250102	AC whitworth 40 ÷ 32 in
00250103	AC whitworth 32 ÷ 24 in
00250104	AC whitworth 24 ÷ 18 in
00250105	AC whitworth 18 ÷ 14 in
00250106	AC whitworth 14 ÷ 10 in
00250107	AC whitworth 10 ÷ 7 in
00250108	AC whitworth 7 ÷ 4.5 in
00250109	AC whitworth 4.5 ÷ 3 in

For ISO metric threads, flank angle 60°

NO	
00240015	Set of inserts ISO 0.40 ÷ 6.00
COMPOSITION OF THE SETS:	
00240000	ISO 0.4 ÷ 0.50
00240001	ISO 0.5 ÷ 0.60
00240002	ISO 0.6 ÷ 0.80
00240003	ISO 0.8 ÷ 1.00
00240004	ISO 1.0 ÷ .25
00240005	ISO 1.25 ÷ 1,50
00240006	ISO 1,5 ÷ 2,00
00240007	ISO 2,00 ÷ 2,50
00240008	ISO 2,5 ÷ 3,00
00240009	ISO 3,00 ÷ 4,00
00240010	ISO 4,00 ÷ 5,00
00240011	ISO 5,0 ÷ 6,00

Setting Standards for Screw Thread Micrometers - Metric, 60° or 55° flank angle

Hardened steel

Insulating sleeve marked with actual size



60° flank angle, metric

NO	Flank angle	mm
00240501	60°	25
00240502	60°	50
00240503	60°	75
00240504	60°	100
00240505	60°	125

60° flank angle, imperial

NO	Flank angle	in
00250501	60°	1
00250502	60°	2
00250503	60°	3
00250504	60°	4
00250505	60°	5

55° flank angle, metric

NO	Flank angle	mm
00240601	55°	25
00240602	55°	50
00240603	55°	75

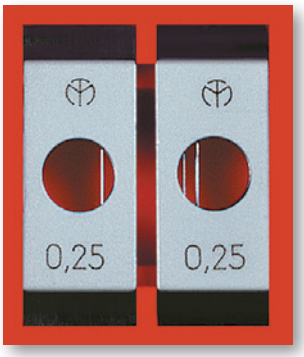
Steel wires, hardened

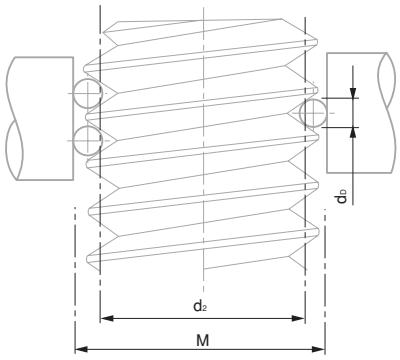
Single pairs are supplied in a plastic box, full set in a wooden case

Wires are mounted on holders: 2-wire holder rests on anvil while the single wire holder is used on spindle side

XB Wires for Screw Threads

For measuring pitch diameter of threads using the three-wire method. Actual flank diameter d2 can either be determined arithmetically or with the aid of the relevant tables based on the measured actual size M – Suitable for all standard micrometers with measuring faces of 6,5 mm diameter.





NO	Diameter of the wires dD in mm	ISO metric threads Pitch in mm	Whitworth threads Number of threads per in	Unified inch-threads UN, UNC, UNF Number of threads per in
00240701	0,17	0,25 / 0,3	–	–
00240702	0,22	0,35	–	72
00240703	0,25	0,4	60	64
00240704	0,29	0,45 / 0,5	–	56
00240705	0,335	0,6	48 / 40	48 / 44
00240706	0,455	0,7 ÷ 0,8	–	32
00240707	0,53	0,9	32 / 28	28
00240708	0,62	1,0	26 / 24	24
00240709	0,725	1,25	22 ÷ 19	20
00240710	0,895	1,5	18 / 16	18 / 16
00240711	1,10	1,75	14	14 / 13
00240712	1,35	2,0	12 / 11	12 / 11
00240713	1,65	2,5	10 / 9	10 / 9
00240714	2,05	3,0 / 3,5	8 / 7	8 / 7
00240715	2,55	4,0 / 4,5	6	6
00240716	3,20	5,0 / 5,5	5 / 4.5	5 / 4.5

Wires in hardened steel

Single pairs supplied in a plastic case, full set in a wooden box.

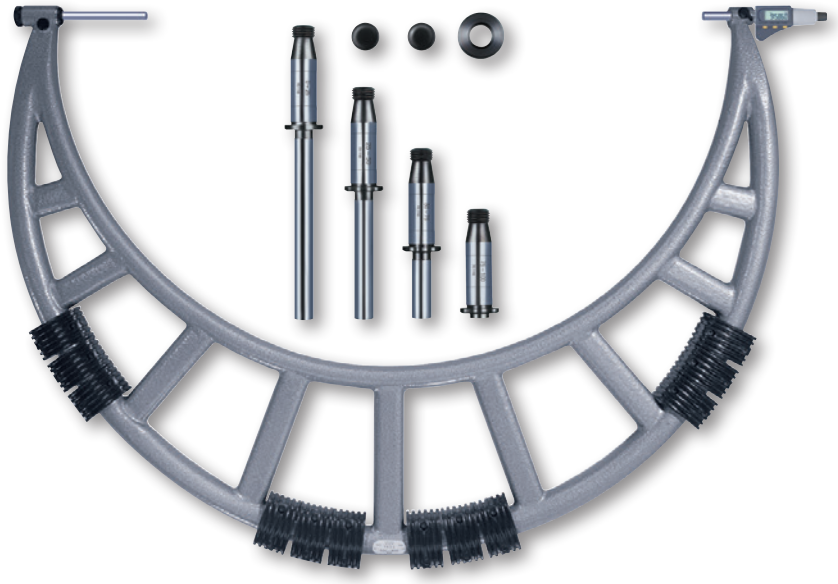
Wires mounted on holders: the 2 wire holder rests on the anvil, whilst the single wire holder is used on the spindle side.

Set of 16 Pairs of XB Wires for Thread Measurement

NO	Diameter of the wires dD in mm
00240700	0,17 ÷ 3,20

MICROMASTER with Interchangeable Anvils

All sets include 4 interchangeable anvils with increasing length in steps of 25 mm. The anvils are adjusted (and numbered) in sets, thus rendering the correction of the indication unnecessary whenever an anvil is exchanged.



NO				
	mm	in	µm	µm
06030047	0 ÷ 100	0 ÷ 3.94	6	3
06030048	100 ÷ 200	3.94 ÷ 7.87	7	4,5
06030049	200 ÷ 300	7.87 ÷ 11.81	8	7
06030050	300 ÷ 400	11.81 ÷ 15.75	9	9
06030051	400 ÷ 500	15.75 ÷ 19.69	10	9
OPTIONAL ACCESSORIES:				
00140301	Dial gauge element			

DIN 863 T3 (Style D16)
0,001 mm / 0.00005 in
LCD, digit height: 7 mm
Conversion mm/in
Tungsten carbide tipped
Inspection report with declaration of conformity
RS232
Additional technical data: see standard
0,5 mm
Max. 10 N
Ø 8 mm
30 mm measuring span
0 ≤ 500 mm: malleable cast iron. > 500 ≤ 1000 mm: steel tube with insulating grips. Maxium flexing of the frame under a measuring force of 10 N: see table



Dial Gauge Element for MICROMASTER and AB Micrometers

Can replace the interchangeable anvils on AB series micrometers. Makes finding the culmination point easier. Ensures a constant measuring force.

NO	
00140301	Dial gauge element

Element body: Ø 11 mm, length 100 mm. Dial gauge 01410211: dial Ø 40 mm, two directional reading.
With dial gauge and clamp
Max. 10 N
Ø 8 mm
0,01 mm
± 1,5 mm

DIN 863 T3 (Style D16) NF E 11-090

Tungsten carbide tipped

0,5 mm

Max. 10 N

8 mm diameter

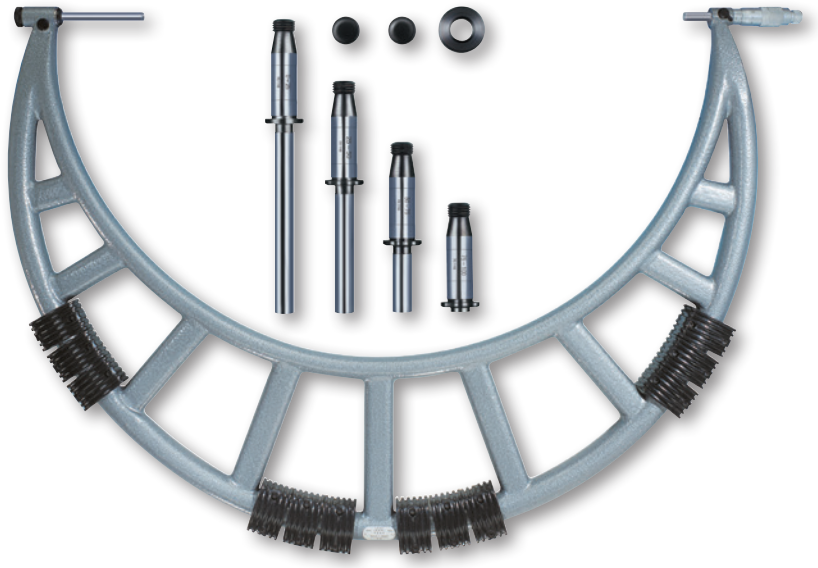
0,01 mm

0 ≤ 500 mm: malleable cast iron; 500 ≤ 1000 mm: steel tube with insulating grips. Max. flexure of the frame under a measuring force of 10 N: see the table opposite

ISOMASTER AB with Interchangeable Anvils

Lightweight, but rugged anvil micrometers. Set No. 00140101 includes 4 interchangeable anvils with increasing length in steps of 25 mm.

Anvils are adjusted and numbered in pairs, thus rendering any correction of the indication unnecessary whenever an anvil is exchanged.



NO			
	mm	µm	µm
00111901	0 ÷ 100	6	3
00111902	100 ÷ 200	7	4,5
00111903	200 ÷ 300	8	7
00111904	300 ÷ 400	9	9
00111905	400 ÷ 500	10	9
OPTIONAL ACCESSORIES:			
00140301	Dial gauge element		

Measuring range up to 1500 mm also available upon request.

DIN 863 T3 (Style D16) NF E 11-090

Tungsten carbide tipped

Set includes 2 guard plates for the frame as well as 1 clamping nut

8 mm diameter

Interchangeable Anvils for ISOMASTER AB Series

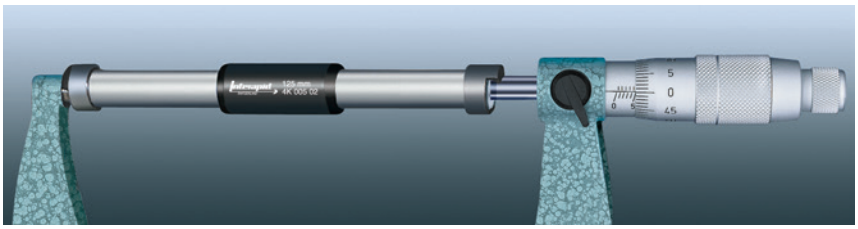
Set of 4 interchangeable anvils with increasing length in steps of 25 mm. The anvils are adjusted and numbered in pairs, thus eliminating the need for resetting the indication when exchanging either of them. Supplied as standard accessories with the AB series micrometers.



NO	
00140101	Interchangeable anvils AB

INTERAPID Setting Standards





- Maximum permissible error over the length: ± (1 + L/100) µm, L in mm
- Hardened steel
- Inspection report with actual measured length
- Cylindrical gauge block with plastic insulating grip and dull chrome shaft
- Two measuring faces, flat and rounded
- With lengths: ≤ 175 mm= 10 mm. ≥ 200 mm = 13 mm.

NO	mm
02140001	25
02140002	50
02140003	75
02140004	100
02140005	125
02140006	150
02140007	175
02140008	200
02140009	225
02140010	250

NO	mm
02140011	275
02140012	300
02140013	325
02140014	350
02140015	375
02140016	400
02140017	425
02140018	450
02140019	475
02140020	500

Measuring range up to 1500 mm also available upon request.

ETALON Cylindrical Step Gauges

For adjustement of the display and calibration.



- Maximum permissible errors for nominal diameters: ≤ 80 mm = 1,5 µm ≥ 90 ≤ 120 mm = 2,0 µm ≥ 130 mm = 2,5 µm
- Alloyed steel, hardened
- Diameters in steps of 5 mm (≤ 50 mm) or 10 mm (> 50 mm).

NO	Ø mm
072112020	5 ÷ 100
072112021	5 ÷ 150

Guide Collars for Setting Standards

Making the positioning of INTERAPID setting standards quick and easy.



NO	mm	mm
02140103	100 ÷ 175	8
02140108	200 ÷ 1475	8

Micrometer Stands

For external micrometers up to 300 mm as well as many other hand-held tools.





No	
00160201	TESA micrometer stand with clamp aperture 16 mm
072110123	ETALON micrometer stand with clamp aperture 20 mm

Length tolerance with reference to the nominal dimension: ± 100 µm

Each set is supplied in a wooden case

Flatness tolerances for optical parallels with lengths: ≤ 27,335 mm = 0,15 µm ≥ 52,00 ÷ 77,335 mm = 0,2 µm

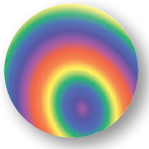
Tolerances in parallelism for optical parallels with lengths: ≤ 27,335 mm: 0,4 µm ≥ 52,00 ÷ 77,335 mm: 0,5 µm

31 mm

Optical Flats with Two Parallel Faces

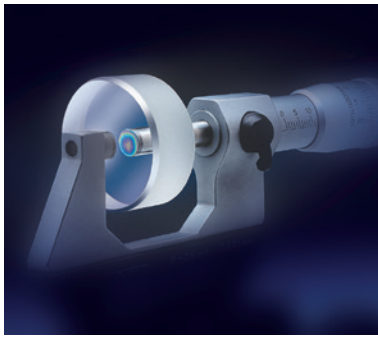
Used for examining the flatness and parallelism of the measuring faces on external micrometers as well as other similar measuring instruments. The difference in length of the optical flats within a set matches a quarter or a third of the spindle pitch of 0,5 mm.











No		mm
02510000	Set interference glass 12 ÷ 12,375 mm	12,00 ÷ 12,375
02510001	Interference glass 12	12,00
02510002	Interference glass 12,125	12,125
02510003	Interference glass 12,25 mm	12,25
02510004	Interference glass 12,375 mm	12,375
02510100	Set interference glass 27 ÷ 27,335 mm	27,00 ÷ 27,335
02510101	Interference glass 27 mm	27,00
02510102	Interference glass 27,165 mm	27,165
02510103	Interference glass 27,335 mm	27,335
02510200	Set interference glass 52 - 52,3	52,00 ÷ 52,335
02510201	Interference glass 52 mm	52,00
02510202	Interference glass 52,165 mm	52,165
02510203	Interference glass 52,335 mm	52,335
02510300	Set interference glass 77 ÷ 77,335 mm	77,00 ÷ 77,335
02510301	Interference glass 77,00 mm	77,00
02510302	Interference glass 77,165 mm	77,165
02510303	Interference glass 77,335 mm	77,335

MICROMASTER Depth Micrometers

Non-rotating measuring rod. Sets with a step length of 30 mm.



No	mm	in	mm
06030069	0 ÷ 90	0 ÷ 3.5	50 x 15
06030070	0 ÷ 180	0 ÷ 7	100 x 15

- DIN 863 T2 (Style T)
- 0,001 mm / 0.00005 in
- Conversion mm/in
- Max. perm. error (meas. element): 3 µm
- Measuring rods with hardened steel tips
- Non-rotating spindle
- Inspection report with a declaration of conformity
- RS232 data output
- 0,5 mm
- 3 mm diameter measuring rods
- 30 mm

Set of Depth Rods for Micromaster

Set of 6 depth rods.



No	mm
06060021	0 ÷ 180

ISOMASTER AQ Depth Micrometers

Measuring rods with a step length of 25 mm.





No	mm	mm
00211002	0 ÷ 75	50 x 15
00211003	0 ÷ 150	50 x 15
00211004	0 ÷ 75	100 x 15
00211005	0 ÷ 150	100 x 15

- DIN 863 T2 (Style T) NF E 11-097
- Max. perm. error of the measuring element: 3 µm
- Measuring rods with hardened steel ends
- 0,5 mm
- 3 mm diameter measuring rods. Measuring face on the base: see table
- 0,01 mm

DIN 863 T2 (Style E)
0,001 mm / 0.00005 in
Conversion mm/in
Max. perm. error of 4 µm
Tungsten carbide tipped
Inspection report with a declaration of conformity
RS232 interface, opto-coupled
Additional technical data: see standard
0,5 mm
Max. 10 N
6,5 mm dia.

MICROMETER HEADS

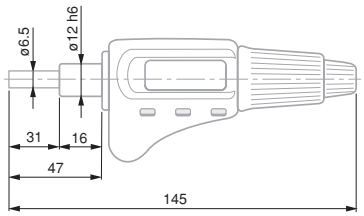
Micrometer heads used principally for the measurement of displacement on special fixtures such as roller tables, XY tables. Mounted using the cylindrical couping shaft.

MICROMASTER Micrometer Heads

Without spindle lock



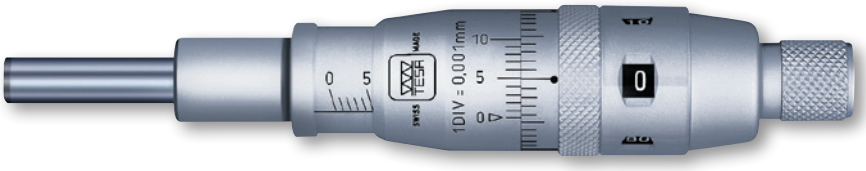
No	mm	∅
06030038	0 ÷ 30	12h6
06030039	30 ÷ 0	12h6
06030040	30 ÷ 0	12h6



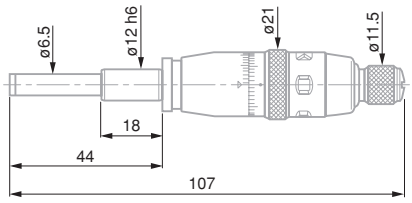
DIN 863 T2 (Style E)
Value of the scale: 0,1 mm
Max. perm. error of 2 µm
Tungsten carbide tipped
0,5 mm
Max. 10 N
6,5 mm dia
Vernier reading to 0,001 mm

TESAMASTER AR Micrometer Heads

Without spindle lock.

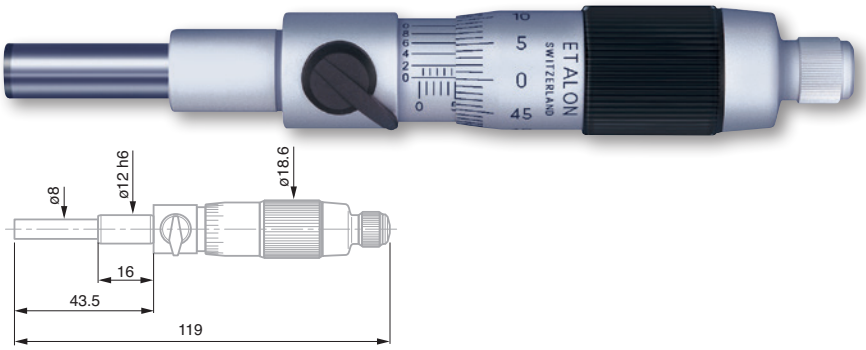


No	mm	∅
00312301	0 ÷ 25	12h6



ETALON 266 Micrometer Heads

With spindle lock.

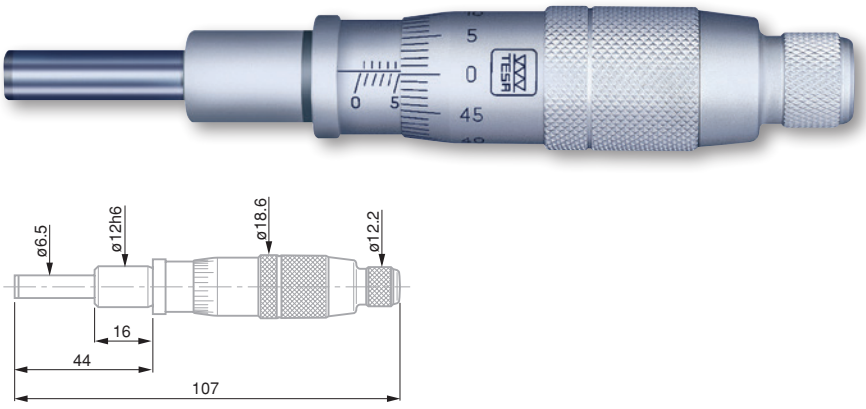


NO	mm	D mm		Spindle lock
072115943	0 ÷ 25	Ø 8	12h6	●

DIN 863 T2 (Style E) NF E 11-090
Max. perm. error: 3 µm
Tungsten carbide tipped
0,5 mm
Vernier reading to 0,002 mm

ISOMASTER AR Micrometer Heads

Without spindle lock.



NO	mm	
00211201	0 ÷ 25	12h6

DIN 863 T2 (Style E) NF E 11-090
Max. perm. error of 3 µm
Tungsten carbide tipped
0,5 mm
Max. 10 N
6,5 mm dia
0,01 mm

ISO 13385-1
Stainless steel, hardened
Inspection report with a declaration of conformity
Technical data: see appropriate standard
Tungsten carbide tipped

TESA DUO-SET 1



NO		
00530020	TESA DUO-SET 1	
CONSISTING OF:		
NO		mm
00510008	CCMA-M dial caliper with measuring range of 150 mm, resolution to 0,02 mm and 2 mm travel per revolution.	0 ÷ 150
00560013	Depth foot for calipers up to 150 mm	
00110101	ISOMASTER AA external micrometer with vernier scale, 0 ÷ 25 mm and resolution to 0,01 mm	0 ÷ 25
00560031	Case for set of instruments	

DIN 862
Stainless steel, hardened
Inspection report with a declaration of conformity
Technical data: according to the appropriate standard
Tungsten carbide tipped

TESA DUO-SET 2



NO		
00530021	TESA DUO-SET 2	
CONSISTING OF:		
NO		mm
00510008	CCMA-M dial caliper with measuring range of 150 mm, resolution to 0,02 mm and 2 mm travel per revolution.	0 ÷ 150
00560013	Depth foot for calipers up to 150 mm	
00310001	TESAMASTER external micrometer with measuring range 0 ÷ 25 mm and vernier scale reading to resolution 0,001 mm.	0 ÷ 25
00560031	Case for set of instruments	

TESA DUO-SET 13



ISO 13385-1
Stainless steel, hardened.
SCS calibration certificate
Technical data: see appropriate standard
Tungsten carbide tipped

NO		
00531004	TESA DUO-SET 13	
CONSISTING OF:		
NO		mm
00530319	TWIN-CAL electronic caliper with measuring range 150 mm, resolution 0,01 mm, IP67 rating and square depth rod.	150
00560013	Depth foot for calipers up to 150 mm	
06030020	MICROMASTER IP54 digital micrometer, 0 ÷ 30 mm, 0,001 mm resolution, IP54 rating.	0 ÷ 30
00560090	Case for set of instruments	

TESA DUO-SET 16



DIN 862
Stainless steel, hardened
SCS calibration certificate
Technical data: see appropriate standard
Tungsten carbide tipped

NO		
00531007	TESA DUO-SET 16	
CONSISTING OF:		
NO		mm
00530094	Standard TWIN-CAL, electronic caliper, with measuring range 150 mm, resolution of 0,01 mm and IP40 protection rating. Round depth rod.	150
00560013	Depth foot for calipers up to 150 mm	
06030010	MICROMASTER EASY digital micrometer, 0 ÷ 30 mm, 0,001 mm resolution.	0 ÷ 30
00560090	Case for set of instruments	



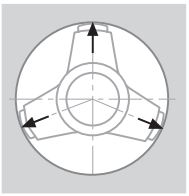
Internal Measurement

THE CHALLENGES OF INTERNAL MEASUREMENT

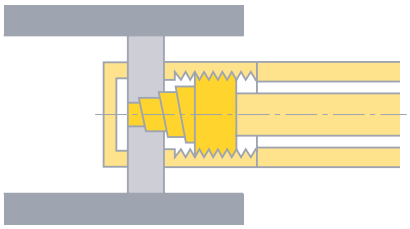
Bore measurement is more difficult than external measurement of components. Apart from the very tight tolerances specificied, all measuring elements having a direct influence on the uncertainty of measurement must be designed in such a way that they can fit into the bore to be checked.

3-LINE CONTACT OFFERS A TRUE ADVANTAGE

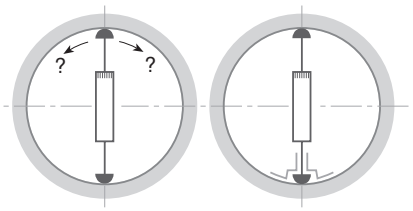
The near perfect auto-centering and auto alignment provided by TESA IMICRO, TESA TRI-O-BOR, ALESOMETER and ETALON INTALOMETER make bore measurement reliable, without the need for an operator to estimate.



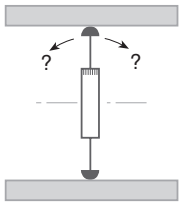
The three measuring bolts are spaced 120° apart, thus providing optimum self-centring.



The measuring bolts with 3-line contact allows the micrometer to align itself parallel to the contact surfaces.



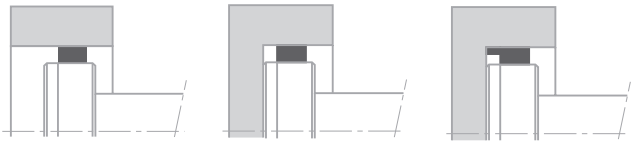
2-point contact measuring instruments are not self-centring. To enable bore measurements, the use of auxiliary means are required.



2-point contact does not permit the tool to align itself in relation to the bore axis.

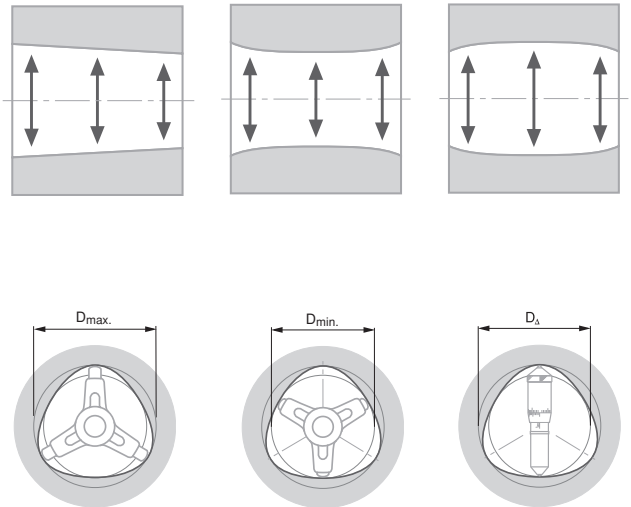
A SINGLE TOOL CAN REPLACE HUNDREDS OF PLUG GAUGES

Unlike plug gauges that check only one toleranced size, a single tool can measure many diameters. Depending on the model that is being used, through holes and blind bores along with short centring shoulders can be inspected reliably.



ESTABLISHING FORM ERRORS

Form errors are established through measurements taken at several points within a bore. Micrometers with 3-line contact determine run-out errors in a triangular way. Micrometers with 2-point contact measure medium-size diameters only. They do not allow users to see what makes diameters measured at various points different.



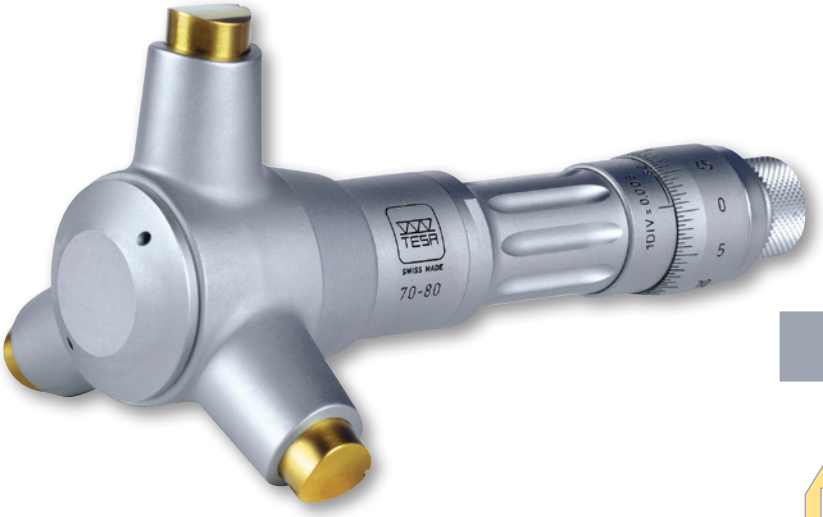
DIN 863 T4 (Style C1) NF E 11-099

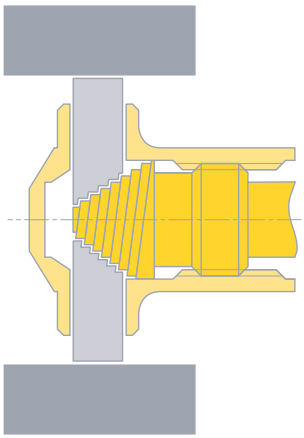
Measuring faces for application ranges from 3,5 to 12 mm: hardened steel (HV30 770) 11 to 100 mm: TiN hard-coating (HV5 2300) 100 to 300 mm: carbide tipped (HV5 1300)

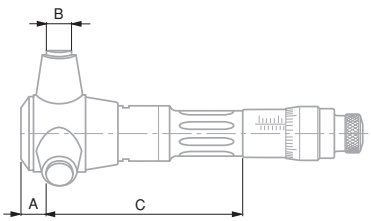
Inspection report with a declaration of conformity

TESA IMICRO with Analogue Indication – Metric

Self-centring and self-aligning internal micrometers. The high-precision thread machined into the measuring cone, combined with the measuring bolts specially arranged to provide 3-line contact, make them the only micrometers in the world that respect the ABBE principle. Measure depth, reliably.







NO							
	mm	mm	µm	µm	A mm	B mm	C mm
00813410	3,5 ÷ 4	0,001	4	4	2	1,5	20
00813411	4 ÷ 4,5	0,001	4	4	2	1,5	20
00813412	4,5 ÷ 5,5	0,001	4	4	2	1,5	25
00813413	5,5 ÷ 6,5	0,001	4	4	2	1,5	25
00810001	6 ÷ 8	0,001	4	4	2,5	2,5	52
00810002	8 ÷ 10	0,001	4	4	2,5	2,5	52
00810003	10 ÷ 12	0,001	4	4	2,5	2,5	52
00810801	11 ÷ 14	0,005	4	4	3,5	4	77
00810802	14 ÷ 17	0,005	4	4	3,5	4	77
00810803	17 ÷ 20	0,005	4	4	3,5	4	77
00811501	20 ÷ 25	0,005	4	4	7	7	78
00811502	25 ÷ 30	0,005	4	4	7	7	78
00811503	30 ÷ 35	0,005	4	4	7	7	78
00811504	35 ÷ 40	0,005	4	4	7	7	78
00812301	40 ÷ 50	0,005	4	4	11	12	84
00812302	50 ÷ 60	0,005	5	5	11	12	84
00812303	60 ÷ 70	0,005	5	5	11	12	84
00812304	70 ÷ 80	0,005	5	5	11	12	84
00812305	80 ÷ 90	0,005	5	5	11	12	84
00812306	90 ÷ 100	0,005	5	5	11	12	84
00812601	100 ÷ 125	0,01	6	6	26	18	81
00812602	125 ÷ 150	0,01	6	6	26	18	81
00812603	150 ÷ 175	0,01	7	7	26	18	81
00812604	175 ÷ 200	0,01	7	7	26	18	81
00813101	200 ÷ 225	0,01	8	8	26	18	81
00813102	225 ÷ 250	0,01	8	8	26	18	81
00813103	250 ÷ 275	0,01	8	8	26	18	81
00813104	275 ÷ 300	0,01	8	8	26	18	81

TESA IMICRO with Analogue Indication – Full Metric Sets

DIN 863 T4 (Style C1) NF E 11-099

Measuring faces on models from 3,5 to 12 mm: hardened steel, HV30 770; 11 to 100 mm: titanium nitride (TiN) hard-coating to HV5 2300. 100 to 200 mm: tungsten carbide tipped to HV5 1300.

Inspection report with a declaration of conformity



		mm	Isolated instruments	mm	Setting rings	mm	Extensions	A mm
COMPOSITION OF THE SETS:								
00813409	BAE	3,5 ÷ 6,5	00813410	3,5 ÷ 4	00843200	4		
			00813411	4 ÷ 4,5	00843201	5,5		
			00813412	4,5 ÷ 5,5				
			00813413	5,5 ÷ 6,5				
00810000	BAF	6 ÷ 12	00810001	6 ÷ 8	00840101	8	00840001	100
			00810002	8 ÷ 10	00840102	10		
			00810003	10 ÷ 12				
00810800	BAG	11 ÷ 20	00810801	11 ÷ 14	00840103	11	00840301	150
			00810802	14 ÷ 17	00840105	17		
			00810803	17 ÷ 20				
00811500	BAH	20 ÷ 40	00811501	20 ÷ 25	00840106	25	00841100	150
			00811502	25 ÷ 30	00840107	35		
			00811503	30 ÷ 35				
			00811504	35 ÷ 40				
00812300	BAJ	40 ÷ 100	00812301	40 ÷ 50	00840108	50	00841800	150
			00812302	50 ÷ 60	00840109	70		
			00812303	60 ÷ 70	00840110	90		
			00812304	70 ÷ 80				
			00812305	80 ÷ 90				
			00812306	90 ÷ 100				
00812600	BAK	100 ÷ 200	00812601	100 ÷ 125	00840112	125	00842600	150
			00812602	125 ÷ 150	00840113	175		
			00812603	150 ÷ 175				
			00812604	175 ÷ 200				

DIN 863 T4 (Style C1)

0,001 mm 0,00005 in

LCD, 7 mm digit height

Floating zero

Metric/inch Conversion

Measuring faces for application ranges 3,5 to 12 mm: hardened steel (770 HV 30) 11 to 100 mm: TiN hard-coating (2300 HV 5) 100 to 300 mm: carbide tipped (1300 HV 5)

3 V lithium battery

1 to 2 a (≈ 2000 h/a)

Automatic shut down after 10 min. Display setting is retained as long as power supply remains stable.

Measuring element IP54 (IEC 60529) or IP40 with active data output

TESA's calibration certificate

Display lock

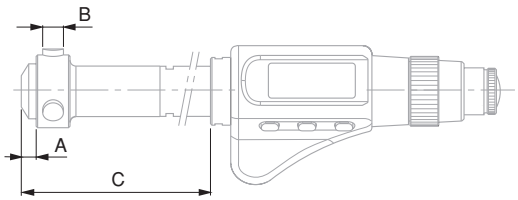
RS232 opto-coupled, bidirectional

TESA IMICRO CAPA µ SYSTEM with Digital Display

A successful combination of the patented TESA capacitive system with the IMICRO unique cone.







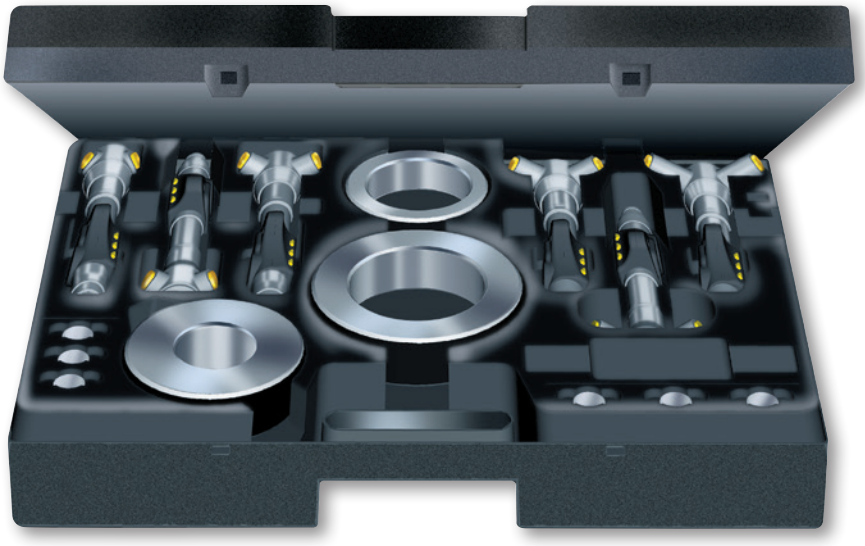
NO	mm	in	µm	µm	A mm	B mm	C mm
06130101	3,5 ÷ 4	0.1377 ÷ 0.1574	4	4	2	1,5	20
06130102	4 ÷ 4,5	0.1574 ÷ 0.1771	4	4	2	1,5	20
06130103	4,5 ÷ 5,5	0.1771 ÷ 0.2165	4	4	2	1,5	25
06130104	5,5 ÷ 6,5	0.2165 ÷ 0.2559	4	4	2	1,5	25
06130105	6 ÷ 8	0.2362 ÷ 0.3150	4	4	2,5	2,5	79
06130106	8 ÷ 10	0.3150 ÷ 0.3970	4	4	2,5	2,5	79
06130107	10 ÷ 12	0.3970 ÷ 0.4724	4	4	2,5	2,5	79
06130108	11 ÷ 14	0.4330 ÷ 0.5512	4	4	3,5	4	93
06130109	14 ÷ 17	0.5512 ÷ 0.6693	4	4	3,5	4	93
06130110	17 ÷ 20	0.6693 ÷ 0.7874	4	4	3,5	4	93
06130111	20 ÷ 25	0.7874 ÷ 0.9843	4	4	7	7	91
06130112	25 ÷ 30	0.9843 ÷ 1.1811	4	4	7	7	91
06130113	30 ÷ 35	1.1811 ÷ 1.3780	4	4	7	7	91
06130114	35 ÷ 40	1.3780 ÷ 1.5748	4	4	7	7	91
06130115	40 ÷ 50	1.5748 ÷ 1.9685	4	4	11	12	104
06130116	50 ÷ 60	1.9685 ÷ 2.3622	5	5	11	12	104
06130117	60 ÷ 70	2.3622 ÷ 2.7560	5	5	11	12	104
06130118	70 ÷ 80	2.7560 ÷ 3.1496	5	5	11	12	104
06130119	80 ÷ 90	3.1496 ÷ 3.5433	5	5	11	12	104
06130120	90 ÷ 100	3.5433 ÷ 3.9370	5	5	11	12	104
06130121	100 ÷ 125	3.9370 ÷ 4.9212	6	6	26	18	100
06130122	125 ÷ 150	4.9212 ÷ 5.9055	6	6	26	18	100
06130123	150 ÷ 175	5.9055 ÷ 6.8897	7	7	26	18	100
06130124	175 ÷ 200	6.8897 ÷ 7.8740	7	7	26	18	100
06130125	200 ÷ 225	7.8740 ÷ 8.8582	8	8	26	18	100
06130126	225 ÷ 250	8.8582 ÷ 9.8425	8	8	26	18	100
06130127	250 ÷ 275	9.8425 ÷ 10.8267	8	8	26	18	100
06130128	275 ÷ 300	10.8267 ÷ 11.8110	8	8	26	18	100

OPTIONAL ACCESSORY

01961000 1 Lithium battery 3V, CR2032

TESA IMICRO CAPA µ SYSTEM with Digital Display – Full Sets

A successful combination of the TESA patented capacitive measuring system with the IMICRO unique cone.



- DIN 863 T4 (Style C1)
- 0,001 mm / 0.00005 in
- LCD, 7 mm digit height
- Floating zero
- Metric/inch Conversion
- Measuring faces for application ranges 3,5 to 12 mm: hardened steel (770 HV 30) 11 to 100 mm: TiN hard-coating (2300 HV 5) 100 to 300 mm: carbide tipped (1300 HV 5)
- 3 V lithium battery
- 1 to 2 a (≈ 2000 h/a)
- Automatic shut down after 10 min. Display setting is retained as long as power supply remains stable.
- Measuring element IP54 (IEC 60529) or IP40 with active data output
- TESA's calibration certificate
- Display lock
- RS 232 opto-coupled, bidirectional

NO	mm	NO	mm	NO	mm	NO	mm
		Singel micrometers		Setting rings		Extensions	
COMPOSITION OF THE SETS:							
06130220	3,5 ÷ 6,5	06130101	3,5 ÷ 4	00843200	4		
		06130102	4 ÷ 4,5	00843201	5,5		
		06130103	4,5 ÷ 5,5				
		06130104	5,5 ÷ 6,5				
06130221	6 ÷ 12	06130105	6 ÷ 8	00840101	8	00840001	100
		06130106	8 ÷ 10	00840102	10		
		06130107	10 ÷ 12				
06130222	11 ÷ 20	06130108	11 ÷ 14	00840103	11	00840301	150
		06130109	14 ÷ 17	00840104	17		
		06130110	17 ÷ 20				
06130223	20 ÷ 40	06130111	20 ÷ 25	00840106	25	00841100	150
		06130112	25 ÷ 30	00840107	35		
		06130113	30 ÷ 35				
		06130114	35 ÷ 40				
06130224	40 ÷ 100	06130115	40 ÷ 50	00840108	50	00841800	150
		06130116	50 ÷ 60	00840109	70		
		06130117	60 ÷ 70	00840110	90		
		06130118	70 ÷ 80				
		06130119	80 ÷ 90				
		06130120	90 ÷ 100				
06130225	100 ÷ 300	06130121	100 ÷ 125	00840112	125	00842600	150
		06130122	125 ÷ 150	00840113	175		
		06130123	150 ÷ 175				
		06130124	175 ÷ 200				

DIN 863 T4 (Style C1)

0,001 mm / 0.00005 in

LCD, 7 mm digit height

Floating zero

Metric/inch Conversion

Measuring faces for application ranges
3,5 to 12 mm: hardened steel (HV30 770)
11 to 100 mm: TiN hard-coating (HV5 2300)
100 to 300 mm: carbide tipped (HV5 1300)

3V lithium battery

1 to 2 a (≈ 2000 h/a)

Automatic shut down after 10 min. Display setting is retained as long as power supply remains stable.

Measuring element IP54 (IEC 60529) or IP40 with active data output

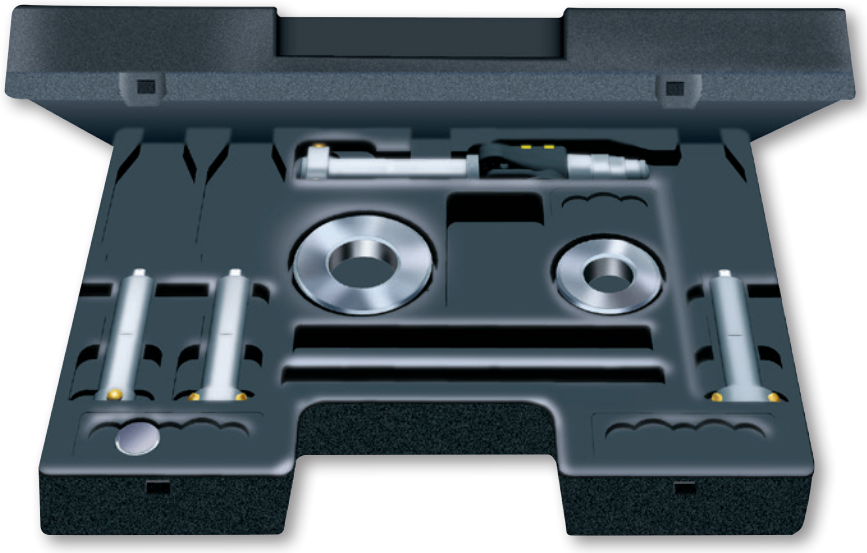
TESA's calibration certificate

Display lock

RS232 opto-coupled, bidirectional

TESA IMICRO CAPA µ SYSTEM with Digital Display – Partial Sets

A successful combination of the TESA patented capacitive measuring system with the IMICRO unique cone.



NO	mm	Elements	Measuring heads	mm	Setting rings	mm	Extensions	mm
COMPOSITION OF THE SETS:								
06130230	3,5 ÷ 6,5	06130010	06140020	3,5 ÷ 4	00843200	4		
			06140021	4 ÷ 4,5	00843201	5,5		
			06140022	4,5 ÷ 5,5				
			06140023	5,5 ÷ 6,5				
06130231	6 ÷ 12	06130011	06140024	6 ÷ 8	00840101	8	00840001	100
			06140025	8 ÷ 10	00840102	10		
			06140026	10 ÷ 12				
06130232	11 ÷ 20	06130011	06140027	11 ÷ 14	00840103	11	00840301	150
			06140028	14 ÷ 17	00840104	15		
			06140029	17 ÷ 20				
06130233	20 ÷ 40	06130011	06140030	20 ÷ 25	00840106	25	00841100	150
			06140031	25 ÷ 30	00840107	35		
			06140032	30 ÷ 35				
			06140033	35 ÷ 40				
06130234	40 ÷ 100	06130011	06140034	40 ÷ 50	00840108	50	00841800	150
			06140035	50 ÷ 60	00840109	70		
			06140036	60 ÷ 70	00840110	90		
			06140037	70 ÷ 80				
			06140038	80 ÷ 90				
			06140039	90 ÷ 100				
06130235	100 ÷ 300	06130012	06140040	100 ÷ 125	00840112	125	00842600	150
			06140041	125 ÷ 150	00840113	175		
			06140042	150 ÷ 175				
			06140043	175 ÷ 200				

Set available on request for extending the application range from 200 to 300 mm.

Cases for Sets of IMICRO Analogue

NO	mm
00863035	3,5 ÷ 6,5
00863005	6 ÷ 12
00860008	11 ÷ 20
00860012	20 ÷ 40
00860017	40 ÷ 100
00863017	100 ÷ 200



Cases for Single IMICRO Digital Instruments

NO	mm
06160002	3,5 ÷ 40
06160003	40 ÷ 100



Cases for Sets of IMICRO Digital

NO	mm
06160005	3,5 ÷ 20
06160006	20 ÷ 40
06160007	40 ÷ 100
00863017	100 ÷ 200



Accessories for Both TESA IMICRO and TESA IMICRO CAPA µ SYSTEM – Extensions for Deep Hole Measurement

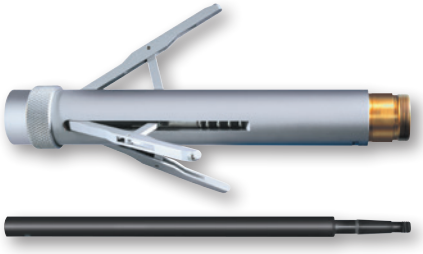
DIN 863 T4 (Style C1)

NO	mm	A mm
00840001	6 ÷ 12	100
00840301	11 ÷ 20	150
00840302	11 ÷ 20	500
00841100	20 ÷ 40	150
00841101	20 ÷ 40	500
00841102	20 ÷ 40	1000
00841800	40 ÷ 100	150
00841801	40 ÷ 100	500
00841802	40 ÷ 100	1000
00842600	100 ÷ 300	150
00842601	100 ÷ 300	500
00842602	100 ÷ 300	1000



Centring Devices for TESA IMICRO

NO	mm	A mm
00860001	40 ÷ 100	150
00862601	100 ÷ 200	200



Cases for Single IMICRO Analogue Instruments

NO	mm
00860007	11 ÷ 20
00860011	20 ÷ 40
00860015	40 ÷ 70
00860016	70 ÷ 100
00863016	100 ÷ 300

NF E 11-099.
Type 1 for models 6 to 10 mm or type 2 for all other models.

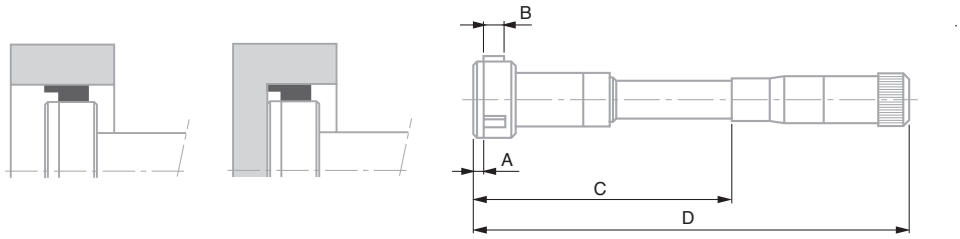
Measuring inserts for application range 6 to 10 mm: steel, hardened to 550 HV 30.
10 to 300 mm: tungsten carbide tipped to HRC ≥ 70.

Calibration certificate upon request

ROCH ALESOMETER with Analogue Indication, Metric

Bore gauges with 3-line contact. All ROCH ALESOMETER let you measure not only through bores, but also blind bores as well as centring shoulders, except for the models covering the application range 6 to 10 mm.





NO							
	mm	mm	µm	A mm	B mm	C mm	D mm
0081725001	6 ÷ 8	0,001	4	1,2	3	54,5	107
0081725003	8 ÷ 10	0,001	4	1,2	3	54,5	107
0081725006	10 ÷ 12,5	0,001	4	0,3	6,5	64,5	117
0081725008	12,5 ÷ 15	0,001	4	0,3	6,5	64,5	117
0081725010	15 ÷ 17,5	0,001	4	0,3	6,8	64,5	117
0081725012	17,5 ÷ 20	0,001	4	0,3	6,8	64,5	117
0081725014	20 ÷ 25	0,001	4	0,3	8,5	70	122,5
0081725016	25 ÷ 30	0,001	4	0,3	8,5	70	122,5
0081725018	30 ÷ 35	0,001	4	0,3	8,5	70	122,5
0081725020	35 ÷ 40	0,001	4	0,3	8,5	70	122,5
0081725022	40 ÷ 50	0,001	4	0,3	14,5	108,7	188,7
0081725024	50 ÷ 60	0,001	5	0,3	14,5	108,7	188,7
0081725026	60 ÷ 70	0,001	5	0,3	14,5	108,7	188,7
0081725028	70 ÷ 85	0,001	5	0,3	14,5	126,7	206,7
0081725030	85 ÷ 100	0,001	5	0,3	14,5	126,7	206,7
0081725032	100 ÷ 125	0,01	7	0,3	30	153,7	233,5
0081725034	125 ÷ 150	0,01	7	0,3	30	153,7	233,5
0081725036	150 ÷ 175	0,01	8	0,3	30	153,7	233,5
0081725038	175 ÷ 200	0,01	8	0,3	30	153,7	233,5

Face A: Not applicable for models larger than 10 mm onwards, as the measuring inserts are too close to the micrometer front face.

ROCH ALESOMETER with Analogue Indication – Full Metric Sets

Bore gauges with 3-line contact. All ROCH ALESOMETER let you measure not only through bores, but also blind bores as well as centring shoulders, except for the models covering the application range 6 to 10 mm.



NF E 11-099. Type 1 for models 6 to 10 mm or type 2 for all other models.

Bore related tolerance: ± (3 µm + 10 · 10^{-6} D) µm

Measuring inserts for application range 6 to 10 mm: steel, hardened to 550 HV 30.
10 to 300 mm: tungsten carbide tipped to HRC ≥ 70.

Calibration certificate upon request

D = nominal diameter in mm (1 µm + 5 · 10^{-6} D) µm

Extension: hardened steel, insulated body agains hand warmth
Setting rings: steel, hardened to 60 HRC.

	mm	Single bore gauges	mm	Setting rings	mm	Extensions	A mm
COMPOSITION OF THE SETS:							
0081725063	6 ÷ 10	0081725001	6 ÷ 8	0211625101	8	0081625081	100
		0081725003	8 ÷ 10				
0081725066	10 ÷ 20	0081725006	10 ÷ 12,5	0211625102	12,5	0081625082	100
		0081725008	12,5 ÷ 15	0211625103	17,5		
		0081725010	15 ÷ 17,5				
		0081725012	17,5 ÷ 20				
0081725068	20 ÷ 40	0081725014	20 ÷ 25	0211625104	25	0081625083	150
		0081725016	25 ÷ 30	0211625105	35		
		0081725018	30 ÷ 35				
		0081725020	35 ÷ 40				
0081725070	40 ÷ 100	0081725022	40 ÷ 50	0211625106	45	0081625084	150
		0081725024	50 ÷ 60	0211625107	60		
		0081725026	60 ÷ 70	0211625109	85		
		0081725028	70 ÷ 85				
		0081725030	85 ÷ 100				

Extensions for Depth Increase for ALESOMETERS

Hardened steel. Insulated body against hand warmth.



	mm	A mm
0081625081	6 ÷ 10	100
0081625082	10 ÷ 20	100
0081625083	20 ÷ 40	150
0081625084	40 ÷ 100	150

DIN 863 T4. Style C1 for models 6 to 10 mm or style C2 for all other models.

0,001 mm / 0.00005 in

LCD, digit height 7 mm

Floating zero

Metric/inch conversion

Measuring inserts for application range 6 to 10 mm: steel, hardened to 550 HV 30. 10 to 300: tungsten carbide tipped, HRC ≥ 70.

3 V lithium battery

1 to 2 a (≈ 2000 h/a)

Automatic shut down after 10 min. Display setting is retained as long as power supply remains stable.

For the measuring element IP54 (IEC 60529) or IP40 with active data output

Inspection report with a declaration of conformity

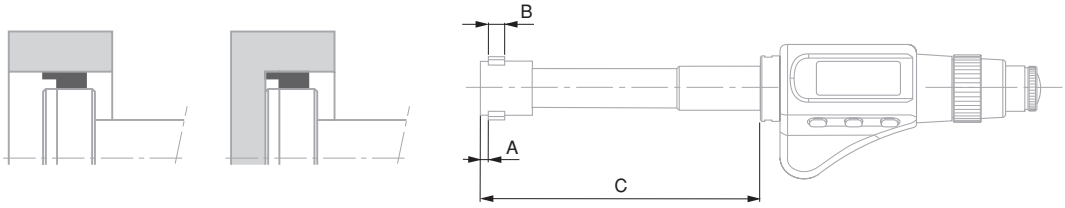
Display lock

RS232 opto-coupled, bidirectional

TESA ALESOMETER CAPA µ SYSTEM with Digital Display

Fitted with a TESA patented capacitive measuring system. Bore gauges with 3-line contact. All TESA ALESOMETER are made to measure through and blind bores as well as short centring shoulders, except for the models covering the application range from 6 to 10 mm.





NO	mm	in	µm	µm	A mm	B mm	C mm
06230051	6 ÷ 8	0.2362 ÷ 0.3150	4	4	1,2	3	55
06230052	8 ÷ 10	0.3150 ÷ 0.3970	4	4	1,2	3	55
06230023	10 ÷ 12,5	0.3970 ÷ 0.4921	4	4	0,3	6,5	65
06230024	12,5 ÷ 15	0.4921 ÷ 0.5905	4	4	0,3	6,5	65
06230025	15 ÷ 17,5	0.5905 ÷ 0.6890	4	4	0,3	6,8	65
06230026	17,5 ÷ 20	0.6890 ÷ 0.7874	4	4	0,3	6,8	95
06230027	20 ÷ 25	0.7874 ÷ 0.9843	4	4	0,3	8,5	100
06230028	25 ÷ 30	0.9843 ÷ 1.1811	4	4	0,3	8,5	100
06230029	30 ÷ 35	1.1811 ÷ 1.3780	4	4	0,3	8,5	100
06230030	35 ÷ 40	1.3780 ÷ 1.5748	4	4	0,3	8,5	100
06230031	40 ÷ 50	1.5748 ÷ 1.9685	4	4	0,3	14,5	140
06230032	50 ÷ 60	1.9685 ÷ 2.3622	5	5	0,3	14,5	140
06230033	60 ÷ 70	2.3622 ÷ 2.7560	5	5	0,3	14,5	140
06230034	70 ÷ 85	2.7560 ÷ 3.3465	5	5	0,3	14,5	140
06230035	85 ÷ 100	3.3465 ÷ 3.9370	5	5	0,3	14,5	140
06230036	100 ÷ 125	3.9370 ÷ 4.9212	6	6	0,3	30	175
06230037	125 ÷ 150	4.9212 ÷ 5.9055	6	6	0,3	30	175
06230038	150 ÷ 175	5.9055 ÷ 6.8897	7	7	0,3	30	175
06230039	175 ÷ 200	6.8897 ÷ 7.8740	7	7	0,3	30	175

OPTIONAL ACCESSORY

01961000 1 Lithium battery 3V, CR2032

Face A: Not applicable for models larger than 10 mm onwards, as the measuring inserts are too close to the micrometer front face.

TESA ALESOMETER CAPA µ SYSTEM with Digital Display - Partial Sets and Components

Fitted with TESA patented capacitive measuring system. Models that cover the application range from 6 to 10 mm can only measure through bores – All other partial sets also allow blind bores as well as short centring shoulders to be inspected.

DIN 863 T4. Style C1 for models 6 to 10 mm or C2 for all other models

0,001 mm / 0.00005 in

Measuring inserts for application range 6 to 10 mm: steel, hardened to 550 HV 30. 10 to 300: tungsten carbide tipped to HRC ≥ 70.

Inspection report with a declaration of conformity



NO	mm	NO Measuring heads	mm	NO Connectors	NO Measuring elements	NO Setting rings	mm	NO Storge case
COMPOSITION OF THE SETS:								
06230100	6 ÷ 10	0081720351	6 ÷ 8	0081620491	06230020	0211625101	8	06260001
		0081720353	8 ÷ 10					
06230110	10 ÷ 20	0081720356	10 ÷ 12,5	0081620492	06230020	0211625102	12,5	06260001
		0081720358	12,5 ÷ 15			0211625103	17,5	
		0081720360	15 ÷ 17,5					
		0081720362	17,5 ÷ 20					
06230111	20 ÷ 40	0081720364	20 ÷ 25	0081620493	06230020	0211625104	25	06260001
		0081720366	25 ÷ 30			0211625105	35	
		0081720368	30 ÷ 35					
		0081720370	35 ÷ 40					
06230112	40 ÷ 100	0081720372	40 ÷ 50	0081620494	06230020	0211625106	45	0081629525
		0081720374	50 ÷ 60			0211625107	60	
		0081720376	60 ÷ 70			0211625109	85	
		0081720378	70 ÷ 85					
		0081720380	85 ÷ 100					

Set available on request for extending the application range from 100 to 300 mm.

Models from 10 to 100 mm: DIN 863 T4 (Style C2) NF E 11-099

Max. perm. error for models covering the application ranges from 5 to 40 mm = 3 µm 40 to 100 mm = 4 µm 100 to 200 mm = 5 µm

Repeatability limit for models covering the application ranges from 5 to 40 mm = 3 µm 40 to 100 mm = 4 µm 100 to 200 mm = 5 µm

Measuring bolts on models from 5 to 100 mm: hardened steel. 100 to 200 mm: tungsten carbide tipped

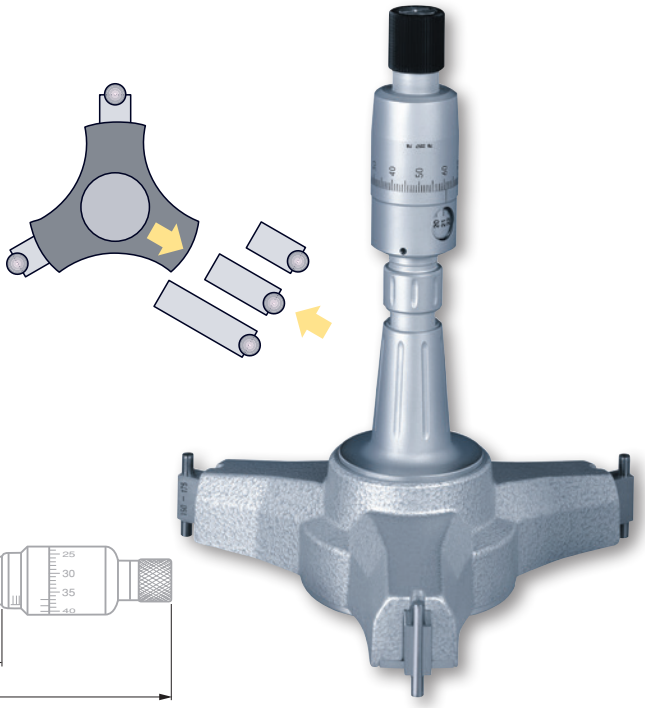
Inspection report with a declaration of conformity

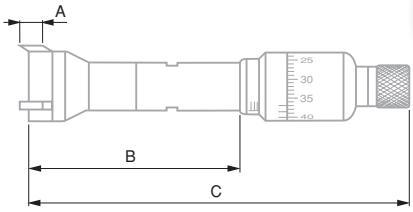
Models from 5 to 100 mm: 0,002 mm Models 100 to 200 mm with vernier reading: 0,01 mm



ETALON INTALOMETER 531

Made to check through holes, blind bores and short centring shoulders. All models covering the application range up to 100 mm have sloped bolts extending beyond the front face of the measuring head.





NO	mm		A mm	B mm	C mm
078112356	5 ÷ 6	2 x 180°	3	≥ 32	≤ 109
078112357	6 ÷ 7	2 x 180°	3	≥ 33	≤ 111
078112358	7 ÷ 8,5	2 x 180°	4	≥ 60	≤ 130
078112359	8,5 ÷ 10	2 x 180°	4	≥ 72	≤ 133
078112360	10 ÷ 12,5	3 x 120°	3	≥ 60	≤ 118
078112361	12,5 ÷ 15	3 x 120°	3	≥ 63	≤ 120
078112362	15 ÷ 17,5	3 x 120°	3	≥ 65	≤ 122
078112363	17,5 ÷ 20	3 x 120°	3	≥ 68	≤ 125
078112364	20 ÷ 25	90°–135°–135°	7	≥ 75	≤ 132
078112365	25 ÷ 30	90°–135°–135°	7	≥ 90	≤ 138
078112366	30 ÷ 35	90°–135°–135°	7	≥ 90	≤ 142
078112367	35 ÷ 40	90°–135°–135°	7	≥ 90	≤ 148
078112368	40 ÷ 45	90°–135°–135°	10,5	≥ 110	≤ 167
078112369	45 ÷ 50	90°–135°–135°	10,5	≥ 113	≤ 170
078112370	50 ÷ 60	90°–135°–135°	15	≥ 123	≤ 187
078112371	60 ÷ 70	90°–135°–135°	15	≥ 130	≤ 193
078112372	70 ÷ 85	90°–135°–135°	15	≥ 145	≤ 213
078112373	85 ÷ 100	90°–135°–135°	15	≥ 155	≤ 224
078110733	100 ÷ 125	3 x 120°	27	≥ 105	≤ 194
078110735	125 ÷ 150	3 x 120°	27	≥ 105	≤ 194
078110737	150 ÷ 175	3 x 120°	27	≥ 105	≤ 194
078110739	175 ÷ 200	3 x 120°	27	≥ 105	≤ 194

Measuring range up to 300 mm available upon request.

ETALON INTALOMETER 531, Metric Sets

Made to check through holes, blind bores and short centring shoulders. All models covering the application range up to 100 mm have sloped bolts extending beyond the front face of the measuring head.



- Models from 10 to 100mm: DIN 863 T4 (Style C2) NF E 11-099
- Max. perm. error for models covering the application ranges from 5 to 40 mm = 3 µm 40 to 100 mm = 4 µm 100 to 200 mm = 5 µm
- Repeatability limit for models convering the application ranges from 5 to 40 mm = 3 µm 40 to 100 mm = 4 µm 100 to 200 mm = 5 µm
- Measuring bolds on models from 5 to 100 mm: hardened steel. 100 to 200 mm: tungsten carbide tipped.
- Inspection report with a declaration of conformity
- Models from 5 to 100 mm = 0,002 mm on vernier, 100 to 200 mm = 0,01 mm

No	mm	No Isolated instruments	mm	No Setting rings	mm	No Extensions	mm
COMPOSITION OF THE SETS:							
078110592	5 ÷ 10	078112356	5 ÷ 6	00840114	6	078103613	100
		078112357	6 ÷ 7	00840115	8,5		
		078112358	7 ÷ 8,5				
		078112359	8,5 ÷ 10				
078110594	10 ÷ 20	078112360	10 ÷ 12,5	00840116	12,5	078103621	150
		078112361	12,5 ÷ 15	00840117	17,5		
		078112362	15 ÷ 17,5				
		078112363	17,5 ÷ 20				
078110596	20 ÷ 40	078112364	20 ÷ 25	00840106	25	078103624	150
		078112365	25 ÷ 30	00840107	35		
		078112366	30 ÷ 35				
		078112367	35 ÷ 40				
078110598	40 ÷ 100	078112368	40 ÷ 45	00843230	45	078104940	150
		078112369	45 ÷ 50	00843239	60		
		078112370	50 ÷ 60	00840118	85		
		078112371	60 ÷ 70				
		078112372	70 ÷ 85				
		078112373	85 ÷ 100				

DIN 863 T4 (Style C2) NF E 11-099

0,01 mm

Tungsten carbide tipped measuring bolts and cone

Inspection report with a declaration of conformity

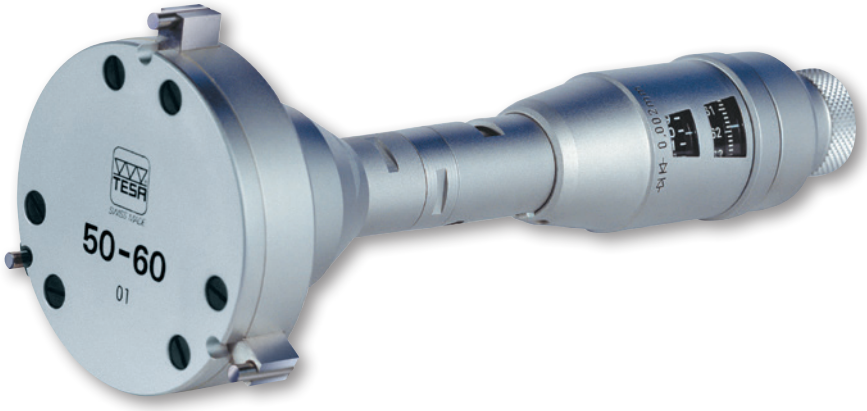
0,002 mm

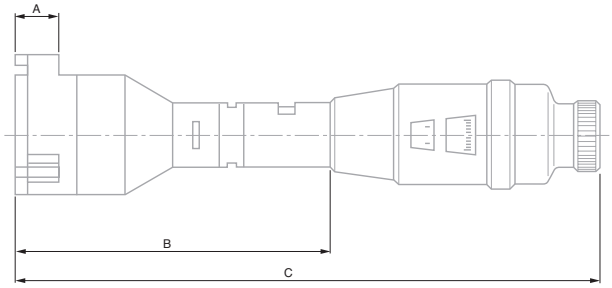
Supplied with 1 heat insulating sleeve (No. 00940020), 2 keys (No. 00940001), 1 screwdriver (No. 00862801).

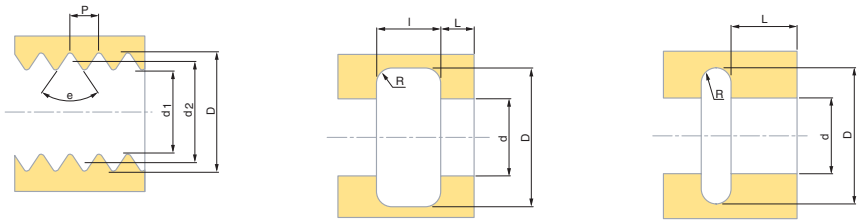
TESA TRI-O-BOR

Self-centring and self-aligning internal micrometers with 3-line contact with the part being inspected.

These micrometers measure trough holes, blind bores and short centring shoulders.







No	mm	µm	µm	A mm	B mm	C mm
00910005	15 ÷ 20	4	4	6	≥ 66	≤ 132
00910006	20 ÷ 25	4	4	6	≥ 66	≤ 132
00910007	25 ÷ 30	4	4	6	≥ 66	≤ 132
00910405	30 ÷ 40	4	4	10	≥ 70	≤ 138
00910406	40 ÷ 50	4	4	10	≥ 70	≤ 138
00910407	50 ÷ 60	5	5	10	≥ 70	≤ 138
00910705	60 ÷ 70	5	5	18	≥ 78	≤ 147
00910706	70 ÷ 80	5	5	18	≥ 78	≤ 147
00910707	80 ÷ 90	5	5	18	≥ 78	≤ 147
00911105	90 ÷ 100	5	5	18	≥ 78	≤ 147
00911106	100 ÷ 110	6	6	18	≥ 78	≤ 147
00911107	110 ÷ 120	6	6	18	≥ 78	≤ 147

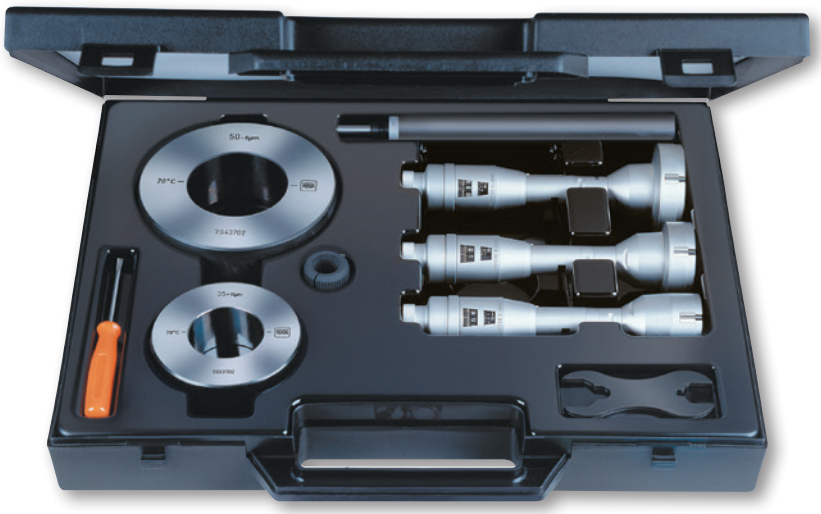
OPTIONAL ACCESSORY

00940000 Extension of 150 mm for TESA TRI-O-BOR

TESA TRI-O-BOR, Full Sets

Self-centring and self-aligning internal micrometers with 3-line contact with the part being inspected.

These micrometers measure through holes, blind bores and short centring shoulders.



DIN 863 T4 (Style 2) NF E 11-099

0,01 mm

Tungsten carbide tipped measuring bolts and cone

Inspection report with a declaration of conformity

0,002 mm

Supplied with 1 heat insulating sleeve No 00940020, 2 key No 00940001, 1 screwdriver No 00862801

NO		mm	Single micrometers	mm	Setting rings	mm	Extensions	mm
COMPOSITION OF THE SETS:								
00910004	BSC	15 ÷ 30	00910005	15 ÷ 20	00840104	15	00940000	150
			00910006	20 ÷ 25	00840106	25		
			00910007	25 ÷ 30				
00910404	BSD	30 ÷ 60	00910405	30 ÷ 40	00840107	35	00940000	150
			00910406	40 ÷ 50	00840108	50		
			00910407	50 ÷ 60				
00910704	BSF	60 ÷ 90	00910705	60 ÷ 70	00840109	70	00940000	150
			00910706	70 ÷ 80	00840110	90		
			00910707	80 ÷ 90				
00911104	BSG	90 ÷ 120	00911105	90 ÷ 100	00840110	90	00940000	150
			00911106	100 ÷ 110	00840111	110		
			00911107	110 ÷ 120				

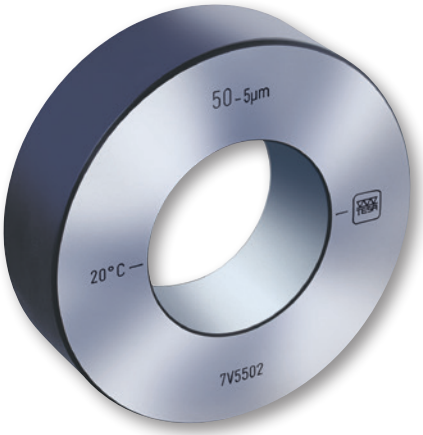
Extension for Depth Increase TESA TRI-O-BOR



NO	mm
00940000	150

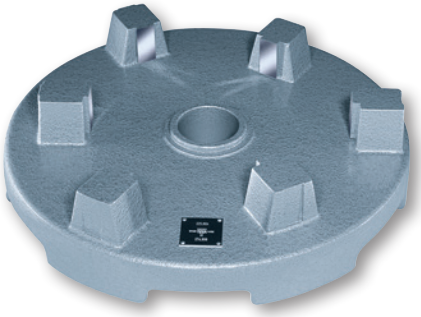
SETTING STANDARDS FOR INTERNAL MICROMETERS

TESA Setting Rings and Setting Masters



Setting ring 50 mm

Setting standard 225-275 mm



No	⌀	d	
	mm	µm*	µm**
00843200	4	1,5	1,5
00843201	5,5	1,5	1,5
00840114	6	1,5	1,5
00840101	8	1,5	1,5
00840115	8,5	1,5	1,5
00840102	10	1,5	1,5
00840103	11	1,5	1,5
00840116	12,5	1,5	1,5
00840104	15	1,5	1,5
00840105	17	1,5	1,5
00840117	17,5	1,5	1,5
00840106	25	1,5	1,5
00840107	35	2	2
00843230	45	2	2
00840108	50	2	2
00843239	60	2	2
00840109	70	2	2
00840118	85	2	2
00840110	90	2	2
00840111	110	2,5	2,5
00840112	125	2,5	2,5
00840113	175	2,5	4
00843101	225, 275	–	6

* Making no allowance for a rim of 1 mm.

** All listed values are determined through a 2-point measurement taken at half-height of the setting ring. The measuring direction is marked with 2 strokes. The measured actual dimension is engraved on every setting master.







Measuring Instruments for Large Dimensions

TESA – THE SPECIALISTS FOR LONG LENGTHS

For large dimensions from 250 mm up to several meters, TESA offers various types of measuring instruments that have long proven their value in practical use.

Whatever the sizes, from a simple distance between two surfaces parallel to one another measurement is always a challenge. Apart from the usual influences, which are proportional to the size whilst adding to your contributions in the uncertainty budget, those due to gravity play a key role in distortion.

Large sizes in mechanical engineering generally mean dimensions in excess of 500 mm. Various measurement procedures are brought into play, using such items as large internal and external micrometers with two-point contact, periphery tapes (for outside diameters), V-bases, rotating measuring disks (rolling-contact) optical systems (triangulation with theodolite), fixed gauges (inside caliper gauges), gauge blocks combinations or adjustable telescopic gauges.

There are other methods that often call for very simple techniques, such as fixed gauges (caliper gauges), combinations of gauge blocks, or even adjustable telescopic gauges.

Here's an example of a proportional relationship. With a bore of Ø 1200 H7, the tolerance area matches 0,1 mm. Reducing both values by a factor of 100 would give a manufacturing tolerance as low as 1 µm. Of course, things are not as simple, but this example gives some ideas about the proportions.



DIN 863 T4 (Style B)

Micrometer: 25 mm

Dial gauge: ± 0,22 mm

Micrometer and dial gauge: 0,01 mm

Micrometer: 0,1 mm

8 µm

Measuring bolts: Spherical and for measuring in the micrometer axis. All inserts are interchangeable

Extension: 1 spherical and 1 flat measuring face

0,5 mm

Tungsten carbide tipped

0,7 to 1N

Extension: 26 mm dia. steel tube with snap-ring system. Also wih built in gauge rods.

Wooden case

Setting standard with identification number

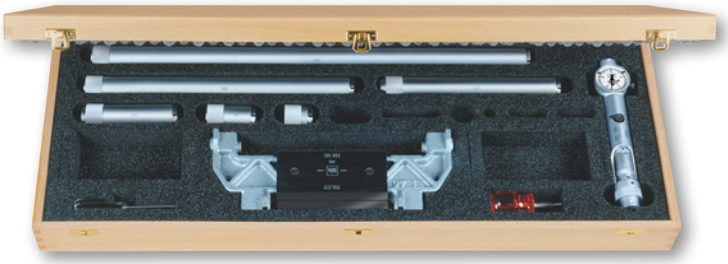
Calibration certificate:
- per setting standard
- per measuring element
- per extension

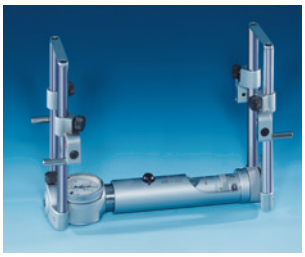
TESA UNITEST Internal Micrometer

Measures internal dimensions in the micrometer's axis with 2-point contact with the workpiece to be checked – Optional accessories are available for inspecting centring shoulders and blind bores along with auxiliary means for external measuring.

Extensions with built-in gauge rods can be mounted on the measuring element, thus allowing any dimension within the application range to be measured, directly.







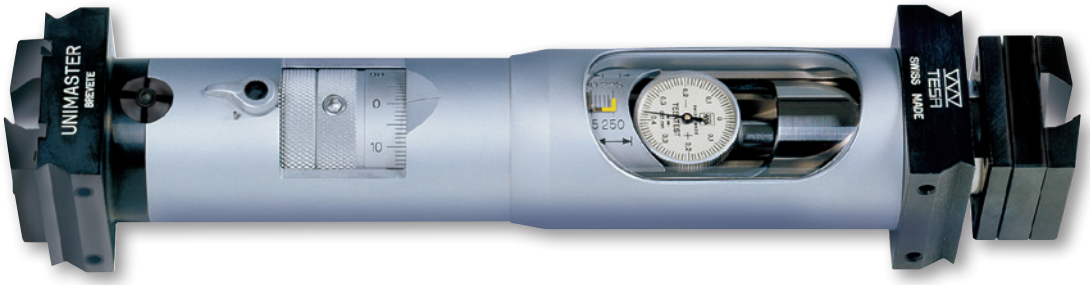
		mm		
01110700	UNITEST (SET)	Internal dimensions 200 ÷ 1400		
CONSISTING OF:				
		mm	mm	µm
01110901	Measuring head	Internal dimensions 200 ÷ 225		
01141001	Setting gauge	Internal / external dimensions	200	
01110801	Extension		25	0,7
01110802	Extension		50	1
01110804	Extension		100	1,5
01110808	Extension		200	2,5
01110812	Extension		300	3,5
01110820	Extension		500	5,5
01160901	Screwdriver			
01162302	Case for Unitest			
OPTIONAL ACCESSORIES:				
01160701	Pair of tungsten carbide tipped measuring bolts for blind bores			
01162301	Auxiliary elements for external measurement		Measuring depth: ≤ 10	
01140801	Suspension device, complete		Measuring depth : ≤ 100	

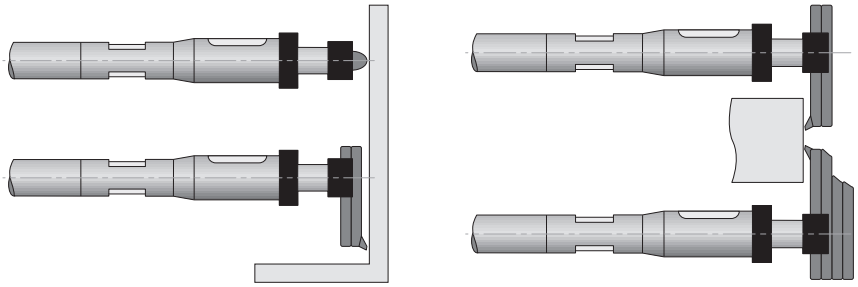
TESA UNIMASTER Universal Measuring Instrument

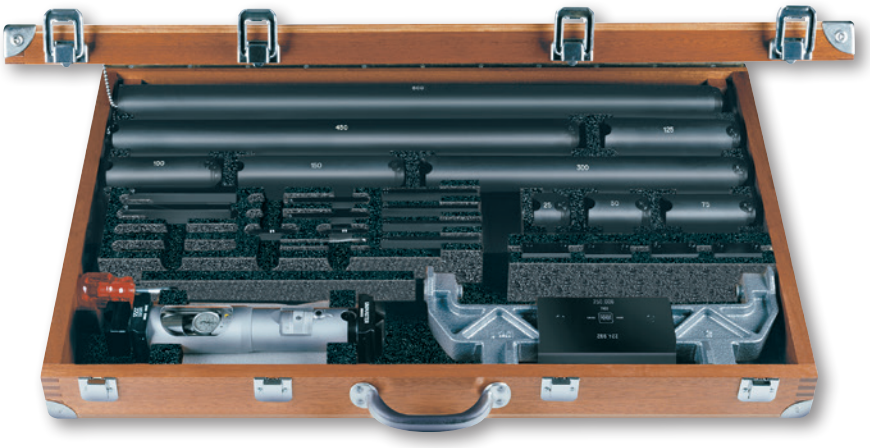
TESA UNIMASTER Universal Measuring Instrument provides the features necessary for direct measurement of specially large internal and external dimensions.

TESA UNIMASTER is similar to internal micrometers with two-point contact with the workpiece being measured. Measures any dimension within the extended application range diretly by simply adding the needed extensions with built-in gauge blocks to the measuring element.

Accurate, robust and easy-to-handle – Can be used either vertically or horizontally with a constant measuring force – Incorporates a lever-type dial test indicator that clearly shows the culmination point – Ensures stable measuring owing to both a negligible deflection and thermal protection on each extension.





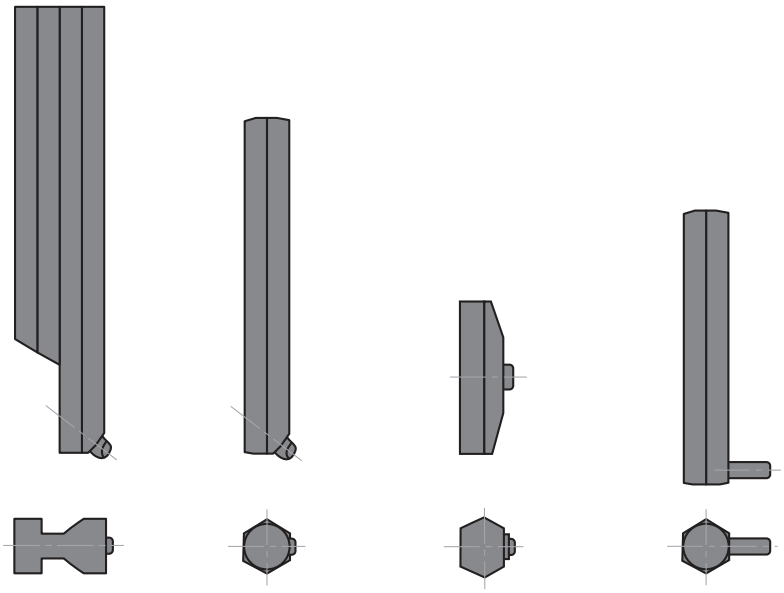


- DIN 863 T4 (Style B)
- Micrometer: 25 mm
- Dial test indicator: ± 0,4 mm
- Micrometer and dial test indicator: 0,01 mm
- 5 µm
- One spherical and one flat measuring faces
- 1 mm
- Tungsten carbide tipped
- 15 to 20 N measuring force reversible between internal and external directions
- Measuring bolts supplied in pairs:
  - No. 01110203 for internal measuring in the micrometer axis.
  - No. 01110205 for internal/external measuring, meas. depth up to 60 mm from the lower edge of the micrometer.
  - No. 01110208, extra-rigid for external measuring, meas. depth up to 75 mm from the lower edge of the micrometer.
- Extension: 38 mm dia. diamter steel tube with snap ring system. Built-in gauge rod.
- Mobile ball-bearing anvil under spring pressure.
- Wooden case
- Measuring element and setting standard with identification number
- Calibration certificate:
  - per setting standard
  - per measuring element
  - per extension



No		mm	mm			
01110000	TESA UNIMASTER metric full	Int. dim. 250 ÷ 1475*	Ext. dim. 225 ÷ 1450*			
CONSISTING OF:						
No		mm	mm	mm	mm	µm
01110300	Measuring element UNIMASTER	Int. dim. 250 ÷ 275	Ext. dim. 225 ÷ 250			
01110203	Set measuring arms interior dimensions					
01110205	Set measuring arms for interior and exterior dimesnions, lenght 75mm			75		
01110208	Set measuring arms for interior and exterior dimentions, lenght 100mm			100		
01110501	Setting gauge			Int. dim.: 250	Ext. dim. : 225	
01110101	Extension			25		0,7
01110102	Extension			50		1
01110103	Extension			75		1,2
01110104	Extension			100		1,5
01110105	Extension			125		1,5
01110106	Extension			150		2
01110112	Extension			300		3,5
01110118	Extension			450		4,5
01110124	Extension			600		6,5
01130001	Special screwdriver					
01110401	Set of suspension accessories (4 brackets together with 4 clamps)					
01112401	Wooden case for complete set					
OPTIONAL ACCESSORIES:						
01110140	Extension 1000 mm			1000		10
01162001	Anvils for internal/external dimensions and throats			Measuring depth: ≤ 20	Tungsten carbide inserts: Ø 4 x 7	
01160001	Roller (2 items are needed)					

*Using 3 extensions at the very most.



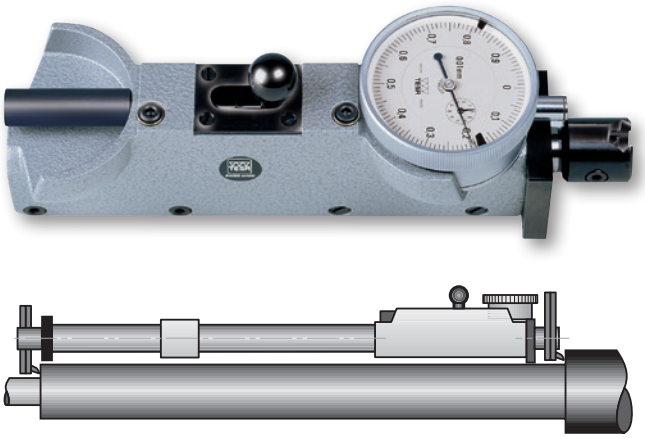
01110208 01110205 01110203 01162001

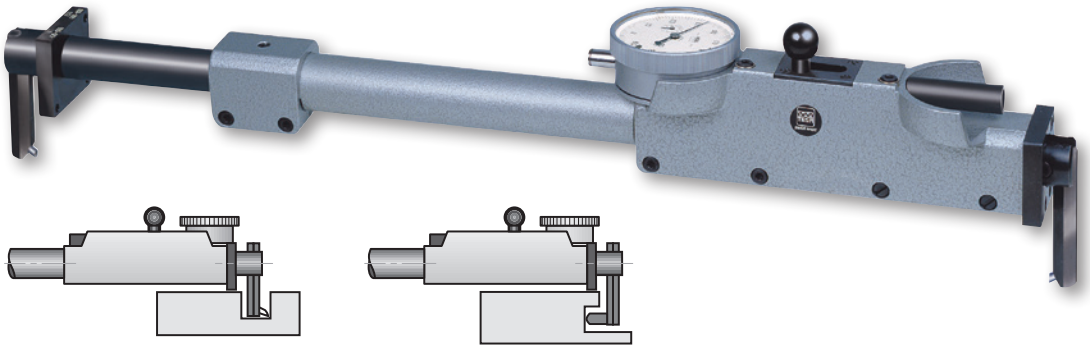
TESA INOTEST Comparative Measuring Instrument

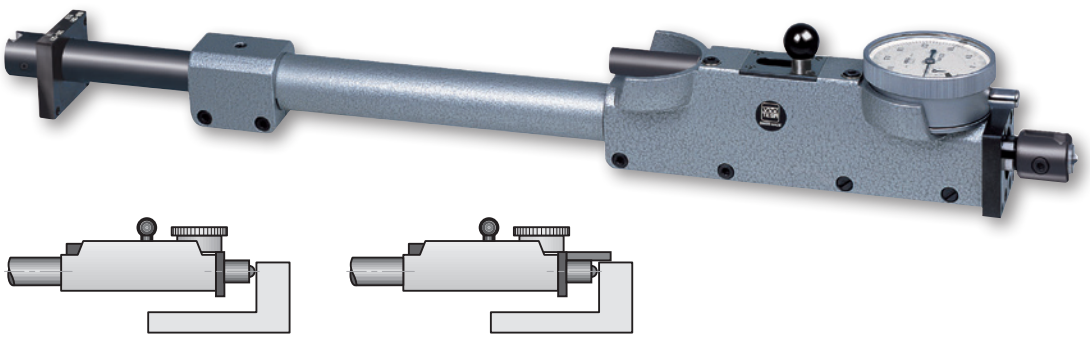
Allows for comparative measurement of large internal or external dimensions.

Consists of a measuring element with interchangeable inserts as well as a set of extensions. Since there is no material measure, the indication is set using a separate standard that can either be a gauge block, setting ring or horizontal measuring bench.

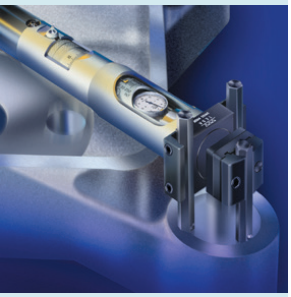
Measuring inserts for inspection in the tool axis, or offset inserts – Vertical or horizontal position of use – Integrated dial gauge to show the culmination point – Constant measuring force – Extensions with heat insulating grip.







- 10 mm
- 0,01 mm
- Measuring bold and extension: Tungsten carbide tipped
- 4 tp 7N. Reversible probing direction to allow both internal and external measuring.
- Watertight dial gauge No. 01470104 and 01480100
- Measuring bolts supplied in pairs:
  - No. 01131901for internal measuring in the instrument axis.
  - No. 01131902 for internal/external masurement, measuring depth up to 30 mm from the lower edge of the tool
- Extension: 25 mm dia. steel tube. 19 mm dia telescopic tube that can be clamped
- Mobile ball-bearing anvil under spring pressure, 10 mm travel
- For additional technical data: see chapter Indicators
- Plastic case
- Dial gauge with serial number
- Dial gauge with inspection report



No		mm	mm
01111900	TESA INOTEST complete set	Int. dim. 275 ÷ 1025	Ext. dim. 250 ÷ 1010
CONSISTING OF:			
No		mm	
01112301	Measuring element INOTEST		
01131901	Pair of inserts for internal measuring		
01131902	Pair of inserts for internal and external measuring, lenght 60 mm	60	
01132001	Set of 4 mounting rods	Ø 7 x 40	
00160101	3 insulating grips (reference code is for 1 item)		
01112001	Extension 250 ÷ 310 mm	Int. dim.: 275 ÷ 335	Ext. dim.: 250 ÷ 310
01112002	Extension 300 ÷ 410 mm	Int. dim.: 325 ÷ 435	Ext. dim.: 300 ÷ 410
01112003	Extension 400 ÷ 610 mm	Int. dim.: 425 ÷ 635	Ext. dim.: 3400 ÷ 610
01112004	Extension 600 ÷ 1010 mm	Int. dim.: 625 ÷ 1035	Ext. dim.: 600 ÷ 1010
01162303	Case INOTEST		
OPTIONAL ACCESSORIES:			
01141901	Extension 500 mm	500	
01141902	Extension 1000 mm	1000	
01162001	Carbide measuring inserts for throats	Measuring depth: ≤ 20	Tungsten carbide inserts: Ø 4 x 7
01161900	Device for small dimensions, Inotest	Int. dim. 35 ÷ 280	Ext. dim. 15 ÷ 255





ETALON 532 Internal Micrometer

This micrometer is designed for measurements with 2-point contact.

Extensions with built-in gauge rods can be used to increase the measuring range – Stiff screw coupling.



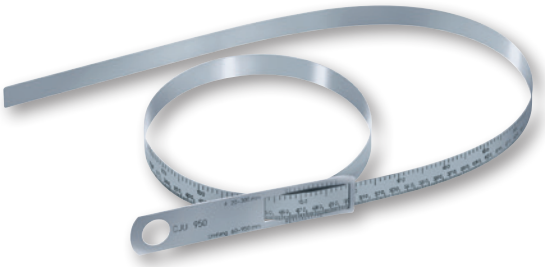
Factory standard
15 mm
0,01 mm
Spheric (R = 15 mm)
29 mm
0,5 mm
Tungsten carbide tipped
Refernce gauge rods
Wooden case

Full set:					**072109101**	**072109107**	**072109108**	**072109117**	**072109128**
		mm			50 ÷ 170	50 ÷ 290	50 ÷ 530	50 ÷ 1010	50 ÷ 1510
COMPOSED BY:									
		mm	mm	µm					
072103576	Micrometrical element	50 ÷ 65		3	●	●	●	●	●
072103585	Extention		15	1,5	●	●	●	●	●
072105462	Extention		30	1,5	●	●	●	●	●
072109030	Extention		60	2	●	●	●	●	●
072103586	Extention		120	2		●	●	●	●
072109055	Extention		240	3			●	●	●
072109066	Extention		480	3,5				●	●
072109089	Extention		500	3,5					●

ROCH Metric Periphery Tapes

Steel tapes with a dual graduation for measuring external circumferences and diameters of cylindrical parts on machines and other fittings – Suitable for malleable parts such as plastic tubing – Used for inspecting tanks or boilers – Also designed for checking steel or concrete pipes, rims, tires etc.

0,1 mm
16 x 0,2 mm type section
Steel band



	Diameter, mm	Circumference, mm	mm
0951750222	20 ÷ 30	60 ÷ 950	0,15
0951750223	300 ÷ 700	940 ÷ 2200	0,20
0951750224	700 ÷ 1100	2190 ÷ 3460	0,20
0951750225	1100 ÷ 1500	3450 ÷ 4720	0,25

Dial gauges – Electronic and Analogue



EASY-TO-USE AND VERSATILE

For more than 50 years we have been producing and distributing a wide range of easy-to-use and versatile dial gauges. Our experience allows us to offer a wide choice of different models.

- *Electronic indicators with combined analogue/digital display using the most up-to-date technology.*
- *Mechanical dial gauges equipped with high-precision movements and double-action shockproof mechanisms. Measuring spans up to 100 mm.*

CHOICE OF DIAL GAUGE OR ELECTRONIC INDICATOR

- *Digital indication provides error-free reading of the measured value. There is no need to read fractions of scale divisions.*
- *Analogue indication offers the advantage of being able to smoothly adjust the increase or decrease of the dimension to be measured on the workpiece. This type of indication is best suited for dynamic measurements such as determining axial and radial runout errors.*
- *Electronic indicators provide many additional functions compared to the mechanical models. For more information, refer to the section on electronic indicators.*
- *The inspection of axial and radial runout errors frequently requires the use of instruments with the lowest hysteresis characteristic. Our electronic indicators, precision dial gauges and dial test indicators meet this requirement.*
- *In order to significantly reduce the effect of systematic errors, it is recommended to carry out comparative measurements. Only deviations from the nominal dimension will be displayed. High precision, small range electronic indicators are the ideal instruments for these types of measurements.*
- *These same instruments also enable avoiding major errors in reading millimetres.*

STANDARDS AND DEFINITIONS

The international ISO 463:2006 standard replaces national standards dealing with mechanical dial gauges. All the same, new definitions and standard requirements pertaining to measuring procedures, although valid, imply changes in design and metrological characteristics, which cannot be entirely indicated in this catalogue. This standard, is defined in the matrix "Product Specification (GPS) – dimensional measuring instruments". It only defines the requirements for the most important characteristics.

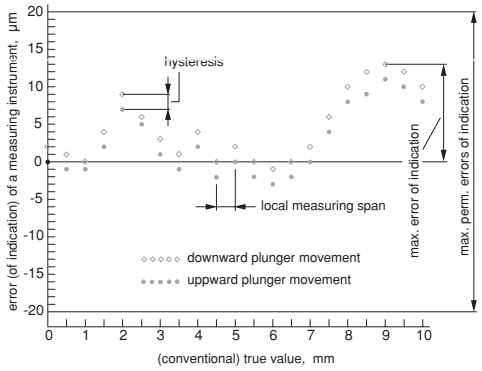
Therefore, all tolerance limits indicated in this catalogue which refer to metrological characteristics are based on our own internal standards.

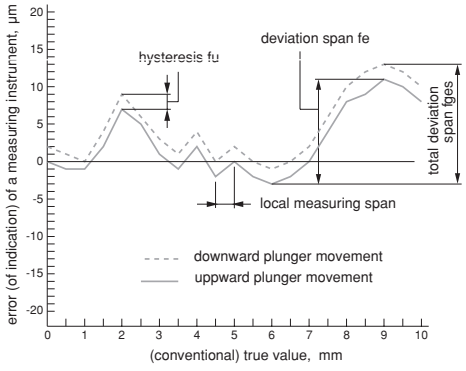
Electronic indicators and short range precision indicators. Definitions used in this section:

Total permissible error in 1 measuring direction over the entire measuring range	
within the partial measuring range	
in the 2 measuring directions	
Repeatability limit	
Max. hysteresis	

Mechanical dial gauges.
Definitions used in this section for the maximum permissible errors of a metrological characteristic (MPE):

Deviation span (error of indication within the measuring range)	
Deviation span (error of indication) within the partial measuring range	
Total deviation span (error of indication within the measuring range)	
Repatability limit (reliability) of indication	
Hysteresis of indication	





Resolution 0,01 mm = ±0,25 mm Resolution to 0,001 mm = ±0,025 mm

6-decade LC display field, plus minus sign

Digit size 10 x 5 mm (H x L)

Combined analogue and numerical display

Glass scale with incremental divisions, capacitive

MI or MIE type: metric/inch conversion

≤ 2 N

≤ 2 m/s

Full-metal housing with front face in polyamide. Stainless steel plunger.M2,5 mounting thread for measuring insert.

RS232, opto-coupled

3V lithium battery type CR2032

1 year to 2 years

EN 50081-1 EN 50082-1

150 g

Transport case with 1 lithium battery 01961000

Inspection report with declaration of conformity

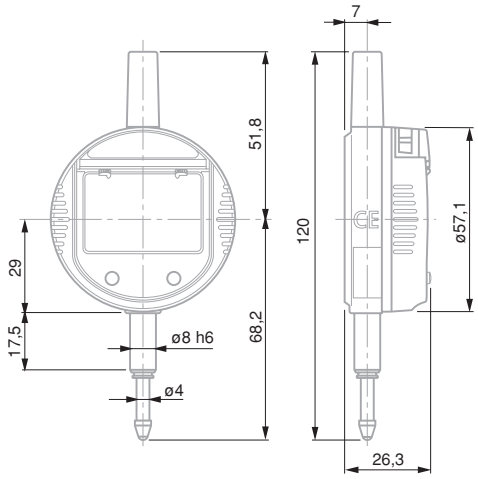
TESA DIGICO 205 / 305

- Dual LC Display, digital and analogue.
- Mechanical tolerance markers.
- Dimensions according to DIN 878.

Main functions

ON/Auto OFF – Data output – Counting sense reversal – Keypad lock.





No		mm	in	mm	in	µm	µm
01930230	DIGICO 205 MI	12,5	0.5	0,01	0.0005	20	10
01930231	DIGICO 305 MI	12,5	0.5	0,001	0.00005	8	2

TESA DIGICO 400 / 500

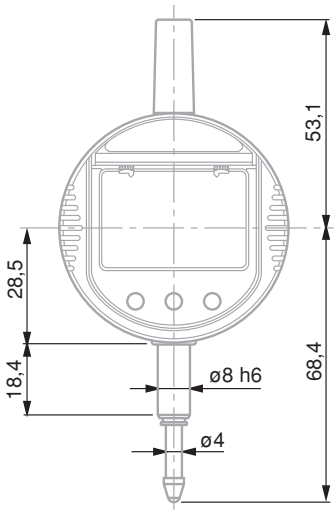
- Measuring modes ABS/REL.
- Dual LC Display, digital and analogue
- Rotation through 270° of display and key functions.
- Mechanical tolerance marks.
- Graphical display of tolerance limits.

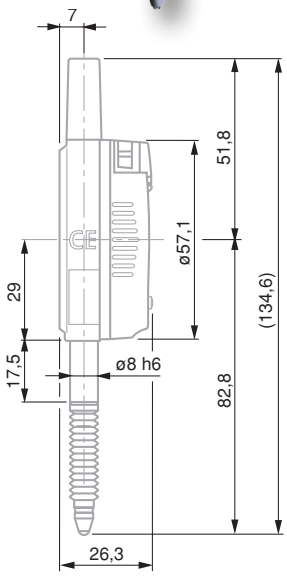
Measuring functions and modes

ON – Auto OFF – PRESET mode – Tolerance mode – Data output – Counting sense reversal – Keypad lock – Metric/Inch units – Full RESET.









No		mm	in	mm	in	µm	µm		g
01930240	DIGICO 405 MI	12,5	0.5	0,01	0.0005	20	10	–	150
01930241	DIGICO 410 MI	25	1	0,01	0.0005	20	10	–	162
01930250	DIGICO 505 MI	12,5	0.5	0,001	0.00005	4	2	–	150
01930255	DIGICO 505 MIP, protected	12,5	0.5	0,001	0.00005	4	2	IP62	150

- Resolution 0,01 mm = ±0,25 mm Resolution 0,001 mm = ± 0,025 mm
- 6-decade LC display field plus minus sign
- Digit size 10 x 5 (H x L)
- Combined analogue and numerical display
- Glass scale with incremental divisions, capacitive
- Conversion mm/in
- Measuring force: < 2 N
- ≤ 2 m/s
- Full-metal housing, front face in polyamide. Stainless steel plunger, . M2,5 mounting thread for measuring insert.
- RS232, opto-coupled
- 3V lithium battery, type CR2032
- 1 year to 2 years
- EN 50081-1 EN 50082-1
- Shipping case including one lithium battery 01961000
- Inspection report with declaration of conformity

Resolution 0,01 mm = ± 0,25 mm Resolution 0,001 mm = ± 0,025 mm

6-decade LC display field plus minus sign

Digit size 10 x 5 mm (H x L)

Combined analogue and numerical display

Glass scale with incremental divisions, capacitive

Conversion mm/in

Measuring force: < 2 N

≤ 2 m/s

Full-metal housing with front face in polyamide. Stainless steel plunger. M2,5 mounting thread for measuring insert.

RS232, opto-coupled

3V lithium battery, type CR2032

1 year to 2 years

EN 50081-1
EN 50082-1

Transport case with 1 lithium battery 01961000

Inspection report with eclaration of conformity

TESA DIGICO 600

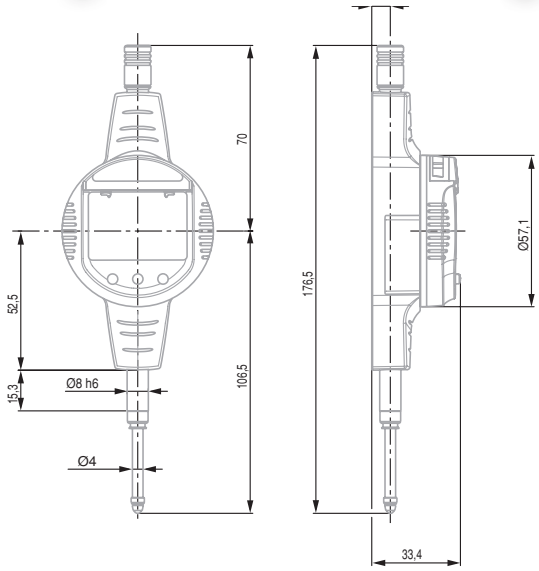
- Measuring modes ABS/REL.
- Dual LC Display.
- Display rotation through 270°. Same goes for the key functions.
- Mechanical tolerance marks.
- Graphical display of tolerance limits.

Measuring functions and modes

ON – Auto OFF – PRESET mode – Tolerance mode – Measured value storage

• Max • Min • Max-Min (TIR) – Data output – Counting sense reversal – Keypad lock – Metric/Inch units – Full RESET.





No		mm	in	mm	in	µm	µm	g
01930256	DIGICO 605 MI	12,5	0.5	0,001	0.00005	4	2	150
01930257	DIGICO 610 MI	25	1	0,001	0.00005	5	2	162

TESA DIGICO 705

For use with 2-point contact bore gauges. Allows setting of the dial gauge to the smallest setting ring value.

– Same functions as DIGICO 600.

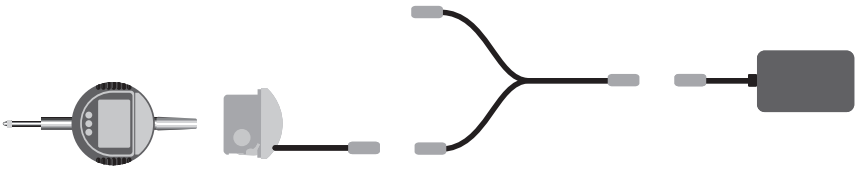




- Resolution to 0,01 mm = ± 0,25 mm Resolution 0,001 mm = ± 0,025 mm
- 6-decade LC display field, plus minus sign
- Digit size 10 x 5 mm (H x L)
- Combined analogue and numerical display
- Glass scale with incremental divisions, capacitive
- Conversion mm/in
- Measuring force < 2 N
- ≤ 2 m/s
- Full-metal housing with front face in polyamide. Stainless steel plunger, M2,5 mounting thread for the measuring insert.
- RS232, opto-coupled
- 3V lithium battery, type CR2032
- 1 to 2 years
- EN 50081-1 EN 50082-1
- Transport case with 1 lithium battery 01961000
- Inspection report with declaration of conformity

No		mm	in	mm	in	µm	µm	g
01930258	DIGICO 705 MI	12,5	0.5	0,001	0.00005	4	2	150

Accessories for TESA DIGICO 200 – 700



No	
01962002	External power supply
01961000	Lithium battery, 3V, CR2032
04761054	Battery charger 100 ÷ 200 VAC / 50 ÷ 60 Hz, 6,6 Vdc, 750 mAh supplied without power cable
04761055	Cable EU for charger 0471054
04761056	Power cable US for charger 0471054

- Measuring inserts, see chapter "Measuring inserts for dial gauges, axial probes and other hand tools".
- Backs and retraction devices, see chapter "Devices for plunger retraction" and "Backs for Dial Gauges".
- Connectivity, see corresponding chapter.

According to selected tolerances
30,4 mm (DIGICO 1) or 60,4 mm (DIGICO 2)
40 mm scale length
According to selected tolerances
6 decades plus minus sign
9 x 4,5 mm digit size (H x W)
LC display with backlight, with 25 divisions
Incremental glass scale
Metric/inch conversion
DIGICO 1: 2 µm DIGICO 2: 3 µm
1 µm
1 µm
DIGICO 1: max. 1 m/s DIGICO 2: max. 2 m/s
Plunger guided on a plain bearing M2,5 mounting thread fo measuring insert.
RS232
3,6 V lithium battery or mains adapter
≈ 1000 h with lithium battery
0,002%/°C
DIGICO case in standard execution: IP54 (IEC 60529)
290 g (DIGICO 1) 310 g (DIGICO 2) Moved mass through the plunger: 28 g (DIGICO 1) 27 g (DIGICO 2)
Supplied in transport packing with 1 lithium battery 01960007 1 lift lever 01960005
Inspection report with a declaration of conformity

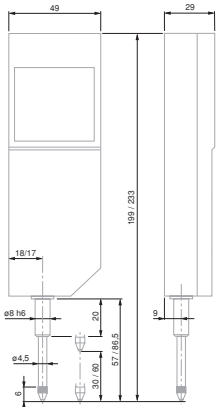
TESA DIGICO 1 / 2

These two indicators are remarkable for their multiple simple functions, long measuring travel and high accuracy.

- Analogue/digital display combined with the possibility of orienting the analogue display in different positions.
- Zero setting at any point within the measuring span.
- Data input via the keypad.
- Counting direction reversible.
- Entry of limit values for classification through displayed symbols. Additional green, red or amber coloured background whenever the instrument is connected to mains.
- Storage of measured values through the functions: "Maximum value", "Minimum value" or "Maximum value minus minimum value".







NO		mm	in	mm	in
01930000	DIGICO 1	30	1.18	0,001	0.00005
01930001	DIGICO 2	60	3.36	0,001	0.00005
OPTIONAL ACCESSORIES:					
04761037	Mains adaptor 230V for DIGICO 1 or 2				
04761057	Mains adaptor 110V for DIGICO 1 or 2				
01960007	3.5 V lithium battery, LR6, AA				
01960005	Bottom mounted lift lever				
04768000	Hand switch for manually triggering data transfer. Jack plug connector, 1,8 m – TESA SPC PRINTER printer – TESATRONIC TT display units				

Force de mesure	DIGICO 1	DIGICO 2
Measuring force* close to measuring plunger stop		
– Bottom	0.85 N ± 0.15 N	0.90 N ± 0.20 N
– Top	1.10 N ± 0.20 N	1.45 N ± 0.25 N
Hysteresis*	0.10 N	0.15 N

* Valid with indicator in vertical position, measuring plunger oriented downwards and in static measurement.

TESA DIGICO 12

Designed to operate in a rugged environment, resistant to spray of liquids (IP65) – 44 mm dial diameter – Provides the advantages of mechanical precision with digital reading

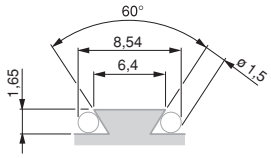
TESA DIGICO 12 – Standard

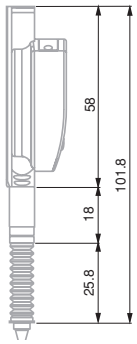
- 44 mm dial casing diameter.
- Resistant against cutting oils and coolants (IP65).
- RS232 SIMPLEX data output combined with external power supply.
- Inductive measuring system, patented.
- Choice between absolute "ABS" and relative "REL" measuring modes.
- Digital display.
- Setting of PRESET value (±130 mm).
- Inverse measuring direction.
- Direct conversion of metric/inch units.
- Automatic shutdown.

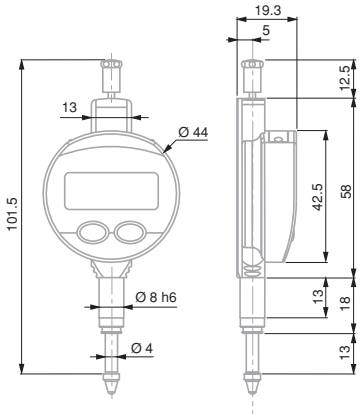
5-digit LC display + sign
Digit height 6 mm
20 µm
Repeatability: 5 µm
0,5 to 0,9 (± 0,15) N
Max. 2 m/sec
Number of measurements per second: 7
Zero setting of display
RS232
3 V lithium battery, type CR 3032
Battery life > 3500 hours
Working temperature range: 5°C to 40°C
Protection level: IP65 (CEI 629)
EN 61326-1
70 g
Supplied in transport packing with 1 lithium battery, type CR 2032 (No 01961000)
Inspection report with a declaration of conformity











NO	mm	in	mm	in	Protection bellows	
01930130	12,5	0.5	0,01	0.0005		IP65
01930132	12,5	0.5	0,001	0.00005		IP65
01930131	12,5	0.5	0,01	0.0005	With	IP65
01930133	12,5	0.5	0,001	0.00005	With	IP65

LCD, 5 digits + sign

Digit height: 6 mm

Max. permissible error: 4 µm

Repeatability limit: 2 µm

0,4 to 0,75 (± 0,15) N

Max. 2 m/sec

Number of measurements per second: 9

Zero-setting of display

RS232

3 V lithium battery, type CR 2032

Battery life: > 4000 hours

Working temperature range: 5°C to 40°C

IP65 (CEI 529)

EN 61326-1

70 g

Supplied in transport packing with 1 lithium battery, type CR 2032 (No 01961000)

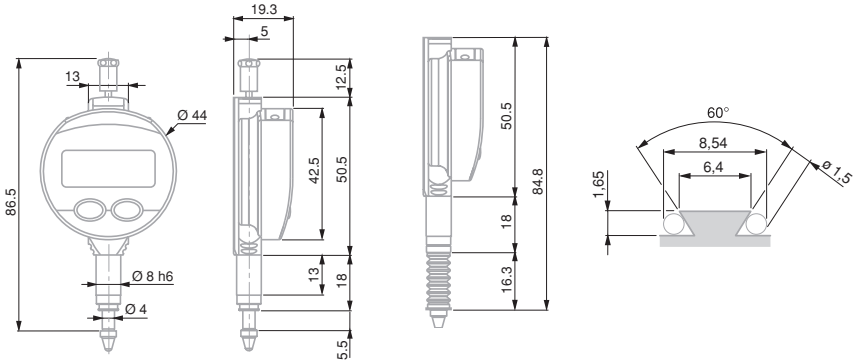
Inspection report with a declaration of conformity

TESA DIGICO 12 – HP

- High precision measuring system.
- Resistant to cutting oils and coolants (IP65).
- Combined analogue/digital display.
- Analogue reading from ±0.025 to ±1.25 mm.
- NOR/MIN/MAX/MAX-MIN measuring modes.
- 44 mm dial casing diameter.
- RS 232 data output combined with external power supply.
- Inductive measuring system, patented.
- Zero-setting of display.
- Direct conversion of metric/inch units.
- Shut down: either automatic or blocked.



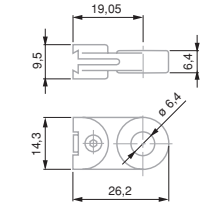




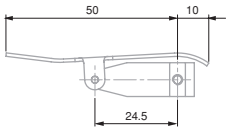
NO						
	mm	in	mm	in	Protection bellows	
01930134	5	0.210	0,001	0.00005		IP65
01930135	5	0.210	0,001	0.00005	With	IP65

Accessories for TESA DIGICO 12

NO	
03238013	Mounting lug
01961012	Upper lift lever
01960005	Bottom mounted lift lever
04761060	RS 232 cable with external power supply
01961000	Lithium battery, 3V, CR2032



03238013



01961012

ETALON HP

High precision comparators
ETALON with short measuring travel

The ultimate in high precision.

Remarkably reliable, even when constantly used for series inspection – Specially designed for comparative measurements requiring a very low measurement uncertainty – Measures axial and radial runouts with very low hysteresis.

- Shockproof movement. Lever and gear transmission system. Long dead travel.
- Non-reflecting dial for easy readout.
- Measuring travel limited to less than one revolution of pointer. No possibility of reading errors.
- Fine adjustment with protective knob to prevent accidental displacement of the pointer.

DIN 879-1 Dimensions according to EN ISO 463

Full-metal dial casing. Stainless steel plunger, hardened.

≈1 N

Measuring plunger on ball-bearings

Adjustable tolerance markers. Coupling thread for retraction cable. M2,5 thread for measuring insert

1 measuring insert already mounted, steel ball tip Ø 3.175 mm. 1 retraction cable.

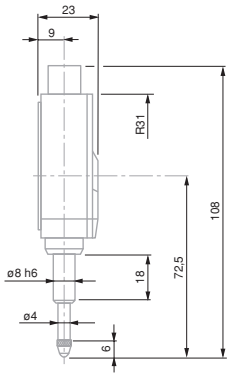




	mm	mm	mm				
01419051	0,1	0,001	3,0	50 ÷ 0 ÷ 50	●	62	–
01419052	0,1	0,001	3,0	50 ÷ 0 ÷ 50	●	62	IP54

Accuracy

		0,001 mm
	Max. perm. errors in one direction throughout the measuring range, G_e	1 µm
	over any selected local range including 10 scale divisions, G_t	0,7 µm
	in both measuring directions throughout the total measuring range, G_{ges}	1,2 µm
	Repeatabaility limit, r_w	0,5 µm
	Max. hysteresis, f_u	0,5 µm



EN ISO 463 Factory standard

Rotating dial. With or without dial lock for standard models

Full-metal dial casing. Mounting shank and plunger in hardened stainless steel

With or without shockproof mechanism

Adjustable tolerance markers. Thread M2,5 for measuring insert

Measuring insert with 3 mm dia. ball tip already mounted

Inspection report with a declaration of conformity

DIAL GAUGES – PREMIUM QUALITY

The TOP quality of our dial gauges guarantee the use of the best and most wear-resistant materials in order to ensure that the most demanding metrological criteria are respected along with a product life that exceeds all other dial gauges

Dial Ø 40 mm – Reading 0,01 mm

Precision dial gauges

These precision dial gauges combine excellent metrological properties with extra-long life.

- Smooth and regular travel, entirely jewel-mounted movement.
- Full-metal dial casing and bezel.
- Shockproof mechanism in both directions of plunger movement.
- Non-reflecting dial.



01410210



353

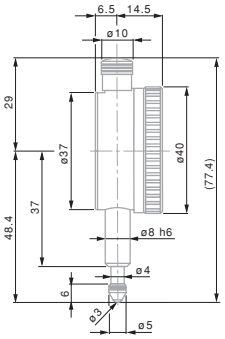


353E

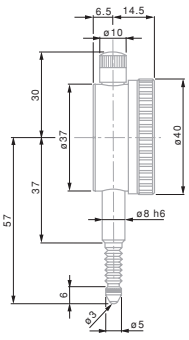
NO		mm	mm	mm	mm				N
01410210	TESA YR	5	5,4	0,01	0,5	0 ÷ 25 ÷ 50	●	●	
01416013	MERCER X185-1	5	5,4	0,01	0,5	0 ÷ 25 ÷ 0	–	●	
01416014	MERCER 186-1	5	5,4	0,01	0,5	0 ÷ 25 ÷ 50	–	●	
01412010	TESA YE	5	5,4	0,01	0,5	0 ÷ 25 ÷ 50	–	–	
353	COMPAC 353	5	5,4	0,01	0,5	0 ÷ 25 ÷ 50	●	–	
353E	COMPAC 353E IP54	5	5,4	0,01	0,5	0 ÷ 25 ÷ 50	●		IP54

Permissible limits of a metrological characteristic (MPE/MPL)

		0,01 mm
	Deviation span	12 µm
	Deviation span within partial measuring span 0,10 mm	6 µm
	Total deviation span	14 µm
	Repeatability limit	3 µm
	Max. hysteresis	3 µm
	Measuring force – IP54 model	= 1,4 N = 2 N



01410210



353E

Dial Ø 57 and 58 mm – Reading 0,01 mm

Precision dial gauges



01410610



512K



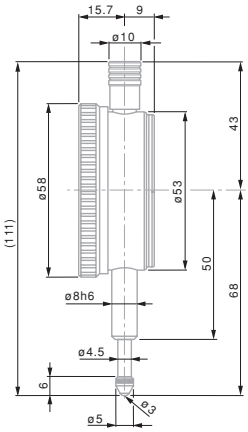
532E



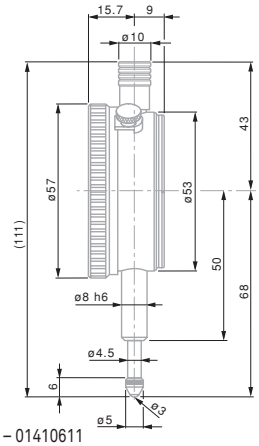
01416021

- EN ISO 463 Factory standard
- Rotating dial. With or without dial lock for standard models
- Full-metal dial casing. Mounting shank and plunger in hardened stainless steel
- With or without anti-shock mechanism
- Adjustable tolerance markers. Thread M2,5 for measuring insert
- Measuring insert with Ø 3 mm ball tip already mounted
- Inspection report with declaration of conformity

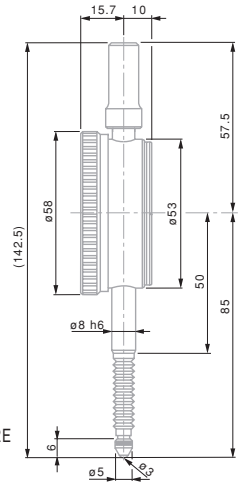
No									
		mm	mm	mm	mm				
01410610	TESA YR	10	10,5	0,01	1	0 ÷ 50 ÷ 100	●	●	
01410611	TESA YR	10	10,5	0,01	1	0 ÷ 50 ÷ 0	●	●	
01412310	TESA YE	10	10,5	0,01	1	0 ÷ 50 ÷ 100	–	–	
01416021	MERCER 251-1	10	10,5	0,01	1	0 ÷ 50 ÷ 100	–	●	
512K	COMPAC 512K	10	10,5	0,01	1	0 ÷ 50 ÷ 100	–	–	
532	COMPAC 532	10	10,5	0,01	1	0 ÷ 50 ÷ 100	●	–	
532E	COMPAC 532E IP54	10	10,5	0,01	1	0 ÷ 50 ÷ 100	●	–	IP54
533S	COMPAC 533S limited travel	± 0.5	4	0,01	1,27	50 ÷ 0 ÷ 50	●	–	



512K



01410610 – 01410611



532E

Permissible limits of a metrological characteristic (MPE/MPL)

		± 0,5	10 mm
	Deviation span	7 µm	15 µm
	Deviation span within the selected local measuring span 0.10 mm	5 µm	8 µm
	Total deviation spanl	9 µm	17 µm
	Repeatability limit	3 µm	3 µm
	Max. hysteresis	3 µm	3 µm
	Measuring force – Models IP54	= 1 N –	≤ 1,5 N ≤ 2,2 N

EN ISO 463
Factory standard

Rotating dial. With or without dial lock.

Full-metal dial casing. Mounting shank and plunger in hardened stainless steel

Adjustable tolerance markers. Thread M2,5 for measuring insert

Measuring insert with 3 mm ball tip already mounted

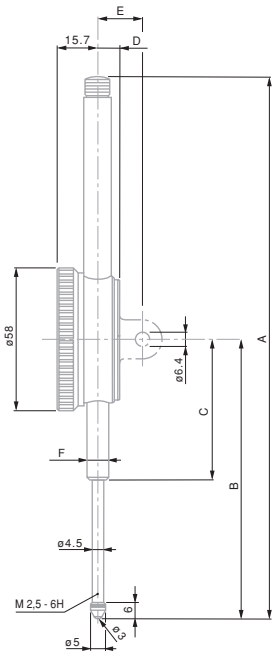
Inspection report with declaration of conformity

Dial Ø 58 mm – Reading 0,01 mm – Long travel

Long range precision dial gauges



712



		mm	mm	mm	mm				
712	COMPAC 712	30	30,5	0,01	1	0 ÷ 50 ÷ 100	●	–	58
722	COMPAC 722	50	50,5	0,01	1	0 ÷ 50 ÷ 100	●	–	58
732	COMPAC 732	100	100,5	0,01	1	0 ÷ 50 ÷ 100	●	–	58

Dimensions

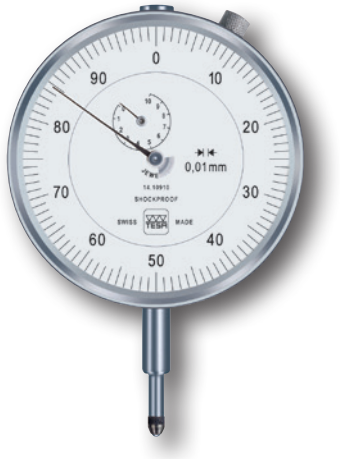
mm	30 mm	50 mm	100 mm
A	148	228	390
B	88	117,2	211,6
C	50	60	103,6
D	10	9	9
E	20	19	19
F	Ø 8h6	Ø 8h6	Ø 8h6

Permissible limits of a metrological characteristic (MPE/MPL)

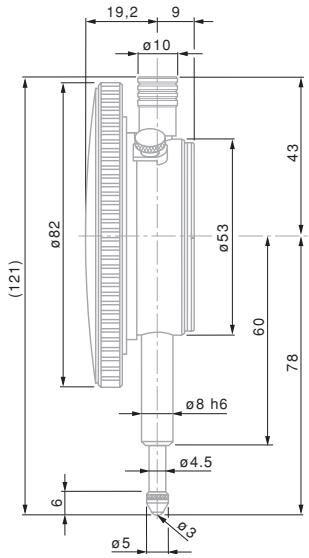
		30 mm	50 mm	100 mm
	Deviation span	20 µm	25 µm	30 µm
	Total deviation span	25 µm	30 µm	35 µm
	Repeatability limit	3 µm	3 µm	3 µm
	Max. hysteresis	5 µm	5 µm	8 µm
	Measuring force	≤ 2,2 N	≤ 2,5 N	≤ 3,2 N

Dial Ø 82 mm – Reading 0,01 mm

Precision dial gauges



01410910



01410910

- EN ISO 463 Factory Standard
- Rotating dial. With ot without dial lock
- Full-metal dial ca-sing. Stainless steel fixing shank and plunger, hardened
- High performance shock-proof system in the 2 directions
- M2,5 thread for measuring insert
- Measuring insert with Ø 3 mm ball tip, already mounted
- Inspection report with declaration of conformity

NO							
	mm	mm	mm	mm			
01410910	10	10,5	0,01	0,1	0 ÷ 50 ÷ 100	●	●

Permissible limits of a metrological characteristic (MPE/MPL)

		10 mm
	Deviation span	15 µm
	Deviation span within partial measuring span of 0,10 mm	8 µm
	Total deviation span	17 µm
	Repeatability limit	3 µm
	Max. hysteresis	3 µm
	Measuring force	≤ 1,4 N

EN ISO 463
Factory standard

Rotating dial

Full-metal casing. Fixing shank and plunger in hardened stainless steel

Adjustable tolerance markers. Thread M2,5 for measuring insert

Measuring insert with Ø 3 mm ball tip already mounted

Inspection report with declaration of conformity

Dial Ø 40 mm – Reading 0,002 mm

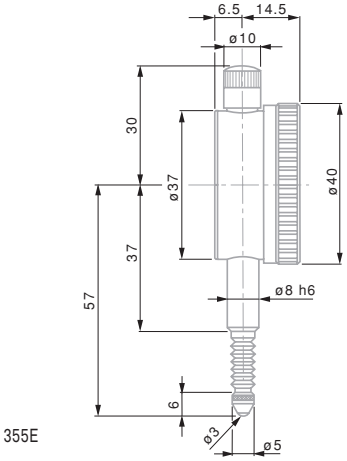
Precision dial gauges



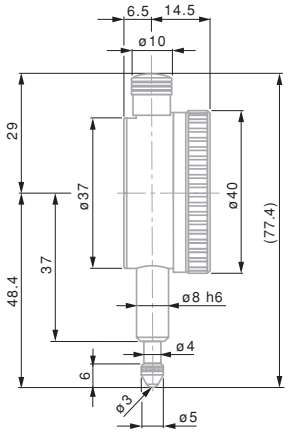
355E



365S



355E



365S

NO	mm	mm	mm	mm					
355	3	3,3	0,002	0,2	0 ÷ 10 ÷ 20	●	–	40	
355E	3	3,3	0,002	0,2	0 ÷ 10 ÷ 20	●	–	40	IP 54
365S	±0,08	1,5	0,002	0,2	8 ÷ 0 ÷ 8	●	–	40	

Permissible limits of a metrological characteristic (MPE/MPL)

		±0,08 mm	3 mm
	Deviation span	2 µm	10 µm
	Deviation span within the selected local measuring span 0,10 mm	2 µm	6 µm
	Total deviation span	4 µm	12 µm
	Repeatability limit	1 µm	1,5 µm
	Max. hysteresis	1 µm	2 µm
	Measuring force – Model IP54	≤ 1,4 N –	≤ 1,4 N ≤ 1,7 N

Dial Ø 58 mm – Reading 0,002 mm

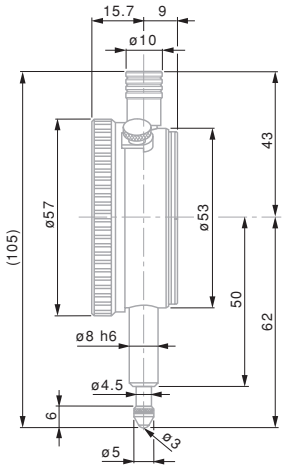
Precision dial gauges


01416034

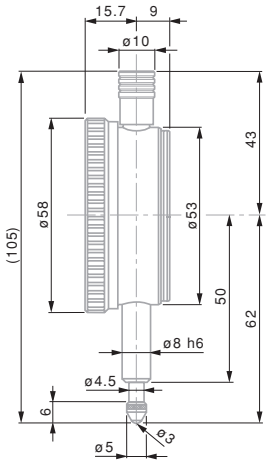

555


565S

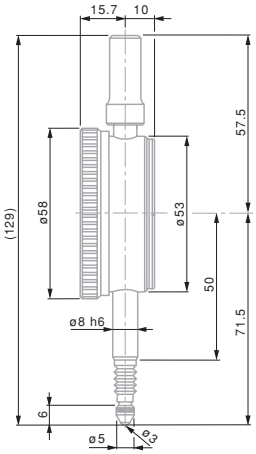

555E



01416034



555



555E

NO		mm	mm	mm	mm					
01416034	MERCER 253-1	5	5,3	0,002	0,2	0 ÷ 10 ÷ 0	–	●	58	–
555	COMPAC 555	5	5,3	0,002	0,2	0 ÷ 10 ÷ 20	●	–	58	
555E	COMPAC 555E IP54	5	5,3	0,002	0,2	0 ÷ 10 ÷ 20	●	–	58	IP 54
565S	COMPAC 565S limited travel	±0,08	3,3	0,002	0,2	8 ÷ 0 ÷ 8	●	–	58	–

Permissible limits of a metrological characteristic (MPE/MPL)

		±0,08 mm	5 mm
	Deviation span	4 µm	12 µm
	Total deviation span	4 µm	14 µm
	Repeatability limit	1 µm	2 µm
	Max. hysteresis	1 µm	2 µm
	Measuring force – Model IP54	≤ 1,5 N –	≤ 1,5 N ≤ 1,7 N

EN ISO 463
Factory standard

Rotating dial. With or without dial lock.

Full-metal dial casing. Mounting shank and plunger in hardened stainless steel

Adjustable tolerance markers. Thread M2,5 for measuring insert

Measuring insert with 3 mm ball tip already mounted

Inspection report with declaration of conformity

EN ISO 463
Factory standard

Cardboard box

Full-metal dial casing. Mounting shank and plunger in hardened stainless steel

With shock-proof mechanism, in both directions

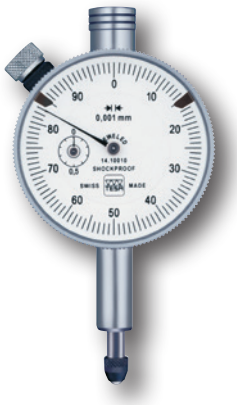
Adjustable tolerance markers. Thread M2,5 for measuring insert

Measuring insert with 3 mm steel ball tip already mounted

Inspection report with declaration of conformity

Dial Ø 40 mm – Reading 0,001 mm

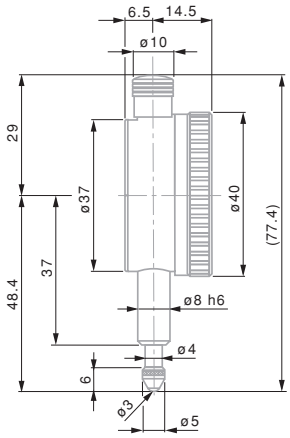
Precision dial gauges



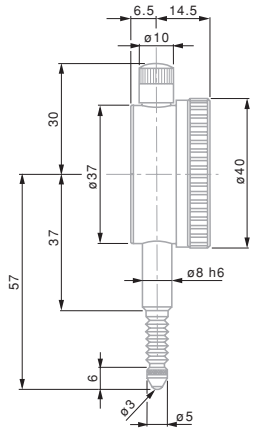
01410010



01410120



01410010



01410120

		mm	mm	mm	mm	mm					
01410010	TESA YR	1	1,5	0,001	0,1	40	0 ÷ 50 ÷ 100	●	●	40	–
01412510	TESA YE	1	1,5	0,001	0,1	40	0 ÷ 50 ÷ 100	●	–	40	–
01410120	TESA YR IP54	1	1,5	0,001	0,1	40	0 ÷ 50 ÷ 100	●	–	40	IP 54
367	COMPAC 367	1	1,5	0,001	0,1	40	0 ÷ 5 ÷ 10	●	–	40	–
367E	COMPAC 367E IP54	1	1,5	0,001	0,1	40	0 ÷ 5 ÷ 10	●	–	40	IP 54

Permissible limits of a metrological characteristic (MPE/MPL)

		1 mm
	Deviation span	4 µm
	Deviation span within the selected local measuring span 0,10 mm	4 µm
	Total deviation span	5 µm
	Repeatabaility limit	1 µm
	Max. hysteresis	1 µm
	Measuring force – Model IP54	≤ 1,7 N ≤ 2 N

Dial Ø 58 mm – Reading 0,001 mm

Precision dial gauges



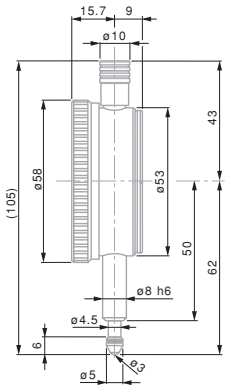
01412511



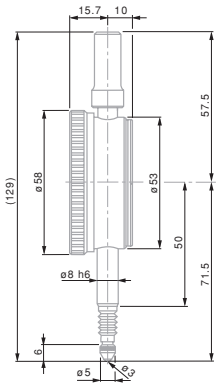
556



01412611



567



556E

- EN ISO 463 Factory standard
- Rotating dial
- Full-metal dial casing. Mounting shank and plunger in hardened stainless steel
- Effective anti-shock in the 2 directions
- Adjustable tolerance markers. Thread M2,5 for measuring insert
- Measuring insert with 3 mm Ø ball tip, already mounted
- Inspection report with declaration of conformity

NO		mm	mm	mm	mm					
01412511	TESA YE	1	1,5	0,001	0,1	58	0 ÷ 50 ÷ 100	●	–	
01412611	TESA YE	5	5,3	0,001	0,2	58	0 ÷ 100 ÷ 200	●	–	
556	COMPAC 556	5	5,3	0,001	0,2	58	0 ÷ 10 ÷ 20	●	–	
567	COMPAC 567	1	3,3	0,001	0,1	58	0 ÷ 5 ÷ 10	●	–	
556E	COMPAC 556E IP54	5	5,3	0,001	0,2	58	0 ÷ 10 ÷ 20	●	–	IP54
01412711	TESA YE IP54	1	1,5	0,001	0,1	58	0 ÷ 50 ÷ 100	●	–	IP54
01410520	TESA YR IP54	1	3,3	0,001	0,1	58	0 ÷ 50 ÷ 100	●	–	IP54

Permissible limits of a metrological characteristic (MPE/MPL)

		1 mm	5 mm
	Deviation span	4 µm	12 µm
	Deviation span within the selected local measuring span 0,10 mm	4 µm	–
	Total deviation span	5 µm	14 µm
	Repeatability limit	1 µm	2 µm
	Max. hysteresis	1 µm	2 µm
	Measuring force – Models IP54	≤ 1,7 N –	≤ 1,5 N ≤ 1,7 N

EN ISO 463
Factory standard

Rotating dial. With or wothout dial lock.

Full-metal dial casing. Stainless steel fixing shank and plunger, hardened

High performance anti-shock system in both directions

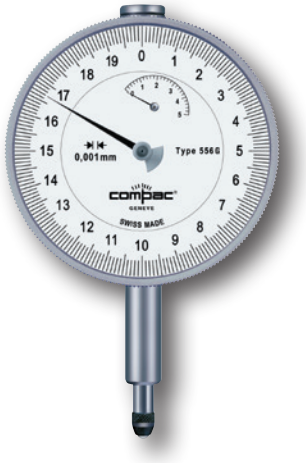
M2,5 thread for measuring inserts

Measuring insert with Ø 3 mm ball tip, already mounted

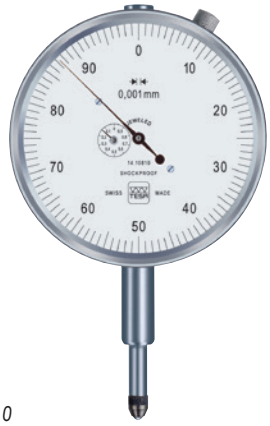
Inspection report with a declaration of conformity

Dial Ø 82 mm – Reading 0,001 mm

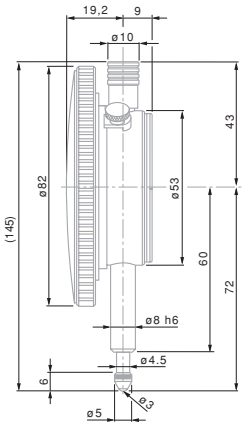
Precision dial gauges



556G



01410810



01410810

No		mm	mm	mm	mm				ø
01410810	TESA YR	1	3,3	0,001	0,1	0 ÷ 50 ÷ 100	●	●	82
556G	COMPAC 556G	5	5,3	0,001	0,2	0 ÷ 10 ÷ 20	●	–	82

Permissible limits in a metrological characteristic (MPE/MPL)

		1 mm	5 mm
	Deviation span	4 µm	12 µm
	Deviation span within partial measuring span of 0,10 mm	4 µm	–
	Total deviation span	5 µm	14 µm
	Repeatability limit	1 µm	2 µm
	Max. hysteresis	1 µm	2 µm
	Measuring force	≤ 1,7 N	≤ 1,5 N

STANDARD DIAL GAUGES

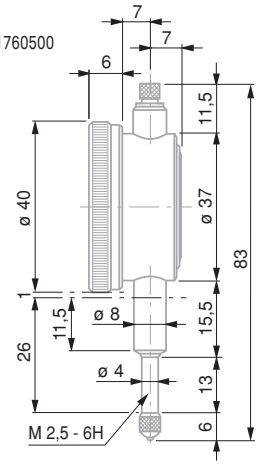
The Standard product line offers a range of heavy duty and competitively priced dial gauges.

Dial Ø 40 / 58 – Reading 0,1 mm

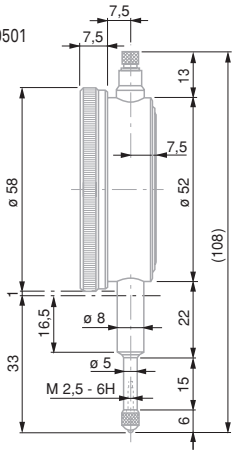
Precision dial gauges

- EN ISO 463 Factory standard
- Rotating dial
- Full-metal casing. Mounting shank and plunger in hardened stainless steel
- Without anti-shock mechanism
- Thread M2,5 for measuring insert
- Measuring insert with 3,175 mm Ø ball tip already mounted

0141760500



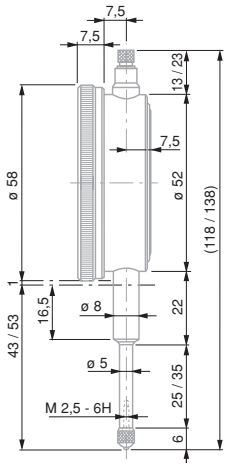
0141760501





0141760500
0141760501

0141760503





014760503

NO	mm	mm	mm	mm		–	N	Ø
0141760500	10	10,5	0,1	10	0 ÷ 5 ÷ 10	–	≤ 1,0	40
0141760501	10	10,5	0,1	10	0 ÷ 5 ÷ 10	–	≤ 1,0	58
0141760503	30	30,5	0,1	10	0 ÷ 5 ÷ 10	–	≤1,5	58

Permissible limits of a metrological characteristic (MPE/MPL)

		0,1 mm
	Deviation span	40 µm
	Deviation span within partial measuring span of 0.1 mm	25 µm
	Total deviation error	55 µm
	Repeatability limit	15 µm
	Max. hysteresis	15 µm

EN ISO 463 Factory standard

Rotating dial

Full-metal casing. Mounting shank and plunger in hardened stainless steel

With or without anti-shock mechanism

Adjustable tolerance markers. Thread M2,5 for measuring insert

Measuring insert with 3,175 mm Ø ball tip already mounted

Inspection report with declaration of conformity

Dial Ø 40 mm – Reading 0,01 mm

Precision dial gauges

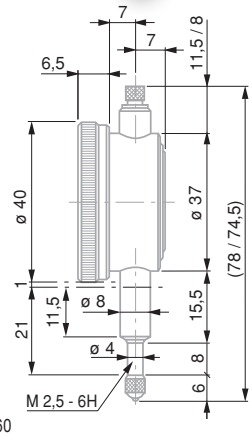
Model 0141760560 provides excellent value for money.



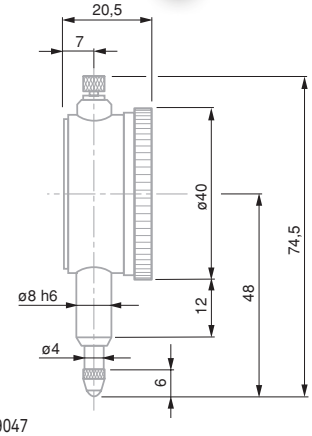
0141760560



01419047



0141760560



01419047

NO			mm	mm	mm	mm		
0141760560	*	ROCH	3	3,4	0,01	0,5	0 ÷ 25 ÷ 50	–
01419047		ETALON	5	-	0,01	0,5	0 ÷ 25 ÷ 50	●

* With extra reverse numbering in red

Permissible limits of a metrological characteristic (MPE/MPL)

		3 mm	5 mm
	Deviation span	10 µm	12 µm
	Deviation span within the selected partial measuring span of 0,1 mm	5 µm	6 µm
	Total deviation span	12 µm	–
	Repeatability limit	3 µm	3 µm
	Max.hysteresis	3 µm	–
	Measuring force	≤ 1,4 N	≈1

Dial Ø 58 mm – Reading 0,01 mm – Long travel

Long travel precision dial gauges



0141760635



0141760661



0141760624



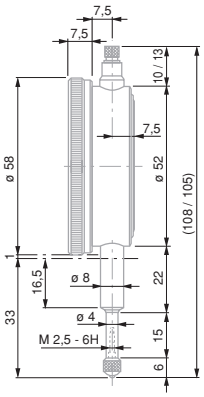
0141760651



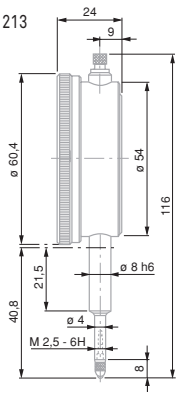
0141761213

- EN ISO 463 Factory standard
- Rotating dial
- Full-metal casing. Mounting shank and plunger in hardened stainless steel
- With or without anti-shock mechanism
- Adjustable tolerance markers. Thread M2,5 for measuring insert
- Accuracy: see table for max. deviations. If measurements are carried out with a downward plunger, the same must be mechanically coupled to the measuring point to eliminate all hysteresis
- Measuring insert with Ø 3,175 mm steel ball tip, already mounted. Exceptions: Model numbers 0141760631 / 0141761213 with ruby ball tips.

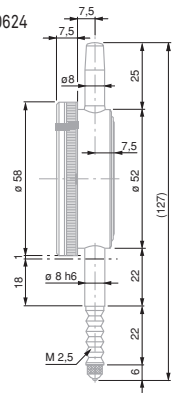
0141760631
0141760635
0141760636



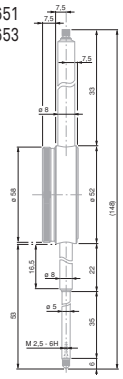
0141761213



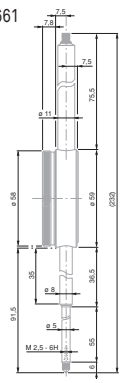
0141760624



0141760651
0141760653



0141760661



NO			mm	mm	mm	mm			N	
0141760631	*	ROCH	10	10,5	0,01	1	0 ÷ 50 ÷ 100	–	≤ 1,4	
0141760635	*	ROCH	10	10,5	0,01	1	0 ÷ 50 ÷ 100	–	≤ 1,4	
0141760636	**	ROCH	10	10,5	0,01	1	0 ÷ 50 ÷ 100	–	≤ 1,4	
0141761213	***	ROCH	15	15,5	0,01	1	0 ÷ 50 ÷ 100	●	≤1,6	
0141760651		ROCH	30	30,5	0,01	1	0 ÷ 50 ÷ 100	–	≤1,6	
0141760653		ROCH	30	30,5	0,01	1	0 ÷ 50 ÷ 100	●	≤ 2,2	
0141760624	*	ROCH IP54	10	10,5	0,01	1	0 ÷ 50 ÷ 100	●	≤ 2	IP54
0141760661		ROCH	50	51	0,01	1	0 ÷ 50 ÷ 100	–	≤ 2,2	

* With extra reverse numbering in red
** With mounted central lug back (see page F-29)
*** Dial Ø 60,4 mm

Permissible limits of a metrological characteristic (MPC/MPE)

		10 mm	15 mm	30 mm	50 mm
	Deviation span	15 µm	20 µm	20 µm	25 µm
	Deviation span within the selected local measuring span 0,10 mm	5 µm	5 µm	5 µm	5 µm
	Repeatability limit	3 µm	3 µm	3 µm	3 µm

EN ISO 463 Factory standard

Rotating dial

Full-metal casing. Mounting shank and plunger in hardened stainless steel

With or without anti-shock mechanism

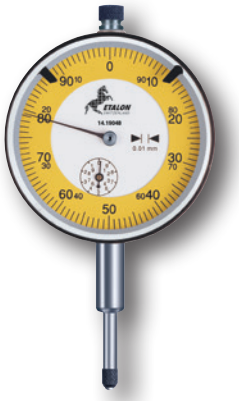
Adjustable tolerance markers. Thread M2,5 for measuring insert

Measuring insert with Ø 3,175 mm steel ball tip, already mounted

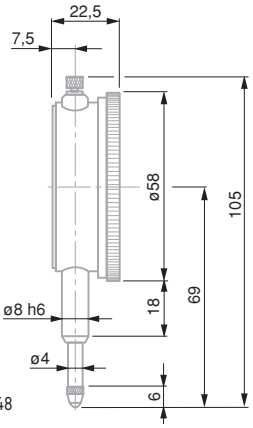
Dial Ø 58 mm– Reading 0,01 mm – Standard and long travel

Precision dial gauges

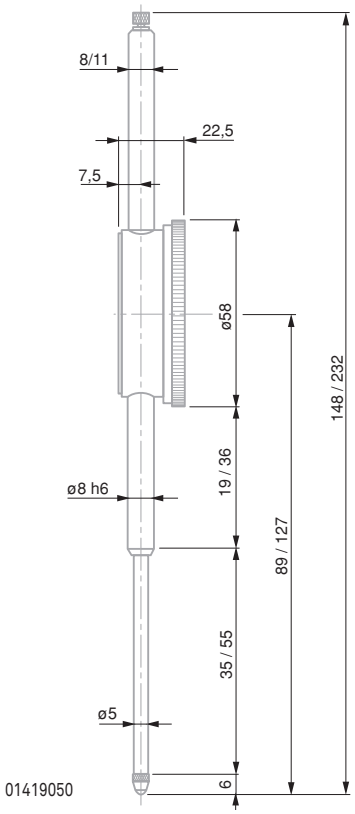
Standard and long travel models



01419048



01419048



01419050

NO	mm	mm	mm			N	Ø
01419048	10	0,01	1	0 ÷ 50 ÷ 100	–	≈1	58
01419050	50	0,01	1	0 ÷ 50 ÷ 100	●	1,5 ÷ 2	58

For magnetic or central lug backs, see backs for ROCH and ETALON dial gauges

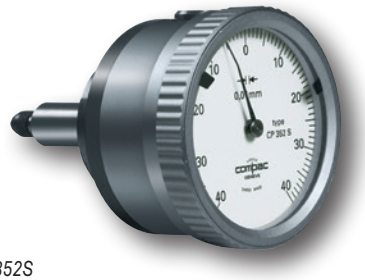
Permissible limits for a metrological characteristic (MPE/MPL)

		mm	10	50
	Deviation span	µm	15	25
	Deviation span within selected partial measuring span 0,10 mm	µm	8	12
	Repeatability Limit	µm	3	3

DIAL GAUGES – ANALOGUE WITH BACK MOUNTED PLUNGER

Mechanical dial gauges with back mounted plungers differentiate by their concept of presenting a display which is perpendicular to the movement of the measuring stem.

Dial Ø 40 mm – Reading 0,01 or 0,002 mm



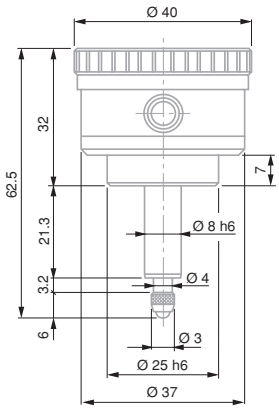
CP352S



CP353



CP355



CP353

EN ISO 463 Factory standard

Rotating dial

Full-metal casing. Mounting shank and plunger in hardened stainless steel

With anti-shock mechanism

Adjustable tolerance markers. Thread M2,5 for measuring insert. Fastening with sleeve Ø 8h6 and 25h6

Measuring insert with Ø 3 mm steel ball tip, already mounted

Inspection report with declaration of conformity

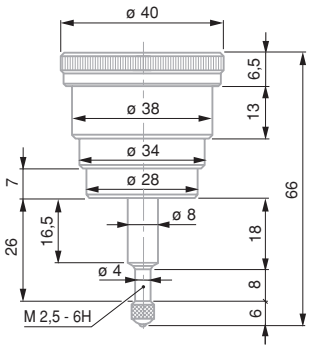
NO		mm	mm	mm	µm	µm	µm	mm		N
CP 353	COMPAC CP353	3	3,2	0,01	14	3	3	0,5	0 ÷ 25 ÷ 50	0,9
CP 355	COMPAC CP355	3	3,2	0,002	14	2	2,5	0,2	0 ÷ 10 ÷ 20	0,9
CP 352S	COMPAC CP352S with limited travel	± 0,4	3,2	0,01	9	3	3	(1)	40 ÷ 0 ÷ 40	0,9

S: Limited range of indication, restricted reading.
The needle makes less than one revolution of the dial, all reading errors due to revolution counter are eliminated.

Dial Ø 40 mm – Reading 0,01 mm



0141760566



0141760566

EN ISO 463 Factory standard

Rotating dial

Full-metal casing. Mounting shank and plunger in hardened stainless steel

Adjustable tolerance markers. Thread M2,5 for measuring insert.

Measuring insert with Ø 3,175 mm steel ball tip, already mounted

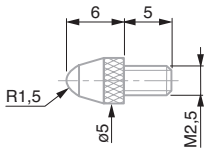
NO		mm	mm	mm	µm	µm	µm	mm		N
0141760566	ROCH	3	3,5	0,01	15	5	15	0,5	0 ÷ 25 ÷ 50	≤ 1,2

With extra reverse numbering in red

INSERTS FOR DIAL GAUGES, AXIAL PROBES, ETC. – EXECUTION WITH M2,5 THREAD

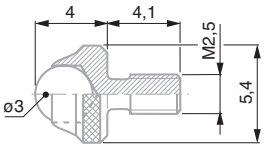
Spherical measuring inserts, standard.

NO	
03510001	Steel
03510002	Carbide
03560001	Sapphire



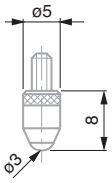
Spherical measuring insert, short

NO	
03560007	Carbide

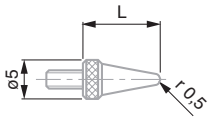


Spherical measuring inserts, long

NO	
03560019	Steel
03560020	Carbide
03560021	Ruby

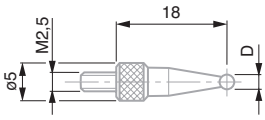


Spherical measuring inserts, R = 0,5 mm.



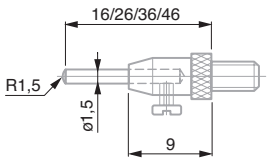
NO		L mm
03560035	Steel	5
03560036	Steel	10
03560037	Steel	15
03560038	Steel	20
03560039	Steel	30
03560040	Steel	40

Spherical measuring inserts



NO		D, mm
03560051	Carbide	1
03560052	Carbide	2
03560053	Carbide	3
03560054	Carbide	4
03560055	Carbide	5
03560056	Carbide	6
03560057	Carbide	7
03560058	Carbide	8

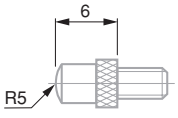
Spherical measuring insert with 4 interchangeable pins, R = 1,5 mm



NO		L, mm
03510201	Steel	16, 26, 36, 46

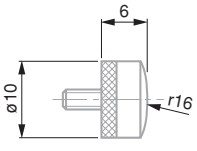
Spherical measuring inserts

NO	
03510101	Steel
03510102	Carbide



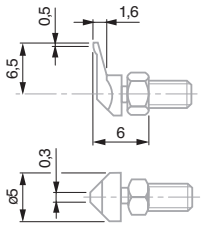
Spherical measuring inserts

NO	
03560017	Steel
03560018	Carbide



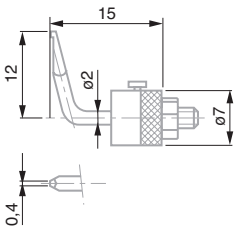
Measuring insert with offset (A)
Pointed measuring face
Lock nut for radial alignment.

NO	
03510401	Steel



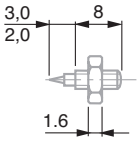
Measuring insert with offset (A)
Pointed measuring face
Lock nut for radial alignment.

NO	
03560063	Steel

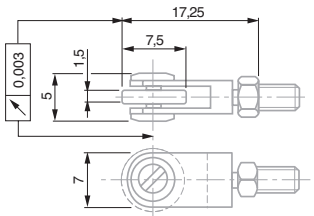


Measuring insert with needle contact point

NO	
03560030	Steel

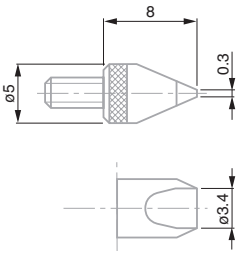


Measuring inserts with ball-bearing rollers
Lock nut for radial alignment



NO	Shape	
03560010	Cylindrical	Steel
03560011	Domed	Steel

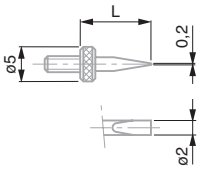
Inserts with a knife blade measuring face
Lock nut for radial alignment



NO	
03560024	Steel
03560025	Carbide

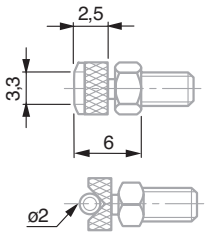
Inserts with a knife blade steel face
Lock nut for radial alignment

NO	L, mm
03560031	5
03560032	10
03560033	15
03560034	20



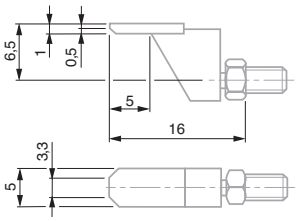
Insert with a cylindrical measuring face
Lock nut for radial alignment

NO	
03510502	Carbide

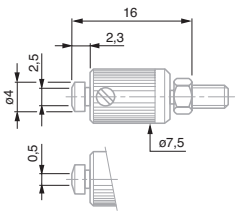


Insert with a narrow, off-centre measuring face
Lock nut for radial alignment

NO	
03510602	Carbide

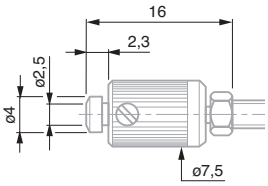


Insert with a narrow measuring face
Parallelism adjustable
Lock nut for radial alignment



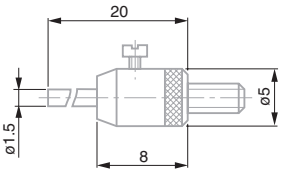
NO	
03510702	Carbide

Insert with a flat measuring face
Parallelism adjustable
Counter-nut for radial alignment



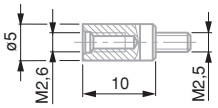
NO	
03510902	Métal dur

Inserts with interchangeable pins
Flat measuring face



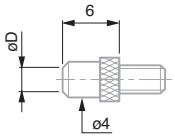
NO	
03560008	Steel
03560009	Carbide

Connectors for measuring inserts



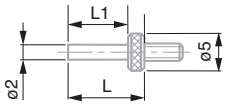
NO	Outside	Inside
03560092	M2,5	M2
03560065	M3	M2,5

Inserts with a flat measuring face.



NO	Ø	
03510801	2,5	Steel
03510802	2,5	Carbide
03560022	3,4	Steel
03560023	3,4	Carbide

Inserts with a flat measuring face, in steel

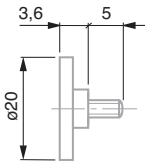


NO	L, mm	L1, mm
03560026	5	2,8
03560027	10	7,8
03560028	15	12,8
03560029	20	17,8

Inserts with flat measuring face

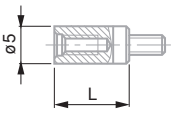


NO	Ø	
03560012	5	Steel
03560013	5	Carbide
03560014	10	Steel
03560015	10	Carbide
03560016	20	Steel



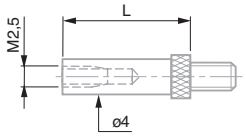
Extensions for measuring inserts

NO	L, mm
03560042	10
03560043	15
03560044	20
03560045	25
03560046	30
03560047	35
03560048	40
03560049	45
03560050	50



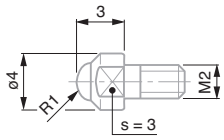
Extensions for measuring inserts.

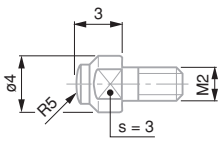
NO	L, mm
03540501	10
03540502	15
03540503	20
03540504	40



– EXECUTIONS WITH A M2 COUPLING THREAD

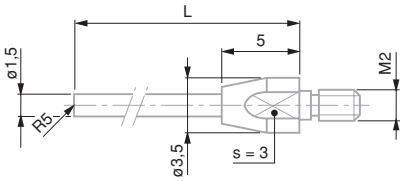
Spherical measuring inserts, M2 thread





NO	mm	
03510204	R 1	Carbide
03510103	R 5	Carbide

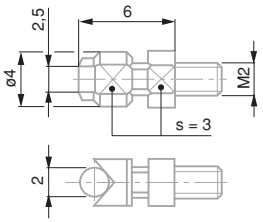
Spherical measuring inserts, R = 5 mm, M2 thread



NO		L, mm
03510202	Carbide	16
03510203	Carbide	26

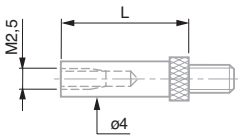
Measuring insert with cylindrical measuring face. Lock nut for radial alignment, M2 thread

NO	
03510503	Carbide



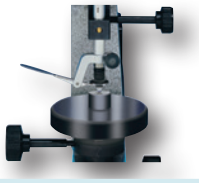
Extensions for measuring inserts, M2

NO	L, mm
03540505	10
03540506	15



ADDITIONAL ACCESSORIES FOR DIAL GAUGES

Device for plunger retraction for mounting on the bottom stem



NO		Consisting of:
03540104		- 03540101: Lever - 03540102: Washer



Retraction lever Bottom mounted lift lever

NO		
01960005	Bottom mounted lift lever	Contains only lifting lever

Device for plunger retraction for mounting on the top stem



NO	mm
03560004	Ø 40
03560005	Ø 58

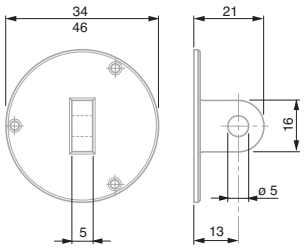


90° angle probe. For the transmission of movements of the measuring plunger. Max. travel up to 10 mm. For dial gauges of 0,01 mm

NO		
03560006	90° angular probe	03560012; Insert with flat measuring face, Ø 5 mm

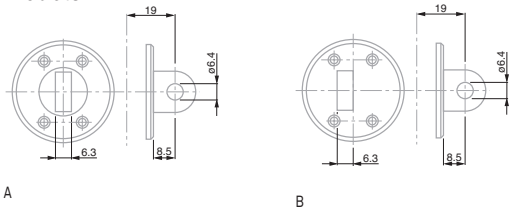
Matt chrome plated except for tinted model numbers 01460010, 01460011

Backs for ROCH and ETALON Dial Gauges



NO	Bezel diameter, mm	Back, mm	
01462004	40	34	Back with central lug
01462005	58, 60, 80	46	Back with central lug

Backs for dial gauges TESA YR – YE / MERCER / COMPAC / DIGICO 200-700 – Ø 40 mm dial models

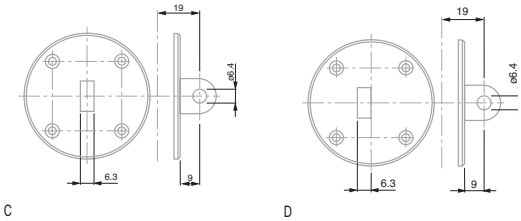


NO	
01460008	A – Back with central lug
01460009	B – Back with offset lug

Dull chrome-plated except for model numbers 01460016, 01460017.

Backs for dial gauges TESA YR – YE / MERCER / COMPAC / DIGICO 200-700 – Ø 58 and 82mm dial models

NO	
01460014	C – Back with central lug
01460015	D – Back with offset lug









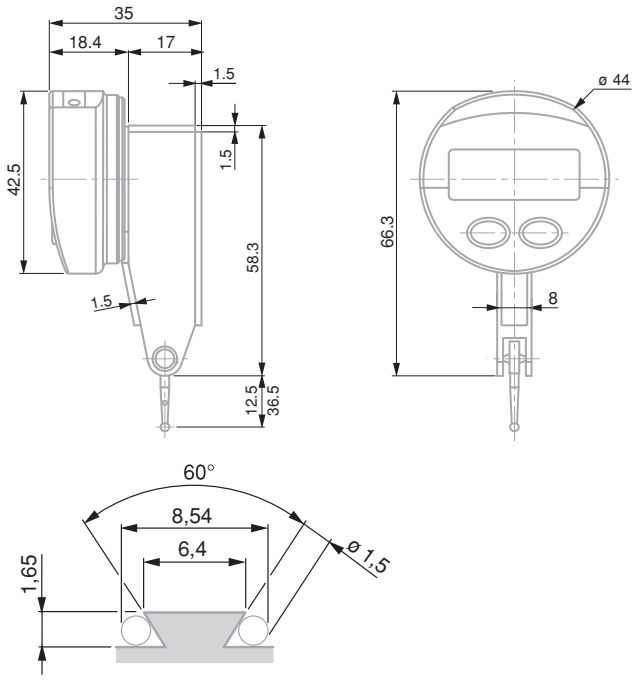
Lever-type Dial Test Indicators

TESA IP65 Electronic Dial Test Indicators

Provides the advantages of a mechanical test indicator with a digital reading.



- Inductive patented measuring system.
- Analogue and digital indication.
- Digital step of 0,01/0,001 mm.
- Selectable scale division: 10, 20, 50 µm/1, 2, 5 µm.
- Cutting oils and liquid coolant resistant (IP65).
- Metric/inch conversion.
- RS232 data output combined with external power supply.
- Displayed measuring modes (NOR/MIN/MAX/MAX-MIN).
- Automatic shut-down.
- Compatible with all TESATAST accessories.



NO					
	mm	mm	in	N (± 15 %)	Stem length, mm
01830001	0,8	0,01/0,001	0.0005/0.00005	0,13	12,5
01830002	0,5	0,01/0,001	0.0005/0.00005	0,07	36,5
OPTIONAL ACCESSORIES:					
01961000	Lithium battery, 3V, CR2032				
04761060	RS 232 cable with external power supply				

Compatible with all TESATAST measuring inserts and accessories

- LCD, 5 digits + unit
- Display digit height 6 mm
- Max. perm. errors: f_e = 10 µm f_{ges} = 13 µm Pre-span = 0,05 mm
- Repeatability: f_w = 1 µm
- Hysteresis : f_u = 3 µm
- L = 12,5 mm; max. 0,05 m/s L = 36,5 mm; max. 0,15 m/s
- Number of measurements per second: 9
- Zero-setting
- RS232
- 3 V lithium battery, type CR2032
- Battery life > 4000 hours
- Operating temperature range: +5°C to + 40°C
- Degree of protection: IP65 (IEC 529)
- EN 61326-1
- 73 g (L = 12,5 mm) 75 g (L = 36,5 mm)
- Supplied in a plastic case with: 1 Insert with a 2 mm dia.(No. 01860202) 1 Wrench (No. 01860307) 1 Mounting rod 8 mm dia. (No. 01840105)

DIN 2270
NF E 11-053

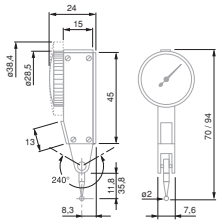
TESATAST DIAL TEST INDICATORS

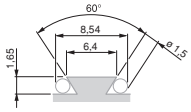
These lever-type dial test indicators are especially intended for use on the shop floor or in the inspection room – Ideally suited for comparative measurements on a surface plate, for instance – Determine form, shape and position deviations as well as axial and runout errors.

- Bidirectional measuring with automatic reversal inside the movement.
- Continuous clockwise pointer rotation providing error-free reading.
- Insensitive to magnetic fields.
- Jewelled movement with 7 rubies.
- Ball-bearing lever system. Measuring insert swivelling through to 240°.
- Very low measuring force.
- Exceptionally robust with full-metal construction.

Standard model

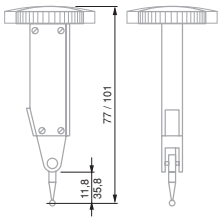
Well proven over thousands of times. The dial face is parallel to the axis of the measuring insert.

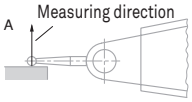




Perpendicular model

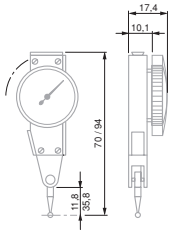
Lever test indicator with dial face mounted at right angle to the axis of the measuring insert.

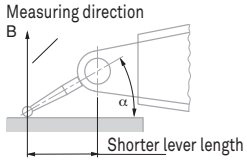




Lateral Model

Dial test indicator with dial face mounted parallel to the axis of the measuring insert but on the flat side of the dial housing.





Note on the use of TESATAST dial test indicators
With the measuring insert lying parallel to the workpiece surface (Fig. A), these indicators give true reading due to the amplification factor to 1:1.
In another measuring position (angle α in Fig. B), the effective lever length changes so that the read value needs to be corrected. With respect to this, also refer to the instruction manual.

Permissible limits of a metrological characteristic (MPE/MPL)

			0,02 mm	0,01 mm	0,001 mm / 0,002 mm
	Deviation span, f_e		27 µm	10 µm	2 µm
	Deviation span within the local measuring span, f_t	0,20 mm	12 µm		
		0,10 mm		5 µm	
		0,02 mm			1 µm
	Total deviation span, f_{ges}		31 µm	13 µm	3,5 µm
	Repeatability limit, f_w		4 µm	3 µm	1 µm
	Max. hysteresis, f_u		4 µm	3 µm	1,5 µm
	Measuring force with insert: Length	12,53 mm		0,15 N	0,15 N
		36,53 mm	0,06 N	0,06 N	

TESATAST Standard Models



NO					
	mm	mm	Ø, mm		Insert, mm
01810005	0,8	0,01	28	0 ÷ 0,4 ÷ 0	12,53
01810006	0,8	0,01	38	0 ÷ 0,4 ÷ 0	12,53
01810007	0,5	0,01	28	0 ÷ 0,25 ÷ 0	36,53
01810008	0,5	0,01	38	0 ÷ 0,25 ÷ 0	36,53
01810009	0,2	0,002	28	0 ÷ 100 ÷ 0	12,53
01810010	0,2	0,002	38	0 ÷ 100 ÷ 0	12,53
S18001695	0,2	0,001	38	0 ÷ 100 ÷ 0	12,53

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Rotating dial

Very low measuring force, see table.

Movement with patented shock proof system

Lever system with friction drive to prevent overload

Accuracy: see table.

Supplied in a plastic case together with:
1 Insert with a 2 mm dia.
1 Wrench (No. 01860307)
1 Mounting rod 8 mm dia. (No. 01840105)

SWISSTAST Standard Models



NO					
	mm	mm	Ø, mm		Insert, mm
01811000	0,8	0,01	28	0 ÷ 0,4 ÷ 0	12,53
01811001	0,2	0,002	38	0 ÷ 100 ÷ 0	12,53

Same technical data as standard models, but equipped with a 2 mm dia. ruby ball tip No. 01860302.

TESATAST Perpendicular Models



NO					
	mm	mm	Ø, mm		Insert, mm
01810204	0,8	0,01	28	0 ÷ 0,4 ÷ 0	12,53
01810205	0,5	0,01	28	0 ÷ 0,25 ÷ 0	36,53
01810304	0,2	0,01	38	0 ÷ 100 ÷ 0	12,53

TESATAST Lateral Models



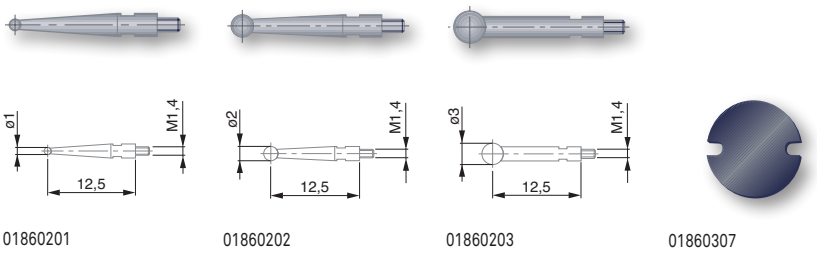
NO	mm	mm	Ø, mm		Insert, mm
01810011	0,8	0,01	28	0 ÷ 0.4 ÷ 0	12,53
01810012	2	0,02	38	0 ÷ 1.0 ÷ 0	36,53
01810013	0,2	0,002	28	0 ÷ 100 ÷ 0	12,53

M1,4 coupling thread

TESATAST Measuring Inserts

NO	Ball tip, mm	Ball tip material	mm
01860201	1	Carbide	12,53
01860202	2	Carbide	12.,53
01860203	3	Carbide	12,53
01860211	1	Carbide	36,53
01860212	2	Carbide	36,53
01860213	3	Carbide	36,53
01860301	1	Ruby	12,53
01860302	2	Ruby	12,53
01860303	3	Ruby	12,53
01860304	1	Ruby	36,53
01860305	2	Ruby	36,53
01860307		Wrench for inserts	

Note:
The original measuring insert mounted on every TESATAST as well as any other insert of the same nominal length but with a different ball tip diameter are fully interchangeable.



01860201 01860202 01860203 01860307

Indicator Sets with Small Support

DIN 2270
NF E 11-053

Technical data: see description for each product

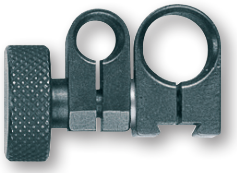
NO	=
01630003	Indicator set with small support
COMPOSITION OF THE SETS:	
01810005	TESATAST standard model
01810010	TESATAST standard model
01860203	Carbide measuring insert
01840104	Mounting rod
01840105	Mounting rod
01860307	Wrench for inserts
01639007	Magnetic support INTERAPID UJ15, dovetail clamp and Ø 8 mm cylindrical clamping



Accessories for TESATAST

Clamp

NO		mm
01860401	Dovetail clamp with tightening screw	Ø 5,6 / Ø 9,5



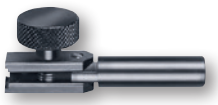
01860401

Mounting Rods

NO		mm
01840404	Short swivel holder	Ø 8 x 25
01840405	Long swivel holder	Ø 8 x 90
01840406	Angular swivel holder	Ø 8 x 25 (Ø 8 for clamping bore)
01840501	Centering holder	Ø 8 x 25 (Ø 4 for clamping point)
01840407	Long sw. holder, fine adjust	Ø 8 x 125



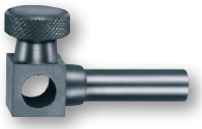
01840501



01840404



01840405



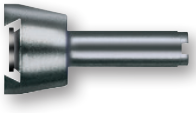
01840406



01840407

Fixing Shank

NO		mm
01840104	Mounting rod	Ø 4
01840105	Mounting rod	Ø 8
01840202	Cylindrical fixing shank	Ø 8 x 80 (Ø 5,6 for the tenon)
01860008	Mounting rod	Ø 6



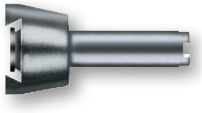
01840104



01840105



01840202



01860008

INTERAPID 312 LEVER DIAL TEST INDICATORS

INTERAPID 312 Dial Test Indicators very large measuring span – Ideal for inspecting all significant size variations, e.g. on the surface plate – Measures position, form and shape errors.



- Safe reading thanks to secondary pointer totalling the number of revolutions made by the main pointer.
- Bidirectional measuring with automatic reversal within the movement.
- Pointer rotation direction is always constant due to automatic reversal effect.
- Jewelled movement with rubies.
- Ball-bearing lever system. Measuring insert swivelling through 210°.
- Particularly robust due to full-metal construction.
- Monobloc housing with mounting through dovetail clamping and a Ø 4 mm swivelling shank.

Standard Model

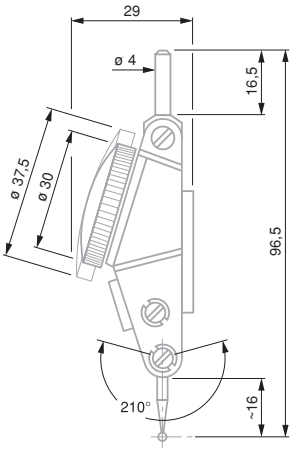
Time-tested dial test indicator. The dial face is mounted parallel to the axis of the insert.

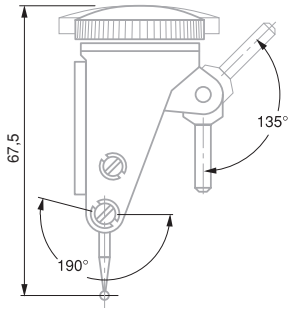
Perpendicular model

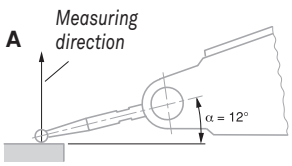
Dial test indicator with dial face mounted at right angle to the axis of the insert.

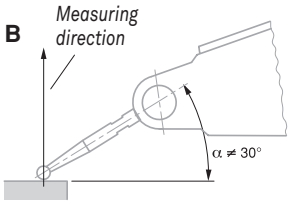
Stylus insert with angular position of 12°

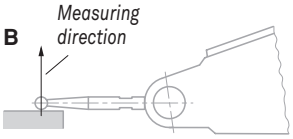
All models INTERAPID 312 are designed to give a true reading when the angle between the stylus and the workpiece surface is 12° (Fig. A).
In any other measuring position, including parallel position of the stylus against the workpiece surface, measured readings have to be corrected accordingly (Fig. B). Please consult the instruction manual on this subject.











Permissible limits of a metrological characteristic (MPE/MPL)

	0,01 mm Pointer revolution		0,002 mm Pointer revolution	
	1	2	1	2
Deviation range over partial measuring range, f_e	10 µm	20 µm	4 µm	8 µm
Total deviation range, f_{ges}	13 µm	23 µm	6 µm	10 µm
Repeatability limit, f_w	3 µm		1 µm	
Max. hysteresis, f_u	3 µm		2 µm	
Measuring force	0,12 N		0,25 N	

INTERAPID 312 Standard Models



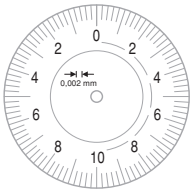
NO					
	mm	mm	Ø, mm		Insert, mm
074111366	1,6	0,01	37,5	0 ÷ 40 ÷ 0	16,5
074111367	1,6	0,01	30	0 ÷ 40 ÷ 0	16,5
074111368	0,4	0,002	37,5	0 ÷ 10 ÷ 0	15,2
074111369	0.4	0,002	30	0 ÷ 10 ÷ 0	15,2



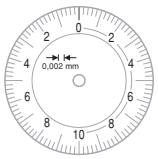
074111366



074111367



074111368



074111369

Rotating dial

Very low measuring force: (see table for tolerance limits)

Lever system with friction drive to prevent overload

Accuracy: see table for tolerance limits

Supplied in a plastic case with:
1 with a Ø 2 mm insert in hardened steel,
1 stylus key
No. 01860307

INTERAPID 312 Perpendicular Models



NO					
	mm	mm	Ø, mm		Insert, mm
074111375	1,6	0,01	37,5	0 ÷ 40 ÷ 0	16,5
074111376	1,6	0,01	30	0 ÷ 40 ÷ 0	16,5

Technical data: see description for each product

Dial Test Indicator Sets, Complete with Accessories – INTERAPID 312 Standard Models



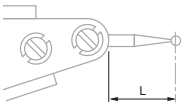
Each full set consists of:

NO	
	INTERAPID 312 lever test indicators as listed in the table below:
074106331	Rectangular mounting attachment
074108942	Reducing sleeve, metric
074106026	Swivel holder, metric
074111474	Case for measuring inserts
01860307	Wrench for measuring inserts

NO	074111366	074111367	074111368	074111369	074106331	074108942	074106026	074111474	01860307
074111502	●				●	●	●	●	●
074111503		●			●	●	●	●	●
074111504			●		●	●	●	●	●
074111505				●	●	●	●	●	●

M1,7 coupling thread

Measuring Inserts



L = length up to ball axis

No		mm	Ball tip, mm	Ball tip material	L mm
074107893		0,01	2	Steel	16,5
074107895		0,01	1,5	Steel	16,5
074107897		0,01	0,8	Steel	16,5
074110481		0,002	2	Steel	15,2
074110492		0,002	1,5	Steel	15,2
074110493		0,002	0,8	Steel	15,2
074105993		0,01	2	Carbide	16,5
074105994		0,01	1,5	Carbide	16,5
074105995		0,01	0,8	Carbide	16,5
074106358	*	0,01	2	Carbide	36,6
074106360	*	0,01	0,8	Carbide	36,6
074110482		0,002	2	Carbide	15,2
074110491		0,002	1,5	Carbide	15,2
074110507		0,002	0,8	Carbide	15,2

* The length of the insert used changes the amplification factor of the lever system. The values read off must therefore be doubled.

Note:
The original measuring insert mounted on every INTERAPID 312 as well as any other insert of the same nominal length but with a different ball tip diameter are fully interchangeable.

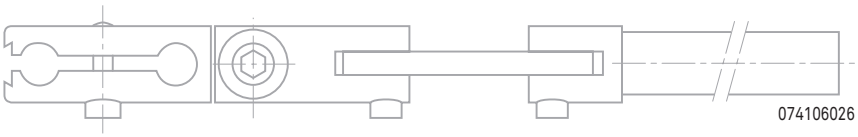
Accessories for INTERAPID 312

Clamping Attachment

No		mm
074108603	Double attachment with clamping point and dovetail	Ø 4

Holders

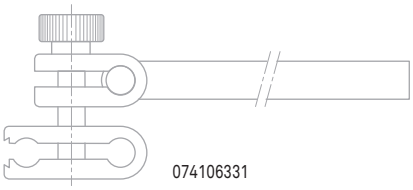
No		mm
074106026	Swivel holder with clamping points and dovetail	Ø 8 x 133 (Ø 4 for clamping point)



074106026

Clamping Attachment

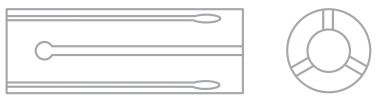
No	
074106331	Rectangular clamping attachment complete



074106331

Reducing Sleeve

No		mm
074108942	Reducing sleeve	Ø 8 / Ø 4



074108942

COMPAC DIAL TEST INDICATORS

Essential for the workshop, but also in the inspection room or measuring laboratory – Ideal for comparative measurement on a surface plate – Detect form and position errors – Measure axial and radial runouts, especially.

Technical Features

- Long measuring travel, up to 3 mm.
- Bidirectional measuring, without reversing lever.
- Same rotation direction of pointers in the two measuring directions (clockwise pointer direction).
- Swivelling probe through 180°.
- Main pivot on self-aligning angular bearings, dimensioned oversize.
- Dovetail mounting machined in the indicator housing.
- Dull chrome-plated bezel and housing.
- Rotating dial.
- Insensitive to magnetic fields generated in mechanical workshops.



Note for use of COMPAC dial test indicators
With the measuring insert lying parallel to the workpiece surface (Fig. A), these dial test indicators give true reading due to the amplification factor of 1:1. In any other measuring position (angle α in Fig. B), the effective lever length changes. The values indicated need be corrected. In this connection, please consult the instruction manual.

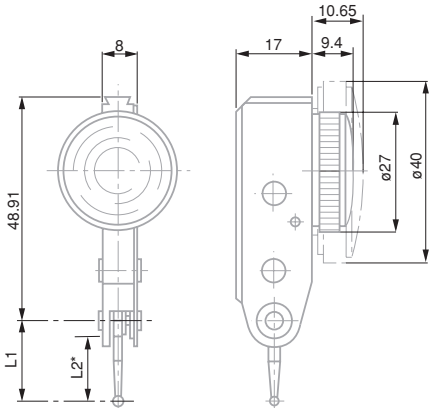






- DIN 2270 and factory standard
- Rotating dial
- Contact points with tungsten carbide ball tips
- Friction lever system to prevent overload
- Supplied in a plastic case, including:
  1 contact point, 2 mm dia.
  1 rigid stem 8 mm dia.,L = 15 mm, No. 01840107
  1 rigid stem 4 mm dia., L = 15 mm, No. 01840109
  (except for series 220).
- Inspection report with a declaration of conformity

COMPAC Series 210 – Standard Models, Metric



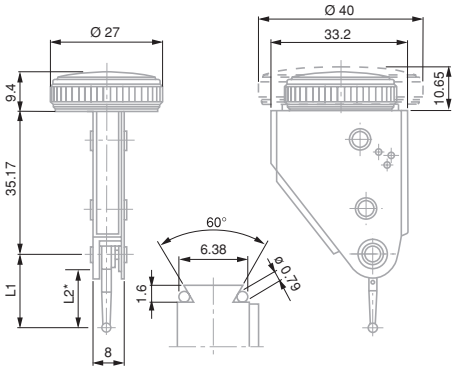


L2; see table of inserts for COMPAC lever-type test indicators

NO	Total travel, mm	mm	µm	µm	µm	Travel/ revolution, mm	Ø, mm		N	Insert L1, mm
213	1,5	0,01	13	3	3	0,5	27	0 ÷ 25 ÷ 50	≤ 0,35	18
213G	1,5	0,01	13	3	3	0,5	40	0 ÷ 25 ÷ 50	≤ 0,35	18
212L	3	0,01	26	3	6	1	27	0 ÷ 50 ÷100	≤ 0,20	36
212GL	3	0,01	26	3	6	1	40	0 ÷ 50 ÷ 100	≤ 0,20	36
215	0,6	0,002	13	1,5	2,5	0,1	27	0 ÷ 5 ÷ 10	≤ 0,30	18
215G	0,6	0,002	13	1,5	2,5	0,1	40	0 ÷ 5 ÷ 10	≤ 0,30	18
215GL	1,2	0,002	26	1,5	5	0,2	40	0 ÷ 10 ÷ 20	≤ 0,20	36
216G	0,6	0,001	13	1,5	2,5	0,1	40	0 ÷ 5 ÷ 10	≤ 0,30	18

COMPAC Series 220 – Perpendicular Models, Metric



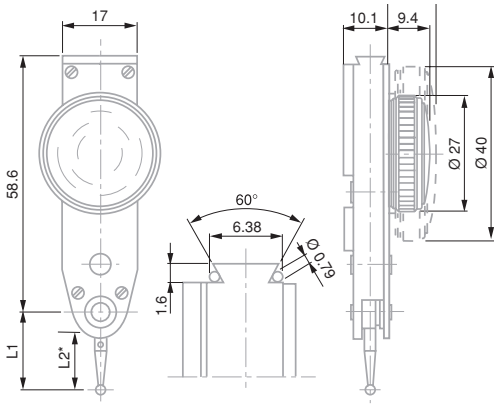


*L2 see table of inserts for COMPAC lever-type test indicators

NO	Total travel, mm	mm	µm	µm	µm	Travel/ revolution, mm	Ø, mm		N	Insert L1, mm
223	1,5	0,01	13	3	3	0,5	27	0 ÷ 25 ÷ 50	≤ 0,35	18
223G	1,5	0,01	13	3	3	0,5	40	0 ÷ 25 ÷ 50	≤ 0,35	18
222L	3	0,01	26	3	6	1	27	0 ÷ 50 ÷ 100	≤ 0,20	36
222GL	3	0,01	26	3	6	1	40	0 ÷ 50 ÷ 100	≤ 0,20	36
225	0,6	0,002	13	1,5	2,5	0,1	27	0 ÷ 5 ÷ 10	≤ 0,30	18
225G	0,6	0,002	13	1,5	2,5	0,1	40	0 ÷ 5 ÷ 10	≤ 0,30	18

COMPAC 230 Parallel Models



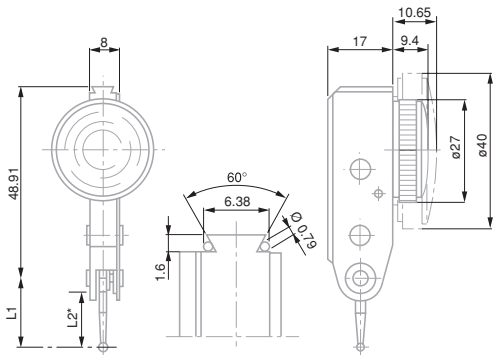


* L1 see table of inserts for COMPAC lever-type indicators

NO	Total travel, mm	mm	µm	µm	µm	Travel/ revolution, mm	Ø, mm		N	Insert L1, mm
233	1,5	0,01	13	3	3	0,5	27	0 ÷ 25 ÷ 50	≤ 0,35	18
233G	1,5	0,01	13	3	3	0,5	40	0 ÷ 25 ÷ 50	≤ 0,35	18
232L	3	0,01	26	3	6	1	27	0 ÷ 50 ÷ 100	≤ 0,20	36
232GL	3	0,01	26	3	6	1	40	0 ÷ 50 ÷100	≤ 0,20	36
235G	0,6	0,002	13	1,5	2,5	0,1	40	0 ÷ 5 ÷ 10	≤ 0,30	18

COMPAC 240 Reduced Range Models





* L2 see table of inserts for COMPAC lever-type indicators

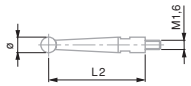
NO	Total travel mm	mm	µm	µm	µm	Ø, mm		N	Insert L1, mm
242	0,8	0,01	13	3	3	27	0 ÷ 40 ÷ 0	≤ 0,25	18
242G	0,8	0,01	13	3	3	40	0 ÷ 40 ÷ 0	≤ 0,25	18
243L	0,5	0,01	13	3	3,5	27	0 ÷ 25 ÷ 0	≤ 0,10	45
243GL	0,5	0,01	13	3	3,5	40	0 ÷ 25 ÷ 0	≤ 0,10	45
245	0,2	0,002	4	1,5	2	27	0 ÷ 10 ÷ 0	≤ 0,25	18
245G	0,2	0,002	4	1,5	2	40	0 ÷ 10 ÷ 0	≤ 0,25	18

- DIN 2270 and factory standard
- Rotating dial
- Contact points with tungsten carbide ball tips
- Friction lever system to prevent overload
- Supplied in a plastic storage case,in-cluding:
  1 contact point, 2 mm dia.
  1 rigid stem 8 mm dia. L = 15 mm, No. 01840107,
  1 rigid stem 4 mm dia., L = 15 mm, No. 01840109
- Inspection report with a declaration of conformity

M1,6 coupling thread

The original inserts mounted on all indicators are fully interchangeble with inserts with different diameter tips as long as the insert has the same nominal length.

Measuring Inserts for COMPAC Models



L1 = Axial length from ball to pivot



01866014

No	Ball tip, mm	Ball tip material	L1, mm	L2, mm
01866014	0,8	Carbide	18	14,26
01866003	2	Carbide	18	14,26
01866021	3	Carbide	18	14,26
01866016	0,8	Carbide	36	32,26
01866004	2	Carbide	36	32,26
01866023	3	Carbide	36	32,26
01866015	0,8	Carbide	45	41,26
01866006	2	Carbide	45	41,26
01866022	3	Carbide	45	41,26
01866026	2	Ruby	18	14,26
01866027	2	Ruby	36	32,26

Accessories for COMPAC

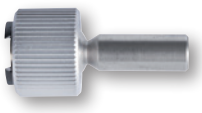
Swivel Clamps



SPT

No	Stem	Clamping length
SPT	8 mm	25 mm
SPTA	1/4 in	1 in

Mounting Rods with Dovetail Grip

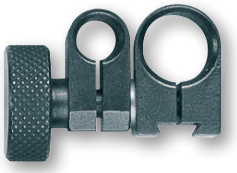


01850106

No		
01850106	Fixing shank swivelling through +/-30°	1/4 in
01850107	Rigid fixing shank	1/4 in
01840106	Fixing shank swivelling through +/-30°	8 mm
01840107	Rigid fixing shank Ø8mm	8 mm
01840108	Fixing shank swivelling through +/-30°	4 mm
01840109	Rigid fixing shank Ø4mm	4 mm

Clamp

NO		mm
01860401	Dovetail clamp with tightening screw	Ø 5,6 / Ø 9,5



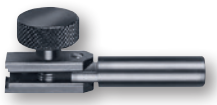
01860401

Mounting Rods

NO		mm
01840404	Short swivel holder	Ø 8 x 25
01840405	Long swivel holder	Ø 8 x 90
01840406	Angular swivel holder	Ø 8 x 25 (Ø 8 for clamping bore)
01840501	Centering holder	Ø 8 x 25 (Ø 4 for clamping point)
01840407	Long sw. holder, fine adjust	Ø 8 x 125



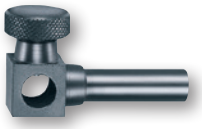
01840501



01840404



01840405



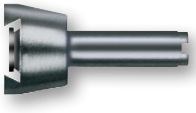
01840406



01840407

Fixing Shank

NO		mm
01840104	Mounting rod	Ø 4
01840105	Mounting rod with dovetail clamp	Ø 8
01840202	Cylindrical fixing shank	Ø 8 x 80 (Ø 5,6 for the tenon)
01860008	Mounting rod	Ø 6



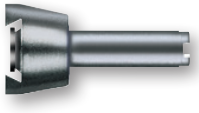
01840104



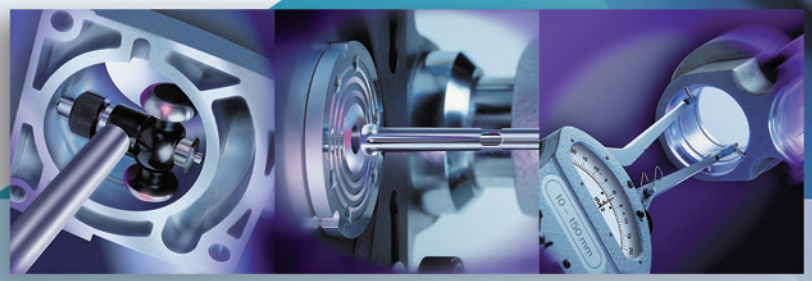
01840105



01840202



01860008



Comparative Measurement

TESA TPS - Motorised setting benches

The TPS are designed for setting hand-held measuring instruments and replace a complete set of ring gauges.

The setting bench is typically used with comparative measuring instruments such as dial guages, lever-type dial test indicators or 2-point bore gauges.

TPS is very simple to use: enter the value and the mobile slide will automatically position itself at this value.

It can be used for checking internal as well as external dimensions of up to 1000 mm, according to the model.

Special adapters help to position the instrument, so that is very easy and quick to use and human errors can be avoided.

For versions with dimensions over 1000 mm, please contact TESA.

- 0,001 mm
- Linear 1,5 + L (mm) / 300 µm
- 1 µm
- 100/240 AC – 1,5 A 50/60 Hz
- Inspection report
- RS232
- Holding force 240 N



TESA TPS 500 + 02160027 + 02160024 (+ DIGICO 705)

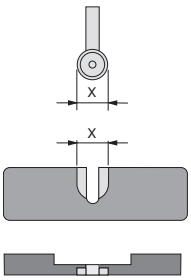
NO		Internal, mm	External, mm	mm	Kg
02130001	TESA TPS 300	0,1 ÷ 300	40 ÷ 340	610 x 300 x 270	75
02130002	TESA TPS 500	0,1 ÷ 500	40 ÷ 540	820 x 300 x 300	90
02130003	TESA TPS 1000	0,1 ÷ 1000	40 ÷ 1040	1330 x 340 x 340	240
CONSISTING OF:					
02160038	Power suppy 80 ÷ 240 V, 50 ÷ 60 Hz				
02160027	Mobile stop adapter				

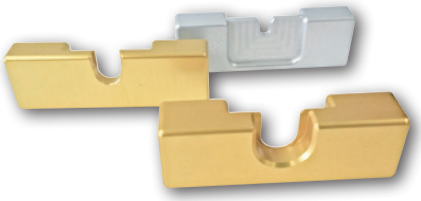
The maximum permissible errors indicated for a metrological characteristic (MPE) have been obtained at a temperature of 20° ± 0,5°C and relative humidity of 50 ± 5 %.

Accessories for Bore Gauges

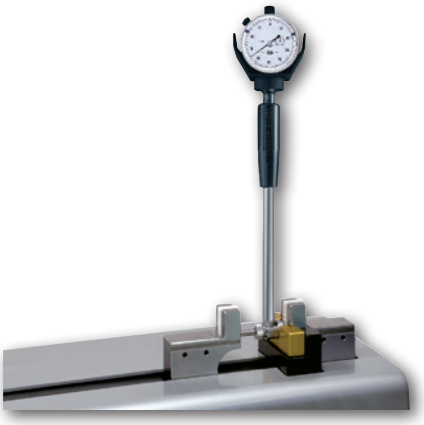
Accessories for TESA VERIBOR bore gauges with round foot are available for different application ranges of up to 50 mm.

They offer a perfect setting by blocking the X and Z axis' rotating movements to let only the Y axis moving to find the min. point.





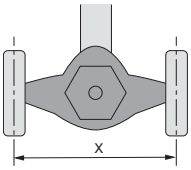
No	mm	X, mm
02160020	4,5 ÷ 6	Ø 4,5
02160021	6 ÷ 12,5	Ø 5,8
S21050003	12 ÷ 25	Ø 9,5
02160023	25 ÷ 50	Ø 17,5



02160021 + TESA VERIBOR

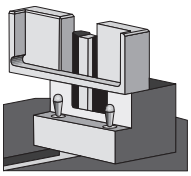
Accessories for Bore Gauge

Accessories for TESA VERIBOR bore gauges with rectangular foot are available for different application ranges from 50 mm up to 550 mm.





02160027



02160024

No	mm	X, mm
02160024	50 ÷ 150	30 ÷ 55
02160025	150 ÷ 300	55 ÷ 90
02160026	240 ÷ 550	90 ÷ 125
02160043		120 ÷ 170
02160044		170 ÷ 220

Each TESA TPS bench is delivered with an adapter No. 02160027



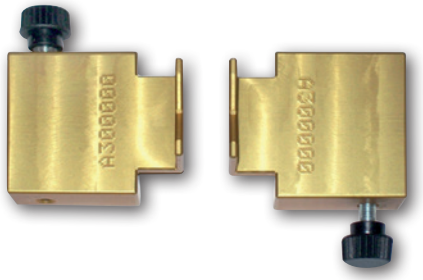
02160027 + 02160024 + TESA VERIBOR

Accessory for External Micrometers

Set of accessories that allow horizontal alignment of the 2 measuring faces of the external micrometer.

Application range up to 150 mm = 1 piece required

Application range from 150 mm = 2 pieces required



02160029

NO		mm
02160029		40 ÷ 300 / 500 / 1000

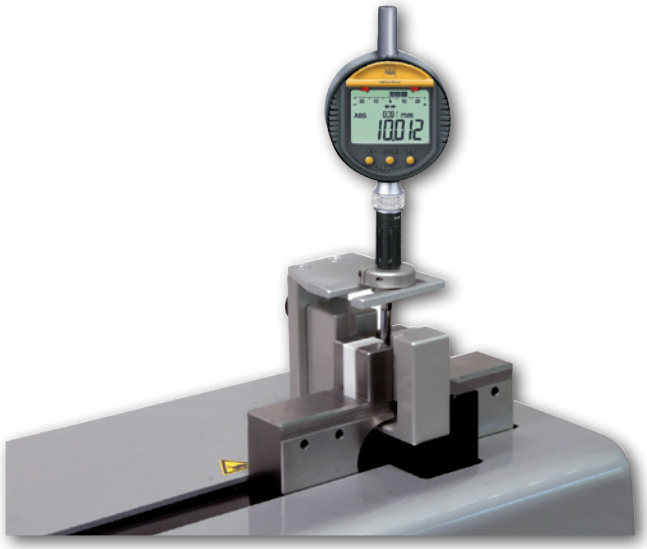
Delivered individually



02160029 + TESA MICROMASTER

Accessory for TESA YA Bore Gauges

TESA YA bore gauges accessory is an assembly of few parts that accept all measuring ranges and make the min. point much easier to find.



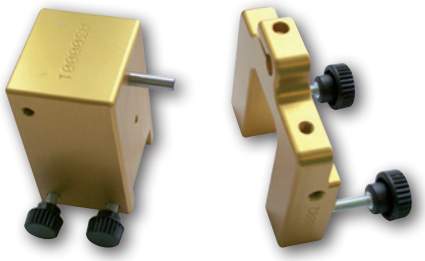
NO		mm
02160028		6 ÷ 12,5

Delivered with 3 adapter rings for Ø 8, 10 et 14 mm

02160028 + TESA DIGICO

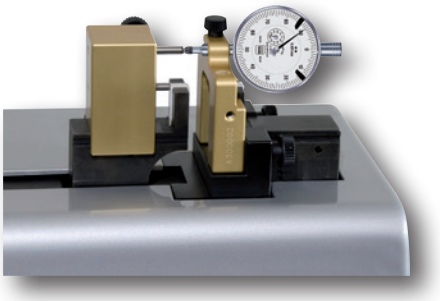
Accessories for Dial Gauges

A composition of 2 parts for fixing dial gauges on the fixed part of the bench.



02160035

NO	
	mm
02160035	10 ÷ 150



Accessory for Internal Arm Comparator

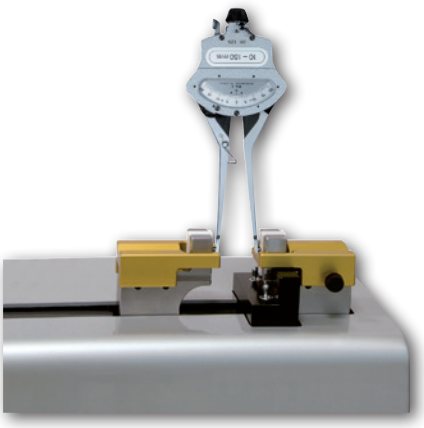
Set of accessories for horizontal alignment of the 2 measuring points, 2 items required.



02160030

NO	
	mm
02160030	10 ÷ 150

Delivered individually



02160030 + TESA IRA 2

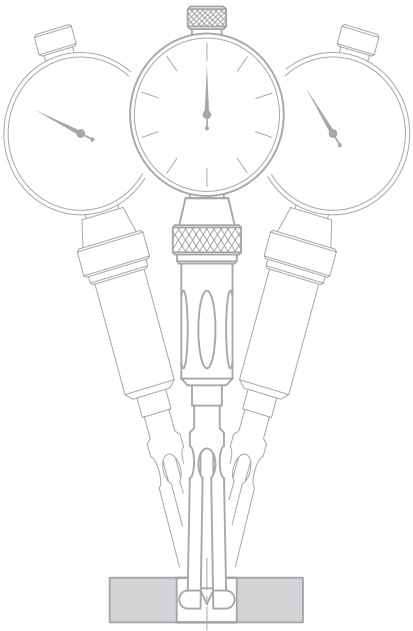
TESA YA COMPLETE INSTRUMENT SETS

Specially designed for small bores from 0,47 up to 12,20 mm - Checking of dimension and bore form errors through 2-point measuring - Offers an excellent repeatability. The YA bore gauges consist of an interchangeable measuring head with a built-in needle and handle with a 8 mm diameter fixing bore for a dial gauge or any other type of sensor

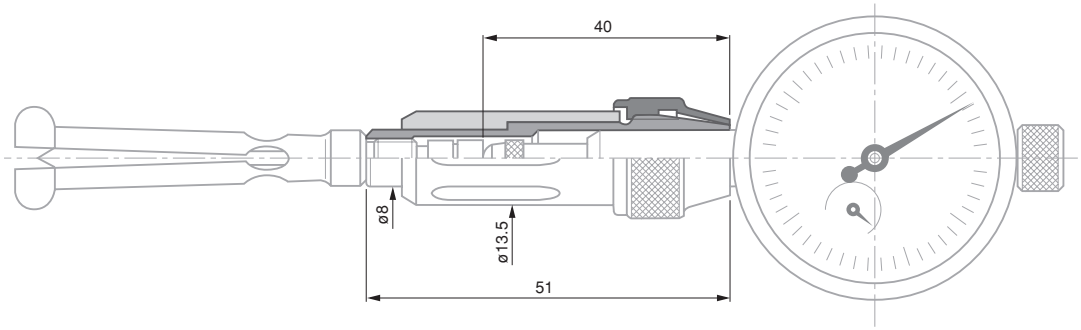
- Measuring heads with spherical faces for through bores.
- Measuring heads for particularly deep bores.

Can be supplied on request:

- Measuring heads with carbide measuring faces.
- Measuring heads for special applications.
- Measuring heads for blind bores and particularly deep bores with other application ranges.
- Carbide measuring needles.
- Depth extensions 125, 250, 500, 750 and 1000 mm.







TESA TECHNOLOGY

COMPLETE INSTRUMENT SETS FOR MEASURING THROUGH BORES

1 µm

Reliability of engraved dimension: ± 2s = 1 µm

Measuring head in hardened steel and carbide, ≈ 1000 HV 25 Measuring needles in hardened steel, ≈ 800 HV 25 Setting rings: with synthetic sapphire for nominal Ø ≤ 1,5 mm and hardened steel for > 1,5 mm, ≈ 780 HV 25

Holder: Mounting of instruments with stem Ø 8h6 mm

Complete set includes:
1 handle No. 01540201.
Measuring heads, needles and setting rings as shown in the table below.
1 TESA YR 01410212 dial gauge (reading to 0,01 mm, Ø 40 mm dial)
1 Extension for for inserts, 10 mm No. 03540501.



NO	mm
01510000	0,47 ÷ 0,97
01510100	0,95 ÷ 2,45
01510200	2,30 ÷ 6,20
01510300	6,00 ÷ 12,20

	NO Measuring heads	mm	Measuring depth max. mm	Meauring depth min, mm	NO Needles	NO Setting rings	Ø mm
COMPOSITION OF THE SETS:							
01510000	01540401	0,47 ÷ 0,53	1,5	0,25	01540001	01540601	0,50
	01540402	0,52 ÷ 0,58	1,8	0,27	01540001	01540602	0,55
	01540403	0,57 ÷ 0,67	2,0	0,29	01540002	01540603	0,60
	01540404	0,65 ÷ 0,77	2,5	0,31	01540002	01540604	0,70
	01540405	0,75 ÷ 0,87	2,8	0,33	01540002	01540605	0,80
	01540406	0,85 ÷ 0,97	3,0	0,35	01540002	01540606	0,90
01510100	01540407	0,95 ÷ 1,15	11	0,6	01540003	01540607	1,00
	01540408	1,07 ÷ 1,25	11	0,6	01540003	01540608	1,10
	01540409	1,17 ÷ 1,35	11	0,6	01540003	01540609	1,20
	01540410	1,27 ÷ 1,45	11	0,6	01540003	01540610	1,30
	01540411	1,37 ÷ 1,55	11	0,6	01540003	01540611	1,40
	01540412	1,50 ÷ 1,90	17	0,9	01540004	01540612	1,50
	01540413	1,70 ÷ 2,15	17	0,9	01540004	01540613	1,75
	01540414	2,05 ÷ 2,45	17	0,9	01540004	01540614	2,00
						01540615	2,25
01510200	01540415	2,30 ÷ 2,75	22	1,2	01540005	01540616	2,50
	01540416	2,65 ÷ 3,20	22	1,2	01540005	01540617	3,00
	01540417	3,05 ÷ 3,50	22	1,2	01540005	01540618	3,25
	01540418	3,35 ÷ 3,85	22	1,2	01540005	01540619	3,50
	01540419	3,80 ÷ 4,30	22	1,2	01540005	01540620	4,00
	01540420	4,20 ÷ 5,00	40	2,0	01540006	01540621	4,50
	01540421	4,70 ÷ 5,50	40	2,0	01540006	01540622	5,00
	01540422	5,30 ÷ 6,20	40	2,0	01540006	01540623	5,75
01510300	01540423	6,00 ÷ 6,80	40	2,0	01540006	01540624	6,50
	01540424	6,60 ÷ 7,50	40	2,0	01540006	01540625	7,00
	01540425	7,30 ÷ 8,15	40	2,0	01540006	01540626	7,75
	01540426	8,00 ÷ 8,80	40	2,0	01540006	01540627	8,50
	01540427	8,50 ÷ 9,40	50	2,0	01540006	01540628	9,00
	01540428	9,15 ÷ 10,00	50	2,0	01540006	01540629	9,50
	01540429	9,60 ÷ 10,80	50	3,3	01540007	01540630	10,00
	01540430	10,65 ÷ 12,20	50	3,3	01540007	01540631	11,50

Special Executions

Available upon request :

- Full instrument sets for measuring blind bores and short centering shoulders.
- Measuring heads with tungsten carbide tipped measuring faces.
- Measuring heads for special applications.
- Measuring heads for through bores, particularly deeper ones covering other application ranges.
- Tungsten carbide measuring needles.
- 125, 250, 500, 750 and 1000 mm depth extensions.

Optional Accessories for TESA YA Bore Gauges

Measuring stand for stationary use.



01639009	INTERAPID UA 30 Support
MUST BE EQUIPPED WITH:	
01610201	UK 25 sliding arm. Used with TESA YA for stationary bore measurement on UA30 support.
01640000	UAZ 10 depth stop plate for UA 30

TESA VERIBOR

Proven design and reliability never questioned over decades –Instruments for 2-point measurements for bores from 4,5 up to 550 mm – Detects form errors – Gauge body with a 8 mm diameter clamping bore for a dial gauge, precision indicator or any other sensor.

- Excellent repeatability due to the circular element fixed on the instrument ensuring practically no play.
- Gauge body made of invar steel to neutralise the influence of the operator's hand warmth on the measuring result.
- Centring shoe for correct alignment of the instrument in the bore.
- Tungsten carbide ball tips for high resistance to wear.

4 µm

2 µm

Measuring bolts and anvils in hardened steel, hardness 60 ± 2 and 63 ± 3 HRC, respectively

Mounting for sensor with stem Ø 8h6

Set including 1 single TESA VERIBOR Light. 1 set of interchangeable fixed inserts covering the entire application range

TESA VERIBOR Light

Instrument with 2 contact points for comparative measurement of bores and detection of form errors – Automatic self-centering in the bore – Can be used with a dial gauge, a precision indicator or a probe with Ø 8h6 clamping stem.





NO		Measuring bolt travel, mm	mm	Measuring depth, mm
05710090	TESA VERIBOR light	1,30	18 ÷ 35	176
05710091	TESA VERIBOR light	1,40	35 ÷ 60	178
05710092	TESA VERIBOR light	1,40	50 ÷ 150	178
05710093	TESA VERIBOR light	1,30 / 1,40	18 ÷ 150	176 / 178

Sets delivered without dial gauge

TESA VERIBOR



Only VERIBOR without dial gauge: 2 µm

Only VERIBOR without dial gauge: ± 2s = 0,5 µm

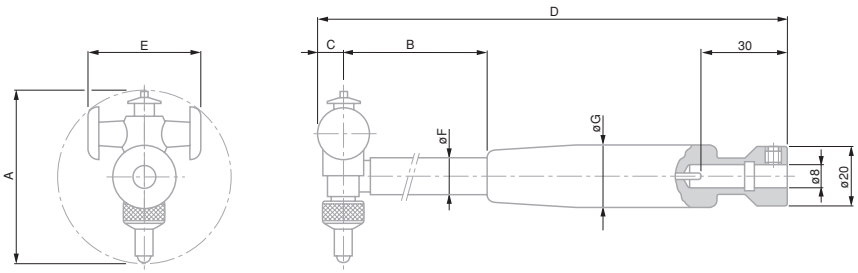
Measuring bolts and anvils fitted with carbide ball tips

Mounting for sensor with stem Ø 8 h6 mm

Set including 1 single TESA VERIBOR. 1 set of interchangeable fixed inserts covering the whole application range.

NO	mm
05710012	4,5 ÷ 6
05710013	6 ÷ 12,5
05710014	12 ÷ 25
05710015	25 ÷ 50
05710016	50 ÷ 150
05710018	50 ÷ 300
05710017	240 ÷ 550

Sets supplied without dial gauges, electronic probes or indicators



A mm	mm	B mm	C mm	D mm	E mm	F mm	G mm
4,5 ÷ 6	0,35	74	2	138	3,3	3,8	16
6 ÷ 12,5	0,5	93	2,6	156	4,3	4,9	16
12÷25	0,9	106	4,5	194	7,8	7,9	19
25÷50	1,3	140	6	228	16	8	19
50÷150	1,4	173	10	279	36	12	23
50÷300	1,4	173	10	279	36 / 66	12	23
240÷550	1,6	227	14	347	112	18	28

Special Versions

Available on request :

- TESA VERIBOR for blind bores and centring shoulders.
- TESA VERIBOR elbow-shaped for hard-to-reach bores.
- Handtools for measuring the distance between two plan-parallel surfaces.
- Handtools for inspecting gear pitch diameters.

ACCESSORIES FOR TESA VERIBOR

Set of Extensions

For extending the application range to Ø 300 mm for VERIBOR No. 05710016.

No		Consisting of
05740001	Set of extensions	– 1 Centring shoe – 3 Extensions 50 mm



Depth Extensions

To be mounted on the body of VERIBOR Ø ≥ 25 ≤ 550 mm for large measuring depths (dimension B in the technical drawing of the VERIBOR).

No		mm
05760029	Extension	1000
05760027	Extension	500

Dial Gauge Protection Guard

Protects the dial gauge against direct shocks and prevents the dial from being inadvertently rotated.

No		mm
05760013	Protection guard	Ø 58



ARM GAUGES

Very practical comparative measuring instrument – Measures at 2 or 3 points depending on the accessory used – Ideal for blind or through bores – also suited for measuring grooves, flutes as well as the internal measurement of parts with parallel faces.

± 0,20 mm or ± 0.008 in

10 ÷ 150 mm 0.375 ÷ 6 in

0,01 mm or 0.0005 in

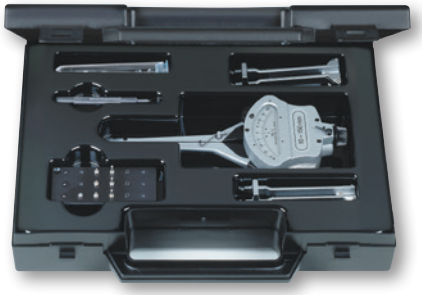
Measuring inserts in hardened steel or tungsten carbide, see opposite table

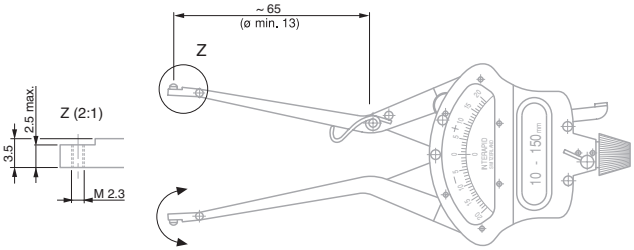
3,5 N

Measuring arm clearance travel: 10 mm

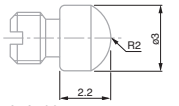
IRA 2 Comparative Gauge

- Large application range from 10 to 150 mm
- Easy to handle thanks to its light weight and ergonomic design
- Built-in indicator with 0,01 mm reading and fine setting
- Centering device for 2-point measurement

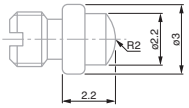




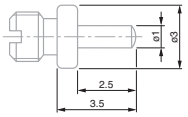
NO		
079105704	INTERAPID IRA 2	mm
079111401	INTERAPID IRA 2, carbide	mm
DELIVERED WITH THE FOLLOWING ACCESSORIES:		
079105667	3 inserts, hardened steel (order number for 1 unit, with 079105704)	
079105756	3 inserts, carbide (order number for 1 unit, with 079111401)	
079105668	3 short inserts, hardened steel (order number for 1 unit)	
079105669	3 long inserts in hardened steel (order number for 1 unit)	
079112126	2 inserts, adjustable for internal dia. >6mm	
079110110	Large insert holder for 3-point measurement	
079108502	IRA centering arm, Ø 15-30 mm	
079110111	Small insert holder for 3-point measurement	
079105694	Special screwdriver for IRA set	



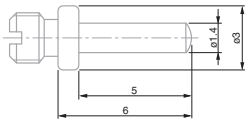
079105667



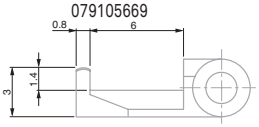
079105756



079105668



079105669



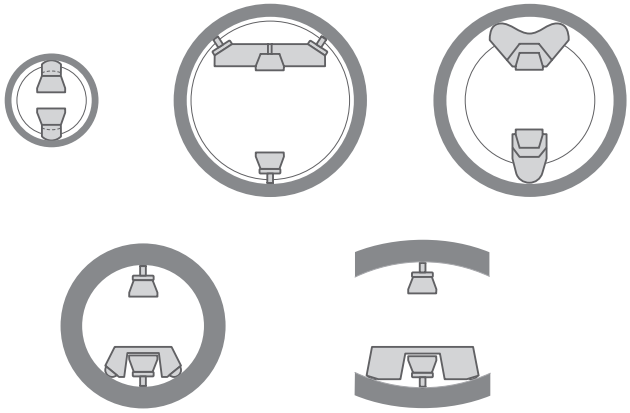
079112126

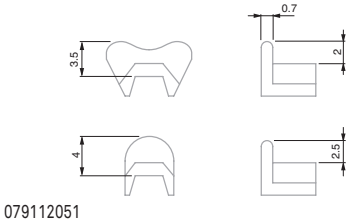


Chrome plated, hardened steel

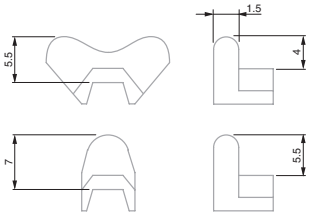
Optional Accessories for IRA-2 Comparative Gauge

NO	
079112051	Small insert set for 3-point measurement
079112052	Long insert set pour 3-point measuring





079112051



079112052

Ø 57 mm
0,2 mm
Dial gauge: 5 µm
30 mm throat depth. Highly stable frame with heat insulating handle.
≈ 2 N
Non-interchangeable measuring inserts. With device for retraction of inserts.

THICKNESS GAUGES

Designed for the direct measurement of thickness of all types of materials: plastics, glass, wood, felt, paper, rubber, etc.
Each gauge is equipped with a rotating dial for zero setting.

Model for Sheets



NO		mm	mm	Flat, mm
074115664	Thickness gauge for sheets	0 ÷ 1	0,001	Ø 6,35

Ø 57 mm
10 mm
Dial gauge: 40 µm
Interchangeable measuring inserts

Models with Open Inserts When Not in Use



NO		mm	mm	mm	Paired inserts included
074115604	0 ÷ 30	0,1	50	flat; Ø 30	074115686
074115605	0 ÷ 30	0,1	50	flat; Ø 20	074115687
074115606	0 ÷ 30	0,1	50	flat; Ø 10	074115726
074115607	0 ÷ 30	0,1	50	convex; Ø 10	074115727
074115608	0 ÷ 30	0,1	50	spherical; Ø 5	074115728

INTERAPID SHE.30 & SHE.35 SMALL HORIZONTAL MEASURING BENCHES

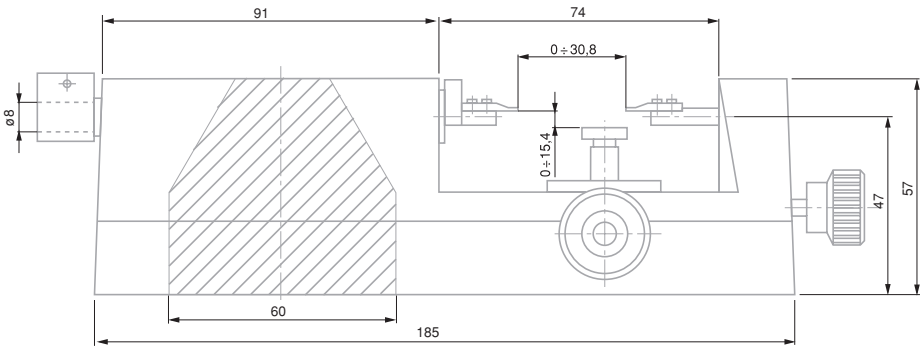
Extremely practical and very precise, these measuring benches are mainly used for the inspection of batches of precision parts as used in the watch making and precision mechanical sectors – Rapid measuring and easy setting from one part to the other – Wide choice of measuring inserts specially designed for the most varied of metrology applications.

INTERAPID SHE.30 for External Dimensions

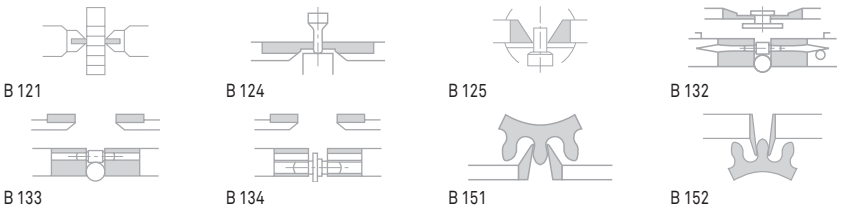


03330004	INTERAPID SHE 30 small measuring horizontal bench for external dimensions (without measuring inserts)
OPTIONAL ACCESSORY:	
03360300	Measuring inserts, carbide, length 3,5 mm, height 0,4 mm

Measuring inserts, either cylindrical or knife-edged are available on request.



Pair of Measuring Inserts in Special Version



0 to 30 mm

Accuracy is usually influenced by the measuring instrument used as well as both flatness and parallelism of the measuring faces of inserts.
Holder precision: Flatness tolerance of two clamping faces: 0,05 mm. Axial positioning tolerance for the two indexing pins with respect to bolt axis: 0,05 mm. Tolerance for the parallelism of the table surface with respect to the bolt axis: 0,05 mm. See drawing

Main body in cast iron. Other parts in steel, hardened and ground

Produced by sensor used. The SHE.30 model is not spring-loaded.

Mobile measuring bolt: guided on a smooth bearing surface and equipped with a semi-circular disc for bolt retraction. Measuring inserts, assembled in pairs, and mounted on the measuring bolt and fixed anvil with a 1 mm diameter pin and 2 M1,4 screws. Support table with possibility of vertical and longitudinal adjustment: Surface 24 x 9,5 mm. Adjustment range: vertical: 15 mm, longitudinal: 14 mm. With fixing screw. Sensor (not included in the supply for SHE 30 bench): electronic indicator, mechanical or precision dial gauge, axial analogue or digital probe with mounting shank of Ø 8 mm

2,1 kg

INTERAPID SHE.35 for Internal Dimensions

30 mm

8 to 38 mm (standard accessory)

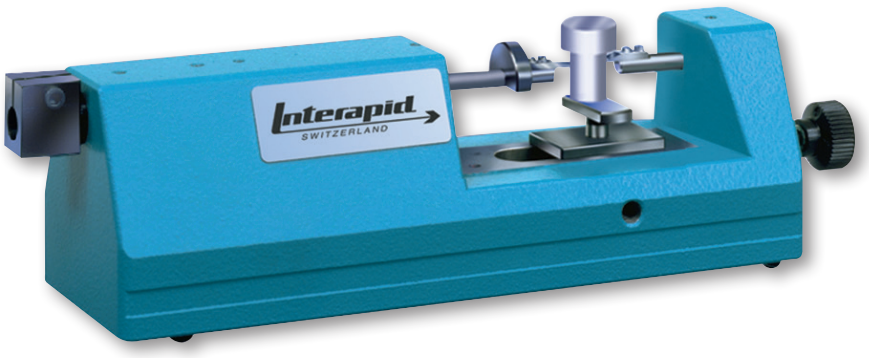
Accuracy is generally influenced by the measuring instrument as well the type of inserts used.

Main body in cast iron. Other parts in hardened and ground steel. Inserts with carbide measuring faces.

Produced by sensor used. The SHE.35 bench is not equipped with a spring.

Mobile measuring bolt guided on a flat bearing surface, also fitted with a retracting ball-shaped handle. Interchangeable measuring inserts supplied in pairs. Fixing shaft Ø 4 mm. Height adjustable support table. Surface: 40 x 70 mm. Setting range: 8 mm. 1 tightening screw. Sensor (must be ordered separately), e.g. dial gauge, electronic or precision indicator, analogue or digital probe. Mounting Ø 8 mm.

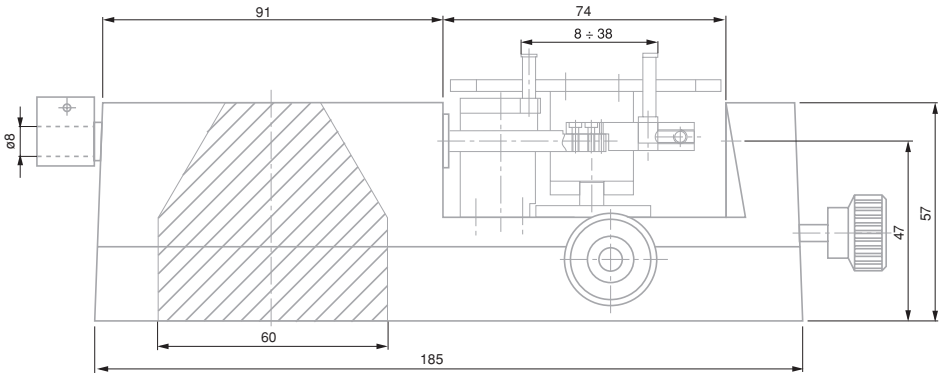
2,3 kg



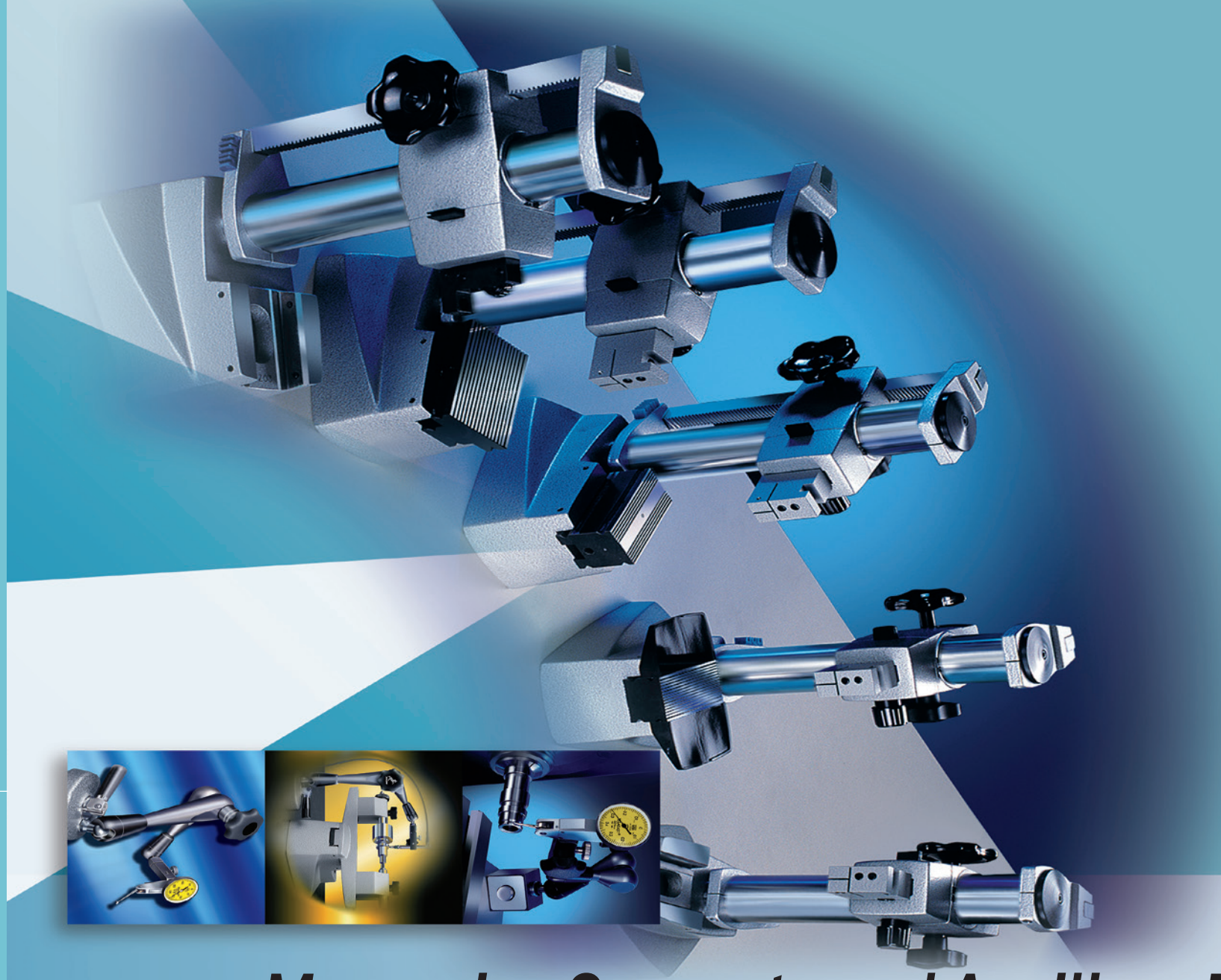
No		
03330006	INTERAPID SHE 35 small horizontal measuring bench for internal dimensions (with measuring inserts)	8 ÷ 38 mm

Inserts with special design also available on request









Measuring Supports and Auxiliary Equipment

TESA measuring supports have been designed to offer the best holding stability for instruments such as dial gauges, lever dial test indicators and probes. Stability is the prime requirement needed to reduce the related uncertainties in a measurement method or set-up.



Base with vee recess and 1 magnetic flat face. Disengageable of magnet possible. Duralumin articulations.

Dovetail clamp with a Ø 8 mm clamping bore

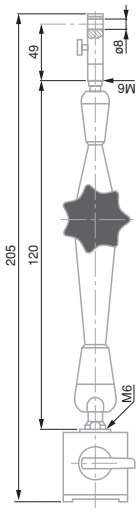
0,4 kg

Supplied without measuring instrument

UNIVERSAL SUPPORTS

Magnetic measuring support with suction base or articulated arm.

INTERAPID Magnetic Support with Articulated Arm (small)





Magnetic support with articulated arm

NO		N	H mm	L mm	Base mm	Consisting of:
01639025	Small magnetic measuring stand with articulated arm	≈ 170	205	120	30 x 30 x 30	– 1 articulated arm length 120 mm – 1 dovetail clamp with fine adjustment – 1 magnetic base 30 x 30 x 30 (L x W x H)

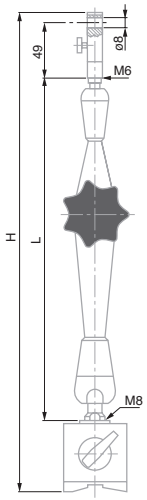
Magnetic base has 1 prismatic and 2 flat faces. Articulations made from duralumin. Disengageable permanent magnet. Dovetail clamp with a Ø 8 mm clamping bore.

Supplied without measuring instrument

INTERAPID Magnetic Support with Articulated Arm

Simple and secure locking using a single rotating knob

- highly rigid arm and articulation.





Magnetic support with articulated arm

NO		N	V-Base for Ø, mm	Fine adjust	H mm	L mm	Base mm	Mass kg	Consisting of:
01639022	INTERAPID magnetic support with articulated arm	≈ 800	30 ÷ 150	●	310	200	60 x 50 x 55	1,45	– Articulated arm – Clamp – Magnetic base
01639023	INTERAPID magnetic support with articulated arm	≈ 800	30 ÷ 150	●	390	280	60 x 50 x 55	1,85	– Articulated arm – Clamp – Magnetic base

INTERAPID Magnetic Support with High Precision Articulated Arm

Magnetic support with high precision articulated arm and fine adjustment for measurements that need repeatability in the range of µm.

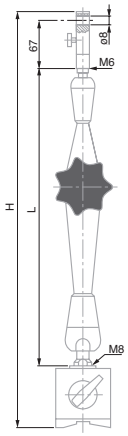
Simple and secure locking with a two-position knob. Highly rigid arm and articulation.

Magnetic base has 1 prismatic and 2 flat faces. Articulations made from duralumin. Disengageable permanent magnet. Dovetail clamp with a Ø 8 mm clamping bore.

Supplied without measuring instrument



Magnetic support with high precision articulated arm



NO	=		N	V-Base for Ø, mm	Fine adjust	H mm	L mm	Base mm	Consisting of:
01639053		INTERAPID High Precision Magnetic Support with Articulated Arm	≈ 1000	30 ÷ 150	●	440	320	73 x 50 x 55	– Articulated Arm – Clamp – Magnetic base

INTERAPID Magnetic Support with Flexible Arm

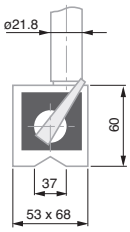
For measurements in hard to reach locations. Instant and reliable locking through lever control.

Holding force on a flat surface ≈ 1000 N

The magnetic base has 1 prismatic and 2 flat faces. Disengageable permanent magnet. Full length 350 mm. Dovetail clamp with an Ø 8 mm clamping bore.

Supplied without measuring instrument





NO	=	
01639020		Magnetic Support with Flexible Arm

Switchable magnet. Clamp with Ø 8 mm clamping bore

Supplied without measuring instrument

INTERAPID Inclinable Magnetic Support

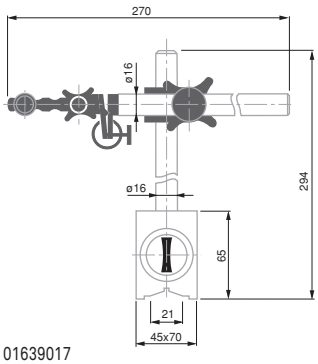
Standard model and models with strong holding force



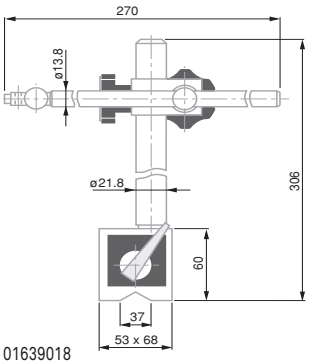
01639017



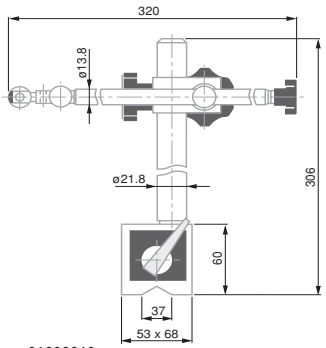
01639019



01639017



01639018



01639019

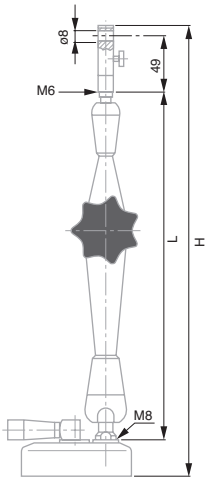
NO		N	V-Base for Ø, mm		Fine adjust
01639017	INTERAPID magnetic support with V-base, 600 N	≈ 600	70 ÷ 220	Standard Version	●
01639018	INTERAPID magnetic support with V-base, 1000 N	≈ 1000	70 ÷ 220	Strong magnetic holding force	–
01639019	INTERAPID magnetic support with V-base, 1000 N	≈ 1000	70 ÷ 220	Strong magnetic holding force	●

INTERAPID Support with Suction Base and Articulated Arm

Holds firmly on any smooth and flat surface

- Clamps instantly and reliably using a suction lever switch.
- Highly rigid articulated arm.
- Free from magnetic fields.





Round suction base made of aluminium (Ø 88 mm, height 28 mm) with flat suction base. Articulations made from duralumin. Suction controlled by lever switch. Dovetail clamp with an Ø 8 mm clamping bore.

1.1 kg

Supplied without measuring instrument

NO		N	Fine adjustment	H, mm	L, mm	Consisting of:
01639024	INTERAPID Measuring support with suction base and articulated arm	≈ 400	●	363	280	– Articulated arm – Fine adjust clamp – Round suction base

Measuring table and column in hardened steel.

Measuring arm with Ø 8 mm clamping bore, without fine adjustment. Measuring span: 48 mm.

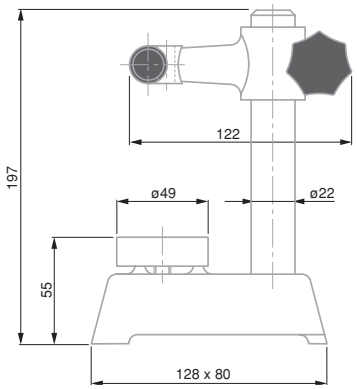
2,7 kg

Supplied without measuring instrument

INTERAPID Small Measuring Support and Table Ø 49 mm

Round steel measuring table





Application example with DIGICO indicator

NO		mm	mm
01639006	INTERAPID small support with Ø 49 mm measuring table	0 ÷ 100	49

Cast iron base

Base with front support face. Clamp for Ø 8 mm mounting rod or dial gauge with lug back. Model No 01639003 also with dovetail clamp.

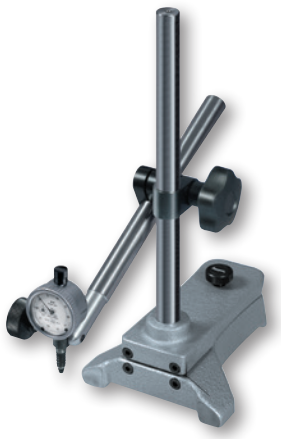
1,3 kg (01639003) 4,35 kg (01639004)

Supplied without measuring instrument

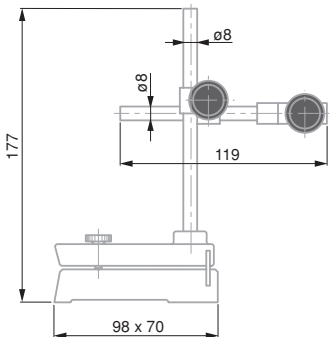
INTERAPID Measuring Support with Inclinable Frontal Arm



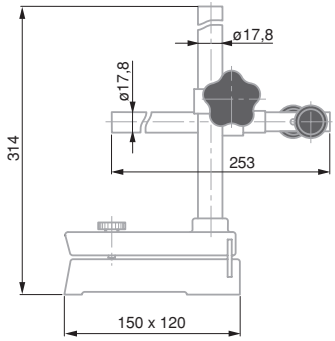
01639003



01639004



01939003



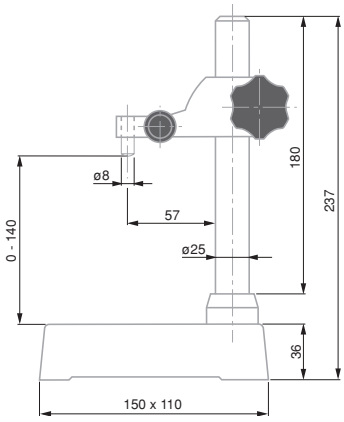
01939004

NO		Used in conjunction with:
01639003	INTERAPID Measuring Support with Inclinable Frontal Arm H = 177 mm	Lever dial test indicators, small dial gauges
01639004	INTERAPID Measuring Support with Inclinable Frontal Arm H = 314 mm	Lever dial test indicators, small dial gauges, precision indicators, probes etc.

INTERAPID UA 1 Table Measuring Support with Ground Table Surface

Basic model without fine adjustment





Measuring table: cast iron. Column: chrome-plated steel, Arm: spheroidal graphite cast iron.

Mesuring surface of table: ground. Column: Can be dismantled. Measuring arm with Ø 8 mm clamp.

3 kg

Supplied without measuring instrument

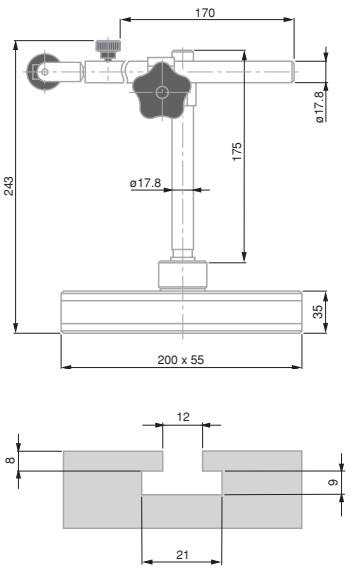
NO		mm	mm
01639008	INTERAPID UA 1 measuring support with table	0 ÷ 140	100 x 100

INTERAPID UD12 Support

Medium sized mobile measuring support for luse with ever type dial test indicators, dial gauges, precision indicators, electronic probes etc.

With fine adjustment mechanism.





Cast iron base

Stand with lateral guiding faces. T-slot for vertical column. 2 rigid articulations

3.3 kg

Supplied without measuring instrument

NO		
01639000	UD 12 universal support	
COMPOSÉ DE:		
01840105	Tige de fixation à queue d'aronde Ø 8 mm	
01640100	UDZ 3 Mounting rod and UDZ3 clamp Ø 8 mm clamp for UD 12	

INTERAPID Table Measuring Stands with Granite Grade 00

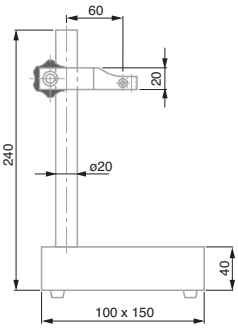
3 µm in accordance with DIN 876 T1, class 00

01639035: black burnished column with Ø 8 mm clamping bore.

01639029: chrome plated column with thread and threaded ring for adjusting the height of the measuring arm. Ø 8 mm clamping bore. Grooved measuring face.

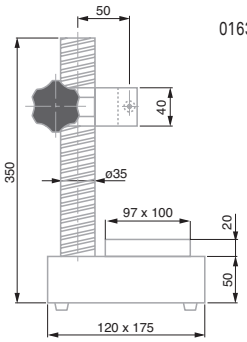
01639033: Chrome plated column. Horizontal sliding arm. Ø 4 mm or 8 mm bore for a dovetail clamp or lug.

Supplied without measuring instrument



01639035

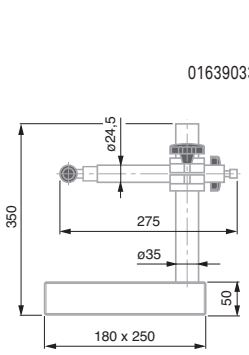




01639029



01639033





No		mm	mm	Measuring surface	Fine adjustment	Measuring table mm	Column height mm	Working surface mm	Span mm	kg
01639035	Table measuring support with granite, column Ø 20	0 ÷ 170	20	Granite	–	100 x 150 x 40	200	100 x 115	50,0	2,6
01639029	Slotted table measuring support with granite, threaded column Ø 35	0 ÷ 225	35	Hardened steel	●	120 x 175 x 50	300	100 x 100	68,5	8,1
01639033	Table measuring support with granite, column Ø 35	0 ÷ 260	35	Granite	●	180 x 250 x 50	300	180 x 200	Adjustable	10,5

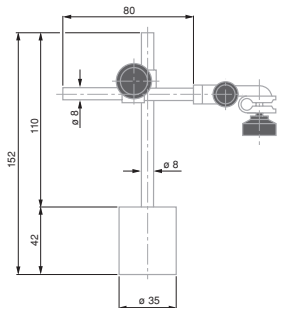
SMALL MAGNETIC SUPPORTS

Ideal for lever type dial test indicators, and dial gauges up to 40 mm diameter
- With 2 articulation joints and fine adjustment.

Small magnetic support UJ 15

Holding force on a flat surface: ≈ 220 N
Rounded base with permanent magnet
0,47 kg
Supplied without measuring instrument





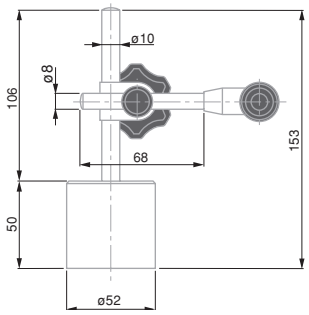
01639007 + 01640501
with dial test indicator

NO		
01639007	Magnetic support INTERAPID UJ15, dovetail clamp and Ø 8 mm cylindrical clamping	

Small magnetic support UJ 15G

Holding force on a flat surface: ≥ 350 N
Rounded base with permanent magnet
0,93 kg
Supplied without measuring instrument





NO		
01639016	UJ Magnetic support	

Accessories for Small Magnetic Stands

50 x 80 x 20 mm
0,60 kg

NO		
01640501	Steel base plate for UJ15 or UJ15G that become movable	

Cast iron table. Chrome plated steel column

Support base: Ground measuring face. 2 T-slots. Removable column.

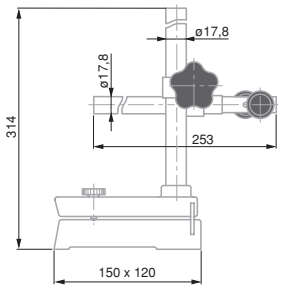
Supplied without measuring instrument

Support base only: 4.,85 kg
Measuring arm: 0,85 kg
Sliding arm: 1,75 kg

UA 30 MEASURING STAND

Base for mounting special fixtures adapated for series inspection

INTERAPID UA 30 Measuring Stand, Without Measuring Arm





NO		mm	in	mm
01639009	INTERAPID UA 30 measuring support with table, without measuring arm	0 ÷ 175	0 ÷ 6.89	125 x 115

Measuring arm 01610200: With fine adjustment. 1 mm travel. Ø 8 mm clamping bore.
Sliding arm 01610201: Sliding holder for TESA YA dial gauges. Adjustable swinging movement. Clamping bore Ø 13 mm. Length of travel 35, 57 or 80 mm. Measuring span 60 mm. Depth stop plate 01640000: Dimensions: 115 x 35 x 3,5 mm. 120° vee recess for Ø ≤120 mm, 2 tightening screws.

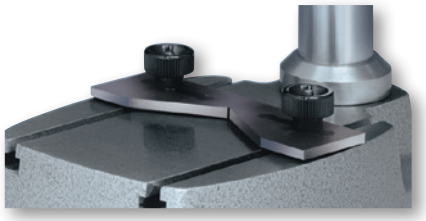
Accessories for UA 30



01610200



01610201



01640000

NO	
01610200	UK 20 measuring arm with fine adjustment for UA30 support
01610201	UK 25 sliding arm. Used with TESA YA for stationary bore measurement on UA30 support
01640000	UAZ 10 depth stop plate for UA 30

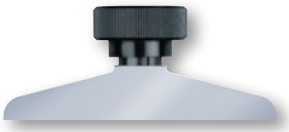
EQUIPEMENT AUXILIAIRES

INTERAPID Depth Foot with a Flat Face

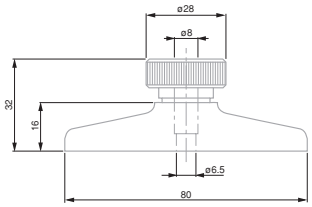
Hardened steel

Lapped measuring faces. Clamp wih lock for mounting a dial gauge or probe

Supplied without measuring instrument







No		mm	
01639046	Depth foot with flat face	80 x 16	8

INTERAPID Depth Foot with Prismatic Measuring Face

For measuring the depth of key slots on cylindrical shafts and determining circularity errors etc.

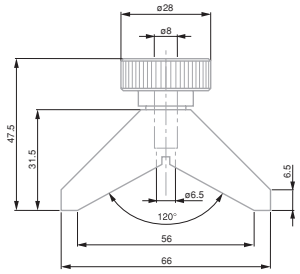
Hardened steel

Lapped measuring faces. Clamp with lock for mounting a dial gauge or probe

Supplied without measuring instrument







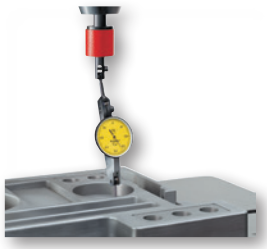
No		Diameter mm	Diameter in	Width mm	Width in	Clamp mm	Clamp in
01639047	Depth foot with prismatic measuring face	10 ÷ 100	0.39 ÷ 3.9	16	0.64	8	0.315

Brown & Sharpe CENTER FINDER Centering Tool

Practical for aligning the centre of a bore with respect to the spindle axis of a machine tool

- Without the clamping shaft, it can also serve as small magnetic support
- Allows the clamping of a dial test indicator, either a standard or perpendicular model.

Center Finder consisting of the following components:
- cylindrical shank for clamping on the chuck of a machine tool.
- powerful round magnetic base with strong holding capacity.
- swivel joint and dovetail collar for clamping a lever-type dial test indicator.





No	
06769006	B&S CENTER FINDER centering tool

Hardened steel

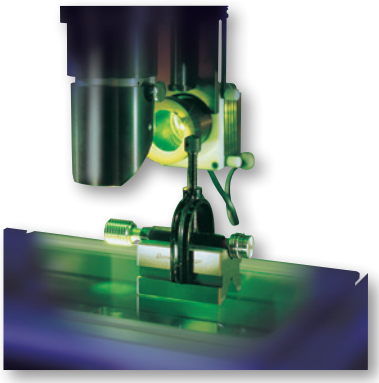
Ground finish for support and vee faces

Not available as individual components

Brown & Sharpe V-Block Set with Clamping Bridge

V-blocks with frames for clamping cylindrical parts diameters ranging from 0,7 to 40 mm.

Can be used for machining or inspecting workpieces





NO		Clamping Range, mm	Clamping Range, in	Consisting of:	
06769007	Set of B&S V-blocks	0,7 ÷ 40	0.3 ÷ 9/32	1 pair of V-blocks 1 extra V-block 1 extra V-block 5 extra V-blocks 2 in-between bridges 2 large frames 1 small frame	5 ÷ 40 mm 3 ÷ 8 mm 1,5 ÷ 5 mm 0,7 ÷ 3,5 mm

7 µm for each pair

2,5 µm for the 6 faces

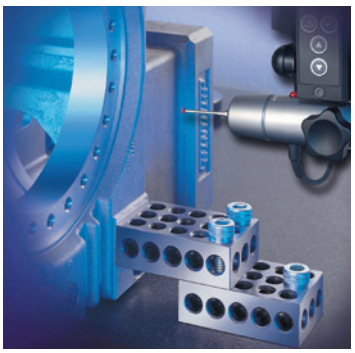
Hardened steel, 55 to 60 HRC

Each block has 18 through bores Ø 9,53 mm and 5 bores with M10 threads

Supplied with five M10 socket head screws and one 8 mm socket wrench

Brown & Sharpe Positioning Block Set

Pair of matched blocks used for positioning and holding workpieces or for use as stops on granite surface plates, a coordinate measuring set-up, a machine-tool or other applications - Each block are precision ground.





NO		mm	in
06769004	Positioning block set, precision ground	75 x 50 x 25	2.95 x 1.95 x 0.98

Brown & Sharpe Adjustable Parallels

Hardened steel

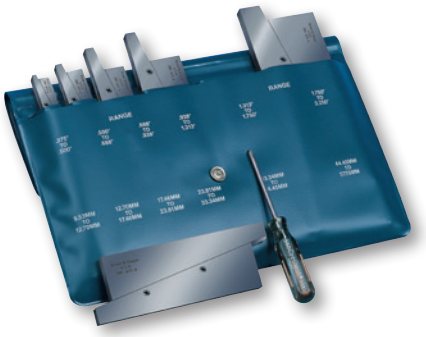
Supplied with a PH 1 screwdriver

Set consists of 6 adjustable parallels.

Used as parallel pads, setting standards for measuring instrumeents or gauges for checking internal dimensions on parallel surfaces.

Each parallel consists of two tapered parts dovetailed together. – Two tightening screws lock the parallels to the size required.

NO			
06769010	Adjustable parallel set		
Consisting of:			
	Height mm	Length mm	Width mm
1 parallel	10 ÷ 13	44	7
1 parallel	13 ÷ 17	54	7
1 parallel	17 ÷ 24	68	7
1 parallel	24 ÷ 33	90	7
1 parallel	33 ÷ 44	106	7
1 parallel	44 ÷ 57	129	7



ROCH Flexible Rules

Class CE II

Stainless spring-loaded steel

In spring stainless steel - Divisions of 1 mm and 0.5 mm.



NO		Length mm	Width mm	Thickness mm
0951750181	ROCH flexible rule L = 200 mm	200	13	0.5
0951750182	ROCH flexible rule L = 300 mm	300	13	0.5
0951750184	ROCH flexible rule L = 500 mm	500	18	0.5
0951750187	ROCH flexible rule L = 1000 mm	1000	18	0.5

Length L = 100 mm, Width = 13 mm max.

Allloyed steel

Blades not supplied individually

ROCH Thickness Gauges



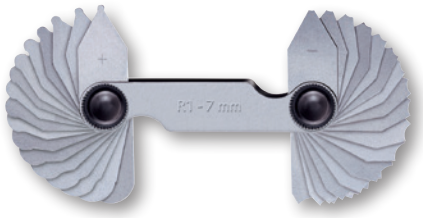
NO		Thickness mm	Step mm	Thickness in	Number of blades
0951753013	ROCH thickness gauge with 13 blades, 0,05 to 1,0 mm	0,05 ÷ 0,3 / 0,4 ÷ 1,0	0,05 / 0,1	0.001968 ÷ 0.003937	6/7
0951753014	ROCH thickness gauge with 20 blades: 0,05 to 1,0 mm	0,05 ÷ 1,0	0,05	0.001968 ÷ 0.003937	20
0951753015	ROCH thickness gauge with 21 blades; 0,1 to 0,2 mm	0,1 ÷ 2,0	0,1 + 1 x 0,05	0.003937 ÷ 0.07874	21

Stainless steel

Blades are not supplied individually

ROCH Radius Gauges

Set of radius gauges with concave and convex blades.
Designed for visual inspection of radii.



NO		Radius mm	Radii mm	Step mm	Number of blades
0951753001	ROCH radius gauge 2 x 17 blades	0,1	1,0 ÷ 2,75 / 3,0 ÷ 7,0	0,25 / 0,5	2 x 17
0951753002	ROCH radius gauge 2 x 16 blades	0,15	7,5 ÷ 15,0	0,5	2 x 16
0951753003	ROCH radius gauge 2 x 15 blades	0,2	15,5 ÷ 19,5 / 20,0 ÷ 25,0	0,2	2 x 15

Alloyed steel

Blades are not supplied individually

ROCH Screw Pitch Gauges

60° flank angles for ISO metric threads or 55° for Whitworth threads.



NO		Thread pitch mm	Threads per in	Metric thread
0951753045	ROCH screw pitch gauge for ISO 60° threads	0,25 / 0,3 / 0,35 / 0,4 / 0,45 / 0,5 / 0,6 / 0,7 / 0,75 / 0,8 / 0,9 / 1,0 / 1,25 / 1,5 / 1,75 / 2,0 / 2,5 / 3,0 / 3,5 / 4,0 / 4,5 / 5,0 / 5,5 / 6,0	–	ISO 60° mm
0951753046	ROCH screw pitch gauge -Whitworth 55° threads	–	62 / 60 / 48 / 40 / 36 / 32 / 30 / 28 / 26 / 25 / 24 / 22 / 20 / 19 / 18 / 16 / 14 / 13 / 12 / 11 / 10 / 8 / 7 / 6 / 5 / 4,5 / 4	Whitworth 55° (threads per inch)

ROCH Portable Magnifier

With a folding handle and additional magnifier. – Retractable support.

Solid resistant plastic



No		Large magnifier	Small magnifier	mm	Small magnifier, mm
0951754511	ROCH portable magnifier	3x	10x	80 x 45	13



Straightness, Angle and Inclination Measurement

INCLINOMETERS AND PRECISION LEVELS

Irrespective of whether they are spirit or electronic inclinometers, all precision levels are based on the same perfectly reliable reference but also cost-free: the centre of the earth's gravity.

Under the force of gravity, the gas bubble in the liquid or the pendulum inclines itself according to this natural physical principle.

The position of the pendulum with respect to the measuring faces of the instrument body can then be measured. Based on this perfect principle, these instruments offer a great number of measuring applications of high precision. The horizontal and vertical positioning of the measuring faces enable the detection of form errors in the geometrical elements on the workpiece to be measured.
These errors often result from deviations in straightness, flatness, position, parallelism and squareness.

Indication of values may vary depending on the type of level, the values typically displayed are:
- inclination (mm/m or in/10 in);
- radian in mrad;
- decimal angle (e.g. 12,37°);
- sexagesimal angle in degrees (°), minutes (') and seconds (") e.g. 15° 30' 45".



TESA MICROBEVEL 1



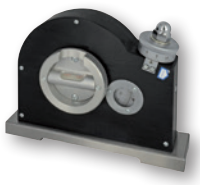
TESA CLINOBEVEL 1 USB



TESA CLINOBEVEL 2



TESA NIVELTRONIC



Spirit clinometers with angle protractor

DIN 2276 Part 2 (Form D)

LCD angle display: Decimal or sexagesimal Inclination mm/m, in/10 or 12 in, mm or in/ basis length, radian (mrad) and the like

Capacitive measuring system with gravity pendulum

2' + 1 numerical interval

21 storable correction values (high accuracy)

Flat face 4 x 90°

100 x 75 x 35 mm

Anodised light alloy

Response time ≈1 s

Automatic shut down after 8 min

Display lock

RS485, asynchronous, 7 bits, 2 stop bits,no parity, 9600 bauds

1 1,5 V battery, type LRC 6, AA

≈ 150 hours

IP65 (IEC 60529)

EN 50081-1 / -2 EN 50082-1 / -2

0,52 kg

Inspection report with declaration of conformity

INCLINOMETERS AND LEVELS

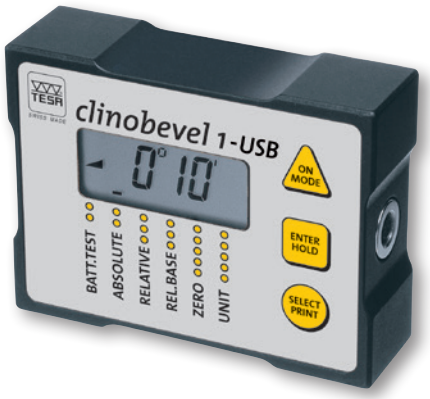
The TESA inclinometers and levels meet the most demanding applications not only in the machine building sector but also in the civil construction sector.

Electronic Inclinometer - TESA CLINOBEVEL 1 USB

Compact universal instrument for direct and differential measurements – Measuring range ± 45° with display of measured angles or inclinations – Reinforced aluminium housing, eloxide surface – Large digital display for error free interpretation of readings.

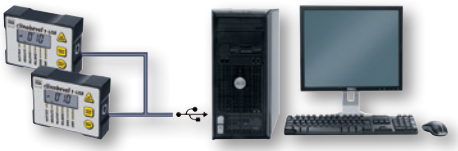
Supplied with CLINOSOFT software permitting the visualisation and storage of measurements as well as the USB cable to host computer.

Multiple applications are possible, notably the measurement of 2 flat surfaces by comparing the measured values with the help of 2 instruments. Automatic generation of inspection reports using Microsoft EXCEL spreadsheet software.





CLINOSOFT Software

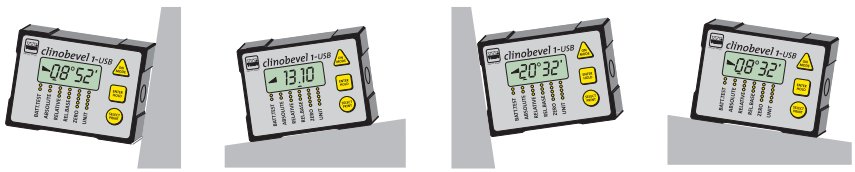


Measuring functions: A ; B ; A+B ; A-B



CLINOSOFT Software

CLINOBEVEL 1-USB, can be used on its 4 faces.



			mm/m	mm	Livré avec:
05330203	CLINOBEVEL 1 USB electronic inclinometer	± 45°	≥ 0,02	100 x 75 x 35	CLINOSOFT software plus USB cable to host computer
OPTIONAL ACCESSORIES:					
04768002	4 batteries LRC 6 AA, 1,5 V for CLINOBEVEL 1 USB, CLINOBEVEL 2, MICROBEVEL,				
05360006	External switch with cable, L = 2 m, for CLINOBEVEL 1 USB				
05360014	External switch, wireless, for CLINOBEVEL 1 USB				

TESA CLINOBEVEL 2 Electronic Inclinometer

Portable precision inclinometer.

Measuring range ±45° with indication of angle or inclination.

Integrated temperature compensation 2 prismatic measuring faces.

Spirit level integrated in transverse direction to eliminate "twist" error.

Simple and rapid calibration: correction of gain by the 3-point method and software integrated in the instrument.

Microprocessor-based features for display setting and instrument adjustment.

The CLINOBEVEL 2 can be used on its two reference faces.

It can also be connected to a second CLINOBEVEL 2 instrument for a differential measurement (Comparative): one of the two instruments operates as a reference without the need to connect to a computer.

The integrated RS 232 interface enables the connection of the instrument to a computer.

Magnetic inserts can be integrated on the measuring faces on request as a special execution.

- DIN 2276 Part 2 (Form D)
- LCD angle display: Decimal or sexagesimal Inclination mm/m, in/10 or 12 in, mm or in/ basis length, radian (mrad) and the like
- Capacitive measuring system with gravity pendulum
- 10" +0,03 % of the readout
- 2 flat measuring faces with V-slot for diameters from Ø 17 to 94 mm
- 150 x 150 x 35 mm
- Rust inhibiting housing
- Response time: < 5 s
- Automatic shut down after 8 min
- RS 232 asynchronous. 7 bits, 2 stop bits, no parity, 9600 bauds
- 2 batteries 1,5 V, type LRC 6, AA
- 40 to 60 hours
- IP65 (IEC 60529)
- EN 50081-1 / -2 EN 50082-1 / -2
- 3 kg





When 2 CLINOBEVEL 2 are connected, one of the instruments becomes the reference

NO				mm
05330202	Electronic InlclinometeTESA CLINOBEVEL 2	±45°	≥ 5" (5 Arcsec = 0,025 mm/mm)	100 x 150 x 35
OPTIONAL ACCESSORIES:				
04768002	4 batteries LRC 6 AA, 1,5 V for CLINOBEVEL 1 USB, CLINOBEVEL 2, MICROBEVEL,			
05360004	Connecting cable between 2 CLINOBEVEL 2, L = 2,5 m			
S53070174	Câble USB pour CLINOBEVEL 2, L=2,5 m			

DIN 2276 Part 2 (Style D)

See table for max. perm. errors

LCD display according to table

Fully encapsulated measuring system with gravity pendulum

See table for max. perm. errors

2 flat measuring faces with V-slot for diameters from 20 to 120 mm

Cast iron base. Chromium plated side faces. Aluminium housing, lacquered

Response time < 3 s

Automatic shut down after 55 min

1 mV per unit (100 kΩ)

1,5 V battery, type LRC 6, AA

100 to 140 hours

≤ 0,1 %/°C based on the measuring range at 20 ± 5°C

EN 50081-1 / -2 EN 50082-1 / -2

TESA MICROBEVEL 1 Inclinometer

TESA MICROBEVEL 1 is particularly suited for measuring slightly inclined surfaces such as the measuring of flatness of surfaces or the geometrical characteristics (deviation, rotation etc.) of a machine tool.

Suited for operation under the most rugged conditions., protected by an aluminium case.

Power supplied by a single standard battery AA 1,5 V for at least 100 hours of operation.



Horizontal model



Square model

Models with steps 0,05 to 0,005 mm/m available on request

		Range 1 or Range 2, mm/m	Base width, mm	Base height, mm	kg (with transport case)
05330003	TESA MICROBEVEL 1 horizontal base 110 x 45 mm	0,01 ou 0,001	110	45	1,8
05330004	TESA MICROBEVEL 1 horizontal base 150 x 45 mm	0,01 ou 0,001	150	45	2,1
05330005	TESA MICROBEVEL 1 square base 150 x 45 mm	0,01 ou 0,001	150	45	3,1
OPTIONAL ACCESSORY:					
04768002	4 batteries LRC 6 AA, 1,5 V for CLINOBEVEL 1 USB, CLINOBEVEL 2, MICROBEVEL,				

Range	mm/m	mm/m	mm	G = mm/m	
1	± 20	± 5	0,01	Flatness ≤ 5 mm/m G = 1 % of the measured value and min. 0,01 mm/m	Flatness > 5 mm/m G = 0,01 mm/m
2	± 2	± 2	0,001	Flatness ≤ 1 mm/m G = 1 % of the measured value and min. 0,001 mm/m	Flatness > 1 mm/m G = 1 % of (2x measured value -1)

TESA NIVELTRONIC Electronic Levels with Analogue Display and Integrated Galvanometer

Electronic levels with analogue display and integrated galvanometer.

These instruments are known for a remarkable stability at zero point. They are used for the inspection and alignment of horizontal and vertical surfaces. They are also suitable for the measurement of slight inclinations, specially for the inspection of flatness of granite surface plates.

The square model is particularly suited for the measurement of flat or cylindrical parts thanks to its prismatic base.



NIVELTRONIC square model with 2 prismatic bases



NIVELTRONIC horizontal model with flat base



NIVELTRONIC horizontal with granite base

DIN 2276 Part 2 (Style D)

See table

Inductive measuring system with gravity pendulum

As per DIN 2276: up to 0,5 * measuring range: min. 0,001 mm/m, max. 1 % of the measured value from 0,5 * measuring range: max. 1 % of (2 * measured value - 0,5 * total range.)

1 µm/m

Horizontal model with a flat measuring face. Square model with 2 flat faces having a V-slot for Ø from 20 to 120 mm

Cast iron body. Horizontal model with granite base.

≈ ± 0,2 V, impedance 4,5 kΩ

4 batteries AAA 1,5 V

EN 50081-1 / -2 EN 50082-1 / -2

No		mm/m	Base length mm	Base width mm	kg
03130063	TESA NIVELTRONIC electronic level, horizontal, analogue display	0,05 / 0,01	150	45	6,0 / 3,7 *
03130060	TESA NIVELTRONIC electronic level, square, analogue display	0,05 / 0,01	200	45	6,5 / 4,4 *

* With/without wooden case

OPTIONAL ACCESSORIES:	
03160007	Granite base 200 x 50 mm for horizontal NIVELTRONIC**
03160008	Granite base 250 x 50 mm for horizontal NIVELTRONIC**
03160009	Granite base 500 x 50 mm for horizontal NIVELTRONIC**
03160048	Holder with voltage regulator (4,65 V) and 4x LR03 AAA for NIVELTRONIC
04761059	4 batteries LR03 AAA, 1,5 V for NIVELTRONIC

Range	mm/m	”	mm/m	”
1	± 0,75	± 150”	0,05	10”
2	± 0,15	± 30”	0,01	2”

DIN 2276/1 (instrument) DIN 877 (graduation)

DIN 2276/1

Mounting with 2 or 3 screws

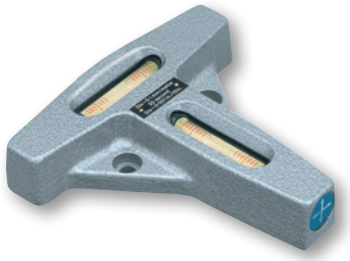
TESA Crossed Spirit Levels – for Assembly

For the inspection and alignment of flat surfaces.

The 2 vials permit a simultaneous alignment in the X and Y axes.
The level can be screwed on to a surface.



Model B: Circular level with cross vials, 3-point mounting. Aluminium alloy protection case, anodised.



Model C: T-shaped level with cross vials, 2-point mounting. Manually lapped measuring base to ensure a much higher precision of the level.

NO		mm/m	Modele type	l x L mm	mm	H mm
05331500	Level, 2 vials, 2 to 5 mm/m, Ø 40	2 ÷ 5	B, Circular level with 2 vials, 3x M2, 35 g (level onlyl)		Ø 40	11
05331502	Level, 2 vials. 0,3 mm/m, Ø 60	0,3	B, Circular level with 2 vials, 3x M4, 85g (level only)		Ø 60	13
05331550	Level, 2 vials; 0,1 mm/m, 80 x 65 mm	0,1	C, T-shaped level with 2 vials, 2x M5, 250 g (level only)	80 x 65		17
05331551	Level, 2 vials; 0,3 mm/m, 80x65 mm	0,3	C, T-shaped level with 2 vials, 2x M5, 250 g (level only)	80 x 65		17

TESA Precision Spirit Levels

For checking and aligning flat or cylindrical surfaces in the horizontal position.

With an ajustment system for zero point and "twist" error.

Prismatic measuring base, manually lapped finish, enabling a higher precision for the level.

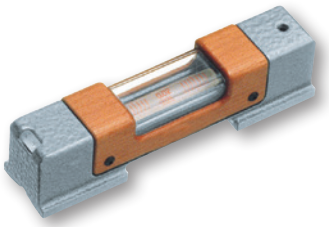
Insulating grip in wood essential for reducing heat transfer due to manual handling.

DIN 877

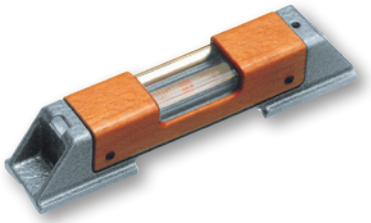
DIN 2276 Part 1

Flat and prismatic measuring faces

Longitudinal and cross level vials



Model B: horizontal precision level



Model C: horizontal precision level

No		mm/m		For shafts Ø, mm	mm
05331050	Precision spirit level 0,02, L = 100 mm	0,02	B, 0,35 kg (level only)	17 ÷ 84	100 x 32 x 35
05331054	Precision spirit level 0,02, L = 150 mm	0,02	B, 0,65 kg (level only)	17 ÷ 94	150 x 35 x 38
05331058	Precision spirit level 0,02, L = 200 mm	0,02	C, 0,95 kg (level only)	19 ÷ 108	200 x 40 x 42
05331061	Precision spirit level 0,1, L = 200 mm	0,1	C, 0,95 kg (level only)	19 ÷ 108	200 x 40 x 42
05331063	Precision spirit level 0,02, L = 250 mm	0,02	C, 1,3 kg (level onlyl)	19 ÷ 120	250 x 45 x 42

TESA Precision Spirit Levels with a Frame

For checking and aligning flat or cylindrical surfaces in horizontal and vertical positions.

Instrument features: 4 measuring faces, 2 prismatic faces (shafts Ø 17 to 135 mm) et 2 smooth flat faces.

With adjustment system for zero point and "twist" error.

Longitudinal vial with sensitivity of 0,02 to 0,1 mm/m, depending on the model.

Side viewing slots for an excellent visibility of the top and side of the main vial.

Cross vial with sensitivity of 2-5 mm/m for easy adjustment.

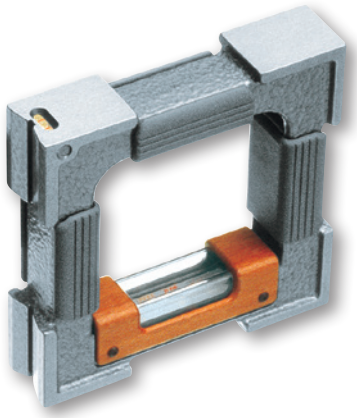
3 insulating grips to avoid any thermal transfer.

DIN 877

DIN 2276 Part 1

4 x 90° flat measuring faces, machined together, 2 of them with V-shape grooves

Longitudinal and cross vials



No		mm/m	For shafts Ø, mm	mm
05331201	Precision spirit level with frame, 0,05/100 x 100 x 32 mm	0,05	17 ÷ 84	100 x 100 x 32
05331202	Precision spirit level with frame, 0,1/100 x 100 x 32 mm	0,1	17 ÷ 84	100 x 100 x 32
05331204	Precision spirit level with frame, 0,05/150 x 150 x 35 mm	0,05	17 ÷ 94	150 x 150 x 35
05331206	Precision spirit level with frame, 0,02/200 x 200 x 40 mm	0,02	19 ÷ 108	200 x 200 x 40
05331210	Precision spirit level with frame, 0,05/250 x 250 x 45 mm	0,05	19 ÷ 120	250 x 250 x 45

DIN 877

DIN 2276 Part 1

Two flat measuring faces machined as a set (90°), v-shaped groove

Longitudinal and cross vials

TESA Precision Spirit Levels, Square Models with Magnetic Inserts

For inspecting and aligning flat or cylindrical surfaces in horizontal and vertical positions.

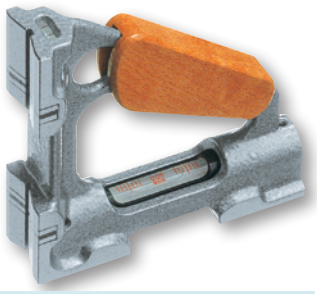
Instrument features: 2 prismatic faces (shafts Ø 19 to 108 mm) with the vertical measuring face having magnetic inserts.

Equipped with an adjustment system for zero point and "twist" error.

Longitudinal vial with a sensitivity from 0,02 to 0,05 mm/m, depending on the model.

Cross vial with a sensitivity of 2-5 mm/m for an easy adjustment.

A quality wooden grip reduces thermal transfer during manual handling.



NO		mm/m	For shafts Ø, mm	mm
05331000	Magnetic square level 0,02/150 x 150 x 40 mm	0,02	19 ÷ 108	150 x 150 x 40
05331002	Magnetic square level 0,05/150 x 150 x 40 mm	0,05	19 ÷ 108	150 x 150 x 40

DIN 877

DIN 2276 Part 1

Flat measuring faces with v-shaped grooves

Hardened and ground steel

Longitudinal and cross vials

TESA Precision Spirit Level with Micrometric Adjustment

Precision spirit level with micrometer adjustment.

For the measurement of inclinations from -20 to +4 mm/m.

1 division = 0,02 mm/m

Instrument features:

+ 1 micrometer rotation = + 2 mm/m (100 divisions)

+ 2 micrometer rotations = + 4 mm/m

- 10 micrometer rotations = - 20 mm/m

Prismatic measuring face (shafts Ø 19 to 120 mm).

Longitudinal vial with sensitivity of 0,02 mm/m

Cross vial with sensitivity of 2-5 mm/m for easy horizontal adjustment.

With side thermal insulators to reduce heat transfers to the instrument during manual handling.



NO		mm/m	For shafts Ø, mm	mm
05331450	Precision spirit level with micrometer element 0,02 / 150 x 45 x 45 mm	0,02	19 ÷ 120	150 x 45 x 45

TESA Spirit Inclinometer with Protractor and Micrometer Element

Enables the measurement of angular deviations in any position of a cylindrical or flat surface.

Instrument features: prismatic measuring face (shafts Ø 17 to 80 mm) (DIN 877 + DIN 2276/1). Scale range: 2x 180°.

The adjustment is executed by disengaging the micrometer element by pressing in the direction indicated by the arrow. Afterwards the vial is oriented manually before engaging the micrometer element and executing the fine adjustment with the latter.

1 scale division = 1 degree.

1 division of the micrometer element = 1 Arcmin

Vial with sensivity of 0,3 mm/m (= 1 Arcmin).

Error limit = 1,5 Arcmin

DIN 877

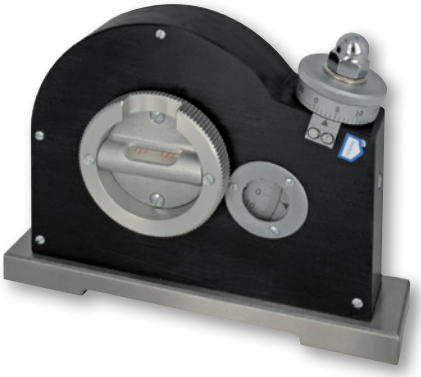
DIN 2276 part 1

Flat measuring faces with v-shaped groove

Hardened and ground steel base

Longitudinal and cross vials

1,6 kg (without case)
2,1 kg (with case)



NO		Scale division of micrometer element	Scale division of level		For shafts Ø, mm	mm
05331750	Spirit clinometer with angle protractor and micrometer element	1 Arcmin	1 Arcmin (0,30 mm/m)	2 x 180°	17 ÷ 80	150 x 35 x 116

Accessories for Clinometers and Levels

NO	
04768002	4 batteries LRC 6 AA, 1,5 V for CLINOBEVEL 1 USB, CLINOBEVEL 2, MICROBEVEL,
05360006	External switch with cable, L = 2 m, for CLINOBEVEL 1 USB
05360014	External switch, wireless, for CLINOBEVEL 1 USB
05360004	Connecting cable between 2 CLINOBEVEL 2, L = 2,5 m
04761059	4 batteries LR03 AAA, 1,5 V for NIVELTRONIC
03160007	Granite base 200 x 50 mm for horizontal NIVELTRONIC
03160008	Granite base 250 x 50 mm for horizontal NIVELTRONIC
03160009	Granite base 500 x 50 mm for horizontal NIVELTRONIC
03160048	Holder with voltage regulator (4,65 V) and 4x LR03 AAA for NIVELTRONIC

FLATNESS MEASURMENT

DIN 874 T2, NF E 11-104

Hardened steel to ≥ 650 HV 10

Straight edges up to 200 mm in a plastic case, ≥ 300 mm in a wooden case.

ROCH Bevelled Straight Edges

Models with 1 bevelled edge, with insulating grip to limit the transfer of thermal heat during manual handling for optimal precision.



Bevelled edge

No		µm	mm
0951750002	Bevelled straight edge	2	75
0951750003	Bevelled straight edge	2	100
0951750005	Bevelled straight edge	3	150
0951750006	Bevelled straight edge	3	200
0951750007	Bevelled straight edge	3	300

SQUARES

Factory standard

Accuracy class 1

Accuracy class 1

Stainless steel, hardness 200 HRB,

ROCH Flat and Try Squares in Steel – Accuracy Class 1

Try square 90° flat in stainless steeel, non-hardened



No		µm		Length of beams, mm	Section mm
0951751605	Try-square steel	15	With 90° hook	100 x 70	20 x 5
0951751607	Try-square steel	18	With 90° hook	150 x 100	28 x 6

Factory standard

Hardened steel

Brown & Sharpe Try Square Set



No			
06739001	Three square set B & S		
Consisting of:		mm	µm
	1 Try square	68 x 45	16
	1 Try square	120 x 70	16
	1 Try square	175 x 95	16

DIN 875 NF E 11-103

Accuracy class 00

Accuracy class 00

Accuracy class 00

Stainless steel, hardened to ≥ 550 HV 30

ROCH Bevelled Edge Squares – Accuracy Class 00

Bevelled edge 90° squares in stainless steel, hardened



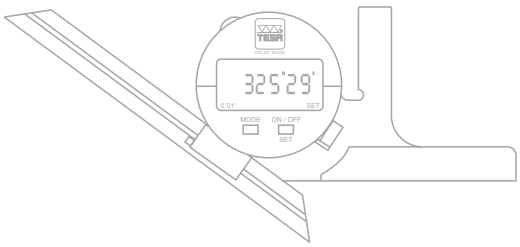
No		µm	Length of beams, mm	Section of beams mm
0951751533	Bevelled edge square, stainless	3	50 x 40	14 x 4,5
0951751534	Bevelled edge square, stainless	3	75 x 50	16 x 4
0951751535	Bevelled edge square, stainless	3	100 x 70	20 x 5

ANGLE PROTRACTORS

Angle Protractor with Digital Display

Measuring ranges 1x 360°, 2x 180°, 4x 90°
Large decimal or sexagesimal display
2 measuring directions
Fine setting with adjustment screw
Locking system
Scale L = 200 mm (300 or 500 mm available as options)
RS232 data output





NO	
00630010	Angle protractor with digital display. Supplied with a scale of L = 200 mm
OPTIONAL ACCESSORIES:	
00660004	Scale 200 mm
00660005	Scale 300 mm
00660006	Scale 500 mm
00660007	Supporting base with 1 flat measuring face and 1 prismatic measuring face
00660008	Square for measuring sharp angles
01961000	Lithium battery, 3V, CR 2032
04761062	Opto-USB cable, duplex, bidirectional communication

- Measuring ranges: 1 x 360°, 2 x 180°, 4 x 90°
- LCD, 5 digits + sign
- 0,01° / 1 minute of arc
- 8,5 mm
- Max. permi. error.: 4 minutes of arc
- Stainless steel body, hardened
- Maximum rotation speed.: 1080°/s
- Preset to 0° or 180°
- RS232 opto-coupled
- 1x CR2032 3,0 V
- 5000 hours
- IP51 (CEI 529)
- 410 g
- Wooden case (ISPM 15 andt NIPM 15)

2 circular scales

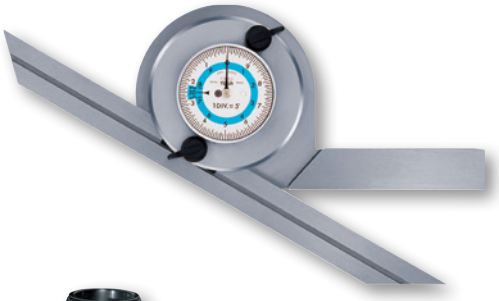
Main scale: 5'. Double numbering in opposite directions. Auxiliary scale: 10°

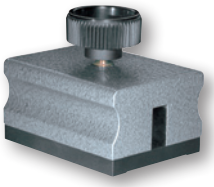
Max. perm. error: 5' (without accessory)

Hardened stainless steel

EAC Angle Protractor with Dial

Circular scale with needle pointer
Easy reading on main and auxiliary scales
Very low hysteresis
Precision movement with compensation for mechanical play.





00610102



00610101

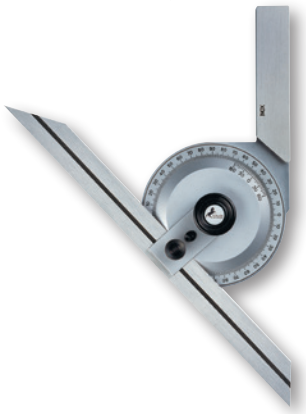
NO			mm
00630001	EAC angle protractor with dial	4 x 90°	200
00630002	EAC angle protractor with dial	4 x 90°	300
OPTIONAL ACCESSORIES:			
00660002	Scale		200
00660003	Scale		300
00610102	Cast iron base with steel bottom suface, hardened		

5'

Max. perm. error: 5' (without accessory)

Stainless steel, hardened

ETALON Angle Protractor with Vernier Scale



NO			Auxiliary scale	mm
076115566	ETALON angle protractor with vernier 200 mm	4 x 90°	No	200
076115567	ETALON angle protractor with vernier 300 mm	4 x 90°	No	300
OPTIONAL ACCESSORIES:				
00660002	Scale			200
00660003	Scale			300
00610102	Cast iron base with steel bottom suface, hardened			

Brown & Sharpe Angle Protractor - Multiple Combinations

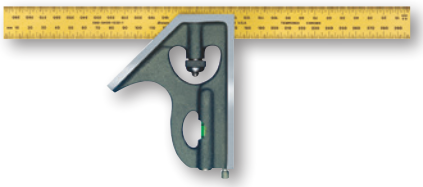
Hardened steel. Measuring faces specially treated against scratches

This angle protractor combination set can be used as a scale, depth gauge, try square, centering tool, marker or even as a spirit level.

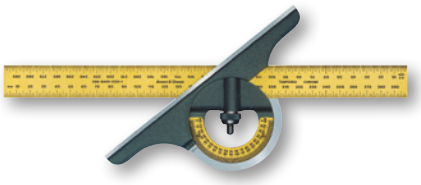


With centering square





With spirit level



With angle protractor 2x 90° graduations

No		Consisting of:
06719000	B&S angle protractor set with multiple combinations	– 1 Ruler graduated in millimetres, length 300 mm – 1 Angle protractor with 2 x 90° graduations – 1 Centering square – 1 Square head with scriber

Brown & Sharpe Sine Bar

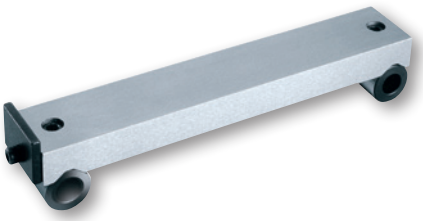
Suited for setting ranges from 0 to 60°

Sine function for establishing the angle that needs to be set on the basis of the length dimensions obtained from parallel gauge blocks.

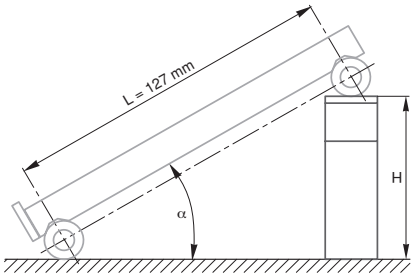
5 µm

Hardened alloy steel

Removable front stop



06769005



Example for the calculation of an angle

Given: H = height of combination gauge blocks in mm
L = length of B&S sine bar in mm

Formula: $H = L * \sin(\alpha)$
$\sin(\alpha) = H/L$
angle = arcsin (H/L)

Calculation for determining angle knowing H et L values:
angle = arcsin (89,803 / 127) = arcsin (0,70711) = 45°



No		L (centre distance), mm	mm
06769005	B&S Sine bar	127 ± 0,004	123 x 25

TESA TECHNOLOGY

Length and Angle Standards

PURCHASING GAUGE BLOCKS CALLS FOR CONFIDENCE

The high accuracy of TESA's gauge blocks is the result of years of experience in producing and making use of these products.

- *Use of high quality raw materials and appropriate heat treatment, thus guaranteeing a durable shape and dimensional stability of the gauge blocks over years.*
- *Very low deviations in flatness and parallelism of the measuring faces, resulting in highly accurate gauges.*
- *Unique flat lapping polish as well as edge rounding techniques, leading to superior wringability.*
- *Proper serial number marked on each gauge block.*

ISO 3650

Gauge blocks with metric nominal lengths conform to ISO 3650:1998. This international standard is based on the ones published either in a region, e.g. the European standard EN ISO 3650:1998 or in a country, e.g. the Swiss standard SN EN ISO 3650, German standard DIN EN ISO 3650 or French standard NF EN ISO 3650. Gauge blocks with imperial nominal lengths comply with BS 4311 - Part 1. Compared to earlier standards, ISO 3650:1998 includes the following main changes :

- *Withdrawal of the accuracy grade 00 (see "Which grade do you need").*
- *Introduction of requirements as regards the uncertainty of measurement in relation to the declaration of conformity of the product according to ISO 14253-1:1998.*
- *Review of some definitions and shortened form of terms according to normative references that are currently applicable (see drawing).*

WHICH MATERIAL DO YOU NEED?

Steel

Steel gauge blocks have proven their reliability for more than a hundred years. This raw material remains the most commonly accepted for length standards.

Steel gauge blocks provide high resistance to wear associated with a good property to adhere to other gauge blocks. However, steel must be protected against corrosion. Provided gauge blocks made from this material are properly handled, they will remain reliable for many years. TESA steel gauge blocks have the following key features:

- *Highly alloyed steel*
- *Hardness guaranteed to 800 HV*
- *Artificially aged for optimum form and dimensional stability*
- *Coefficient of thermal expansion: (11,5 ± 1,0) x 10^{-6} K^{-1}*

Tungsten Carbide

Gauge blocks in tungsten carbide are 10 times as resistant to wear as steel gauges. They are intended for frequent use, also where superior wringing quality is required. TESA tungsten carbide gauge blocks provide:

- *Hardness guaranteed to 1400 HV*
- *Coefficient of thermal expansion: (4,23 ± 0,1) x 10^{-6} K^{-1}*

Ceramic

Ceramic gauge blocks are extremely resistant to wear and scratches. Due to the properties of this material, any minor damage is unlikely to affect the wringability of their measuring faces. Being corrosion resistant, these gauge blocks are insensitive to "rusty hands", amongst other issues. Manufactured from stabilised zirconia, TESA ceramic gauge blocks have the following key features:

- *Non-magnetizable*
- *Hardness guaranteed to 1400 HV*
- *Coefficient of thermal expansion: (9,7 ± 0,8) x 10^{-6} K^{-1}*

WHICH GRADE DO YOU NEED?

Grade 2

*These gauge blocks are commonly used as **Working Standards** in inspection rooms within a manufacturing area to set and calibrate measuring instruments and other equipment as well as to inspect tools, fixtures and machines.*

Grade 1

*Gauge blocks of this class are mainly used as **Working Standards** to set and calibrate plug gauges and measuring instruments in measuring rooms or inspection areas within a manufacturing area.*

Tolerence Grade 0

*These gauge blocks are designated for use as **Company Standards** in calibration laboratories or environmentally controlled inspection rooms to set and calibrate plug gauges as well as measuring equipment.*

Calibration grade K

*Gauge blocks of this tolerance class are intended for use as **Reference Standards** in metrology oriented laboratories of National Institutes, precision measuring rooms and other laboratories of National Calibration Services, whether officially accredited or not.*

They should be used as masters to calibrate gauge blocks, length standards of same accuracy and also measuring instruments.

Precision Grade 00

The new standard ISO 3650 no longer takes this accuracy grade into consideration as the uncertainties of measurement achieved with the procedure applied for calibration usually lead to a disparity against specified tolerances.

The rules to the expression of uncertainty of measurement for proving the conformity or nonconformity of the product with the specification, as stated in the standard ISO 14253- 1:1998, have dictated the decision to withdraw the accuracy grade 00.

A wide experience in practical use of gauge blocks has proven that gauges of the calibration class K could easily replace those of the earlier accuracy grade 00.

As a result, gauge blocks of grade 00 are no longer available.

CERTIFICATE OF CALIBRATION AND TRACEABILITY.

All set compositions from TESA are supplied with a certificate of calibration issued by the accredited calibration laboratory of a national calibration service.

This service can either be the Swiss calibration service (SCS), British calibration service (UKAS) or Deutsche Akkreditierungsstelle (DAkkS) depending on the manufacturer.

Accreditation is the authenticated assurance of the skills of the calibration laboratories as well as of the full traceability to national standards that conform with the International System of Units (SI).

This is for any reference standard or measuring equipment being used.

Owing to a multilateral agreement (MLA), any certificates of calibration issued by the members of the European Cooperation for Accreditation of Laboratories (EA) is internationally accepted.

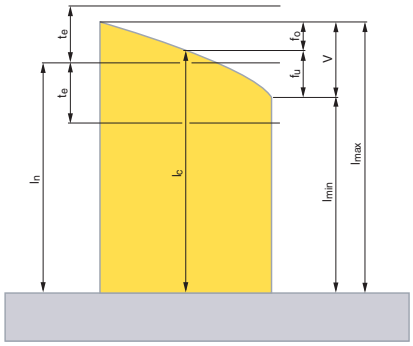
DELIVERIES

TESA gauge blocks can be delivered individually or in full sets with nominal lengths as listed in this section. Additional gauge sets and lengths can be made available upon request. Since individual gauge blocks could no be listed in their whole here, any inquiry or purchase order should specify :

- *Desired nominal length*
- *Chosen material*
- *Calibration grade or any other grade*

Limit Deviations and Tolerances

	Limit deviations t_e			
	Tolerances t_v			
	Flatness tolerances t_f			
Nomianl length	Calibration grades and other grades			
	K	0	1	2
	Flatness tolerance t_f			
mm	µm	µm	µm	µm
0,5 = l_n = 150	0,05	0,1	0,15	0,25
150 < l_n = 500	0,1	0,15	0,18	0,25
500 < l_n = 1000	0,15	0,18	0,2	0,25



Nominal length l_n; Central length l_c; Variation v with f_o and f_u; Limit deviations t_e at any point proceeding from the nominal length.

	Calibration grade K		Grade 0		Grade 1		Grade 2	
Nominal length	Limit deviation of length at any point from nominal length	Tolerance for the variation in length	Limit deviation of length at any point from nominal length	Tolerance for the variation in length	Limit deviation of length at any point from nominal length	Tolerance for the variation in length	Limit deviation of length at any point from nominal length	Tolerance for the variation in length
LIMIT DEVIATIONS AND TOLERANCES ACCORDING TO ISO 3650								
mm	± t_e µm	t_v µm	± t_e µm	t_v µm	± t_e µm	t_v µm	± t_e µm	t_v µm
0,5 = l_n ≤ 10	0,2	0,05	0,12	0,1	0,2	0,16	0,45	0,3
10 < l_n ≤ 25	0,3	0,05	0,14	0,1	0,3	0,16	0,6	0,3
25 < l_n ≤ 50	0,4	0,06	0,2	0,1	0,4	0,18	0,8	0,3
50 < l_n ≤ 75	0,5	0,06	0,25	0,12	0,5	0,18	1,0	0,35
75 < l_n ≤ 100	0,6	0,07	0,3	0,12	0,6	0,2	1,2	0,35
100 < l_n ≤ 150	0,8	0,08	0,4	0,14	0,8	0,2	1,6	0,4
150 < l_n ≤ 200	1,0	0,09	0,5	0,16	1,0	0,25	2,0	0,4
200 < l_n ≤ 250	1,2	0,1	0,6	0,16	1,2	0,25	2,4	0,45
250 < l_n ≤ 300	1,4	0,1	0,7	0,18	1,4	0,25	2,8	0,5
300 < l_n ≤ 400	1,8	0,12	0,9	0,2	1,8	0,3	3,6	0,5
400 < l_n ≤ 500	2,2	0,14	1,1	0,25	2,2	0,35	4,4	0,6
500 < l_n ≤ 600	2,6	0,16	1,3	0,25	2,6	0,40	5,0	0,7
600 < l_n ≤ 700	3,0	0,18	1,5	0,3	3,0	0,45	6,0	0,7
700 < l_n ≤ 850	3,4	0,2	1,7	0,3	3,4	0,5	6,5	0,8
800 < l_n ≤ 900	3,8	0,2	1,9	0,35	3,8	0,5	7,5	0,9
900 < l_n ≤ 1000	4,2	0,25	2,0	0,4	4,2	0,6	8,0	1,0
LIMIT DEVIATIONS AND TOLERANCES ACCORDING TO BS 4311, PART 1:1993								
in	± t_e µin	t_v µin	± t_e µin	t_v µin	± t_e µin	t_v µin	± t_e µin	t_v µin
l_n ≤ 0.4	5	2	5	4	10	6	20	12
0.4 < l_n ≤ 1	6	2	6	4	12	6	25	12
1 < l_n ≤ 1	8	3	8	4	15	7	30	12
2 < l_n ≤ 3	10	3	10	5	20	7	40	14
3 < l_n ≤ 4	12	3	12	5	25	8	50	14
LIMIT DEVIATIONS AND TOLERANCES ACCORDING TO FACTORY STANDARD FOR GAUGE BLOCKS OVER 4 IN								
in	± t_e µin	t_v µin	± t_e µin	t_v µin	± t_e µin	t_v µin	± t_e µin	t_v µin
4 < l_n ≤ 6	31	3	15	5	31	8	63	16
6 < l_n ≤ 8	40	3	20	6	40	10	79	16
8 < l_n ≤ 10	47	4	23	6	47	10	95	18
10 < l_n ≤ 12	55	4	28	7	55	10	110	20
12 < l_n ≤ 16	70	5	35	8	70	12	140	20
16 < l_n ≤ 20	87	5	43	10	87	14	174	24

GAUGE BLOCKS

Gauge Block Set M32, M47, M88, M112 and M122.

Nominal lengths 1 ÷ 100 mm in steel, carbide or ceramic.

Grades K, 0, 1 and 2 available in all sets. Steel gauges to all grades with DAkkS certificate. Carbide or ceramic gauges to all grades with UKAS certificate.

ISO 3650

Limit deviations t_e, see Table

Tolerances t_v, see Table

see Table

Steel: highly alloyed, wear resistant. Tungsten carbide: wear resistant and stable. Ceramic: stabilised zirconia, extremely resistant to wear and scratches

Steel: $(11,5 \pm 1,0) \times 10^{-6} K^{-1}$ Tungsten carbide: $(4,23 \pm 0,1) \times 10^{-6} K^{-1}$ Ceramic: $(9,7 \pm 0,8) \times 10^{-6} K^{-1}$

Steel gauges to all grades with DAkkS certificate. Carbide or ceramic gauges to all grades with UKAS certificate

TESA Gauge Block Set M32, Metric

		Grade
0651516027	Steel	K
0651515027	Steel	0
0651511027	Steel	1
0651512028	Steel	2

Set compositions

mm	Steps, mm	Pieces
1,005	–	1
1,01 ÷ 1,09	0,01	9
1,1 ÷ 1,9	0,1	9
1,0 ÷ 9,0	1,0	9
10, 20, 30, 60	–	4

TESA Gauge Block Set M47, Metric

		Grade
0651516021	Steel	K
0651515021	Steel	0
0651511021	Steel	1
0651512021	Steel	2

Set compositions

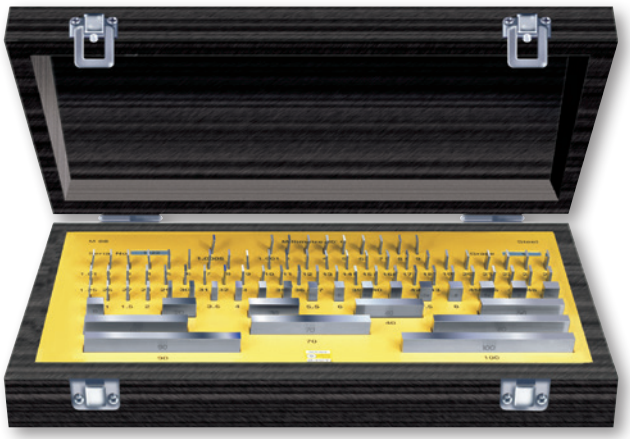
mm	Steps, mm	Pieces
1,005	–	1
1,01 ÷ 1,09	0,01	9
1,1 ÷ 1,9	0,1	9
1,0 ÷ 24,0	1,0	24
25 ÷ 100	25	4

TESA Gauge Block Set M88, Metric

		Grade
0651516014	Steel	K
0651515014	Steel	0
0651511014	Steel	1
0651512014	Steel	2

Set compositions

mm	Steps, mm	Pieces
1,0005	–	1
1,001 ÷ 1,009	0,001	9
1,01 ÷ 1,49	0,01	49
0,5 ÷ 9,5	0,5	19
10 ÷ 100	10	10



TESA Gauge Block Set M112, Metric

		Grade
0651516012	Steel	K
0651515012	Steel	0
0651511012	Steel	1
0651512012	Steel	2

Set compositions

mm	Steps, mm	Pieces
1,0005	–	1
1,001 ÷ 1,009	0,001	9
1,01 ÷ 1,49	0,01	49
0,5 ÷ 24,5	0,5	49
25 ÷ 100	25	4

TESA Gauge Block Set M122, Metric

		Grade
0651516011	Steel	K
0651515011	Steel	0
0651511011	Steel	1
0651512011	Steel	2

Set compositions

mm	Steps, mm	Pieces
1,0005	–	1
1,001 ÷ 1,009	0,001	9
1,01 ÷ 1,49	0,01	49
1,6 ÷ 1,9	0,1	4
0,5 ÷ 24,5	0,5	49
30 ÷ 100	10	8
25, 75	–	2



Special Versions

Available on request :

- Tungsten carbide gauge block set
- Ceramic gauge block set
- TESA maintenance kit

ISO 3650

Limit deviations t_s, see Table

Tolerances t_v, see Table

see Table

Steel: highly alloyed, wear resistant. Tungsten carbide: wear resistant and stable. Ceramic: stabilised zirconia, extremely resistant to wear and scratches

Steel: $(11,5 \pm 1,0) \times 10^{-6} K^{-1}$ Tungsten carbide: $(4,23 \pm 0,1) \times 10^{-6} K^{-1}$ Ceramic: $(9,7 \pm 0,8) \times 10^{-6} K^{-1}$

Steel gauges to all grades with DAkkS certificate. Carbide or ceramic gauges to all grades with UKAS certificate

Diameter and thickness as shown in table

Optical flats with 2 flat measuring faces. No guaranty can be given for parallelism.

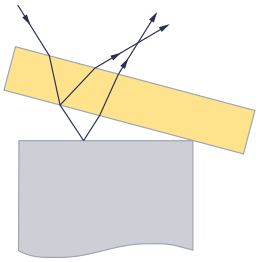
ACCESSORIES FOR GAUGE BLOCKS

The interference lenses allow visual inspection of the surface of the gauge blocks.

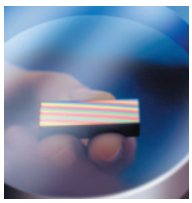
TESA Optical Flats

Used for examining flatness and adhesion of gauge blocks or any other test pieces having flat faces with same high grade of accuracy.





No	⌀ mm	Thickness, mm	µm
02530050	50	15	0,125
02530075	75	20	0,125



Light source: 35 W sodium lamp, 89% monochromatic, colour yellow, wavelength 0,575 µm

Surface plate: 0,5 µm

Surface plate: 2,5 µm

406 x 406 x 355 mm (W x D x H)

Surface plate in hardened steel

Case in lacquered wood

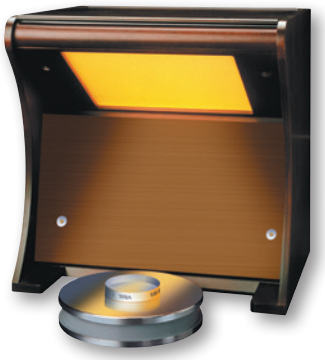
TESA Monochromatic Light Unit

For use with optical flats or optical parallels to measure both the flatness and parallelism of the measuring faces by interferometry.

Monochromatic light source providing high-contrast interference fringes.

This light unit uses a single wavelength so that bright/light fringes only are visible.

The light source at the rear of the case also permits a visual examination, e.g. with the aid of a knife-edge or bevelled straight edge.



No		V
0652500422	Universal monochromatic light	210 ÷ 230
STANDARD ACCESSORIES:		
0651570269	200 mm dia. surface plate, lapped and polished measuring face	
0652500424	Sodium light bulb (spare lamp)	

Brown & Sharpe Angle Gauges

For setting and calibration purposes – Smallest step to 15' (1/4°).



30"

Width:
6,35 mm (1/4 in)
Length:
≥ 76,2 mm (3 in)

Hardened steel

NO	=	Set Composition
06769002	Precision angle block set	15' / 30' / 1° / 2° / 3° / 4° / 5° / 10° / 15° / 20° / 25° / 30°

TESA TECHNOLOGY

Calibration Equipment





CONFIDENCE IS NOT ENOUGH...

The control of inspection and measuring equipment is an element of quality management that is now more important than ever before. The introduction of the ISO 9000 family of international standards has also led to major changes in this field. Amongst other things, ISO 9001 specifies that : "all inspection and measuring equipment than can affect product quality must be identified, calibrated and adjusted at prescribed intervals, or prior to use, against certified equipment having a known valid traceable relationship to internationally or nationally recognised standards".

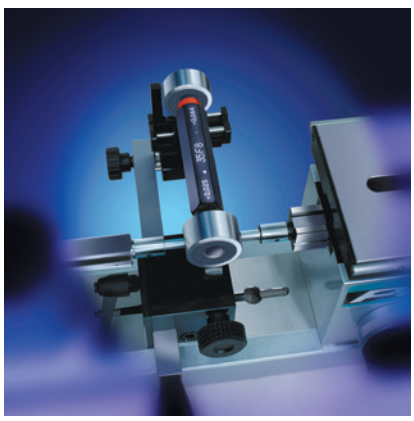
This standard also states that the supplier shall: "ensure that the inspection and measuring equipment is capable of the necessary accuracy and precision".

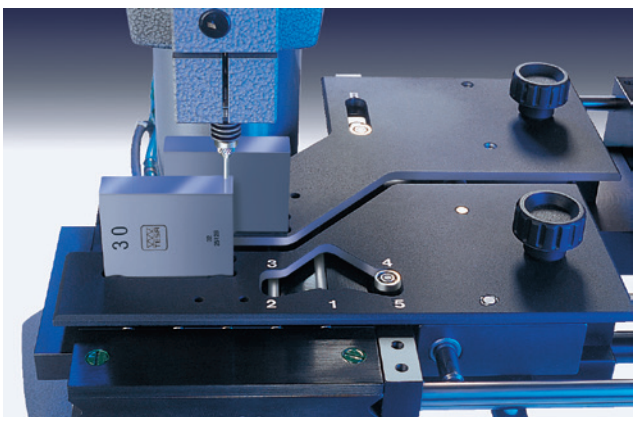
A Vast Choice

TESA can offer you the most varied methods of measurement specifically suited for the inspection and calibration of standards, handtools and plug gauges. Some of these are described in the various sections of this catalogue, in particular:

- *Gauge blocks*
- *Setting rings*
- *Cylindrical setting standards with outside diameters*
- *Optical flats*
- *Parallel optical flats*
- *Electronic levels for both straightness and flatness measurement*
- *Instruments for both squareness and perpendicularity measurement*
- *Calibration equipment for length measuring devices fitted with inductive probes.*

This section is devoted to measuring systems that serve to calibrate other inspection equipment, but they can also be used for high-accuracy measurement of precision parts.

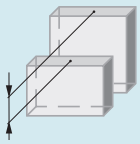
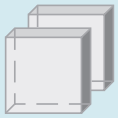




PRESENTATION OF TESA MEASURING GAGE BLOCKS

TESA offers two models, the operation of which is based on two different measurement procedures.

- TESA UPD directly measures gauge blocks within a measuring span of 25 mm/1 in.
- TESA UPC is used for comparative measurement of gauge blocks having a same nominal length.

TESA Gauge Block Comparators		UPD	UPC
Measuring procedures			
– Comparison of different nominal lengths up to 25 mm		●	
– Number of reference gauge blocks required for the calibration of a set of 122 pieces: 9 blocks		●	
– Number of blocks required for the calibration of the device: 9 blocks + 6 pairs		●	
Comparative measurement			
– Comparison of gauge blocks having the same nominal length		●	●
– Number of reference gauge blocks required for the calibration of a set of 122 pieces: 122 blocks		●	●
– Number of gauge blocks required for the calibration of the device: 6 pairs		●	●
Measuring errors			
Read also the explanations provided in this same chapter with regard to the measuring errors of each instrument			
Repeatability limit	0,015 µm	●	●
	0,025 µm		●
Measuring uncertainty	U = ± (0,05 + 0,5 · L) µm L in m	●	●
	U = ± (0,10 + 1,0 · L) µm		●
Range of application			
Nominal lengths	0,5 to 100 mm/0.02 to 4.0 in	●	●
	0,5 to 500 mm/0.02 to 20 in	▲	▲
Measuring range			
25 mm/1 in			●
Sensors for capturing length dimensions			
– 2 axial probes in sum measurement		●	●
– Digital measuring system, opto-electronic with incremental divisions		●	
– Analogue measuring system, electronic and inductive			●
– Activation of the measuring force			
• electro-motorised		●	
• by spring force			●
– Retraction of the measuring bolt			
• electro-motorised		●	
• by vacuum			●
Template system			
– Single template system		●	●
– Dual template system		●	❍
Positioning of gauge blocks with a nominal length of up up 10 mm		❍	❍
Suction loader with a an electric vacuum pump			
TESA UPT temperature measuring device		●	❍
Measurement of the electrical resistance using 4 thermal sensors (4 wire type)			
TESA software for processing the measured values		●	●
– TESA UP, WINDOWS 98, 2000, NT, XP, 7 (32 bits)			

▲ Available on request ❍ Recommended option

GAUGE BLOCK COMPARATORS

In the hierarchical chain of dimensional measurements that can be traced back to the standard metre length unit, gauge blocks hold a key position. This makes them the most important material references used in metrology.

The application of the length unit, based on specific wavelengths of light, to gauge blocks is achieved in the first instance by fundamental interferential measurement. Using gauge blocks measured by interferometry, defined lengths are thus transferred to other gauge blocks in measurements further down the hierarchical chain.

TESA UPD – for Direct and Comparative Measurements

- Direct measurement of gauge blocks with a variation in nominal length of up to 25 mm or 1 in.
  - Enables the number of reference gauge blocks required to be reduced by nearly 80 %.
- Comparative measurement of gauge blocks having a same nominal length.
  - Enables lower measurement uncertainties to be achieved due to weaker influences of the systematic errors.
- Equipped with HEIDENHAIN high-precision incremental probes.
- Templates with a new concept for positioning the gauge blocks.
  - Single or dual template system to provide optimum ease of handling of the gauge blocks
- Integrated device for most accurate temperature acquisition.
- On-line transfer of both measured length and temperature values.
- Computer-aided data processing with all the corrections necessary included.

Dual template system for the maintenance of your reference gauge blocks (TESA patented)

- The simultaneous use of two templates allows you to "rest up" your gauge blocks until you need them.
- The application of this new concept turns into significant savings in both time and money.
- During measurement cycles carried out on a routine basis, the distance travelled over the measuring table is reduced by nearly 70 %.
  - This contributes to significant reductions of the risks of damaging and wearing the measurement faces.
- The double protection of your reference gauge blocks leads to significant cost savings through the reduction if the need for:
  - recalibration
  - restoration of the measuring faces
  - replacement of worn or damaged gauge blocks
  - increased downtime (whilst extending the life of your reference gauge blocks)

Single Template System

- Using this system your reference gauge blocks are moved together with those to be calibrated during the measurement cycles.

EN ISO 3650 (ASME B89.1.9-2002 on request)

For gauge blocks with nominal lengths from 0,5 mm to 100 mm / 0.02 in to 4 in (0,5 to 500 mm on request)

Measuring configuration
Two probes with mechanical contact with the measuring face to be probed are connected in sum measurement (function +A+B).

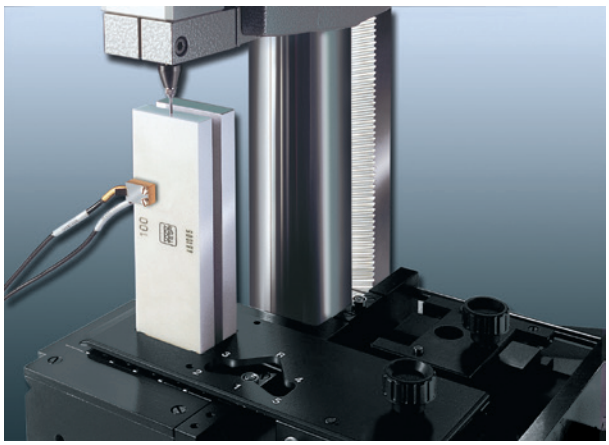
Measuring points
On the reference gauge block: at the centre of the measuring face (point R). On the gauge block to be measured: at the centre (point 1) as well as the four corners of the measuring face, each lying 2 mm away from the adjacent faces (points 2 to 5).

The central length l_c is determined by probing both points R and 1. For establishing lengths at any point, the measurements shall be carried out at points R plus 1 to 5.

The variation in length v is obtained from measurements taken at points 1 to 5.

Calibration certificate from the supplier for the comparator or the Swiss Calibration Service for the temperature device.

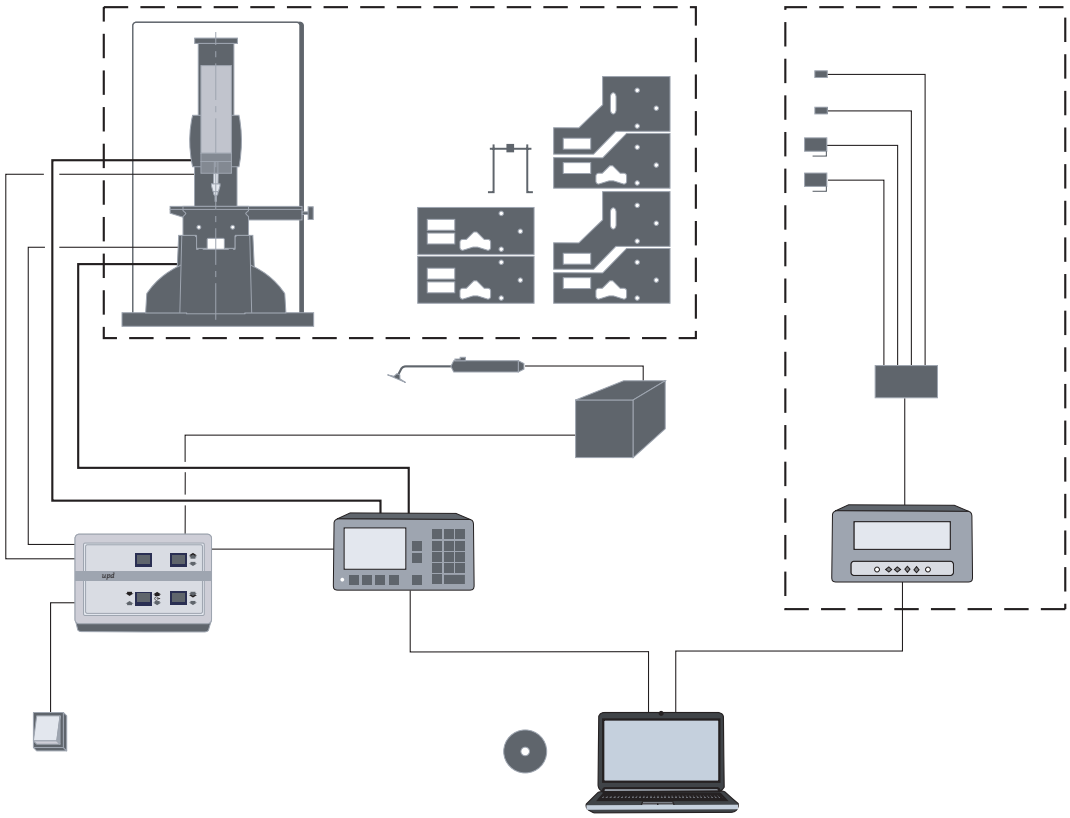




2 different delivery programs

05930005	TESA UPD gauge block comparator with temperature device*		●
05930004	TESA UPD gauge block comparator without temperature device	●	
CONSISTENT OF:			
05930008	TESA UPD mechanical part	●	●
05960016	HEIDENHAIN computing counter ND 287 featuring 2 probe inputs	●	●
05960013	Control panel	●	●
05960014	Connecting cable for control panel to ND 287 computing counter	●	●
04768001	Foot switch	●	●
01660011	Suction loader		●
03260433	Electrical vacuum pump with external control, 230 VAC, 50 Hz		●
05960028	Connecting cable for electronic vacuum pump to control panel		●
05930011	TESA UPT temperature device, complete		●

Other delivery program available on request
* Special execution for 110 VAC, 60 Hz also available on request (ref. S32070030 instead of 03260433)



Errors of Measurement
Provided all metrological conditions are met, the reliability of the comparator used for direct measurement of steel gauge blocks is expressed as follows:

Repeatability limit (with no influence of external temperature): 0,015 µm

Uncertainty of measurement: U = ± (0,05 + 0,5 · L) µm (L in m)

Condition requires the use of reference standards whose measurement uncertainty is equal to:
U ≤ ± 0,015 µm for the comparator
U ≤ ± (0,02 + 0,2·L) µm (L in m) for the gauge blocks

TESA UPC – for Comparative Measurement

TESA UPC Gauge Block Comparator for Comparative Measurement

- Measures gauge blocks of same nominal length by comparison.
- Comes with the new template system for positioning the gauge blocks.
- Single or dual template system for optimum ease of gauge handling.
- Features TESA high-precision inductive probes.
- Allows ultra-precise temperature measurement, integrated.
- Transfers on-line all measured length and temperature values.
- Executes computer-aided data processing with all required correction values included.
- Performs calibrations that meet the requirements of both ISO standards and EA guidelines (EAL – European cooperation for Accreditation of Laboratories).
- Includes an execution for greater accuracy along with a calibration certificate (optional).



TESA UPC is specially designed for the calibration – or dimensional inspection – of gauge blocks with nominal lenghts ranging from 0,5 to 100 mm. The configuration, which consists of two probes aligned opposite one another, associated with both the concept and quality of the measuring system provides full guarantee for an extra low uncertainty of measurement. Although TESA UPC is mainly intended for manufacturers and end-users of gauge blocks, this comparator is also widely used in nationally accredited laboratories.



If specified, TESA can also provide the temperature device available as an option. This device has 4 PT100 platinum resistances, each capturing the temperature of the two gauge blocks along with that of both the measuring table and the support. Computer-aided data processing lets you carry out any calibration most reliably and rationally – for sure.

EN ISO 3650

For gauge blocks ranging from 0,5 mm to 100 mm or 0.02 in to 4 in (0,5 to 500 mm on request)

Comparative measurement procedure with transference of the length of a reference gauge block to the gauge block being measured.

Measuring configuration
2 probes connected in sum measurement (function +A+B) with mechanical contact with the measuring face.

Measuring points
On the reference gauge block: at the centre of the measuring face (point R). On the gauge block to be measured: at the centre (point 1) as well as the 4 corners of the measuring face, each lying 2 mm away from the adjacent faces (points 2 to 5).

Central length l_c is defined by probing both points R and 1.

Establishing lengths at any point requires measurements to be taken at points R plus 1 to 5.

Variation in length v is the result of measurements taken at points 1 to 5.

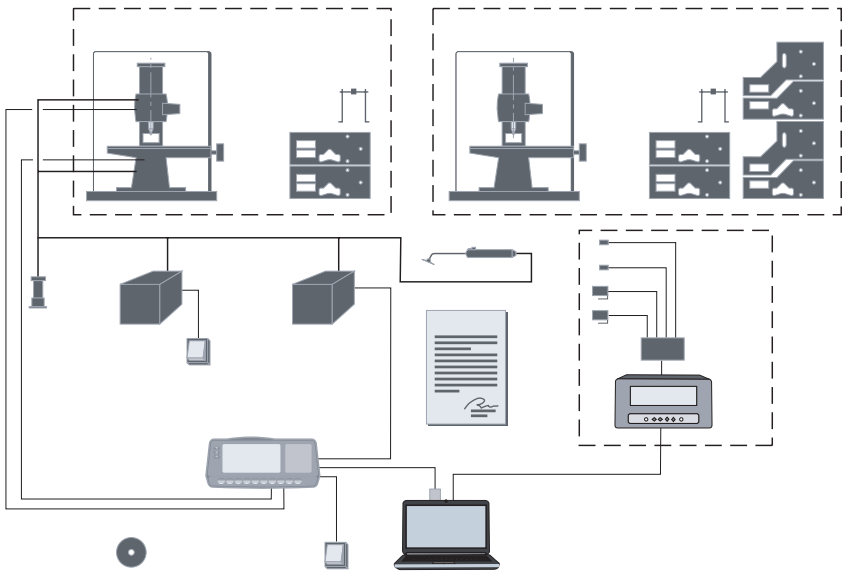
≈ 23 kg (comparator complete, but without computer).
≈ 4 kg (temperature device)

All instruments with the option for greater accuracy are delivered with serial numbers

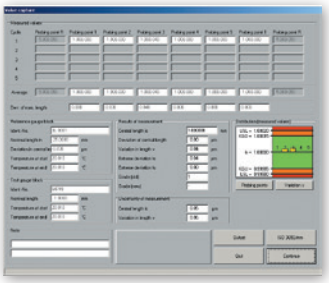
In-house calibration certificate for the version with greater accuracy or declaration of conformity for the standard version. Temperature device with SCS certificate.

NO					
TESA UPC GAUGE BLOCK COMPARATOR EQUIPPED WITH SINGLE TEMPLATE SYSTEM					
05930000	Standard execution without computer application				●
05930003	Execution for greater accuracy, with computer application			●	
TESA UPC GAUGE BLOCK COMPARATOR EQUIPPED WITH SINGLE AND DUAL TEMPLATE SYSTEM					
05930013	Execution for greater accuracy without computer application		●		
05930015	Execution for greater accuracy, with computer application	●			
EACH VERSION CONSISTS OF:					
01610401	TESA UPC mechanical part equipped with the single template system			●	●
05960030	TESA UPC mechanical part equipped with both single and dual template system	●	●		
03260401	Pneumatic retraction of the measuring bolt, manually operated				●
03260432	Electric vacuum pump with foot switch		●		
03260433	Electric vacuum pump with external control	●		●	
01660011	Pneumatic suction loader	●	●	●	
04430012	TESATRONIC electronic unit TT90	●	●	●	●
05960039	Set of TESA UPC accessories, including the components 04761049, 04760087 and 04761070				
04761049	Opto-RS cable, bidirectional	●		●	
04760087	Opto-RS interface	●		●	
04761070	Connecting cable TESATRONIC TT90 to vacuum pump	●		●	
04768000	Hand switch	●		●	
01690021	Option for greater accuracy with calibration certificate	●	●	●	

Error of Measurement	
Provided all the metrological conditions are met, the reliability of the two standard executions No. 05930000 and 05930002 is expressed as follows:	Provided all the metrological conditions are met, the reliability of both executions No. 05930001 and 05930003 along with the option for greater accuracy (No. 01690021) is expressed as follows:
Repeatability limit (with no effect due to external temperature): 0,025 µm	Repeatability limit (with no effect due to external temperature): 0,015 µm
Measurement uncertainty* U = ± (0,10 + 1,0 · L) µm (L in m)	Measurement uncertainty* U = ± (0,05 + 0,5 · L) µm (L in m)
Condition involves the use of reference standards (see page L-14 and L-15) whose uncertainty is as follows: U ≤ ± 0,030 µm when calibrating the comparator U ≤ ± (0,05 + 0,5 · L) µm (L in m) when calibrating the gauge blocks	Condition involves the use of reference standards (see page L-14 and L-15) whose uncertainty is as follows: U ≤ ± 0,015 µm when calibrating the comparator U ≤ ± (0,02 + 0,2 · L) µm (L in m) when calibrating the gauge blocks
* Applicable to steel gauge blocks	



TESA UP – Software Programme for Value Processing



TESA UP programme for processing measured values suitable for both TESA gauge block comparators UPD and UPC as well as for comparators from other manufacturers.

- Choice of 10 languages.
- On-line processing of length and temperature values as transferred.
- Measurement cycles and result outputs according to EN ISO 3650.
- Flexible architecture for optimum adaptation to specific user's needs.
- Possible entry of limit values and accuracy grades peculiar to users.
- Surveillance of value dispersion or value drift throughout length and temperature measurements.
- Automatic execution of all relevant corrections. The programme makes allowances for actual sizes of the reference standards, flattening due to different materials used (steel, tungsten carbide, ceramic), compensation of temperature variations with reference to 20°C according to the varying coefficients of linear expansion – as typical examples.
- Assignment of gauge blocks to their relevant grade.
- Possible storage of gauge block set related data.
- Inch or metric value processing.
- Calibration certificate in several formats.

EN ISO 3650

Minimum profile requirements for the computer needed to run the TESA UP software programme Personal Computer
- Configuration without heat source to avoid disturbing the ambient temperature at the measurement spot
- Operating system: Windows 7 or earlier versions (32 bits)
- Processor: 650 MHz
- 1 Hard disc (6 GB)
- RAM capacity: 64 MB
- CD-ROM drive (24x)
- RS232 serial port 1 for length values 1 for temperature values
- 3 USB ports

NO		
05960025	TESA UP software programme for gauge block calibration	1 CD-ROM plus 1 USB key of protection

Gauge Blocks for the Calibration of Comparators

To calibrate both TESA gauge block comparators UPD and UPC, we recommend the use of the gauge block set described hereafter. The 9-piece set is alsoy required for calibrating TESA UPD.

Set composition including 11 steel gauge blocks, class K

Each pair is in full compliance with:

- EAL-G21 – Calibration of gauge block comparators – European cooperation for Accreditation of Laboratories
- DKD-R 4-1 – Guidelines of the German Calibration Service (DKD) for the calibration of gauge block comparators.

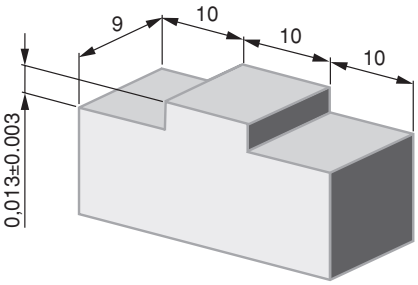
EN ISO 3650

Special high-alloy steel, wear resistant and stable.Exception: 6 mm special carbide gauge blocks.

The given expanded uncertainty k = 3 refers to the difference of central length of both gauge blocks A and B forming the pairs 1 to 5 as well as to the deviations f_o and f_u from the central length of gauge blocks forming both pairs 2 and 3. No need to calibrate those of pair No. 6.

NO		µm
S59110152	Set of 11 gauge blocks with PTB (Physikalisch Technische Budesanstalt) certificate	± 0,015
S59110489	Set of 11 gauge blocks with DAkkS certificate	± 0,030

Full tungsten carbide set also available on request



NO			
Pairs N°	Nominal length A mm	B mm	
1	0,5	0,5	
2	1,0	1,005	
3	1,0	1,01	
4	4,5	4,5	
5	100,0	100,0	
6	6,0	6,0 *	

* Special bridge-shaped gauge blocks (see drawing) used for establishing the measuring deviations of lower probe B.

EN ISO 3650

Special high-alloy steel wear resistant and stable

For calibration certificates, see opposite

Expanded uncertainty k = 2 is valid for that given

Additional Gauge Block Set for Calibration of the TESA UPD System

In order to achieve the lowest uncertainty of measurement, we recommend the use of grade K gauge blocks which have been measured directly by interferometry and are supplied with a calibration certificate, irrespective of any other requirement such as the ambient conditions.

NO		
S59300103	Set 9 gauge blocks with METAS certificate (Swiss)	± 0,02 + 0,2 · L µm (L in m)
S59300107	Set 9 gauge blocks with PTB certificate (Germany)	± 0,02 + 0,2 · L µm (L in m)
S59300104	Set 9 gauge blocks with SCS certificate	± 0,05 + 0,5 · L µm (L in m)

	Set composition (mm) 1 / 5 / 10 / 15 / 20 / 25 / 50 / 75 / 100
	Steel
	Accuracy grade K

Other set composition or carbide gauge blocks also available on request.

TESA UPT

Fully calibrated for the measuring ranges from 19°C up to 24°C with a numerical interval to 0,001°C.

Supplied with a calibration certificate issued by the Swiss Calibration Service (SCS). Uncertainty of measurement achieved during calibration U = ± 0,03°C.

NO	
05930011	Temperature measurement device
CONSISTING OF:	
05960018	Set of 4 temperature sensors PT 100
05960038	Meausring unit for temperature, FLUKE 1529
05960012	Interface Box 4 x PT 100
05960011	Connecting cable for adapter No. 05960012 to measuring unit No. 05960038
05960026	Connecting cable from UPC to computer (9-pin/m and 9-pin/f connector)

ETALON POLO HORIZONTAL MEASURING BENCH

A giant for small sizes – Specially designed for the control of measuring and test equipment in compliance with ISO 9000.

- Application range from 0 up to 100 mm for external dimensions of 2,5 up to 110 mm for internal dimensions – 50 mm measuring span.
- Resolution to 0,001 or 0,0001 mm – Metric/Inch conversion.
- Maximum permissible error of 0,5 µm.
- Measuring force from 0 to 4 N.
- Comes with a calibration certificate issued by the supplier.





Calibration of Standards:

- Cyllindrical test pins
- Setting standards with cylindrical, plane-parallel measuring faces
- Threaded reference gauges (calibrated using the 3-wire method)
- Setting masters
- Setting rings

Calibration of Plus Gauges:

- Limit plug gauges
- Plug gauges "GO"
- Plug gauges "NO GO"
- Plain plug gauges
- Ring gauges "GO"
- Ring gauges "NO GO"
- Threaded plug gauges

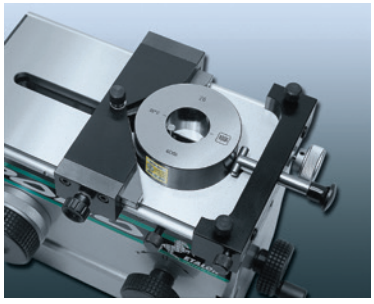
Workpiece Inspection:

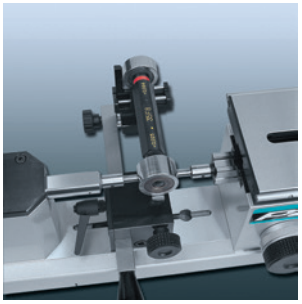
External dimensions

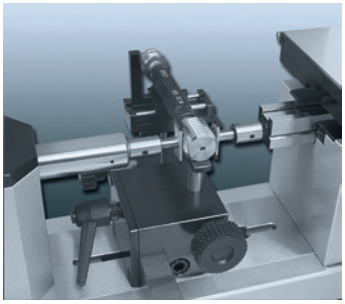
- Stepped shafts
- Cutting tools
- Cylindrical pins
- Ball tips
- Grooves
- Short centring shoulders
- Threads (measured according to the 3-wires method)

Internal dimensions

- Through bores
- Blind bores
- Centring grooves
- Slots
- Sliding guides







Max. perm. error within the measuring span: 0,5 µm with standard accessories

0,1 µm

Opto-electronic measuring system with incremental glass scale, type LIF – HEIDENHAIN

Tilting range of the floating table ± 0,5°

EN 50081-1
EN 50082-2
EN 61000-4-2
EN 61000-4-4

Setting 0 to 4 N

50 mm measuring span

19 kg net (main part alone, without table). Floating table: 2,8 kg net

8,0 • 10^{-6}/°C

- 0 to 100 mm for external dimensions
- 10 to 110 mm with standard accessories
- 2,5 to 110 mm with optional accessories

ETALON POLO with Floating Resting Table

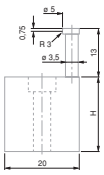
Calibration of measuring instruments

- Dial Gauges
- Lever Dial Test Indicators
- Electronic transducers

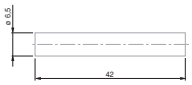


05939001	ETALON POLO measuring bench with floating table and electronic computing counter
CONSISTING OF:	
05919002	Main part
05969024	1 pair of inserts for external dimensions
05969015	Floating measuring table
05969029	HEIDENHAIN computing counter ND 287
DELIVERED WITH THE FOLLOWING ACCESSORIES:	
05969020	1 Pair of standard inserts for internal dimensions from 10 mm
05969030	Protective cover

Pair of Standard Measuring Inserts for External and Internal Dimensions from 10 mm



05969020

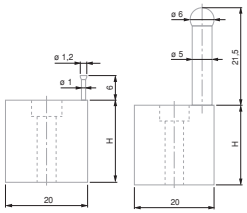


05969024

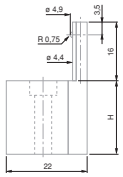
NO	=	Description
05969020	1 Pair of standard inserts for internal dimensions from 10 mm	To be used with floating table N° 05960015, H = 20 mm
05969024	1 pair of inserts for external dimensions	6,5mm Ø carbide inserts with a flat face

Measuring Inserts for Internal Measurement used with the Floating Resting Table

Height H = 20 mm. M4 locking screw.



05969021 05969022



05969023

NO	=	Description
05969021	Internal measuring inserts from 2,5 mm	Barrel-shaped inserts with a 1,2 mm dia. carbide ball tip.
05969022	Internal measuring inserts from 13 mm	Fitted with a 6 mm dia. carbide ball tip.
05969023	Internal measuring inserts from 5 mm	Fitted with a 1,5 mm dia. carbide ball tip.

Bench Stand with Swivelling Plate



For raising the measuring bench form horizontal to vertical position. Accomodates a clamp lever. Length (upright): 295 mm, mass ≈ 20 kg.

NO	=
05969000	Bench stand with swivelling plate

Base for the Computing Counter



Base for raising up the HEIDENHAIN ND 287 counting unit, height 380 mm, weight 5,2 kg.

NO	=
05969001	Stand for computing counter

Floating Resting Table

Used for external measurement on oblong parts up to 60 mm in diameter; centres, L=160 mm; movable positioning fixture for parts having varying lengths, 3 freedom degrees.



NO	=
05969032	Resting table without vise
05969033	Vise for plug gauges
05969034	Floating table

Stands for Checking External Dimensions



NO	=
05969007	Ø 3 mm stand for external Ø
05969008	Ø 6 mm stand for external Ø

Stand with Ø 10 mm Fixing Bores

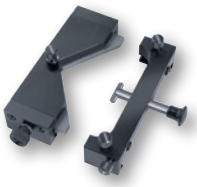
For H-shaped table (05969003) and for control system for lever-type indicator (05969004)



NO	
05969002	Stand with Ø 10 mm bore for 05969003 and 05969004

Centering Device

Allows the user to search for the transverse culmination point against the measuring direction. Used with either the fixed or floating table No. 05969014 or 05969015. Prismatic stop adjustable transversely, max. diameter 110 mm. Counter pressure piece finished with cylindrical stop pins.



NO	
05969012	Centering device for culmination point

Fixing Shank

For clamping the instruments that need to be calibrated such as dial gauges or precision indicators etc.



059690010

NO	
05969010	For fixing shafts with a Ø 8 mm
05969011	For fixing shafts with a Ø 3/8 in

Holder for a Dial Test Indicator (Lever-type)

Provided with 2 dovetail clamps, TESATAST-type or in compliance with BS 2795:1981



NO	
05969004	Holding device for test indicator

Spindle for Calibrating Dial Gauges, Dial Test Indicators and such like

Setting range = 50 mm, Spindle rotation = 0,5 mm



NO	
05969009	Spindle for calibrating dial gauges, dial test indicators and such like



Surface Roughness Testing





THE ROUGHNESS PARAMETERS MOST COMMONLY USED ARE: RA, RZ AND RMAX

TESA RUGOSOFT and MEASUREMENT STUDIO Software

These software tools allow the storage of surface roughness measurements along with roughness parameters and roughness profile. A measuring programme created in the software can be transferred to the instrument together with measuring parameters. The results are available at all times, complete with statistcal analysis and can be exported for reports, for example.

Mean roughness Ra (ISO 4287, DIN 4768)

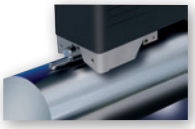
The mean roughness Ra matches the arithmetical mean of the absolute values related to the profile deviation y within the reference length l.

Max. profile valley depth Rmax (DIN 4768)

The max. profile valley depth Rmax is for the most significant single roughness depth Zi within the total length lm.
According to ISO 4288 and DIN 4287 - Part 1, this parameter is also specified as Ry max.

Mean roughness depth Rz DIN (DIN 4768)

The mean roughness depth Rz is the arithmetical mean of single roughness depths of successive sampling lengths le. According to ISO 4287 and DIN 4762, the parameter Rz DIN is also specified as Ry5.
Since Rz changes its name in both DIN 4768 and ISO 4287, this parameter is also specified as Rz DIN or Rz ISO. If the parameter Rz is measured according to DIN, it is generally admitted that the extreme value specified by ISO is matched providing that Rz ISO does not exceed Rz DIN.

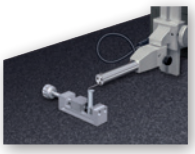


Use of Roughness Comparison Specimens

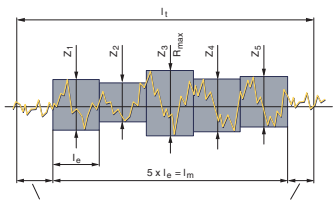
These specimens are used for testing any surface finish quality and have long proven their value in practice.
They are used for touch and/or sight comparisons against the surface of work pieces that are produced using the same manufacturing process. The condition is that materials have to be comparable.
When comparing the workpiece surface against the specimen, roughness is not quantitatively expressed. The assessment of the extent to which the surface finish of both is alike can only be subjective.
Sight comparison requires optimum light source angle. For small surfaces, the use of a magnifying glass with up to 8x magnification is recommended.
Touch comparison is made using the finger tip or a small copper piece such as a coin, for instance.

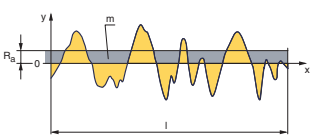


RUGOSURF 20



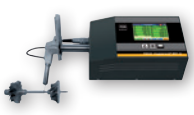
RUGOSURF 90G in profile measuring mode with PROFILE SET 2 mm







RUGOSURF 20 with dot matrix printer



RUGOSURF 90G

RUGOSURF 20, RUGOSURF 10G, RUGOSURF 90G ROUGHNESS GAUGES

TESA offers a range of 3 portable RUGOSURF roughness gauges adapted for different levels of precision from the production floor to the test laboratory.
These devices are particularly appreciated by operators for their ease of use, robustness and reliability.

The range includes data management software to process measured values for an optimal overview of roughness profiles, statistical data and customizable measurement reports.



RUGOSURF 20



RUGOSURF 10G



RUGOSURF 90G

TESA RUGOSURF 20

Portable roughness gauge, robust and versatile.
Well suited for production environments or inspection of inward goods.

ISO 3274 (Cl.1)

122 x 60 x 62 mm (without probe)

USB

650 g

Measures roughness parameters according to:
- ISO 4287
- JIS B0601
- DIN and ISO 12085 (MOTIF or CNOMO).

Measuring range in the Z-axis of 400 µm (6300 µin).
15 roughness parameters.
Each parameter can be activated individually or not.
Possible tolerancing of parameter values.



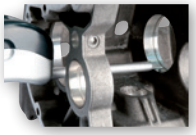
Scope of supply

Direct display:
- of all measured values, with tolerance levels diplay,
- of R roughness profile,
- the Bearing Area Curve (BAC),
- the Amplitude Distribution Curve (ADC).



With a measuring stand with suction base

2" Black&White LCD screen, high contrast for optimum visual representation.
Flexible autonomy through mains adapter or battery pack.
Storage of the measured parameters.
Multilingual menu options.
USB cable connection (optional).
Direct printing to a dot matrix printer (optional).
Measurement transfer, database creation and reporting available using TESA RUGOSOFT software tool (optional).
Access to narrow and hard to reach locations possible through 100 mm probe extension (optional).



Measurement of narrow hard to reach crevices thanks to the 100 mm probe extension



With vertical positioning support





Description:
1. Start / Measure
2. Probe protection
3. LCD 2" screen
4. Enter key
5. Defilement key
6. Return key / Measurement parameters
7. ON/OFF Switch
8. Batter charger connector
9. USB Connector for PC
10. Printer connector

	06930013
	TESA RUGOSURF 20 portable surface roughness tester for use in the workshop Z = ± 200 µm (± 0.0079 in) X = 16 mm (0.63 in)
Measuring span, µm	400 µm (0.0157 in) on Z axis, 16 mm (0.63 in) on X axis
Indication span, µm	Ra = 0 ÷ 100 µm; Rt = 0,05 ÷ 400 µm
Accuracy class	in accordance with ISO 3274 Class 1
Measuring force, N	0,75 mN in accordance with ISO 3274
Resolution, µm	0,001 µm
Display	LCD 2" black/white (160 x 100 pixels)
Roughness parameters	DIN / ISO / JIS / ASME: Ra, Rq, Rt, Rc, RSm, RPc Rmr, Rz, Rmax PPc, Pmr MOTIF ISO 12085 (CNOMO): Pt, R, Rx, AR
Graphics	Bearing Area Curve (BAC), Amplitude Distribution Curve (ADC), Profile-R
Cut-off lenght, mm	0,25 – 0,80 – 2,50 mm (0.010 – 0.030 – 0.100 in)
Number of cut-off	1 to 5
Stylus diamond tip (R = µm; angle °)	R = 5 µm, 90°
Memory capacity	max 1000 measurements with parameters; max 20 mesurements with profile and graphics
Dimensions, mm	122 x 60 x 62 mm
Degree of protection for keyboard (IP XX)	IP67 (membrane keyboard)
Digital data output (USB)	USB cable connector to PC
Weight, g	650 g
Included in delivery	RUGOSURF 20 SB10 standard skid probe Roughness standard Ra = 2,97 µm Positioning pin Ø 8 mm for use vertically Detachable probe protector Integral rechargeable battery Charger and adapter EU/US User manual Plastic carrying and storage case
Measuring response time	1 to 10 s
Probing speed, mm/s	1 mm/s (2 mm/s probe retract to measuring position)
Units	mm or inch
Power supply	100 ÷ 240 VAC; 50 ÷ 60 Hz; 12 V, 400 ÷ 650 mAh

OPTIONAL ACCESSORIES:	
04760099	Cable RUGOSURF 20 to PC
06960033	Printer for RUGOSURF + cables
06960034	RUGOSOFT Software + Dongle
06960035	Granite 400 x 250 mm with vertical support H150 mm, 25 kg, Grade 0 for Rugosurf 20 and 10G
06960081	Probe SB10 2µm for RUGOSURF 20 and 10G as SB10 but R = 2 µm
06960037	SB20 probe for RUGOSURF 20 et 10G for grooves of depth < 5 mm
06960038	SB30 probe for RUGOSURF 20 and 10G for small bores of Ø > 4 mm
06960039	SB40 Probe for RUGOSURF 20 and 10G V-shape for cylinders of Ø > 1 mm
06960040	SB50 probe for RUGOSURF 20 and 10G for concave surfaces and for measuring at 90° with RUGOSURF 10G
06960057	SB110 probe for RUGOSURF 20 and 10G for concave or convex surfaces, R > 5 mm
06960056	100 mm extension for probe with skid for RUGOSURF 20, 10G, 90G
06960064	Roughness standard Ra = 0,1 µm (4 µin)
06960065	Roughness standard Ra = 0,5 µm (20 µin)
06960066	Roughness standard Ra = 1,0 µm (40 µin)

STANDARD ACCESSORIES:	
06960036	SB10 standard probe for RUGOSURF 20 and 10G R = 5 µm, 90°
06960041	Roughness standard Ra = 2,97 µm (117 µin)
06960045	Battery NiMH 7,2 V, 300 mAh, format PP3 for RUGOSURF 20 et 10G
057655	Vertical and adjustable positioning supports (2 parts) V-form for cylinder Ø > 100 mm for RUGOSURF 20
057941	Transport case with internal protection foam for RUGOSURF 20

ISO 3274 (Cl.1)

122 x 53 x 75 mm (without probe)

USB

590 g

TESA RUGOSURF 10G

Portable, versatile gauge unit with compact design, well suited for use in goods inwards inspection, production or the measurement laboratory.

3 horizontal measuring positions of probe 0°, -90° et +90°.

Measures roughness parameters according to standards:

- ISO 4287
- JIS B0601
- DIN and ISO 12085 (MOTIF or CNOMO).

TFT 2" graphic display for optimum visual representation of any measured parameters and workpiece profiles.

Direct displaying of all measured values and computed profiles.

31 roughness parameters available.

Flexible autonomy through mains adapter or battery pack.

Data storage, printing or transfer to a PC of a maximum of 999 measured results.

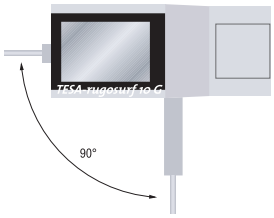
Possible tolerancing of all parameter values.

Multilingual menu options.

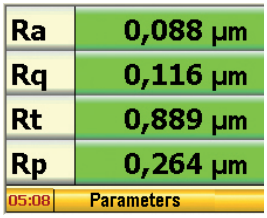
USB data output enabling a direct connection to a matrix printer unit or a PC equipped with RUGOSOFT 10 software (both are optional).



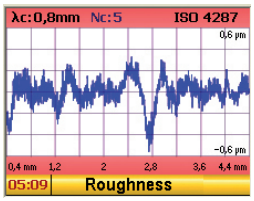




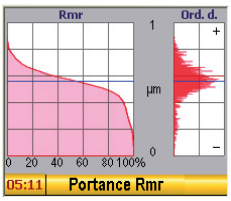
Probe measuring positions at -90°, 0°, +90°



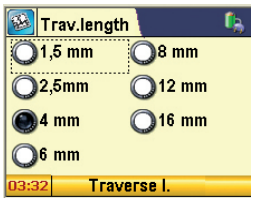
Measuring results



Profile measurement



Bearing area cruve (BAC) and amplitude distribution curve (ADC)

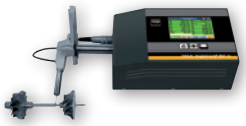


Measuring travel

NO	**06930011**
	TESA RUGOSURF 10G portable surface roughness tester for use in the workshop Z = ± 200 µm (± 0.0079 in) X = 16 mm (0.63 in) 3 probe measuring positions
Measuring span, µm	400 µm (6300 µin) on Z axis, 16 mm (0.63 in) on X axis
Display span, µm	Ra = 0 ÷ 100 µm; Rt = 0,05 ÷ 400 µm
Precision class	in accordance with ISO 3274 Class 1
Measuring force, N	0,75 mN (in accordance with ISO 3274)
Resolution, µm	0,001 µm (0.1 µin)
Display	TFT 2" colour graphic screen
Roughness parameters	DIN / ISO / JIS / ASME: Ra, Rq, Rt, Rp, Rc, Rv, RSm, Rδc, RPc Pa, Pq, Pt, Pp, Pc, Pv, PSm, Pδc, PPc Rmr, Rz, Rmax Rk, Rpk, Rvk, Mr1, Mr2 DB N 31007: R3z, R3zm MOTIF ISO 12085 (CNOMO): Pt, R, Rx, AR
Graphics	Bearing area curve, profil-R, profil-P
Cut-off length, mm	0,25 – 0,80 – 2,50 mm (0.01 – 0.03 – 0.10 inch)
Number of cut-off	1 to 10 for a cut-off of 0,25 and 0,8 mm
Diamond point of stylus (R = µm; angle °)	R = 5 µm, 90°
Built-in memory	Max. 1000 parameters; max. 20 measurements with parameters, profiles and graphics
Dimensions, mm	122 x 53 x 81 mm
Degree of protection of keyboard (IP XX)	IP67
Digital output (USB)	USB cable connector to PC
Weight, g	590 g
Included in delivery	RUGOSURF 10G Roughness standard Ra = 2,97 µm Built in rechargeable battery SB10 standard probe Battery charger EU and US Adaptor Positionng clamp for stand Ø 8 mm Vertical positoning stand User instructions
Probing speed, mm/s	1 mm/s
Units	mm or inch
Power supply	100 ÷ 240 VAC; 50 ÷ 60 Hz, 12 V, 400 ÷ 650 mAH

OPTIONAL ACCESSORIES:	
06960062	Cable RUGOSURF 10G and RUGOSURF 90G to PC (connector v3)
06960033	Printer for RUGOSURF + cables
06960034	RUGOSOFT Software + Dongle
06960035	Granite 400x250 mm with vertical support H 150 mm, 25 kg, Grade 0 for Rugosurf 20 and 10G
06960081	Probe SB10 2µm for RUGOSURF 20 and 10G as SB10 but R = 2 µm
06960037	SB20 probe for RUGOSURF 20 et 10G for grooves of depth < 5 mm
06960038	SB30 probe for RUGOSURF 20 and 10G for small bores of Ø > 4 mm
06960039	SB40 Probe for RUGOSURF 20 and 10G V-shape for cylinders of Ø > 1 mm
06960040	SB50 probe for RUGOSURF 20 and 10G for concave surfaces and for measuring at 90° with RUGOSURF 10G
06960057	SB110 probe for RUGOSURF 20 and 10G for concave or convex surfaces, R > 5 mm
06960056	100 mm extension for probe with skid for RUGOSURF 20, 10G, 90G
06960064	Roughness standard Ra = 0,1 µm (4 µin)
06960065	Roughness standard Ra = 0,5 µm (20 µin)
06960066	Roughness standard Ra = 1,0 µm (40 µin)

STANDARD ACCESSORIES:	
06960036	SB10 standard probe for RUGOSURF 20 and 10G R = 5 µm, 90°
06960041	Roughness standard Ra = 2,97 µm (117 µin)
06960045	Battery NiMH 7,2 V, 300 mAh, format PP3 for RUGOSURF 20 et 10G
056631	Adjustable vertical positioning suports (2 parts) V-form for cylinder Ø > 100 mm for RUGOSURF 10G
06960047	Transport case with internal protection foam for RUGOSURF10-10G



Probe measuring position at 90° and adjustable in height

TESA RUGOSURF 90G

Small-size, versatile roughness gauge with tactile colour screen providing maximum ease of use. Ideally suited for high-precision measurements on the shop floor or in the inspection laboratory.

ISO 3274 (cl. 1)

270 x 140 x 90 mm (without probe)

USB

3 kg

Special features of RUGOSURF 90G:

- Supplied with SB60/10 probe with removable pad: one single probe can be used to measure roughness or undulation!
- RUGOSURF 90G can measure a components with a height of up to 90mm, thanks to a vertical positioning screw without any additional accessory!
- With the PROFILE SET 2 mm (06960100) RUGOSURF 90G becomes a profile measurement instrument with a width of 2000 µm measuring in the Z axis (optional)!

Tactile TFT 3.5" colour screen.

Direct display of all measured values and computed profiles.

Measuring span

Z = 1000 µm (0.039 in)

X = up to 50 mm



RUGOSURF 90G with tactile colour screen Measurement with or without skid

Special 2 in 1 probe can measure with contact skid (roughness measurement) or without contact skid (measure of undulation).

Vertical adjusting screw for probe positioning up to a height of 90 mm without the need of an accessory.

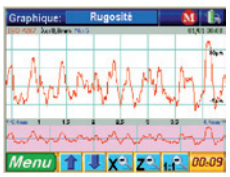
Tolerancing of all parameters possible.

USB ditial output for transfer of measured values to a PC with TESA MEASUREMENT STUDIO software (optional).

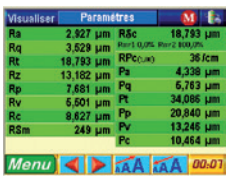
Unique in its category, this instrument can also do profile measurement (Z = 2 mm) if used with PROFILE SET 2 mm (optional).

Measures roughness parameters according to standards:

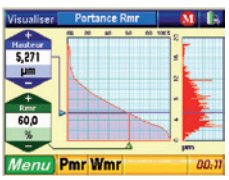
- ISO 4287
- 12085 (CNOMO)
- ISO 13565
- DIN 4776
- JIS B0601:2001
- ASME B46-2002



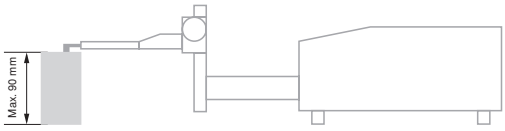
Roughness profile



Roughness parameters



Bearing area curve (BAC) and amplitude distribution curve (ADC)



Fine adjustment of vertical position up to 90 mm

	06930012
	TESA RUGOSURF 90G portable table roughness tester Z = ± 500 µm (± 0.0197 in) X = 50 mm (1.968 in) probe with detachable skid
Measuring span, µm	Z Axis = 1000 µm (39370 µin); X Axis = 50 mm (1.969 in)
Indication span, µm	Ra = 0 ÷ 400 µm; Rt = 0 ÷ 1000 µm
Precision class	In accordance with ISO 3274 Class 1
Measuring force, N	0,75 mN according to ISO 3274
Resolution, µm	0,001 µm (0.01 µin)
Display	Tactile graphic colour screen TFT 3.5" (320 x 240 pixels)
Roughness parameters	DIN / ISO / JIS / ASME: Ra, Rq, Rt, Rp, Rc, Rv, RSm, Rδc, RPc Pa, Pq, Pt, Pp, Pc, Pv, PSm, Pδc, PPc Wa, Wq, Wt, Wp, Wc, Wv, WSm, Wδc, WPc Rmr, Rz, Rmax, Rsk, Rku, Wz Rk, Rpk, Rvk, Mr1, Mr2 DB N 31007: R3z, R3zm MOTIF ISO 12085 (CNOMO): Pt, R, Rx, AR, Wte, W, AW, Wx, Rke, Rpke, Rvke, Pdc, PPc, Mr1e, Mr2e
Graphics	Profil-W, Profil-R, Profil-P, Bearing area curve
Cut-off length, mm	0,08 – 0,25 – 0,80 – 2,50 – 8,00 mm
Number of cut-off	1 to 19 for cut off up to 2,5 mm; 1 to 5 for cut off of 8,00 mm
Diamond or stylus tip (R = µm; angle °)	R = 5 µm, 90°
Memory capacity	Max. 60'000 measurements with parameters
Dimensions (mm)	270 x 140 x 90 mm
Degree of protection of keyboard (IP XX)	IP67 (membrane keyboard)
Digital output (USB)	USB cable connector to PC
Weight, kg	3 kg
Included in delivery	– RUGOSURF 90G – Roughnness standard Ra = 2,97 µm – Standard probe SB60/10 with or without skid – Probe holder – Guiding column, vertical setting range 90 mm – Integrated rechargeable battery, 12 V – Charger for battery
Measuring response time	–
Probing speed, mm/s	0,5 mm/s or 1,0 mm/s selection options
Units	mm or inch
Power supply	100 ÷ 240 VAC / 50 ÷ 60 Hz; 18 V, 2,2 Ah

OPTIONAL ACCESSORIES:	
06960062	Cable RUGOSURF 10G and RUGOSURF 90G to PC (connector v3)
06960033	Printer for RUGOSURF + cables
06960048	MEASUREMENT STUDIO software + dongle for RUGOSURF 90G
06960055	Granite 630 x 400 mm with vertical support H250mm, 60 kg, Grade 0 for RUGOSURF 90G
06960064	Roughness standard Ra = 0,1 µm (4 µin)
06960065	Roughness standard Ra = 0,5 µm (20 µin)
06960066	Roughness standard Ra = 1,0 µm (40 µin)
06960100	PROFILE SET 2 mm for profile measurement with RUGUSURF 90G
06960056	100 mm extension for probe with skid for RUGOSURF 20, 10G, 90G
06960067	SB60/10 2µm probe for RUGOSURF 90G as SB60/10 but R = 2 µm
06960050	SB20P probe for RUGOSURF 90G for grooves of depth < 5 mm
06960051	SB30P probe for RUGOSURF 90G for small bores with Ø > 4 mm
06960052	SB40P probe for RUGOSURF 90G V-shape for cylinders with Ø > 1 mm
06960053	SB50P probe for RUGOSURF 90G for concave surfaces and for measuring at 90° with RUGOSURF 90G
06960054	SB120P probe for RUGOSURF 90G for grooves of depth < 20 mm
06960058	SB120S probe without skid for RUGOSURF 90G for grooves of depth < 15 mm
06960061	SB60-D2-L30 probe, L = 30 mm for RUGOSURF 90G for small bores of Ø > 2 mm

STANDARD ACCESSORIES:	
06960049	SB60/10 standard probe for RUGOSURF 90G R = 5 µm, 90° detachable skid
06960041	Roughness standard Ra = 2,97 µm (117 µin)
056645	Transport case with internal protective foam for RUGOSURF 90G

Roughness parameters according to: ISO 4287, ISO 13565-1, ISO 13565-2, ISO 12085, VDA 2007

Z = 2 mm
X = 50 mm

Z = 0,1 µm
X= 0,4 to 4,0 µm according to the length being measured

Z = 3,5 + 0,75*H microns, (H in the Z axis, in mm) X = 3,5 + L /10 microns (L in the X axis, in mm)

0,3 mg (0,003 mN) with the SB2000 probe

1 mm/s

Maximum angle of 70° (upward position); maximum angle of 85° (downward position)

TESA PROFILE SET 2 mm

PROFILE SET 2 mm for profile measurement (compatible with RUGOSURF 90G).

When equipped with the SB2000 probe and used with the PROFILE STUDIO software dedicated for profile measurement STUDIO PROFILE, the RUGOSURF 90G roughness gauge converts into a profile-measuring tool.

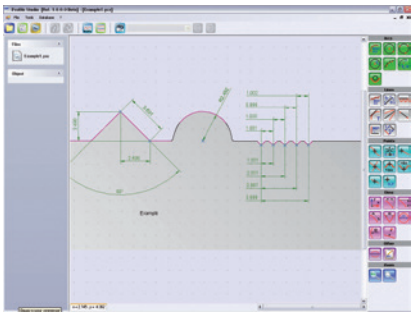
A simple, ingenious and accurate solution, this optional accessory measures lengths, radiii and angles of parts which are sometimes impossible to verify by other means.

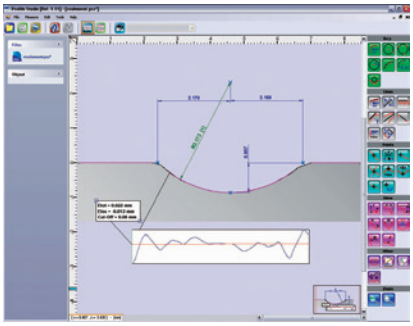
The setting up and the evaluation of measurements is simple and fast. Dimensions can be inserted into the measured profile after defining geometric elements (point, line, arc or intersection between two lines, for example). The tolerance values allow verification of the results at a glance. Rotation and symetry of the profile also allows its orientation.

A previous measurement can be used as model for the repeated measurement of a part of identical geometry. This saves valuable time and facilitates operations as important manual measurements can be replicated automatically.

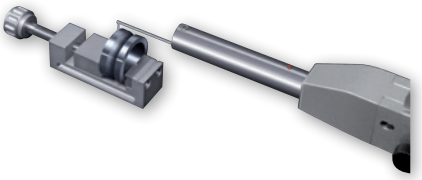
A standard profile with a measurement report is included in the PROFILE SET 2 mm set.

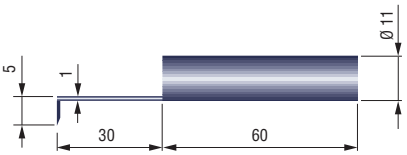
A detailed measurement report with customizable header can be generated from the PROFILE STUDIO software.





PROFILE STUDIO software





SB2000 probe

06960100	PROFILE SET 2 mm for profile measurement with RUGUSURF 90G
DELIVERED WITH THE FOLLOWING ACCESSORIES:	
06960101	PROFILE STUDIO Software
06960102	SB2000 probe for PROFILE SET 2 mm, R= 15 µm, 20°
06960103	Setting master for PROFILE SET 2 mm
06960062	Cable RUGOSURF 10G and RUGOSURF 90G to PC (connector v3)

RUGOSOFT Software

Software for RUGOSURF 20 and RUGOSURF 10G.

Enables the user to import stored measurement values from the device to the computer for the management of a database.

Optimal and detailed visualization of the results: parameters, profiles (R roughness and P primary profile) or a combination of both.

Calculation of roughness parameters.

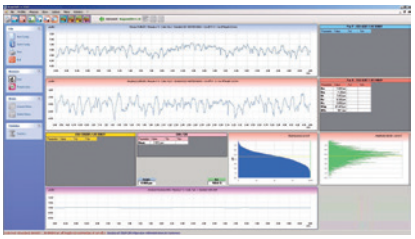
Statistical analysis of a set of measurements.

Creation and storage of measuring programs (instrument parameters and parameters to be measured) in the software, which can then be loaded onto the instrument.

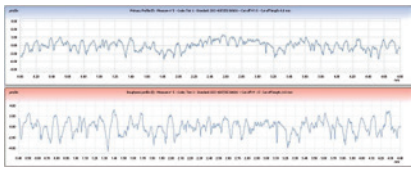
Customizable measurement report.

Output from the PC

- measuring results with measuring parameters
- profiles as coordinates
- measuring report in format: .xls .pdf .doc .rpt (Crystal Report) or also .rtf (Rich Text Format)



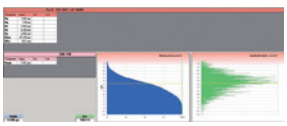
RUGOSOFT



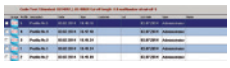
Roughness profile and primary profile



Statistics



Parameters and bearing area curve



List of measurements

		Included in delivery
06960034	RUGOSOFT Software + Dongle	– USB protection key (dongle) – Installation CD – User instructions plus online support (included in the installation CD)
OPTIONAL ACCESSORIES:		
04760099	Cable RUGOSURF 20 to PC	
06960062	Cable RUGOSURF 10G and RUGOSURF 90G to PC (connector v3)	

MEASUREMENT STUDIO Software

Software for RUGOSURF 90G.

Enables the import of stored measurement data from the device to the computer, for processing in a database.

Optimal and detailed visualization of the results: parameters, profiles (W undulation, P primary profile and R roughness) or the three.

Calculation of roughness parameters including VDA parameters.

Statistical analysis of a set of measurements.

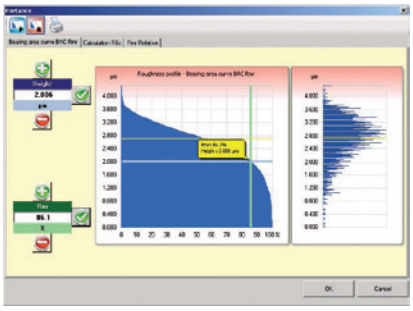
Creation and storage of measuring programs in the software, which can then be loaded onto the instrument.

Customizable measurement report.

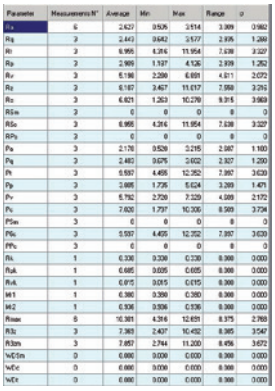
Output from the computer
- measuring results with measuring parameters
- profiles as coordinates
- measuring report in format .xls .pdf .doc .rpt (Crystal Report) or .rft (Rich Text Format)



MEASUREMENT STUDIO



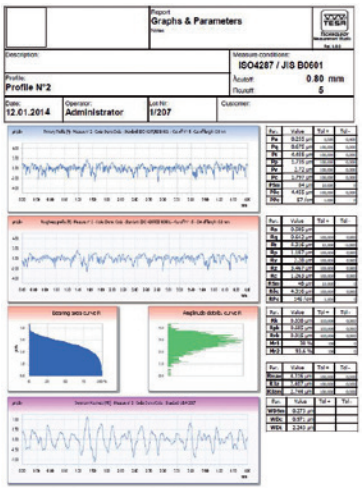
Bearing area curve



Statistics

Par VDA 2007			
Parameter	Value	Tol-	Tol+
WDSm	0.273 µm		
WDc	0.971 µm		
WDt	2.243 µm		

VDA parameters



Measuring report with customisable header and logo

		Included in delivery
06960048	MEASUREMENT STUDIO software + dongle for RUGOSURF 90G	– USB protection key (dongle) – Installation CD, 6 languages – User instructions (included on the installation CD) – USB connection cable to the PC for RUGOSURF 10G and RUGOSURF 90G, length 1,80 m

PROFILE STUDIO Software

For profile measurement using the RUGOSURF 90G.

Allows evaluation of micro and macro geometric characteristics of a surface.

Measurement programme creation that can be saved for the same measurements on a batch of identical parts from the same set or for subsequent batch measurements: it is possible to use all the dimensions and tolerances of a reference profile for a measurement of a batch of the same part.

Measurement instructions and help assistance for calibration controlled from the PC.

Import and export of measurement parameters from and to the device.

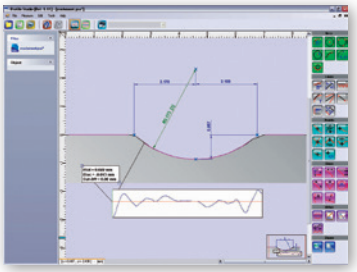
Storage of measurement results and of the measured parameters as database.

Database search with filters (date, operator, batch, etc.).

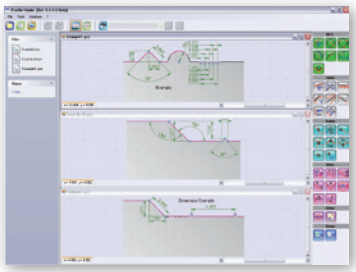
Detailed visualization of the measured profile and geometric construction tools (arc, line, point, intersection, angle, etc.).

Measurements reports with customizable header.

Languages: English, German, French, Spanish, Italian, Portuguese, Slovenian.



PROFILE STUDIO software



Measurement of geometric elements

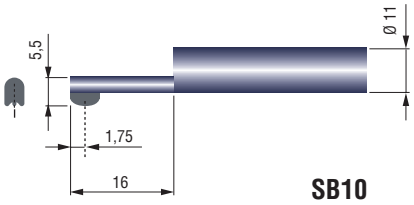
NO		Included in delivery
06960101	PROFILE STUDIO Software	CD with PROFILE STUDIO software
OPTIONAL ACCESSORIES:		
06960102	SB2000 probe for PROFILE SET 2 mm, R = 15 µm, 20°	
06960103	Setting master for PROFILE SET 2 mm	
06960062	Cable RUGOSURF 10G and RUGOSURF 90G to PC (connector v3)	

PROBES FOR TESA RUGOSURF

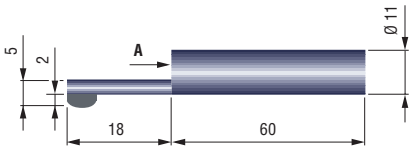
Standard probes for TESA RUGOSURF roughness gauges, available with different geometries and sizes according to the nature and type of surface being measured.

Standard Probes

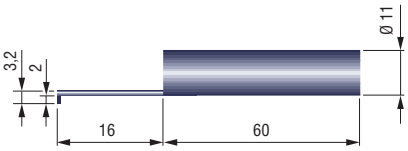
Standard probes supplied with TESA surface roughness gauges and SB2000 probes for profile measurement



SB10 probe



SB60/10 probe with removable skid for RUGOSURF 90G

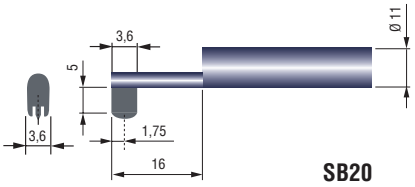


SB2000 probe without skid

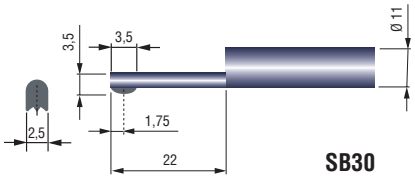
NO	=
06960036	SB10 standard probe for RUGOSURF 20 and 10G R = 5 µm, 90°
06960049	SB60/10 standard probe fur RUGOSURF 90G R = 5 µm, 90° detachable skid

Unless otherwise stated, 90° diamond tip, radius R = 5 µm

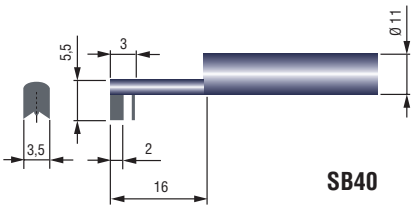
Optional Probes for RUGOSURF 20 and 10G



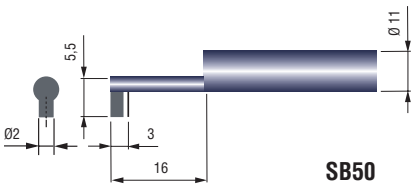
06960037



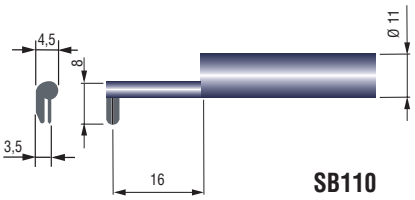
06960038



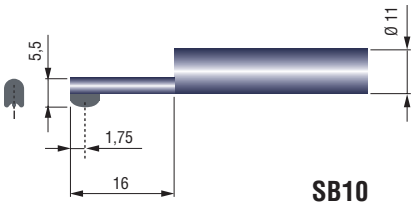
06960039



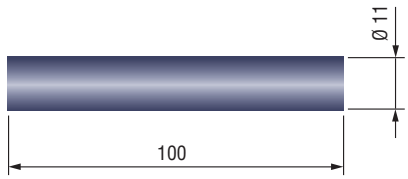
06960040



06960057



06960081 SB10 but R = 2 µm

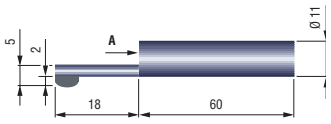


06960056

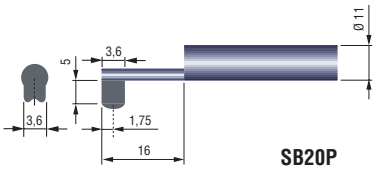
06960037	SB20 probe for RUGOSURF 20 et 10G for grooves of depth < 5 mm
06960038	SB30 probe for RUGOSURF 20 and 10G for small bores of Ø > 4 mm
06960039	SB40 Probe for RUGOSURF 20 and 10G V-shape for cylinders of Ø > 1 mm
06960040	SB50 probe for RUGOSURF 20 and 10G for concave surfaces and for measuring at 90° with RUGOSURF 10G
06960057	SB110 probe for RUGOSURF 20 and 10G for concave or convex surfaces, R > 5 mm
06960081	Probe SB10 2µm for RUGOSURF 20 and 10G as SB10 but R = 2 µm
06960056	100 mm extension for probe with skid for RUGOSURF 20, 10G, 90G

Unless otherwise stated, 90° diamond tip, radius R = 5 µm

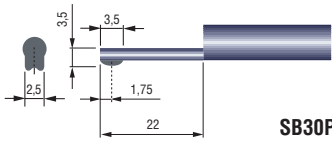
Optional Probes for RUGOSURF 90G



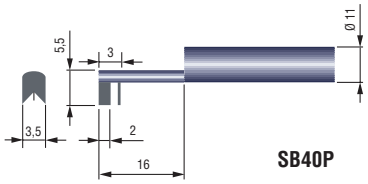
06960067



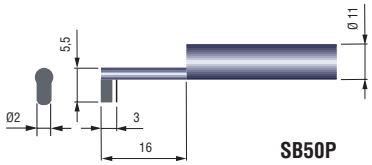
06960050



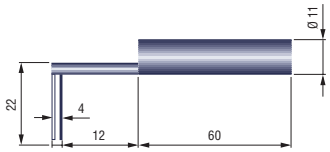
06960051



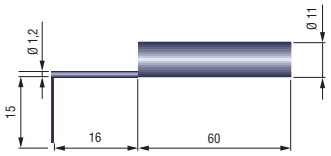
06960052



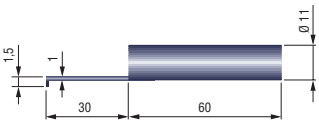
06960053



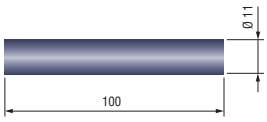
06960054



06960058



06960061



06960056

NO	
06960067	SB60/10 2µm probe for RUGOSURF 90G as SB60/10 but R = 2 µm
06960050	SB20P probe for RUGOSURF 90G for grooves of depth < 5 mm
06960051	SB30P probe for RUGOSURF 90G for small bores with Ø > 4 mm
06960052	SB40P probe for RUGOSURF 90G V-shape for cylinders with Ø > 1 mm
06960053	SB50P probe for RUGOSURF 90G for concave surfaces and for measuring at 90° with RUGOSURF 90G
06960054	SB120P probe for RUGOSURF 90G for grooves of depth < 20 mm
06960058	SB120S probe without skid for RUGOSURF 90G for grooves of depth < 15 mm
06960061	SB60-D2-L30 probe, L = 30 mm for RUGOSURF 90G for small bores of Ø > 2 mm
06960056	100 mm extension for probe with skid for RUGOSURF 20, 10G, 90G

Unless otherwise stated, 90° diamond tip, R = 5 µm

DOT MATRIX PRINTER FOR RUGOSURF

Dot matrix printer for TESA RUGOSURF portable roughness gauges and with built-in batteries, which enable the printing of measured parameters and roughness profiles regardless of the environment and the conditions.

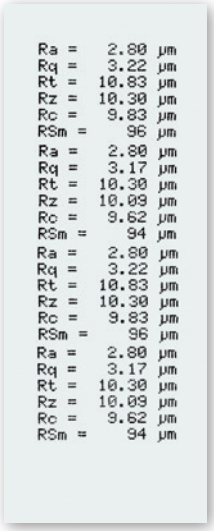
It is also possible to print stored measurements data from the instrument memory.

PR Dot Matrix Printer

Dot matrix printer for TESA RUGOSOFT roughness gauges.
For printing measured parameters, and roughness profiles.
Also for printing measurement data saved in the instrument memory.



PR dot matrix portable printer for RUGOSURF

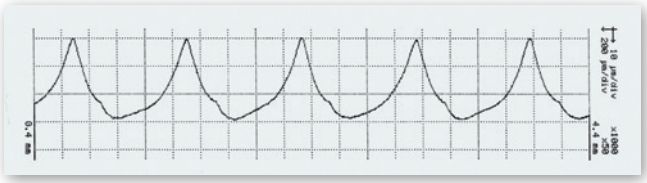


Roughness parameters measured



Measuring results and graphics with header

Roughness profile



NO		Characteristics	Dimensions L x W x H, mm	Weight, g	Included in delivery
06960033	Printer for RUGOSURF + cables	Print-out of measured parameters	165 x 120 x H100 mm (6.50 x 4.72 x H3.94 in)	760 g (only printer)	– Printer – Cables for connection to the RUGOSURF – Ink ribbon – Roll of paper – Rechargeable battery – User instructions – Transport case
DELIVERED WITH THE FOLLOWING ACCESSORIES:					
056109	Connecting cable RUGOSURF 10G and RUGOSURF 90G to dot matrix printer				
058213	Connecting cable RUGOSURF 20 to dot matrix printer				

Accessories for PR Dot Matrix Printer

Ink ribbon for printer
Paper roll
Battery
Transport case



06960044

06960043	Set of 3x ink ribbons for dot matrix printer
06960044	Set of 10 paper rolls size 57 mm for dot matrix printer
056133	Power supply 100 ÷ 240 V, 50 ÷ 60 Hz, 0,5 Ah, Output 9 V DC, max. 18 W, 5,5 mm connector with EU and US adapter, for PR dot matrix printer
056223	Transport case with foam for internal protection of PR dot matrix printer

ACCESSORIES FOR TESA RUGOSURF, PROFILE SET 2 MM

Accessories for TESA RUGOSURF surface rougness testers, including Ra roughness specimens, granite bases with measuring supports, vertical supports for positioning, etc.

Other Accessories for RUGOSURF

External control for RUGOSURF 10G or 90G

Fixing pin Ø 8mm for universal support for RUGOSURF 20 ou 10G

Vertical positioning supports for RUGOSURF 20 or 10G

Probe holder for RUGOSURF 90G



06960042

NO	
056631	Adjustable vertical positioning suports (2 parts) V-form for cylinder Ø > 100 mm for RUGOSURF 10G
057655	Vertical and adjustable positioning supports (2 parts) V-form for cylinder Ø > 100 mm for RUGOSURF 20
056633	Fixing pin Ø 8 mm for universal support for RUGOSURF 20 and 10G
056641	Probe holder with two positions – blocked position for measuring with a probe without skid – free position for measuring with a probe with skid for RUGOSURF 90G
06960042	External control for RUGOSURF 10G and 90G
06960059	External control with PR dot matrix printer cable for RUGOSURF 10G and 90G

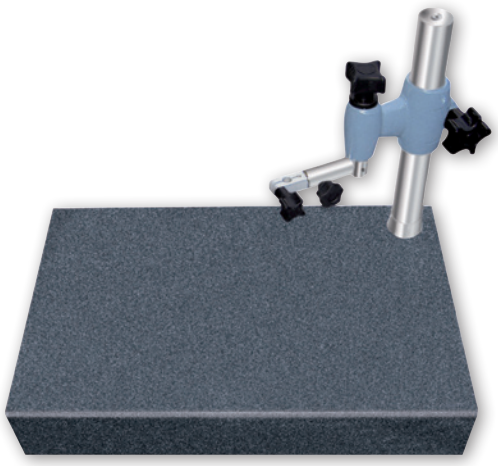
Chargers and Rechargeable Batteries



06960045

NO	
06960045	Battery NiMH 7,2 V, 300 mAh, format PP3, for RUGOSURF 20 et 10G
056224	Battery NiMH 12 V, 1800 mAh, for RUGOSURF 90G
06960046	Charger and power supply 100 ÷ 240 VAC, 50 ÷ 60 Hz, 12 V, 400 ÷ 600 mAh with EU and US adapter for RUGOSURF 20 and 10G
056639	Charger and power supply 100 ÷ 240 VAC, 50 ÷ 60 Hz, 18 V, 2,2 Ah with EU and US adapter for RUGOSURF 90G

Granite Bases with Measuring Support for RUGOSURF



Granite base with measuring support for RUGOSURF 20 or 10G

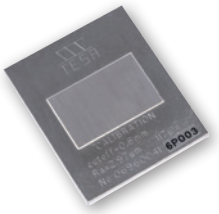


Granite base with measuring support for RUGOSURF 90G with manual vertical positioning device

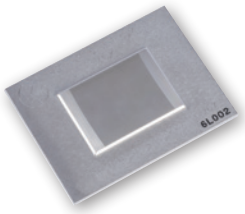
NO	=
06960035	Granite 400 x 250 mm with vertical support H 150 mm, 25 kg, Grade 0 for Rugosurf 20 and 10G
06960055	Granite 630 x 400 mm with measuring support and manual vertical positioning device H250mm, 60 kg, Grade 0 for RUGOSURF 90G

Ra Roughess Standards

As per EN ISO 5436-1 standard



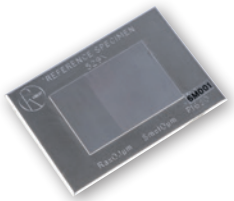
Standard Ra = 2,97 µm



Standard Ra = 1,00 µm



Standard Ra = 0,50 µm



Standard Ra = 0,10 µm

NO	=
06960041	Roughness standard Ra = 2,97 µm (117 µin)
06960066	Roughness standard Ra = 1,0 µm (40 µin)
06960065	Roughness standard Ra = 0,5 µm (20 µin)
06960064	Roughness standard Ra = 0,1 µm (4 µin)

Setting Standard for PROFILE SET

For profile measurement

NO	=
06960103	Setting master for PROFILE SET 2 mm

ISO 2632 Parts 1 and 2

Rust-resistant nickel

Specimens for roughness comparison cannot be used as reference ones. Therefore, they are not suitable for calibrating surface roughness testers.

Leather case

RUGOTEST Roughness Comparison Specimens

For tactile and visual comparison of the workpiece surface finish according to various machining processes.

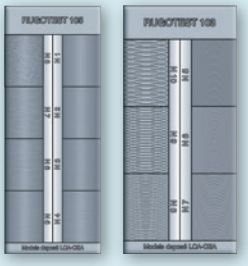
The specimen sets are according to individual machining processes.

ISO 2632-1 and 2632-2

		RUGOTEST N°	Number of samples	ISO roughness parameters	Dimensions, mm	g	Included in delivery
081112053	RUGOTEST 1	1	27	M1 - N10	135 x 105	160	Side milling (3 specimens), N8-N9-N10; Face milling (5 specimens), N6-N7-N8-N9-N10; Turning/Planing (5 specimens), N6-N7-N8-N9-N10; Grinding (6 specimens), N2-N3-N4-N5-N6-N7; Lapping (4 specimens), N2-N3-N4-N5; Finish grinding / honing (4 specimens), N1-N2-N3-N4
081112054	RUGOTEST 2	2	16	N6 - N11	120 x 90	160	
081112055	RUGOTEST 3	3	18	N6 - N11	120 x 90	190	With samples for shot blasting, spherical coarse grains (3 specimens), N9-N10-N11; With samples for shot blasting, spherical fine grains (6 specimens), N6-N7-N8-N9-N10-N11; With samples for shot blasting, angular coarse grains (3 specimens), N9-N10-N11; With samples for shot blasting, angular fine grains (6 specimens), N6-N7-N8-N9-N10-N11
081112056	RUGOTEST 4	4	6	N6 - N8	120 x 90	160	Straight filing (3 specimens), N6-N7-N8; Cross filing (3 specimens), N6-N7-N8
081112057	RUGOTEST 5	5	10	N0 - N4	120 x 90	200	Surface cylindrical form (5 specimens), N0-N1-N2-N3-N4; Surface flat form (5 specimens), N0-N1-N2-N3-N4;
081112058	RUGOTEST 101 Sanding	101	6	N6 - N11	110 x 50	110	
081112059	RUGOTEST 102 Turning	102	6	N5 - N10	110 x 50	105	
081112060	RUGOTEST 103 Face milling	103	6	N5 - N10	110 x 50	110	
081112061	RUGOTEST 104	104	8	N1 - N8	130 x 50	125	
081112062	RUGOTEST 105 Circular grinding	105	8	N1 - N8	130 x 50	130	
081112063	RUGOTEST 107 Spark erosion	107	6	N5 - N10	110 x 50	110	
081112344	RUGOTEST Spark erosion	12	12	Charmilles 12 to 45	127 x 27	60	
081112346	RUGOTEST A4 Set of 4 sets of surface specimens with RUGOTEST 1, 2, 3 and 4				330 x 250	710	
081112345	RUGOTEST A6 Set of 6 sets of surface specimens with RUGOTEST 101, 102, 103, 104, 105, 107				330 x 250	780	









ISO Roughness Parameters	Roughness Ra µm (µin)	Charmilles Roughness Parameters (VDI 3400)	Roughness Ra µm
N0	0,0125 (0.5)	12	0,40
N1	0,025 (1)	15	0,56
N2	0,05 (2)	18	0,80
N3	0,1 (4)	21	1,12
N4	0,2 (8)	24	1,60
N5	0,4 (16)	27	2,24
N6	0,8 (32)	30	3,15
N7	1,6 (63)	33	4,5
N8	3,2 (125)	36	6,3
N9	6,3 (250)	39	9,0
N10	12,5 (500)	42	12,5
N11	25,0 (1000)	45	18,0

ISO 2632 Parts 1 and 2

Rust-resistant nickel

The comparison specimens are not roughness standards. They should not be used for the calibration of surface roughness instruments

Leather case

Height Gauges





INSPECTION DURING THE COURSE OF THE MANUFACTURING PROCESS

Height gauges are single-axis handtools made to measure on a surface plate, preferably on granite. The TESA-µHITE version being offered in this section clearly shows that combining a surface plate with any height gauge can create a complete measuring system.
Providing the necessary versatility, they are well suited for dimensional inspection directly on a machine or a group of machines, usually during the various setting and sampling operations throughout the whole manufacturing process.
They are specially made for checking parts that are difficult to machine due to their critical sizes.



TESA-HITE or TESA MICRO-HITE, whether manually operated or motor-driven, do not require any special skills. Nearly everyone working in the workshop can use them easily.

SCS Calibration Certificate

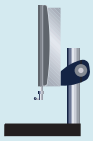
The newly implemented TESA-HITE and TESA MICRO-HITE production line now also includes its own temperature-controlled laboratory recently certified by the Swiss Accreditation Service (SCS), so that each height gauge comes with a SCS calibration certificate provided free of charge.
The negligible temperature variation along with the use of high-precision step gauges allow the lowest uncertainty of measurement to be achieved during the calibration process.
As a first step, all values needed for automatic compensation for the systematic errors of the finished height gauge through Computer Aided Accuracy (CAA) are captured.
Once conveniently calculated, each single compensation value is then stored in the tool memory so as to allow the automatic calculation of the measured values during calibration.
Finally, the relevant calibration certificate is issued based on the values obtained during a new series of measurements taken at another measuring station, also equipped with step gauges. The applied calibration procedure together with the SCS based certification ensure that every TESA height gauge is traceable to national standards.





Height Gauges – One of TESA's Strengths

TESA offers the largest range of height gauges for reliable one or two-dimensional measurements. End users can choose the most suitable model not only according to the requirements of their metrology applications, but also according to their financial resources.
This wide range goes from the simple height and scribing gauge to the motorised vertical column suitable for high-precision measurements in two coordinate directions.

					1D	⌀	⊥	◁	2D		Motorized
	Height Gauges	µm (L in m)	Standard Accessory (mm)	Special Accessory (mm)							
	TESA-HITE Magna	8	870	1095	●	●					
	TESA-HITE	2,5 + 4L	870	1095	●	●	●				
	TESA-HITE plus M	2,5 + 3L	860	1085	●	●	●	●	●	●	●
	TESA MICRO-HITE	2 + 3L	1075	1300	●	●	●	●	●		
	TESA MICRO-HITE plus M	1,9 + 1,5L	1075	1300	●	●	●	●	●	●	●
	TESA-µHITE	1 or 2	160	360	●	●					●
	TESA-µHITE + POWER PANEL plus M	1 or 2	160	360	●	●		●	●	●	●
	ETALON height and scribing gauges	40	1000	–	●						

TESA-HITE Magna 400 and 700

Conceived using well-proven TESA technology, both the TESA-HITE magna 400 and 700 models are equipped with the TESA patented magna µ measuring system and can be used in the harshest workshop conditions, especially where the gauges are exposed to splashing liquids of any kind and the penetration of dust particles. Their unique characteristics means that the gauges offer the most favourable price/performance ratio found in the market and constitute an essential tool in the workshop. Robust and reliable, their futuristic design guarantees maximum strength when used near production machines. Each height gauge is provided with a rechargeable battery and can be used to measure height or step dimensions as well as diameters, centre to centre distance of bores or grooves, the size of grooves and much more.

- Wide application range, two sizes available with measuring span to 415 mm/ 16 in or 715 mm/28 in, respectively.
- Electronics totally protected against oil and water splashing or dust particles (IP65).
- Control panel with numerical display to 0,001 / 0,005/0,01 mm or 0,0001/0.0002/ 0.001 in.
- Dynamic probing of the workpiece with a constant measuring force.
- Easiness, high reliability when checking bores or shafts using TESA's unique device for automatic detection of the culmination point – patented.
- Acoustic signal to acknowledge value capture, also conveniently programmable.
- Ability to measure parallelism errors.
- TESA's magnetic system, guaranteeing correct operating even in harsh workshop conditions – patented.
- Large LC display, also with symbols for the measuring functions.
- Zero-setting anywhere within the measuring range.
- PRESET function for entering any given value.
- Metric/inch conversion.
- RS 232 data output.
- SCS calibration certificate provided with each height gauge.

Factory standard

83 x 49 mm LC display. 7-decade plus minus sign. Also with graphical symbols for all active functions.

0,001 mm or 0.0001 in

12 mm

Magnetic scale, patented system

Metric/Inch conversion

1,5 ± 0,5 N (at switch point)

500 mm/s 20 in/s

Probing head mounted on a ball-bearing, hand wheel for head displacement, fine setting. Head drive carriage can be locked.

RS232

Rechargeable batteries, 6V

≈ 60 h

Fixed zero





Linear expansion (12 ± 1,5) x 10^{-6} K^{-1}

100 %

IP55 or IP65 for both electronics and measuring system (IEC 60529)

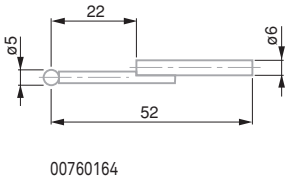
SCS calibration certificate

NO		mm	in
00730047	Height gauge TESA-HITE magna 400	415	16
00730059	Height gauge TESA-HITE magna 700	715	28
CONSISTING OF:		**400**	**700**
00760143	Standard probe insert holder	●	●
00760157	Rechargeable battery, 6V	●	●
00760164	Standard probe insert with 5 mm dia. steel ball tip	●	●
00760231	Master piece for establishing the probe constant, nominal dimension 6,350 mm / 0.250 in	●	●
04761054	Mains adapter 100 ÷ 200 VAC / 50 ÷ 60 Hz	●	●
04761055	Cable EU for mains adapter	●	●
04761056	Cable US for mains adapter	●	●
OPTIONAL ACCESSORIES:			
04761052	Extension cable, Sub-D 9p/f to 9p/m, 2 m		
04761063	Sub-D 9p/m to USB cable, 2 m		

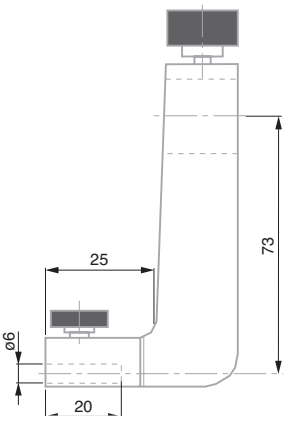
Technical Data

Models		TESA-HITE magna 400	TESA-HITE magna 700
	mm	415	715
	in	16	28
With standard accessory	mm	0 ÷ 570	0 ÷ 870
	in	0 ÷ 22	0 ÷ 34
With probe insert holder No. 00760057	mm	0 ÷ 625	0 ÷ 925
	in	0 ÷ 24	0 ÷ 36
With probe insert holder No. S07001622	mm	0 ÷ 795	0 ÷ 1095
	in	0 ÷ 31	0 ÷ 43
With standard accessory	µm	< 8	< 8
	in	< 0.0003	< 0.0003
With standard accessory		On flat surfaces: 2 σ = < 3µm / < 0.00015 in Into bores: 2 σ = < 5µm / < 0.00020 in	
	kg	15	18

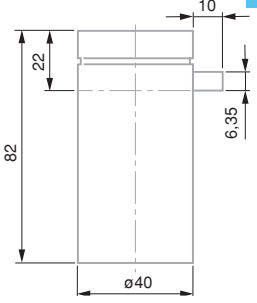
Standard Accessories



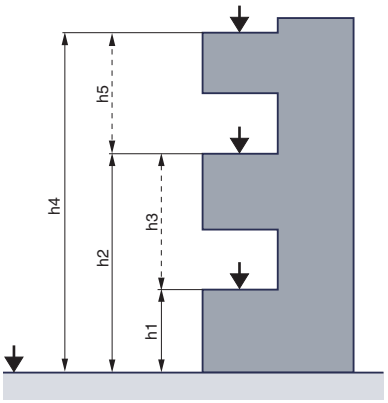
00760164



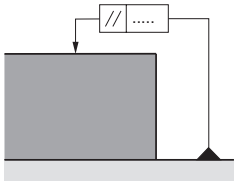
00760143



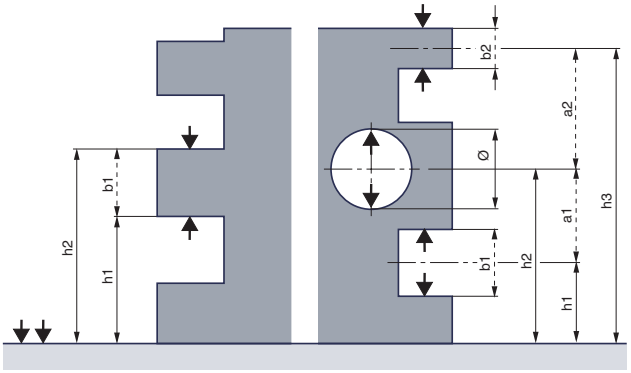
00760231



One-dimensional measurement



Measurement of parallelism



One-dimensional measurement

Factory standard

83 x 49 mm LC display. 7-decade plus minus sign. Also with graphical symbols for all active functions.

0,0001 mm or 0.00001 in

12 mm

Incremental glass scale, opto-electronic

mm/In conversion

1,5 ± 0,5 N (at switch point)

500 mm/s 20 in/s

Air-cushion for easy displacement over the surface plate.

Probing head mounted on a ball-bearing, hand wheel for head displacement, fine setting. Head drive carriage can be locked.

RS232

Rechargeable batteries, 6V

≈ 60 h

Fixed zero

TESA-HITE 400 / 700

By their robustness and reliability, the TESA-HITE 400 and 700 provided with its optoelectronic incremental rule (TESA patented) measurement system are ideally suited for applications in the workshop.

Their battery power gives them full autonomy.

Each version allows, among other things, the entry height dimensions or staged, the diameter, the distance between two grooves or two holes and groove width.

- Integrated air-bearing for easy displacement across the granite plate.
- Electronics totally protected against oil and water splashing, dust particles (IP65).
- Control panel with numerical display to 0,0001 / 0,001 / 0,01 mm or 0.00001 / 0.0001 / 0.001 in.
- Dynamic probing of the workpiece with a constant measuring force.
- Easiness, high reliability when checking bores or shafts using TESA's unique device for automatic detection of the culmination point – patented.
- Acoustic signal to acknowledge value capture, also conveniently programmable.
- Ability to measure any deviation in parallelism.
- Possible use of a digital sensor for determining perpendicularity errors with stated angle of the linear regression line.
- Patented TESA's opto-electronic system. Long-lasting stability of the glass scale for unbroken high accuracy.
- Large LC display with symbols for the measuring functions.
- Zero-setting anywhere within the measuring range.
- PRESET function for entering any given value.
- Metric/inch conversion.
- RS 232 data output.
- SCS calibration certificate provided with each height gauge.



		mm	in
00730043	TESA-HITE 400	415	16
00730044	TESA-HITE 700	715	28
CONSISTING OF:		**400**	**700**
00760143	Standard probe insert holder	●	●
00760157	Rechargeable battery, 6V	●	●
00760219	Master piece for establishing the probe constant, nominal dimension to 6,350 mm / 0.250 in	●	●
00760226	Electric pump for creating the air-cushion beneath the gauge base, already mounted	●	●
00760227	Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide	●	●
04761054	Mains adapter 100 ÷ 200 VAC / 50 ÷ 60 Hz	●	●
04761055	Cable EU for mains adapter	●	●
04761056	Cable US for mains adapter	●	●
OPTIONAL ACCESSORIES:			
04761052	Extension cable, Sub-D 9p/f to 9p/m, 2 m		
04761063	Sub-D 9p/m to USB cable, 2 m		
04760070	RS port, used to connect a digital sensor for perpendicularity measurement		

Linear expansion (12 ± 1,5) x 10^{-6} K^{-1}

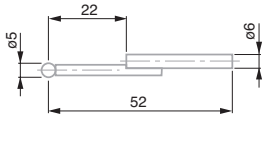
IP40, electronics to IP65 (IEC 60529)

SCS calibration certificate

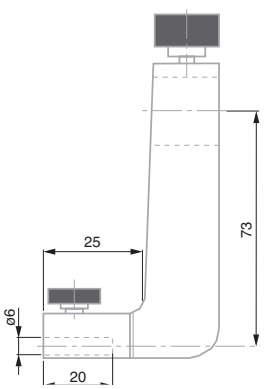
Technical data

Models		TESA-HITE 400	TESA-HITE 700
	mm	415	715
	in	16	28
With standard accessory	mm	0 ÷ 570	0 ÷ 870
	in	0 ÷ 22	0 ÷ 34
With probe insert holder No. 00760057	mm	0 ÷ 625	0 ÷ 925
	in	0 ÷ 24	0 ÷ 36
With probe insert holder No. S07001622	mm	0 ÷ 795	0 ÷ 1095
	in	0 ÷ 31	0 ÷ 43
With standard accessory	µm	(2,5 + 4 L) µm (L in m)	
	in	(0.0001 + 0.000004 L) in (L in in)	
With standard accessory		On flat surfaces: 2 σ = < 2 µm / < 0.0001 in Into bores: 2 σ = < 3 µm / < 0.00015 in	
Frontal, mecanical	µm	9	13
	in	0.00035	0.0005
	kg	27	32

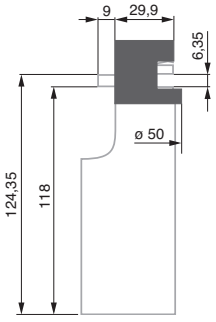
Standard Accessories



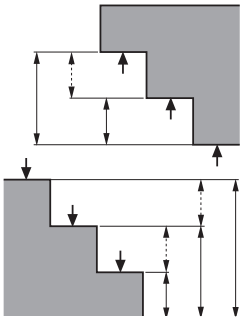
00760227



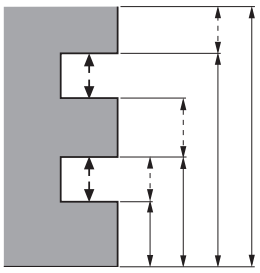
00760143



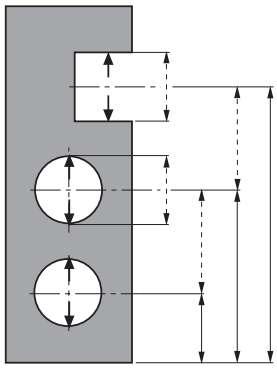
00760219



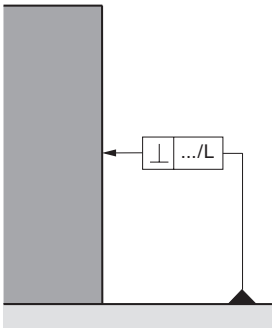
One-dimensional measurement



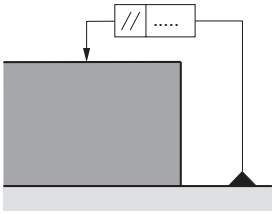
One-dimensional measurement



One-dimensional measurement



Perpendicularity measurement



Parallelism measurement



Squareness verification with inductive probe and TWIN-T10 display

TESA-HITE Plus M 400 / 700

The added value of the motorised TESA-HITE plus M 400 / 700 is not only noticeable in their technical features, but also in their ease of use. Combine with the programming function, this solution is ideal for recurrent measurements in the shop floor environment.

Advanced functions allow for complex calculations such as those required for two-axis or perpendicularity measurement. These height gauges with outstanding features offer the most attractive price/performance relationship, making them indispensable for the workshop.

- Wide application range.
- Electronics entirely protected from the penetration of liquids and dust particles.
- Integrated air cushion, mounted control panel.
- Easy, intuitive use of the rotary power control.
- Provide all the measuring functions of a dedicated motorised column, including height, diameter, distance, parallelism, perpendicularity, straightness, angle and 2D measurement besides programming, automatic probing cycles, statistical value processing.
- TESA's patented measuring system, opto-electronic.
- Probe insert holder and inserts compatible with those of TESA MICRO-HITE.
- SCS calibration certificate attached to each height gauge.







- Factory standard
- Dual LC display, 128 x 63 mm in size.
  - Upper display field for length values (7 segments/sign) also with symbols for the functions.
  - Lower full dot display field for perpendicularity and straightness along with symbols for all operator-controlled function keys.
  - 7 segment display plus minus sign for the measured values
- 0,0001 mm or 0.00001 in
- Main display with a size to 12,7 x 6,4 mm or 6,3 x 4,2 mm for auxiliary display
- Incremental glass scale, opto-electronic data capture
- Mm/in conversion
- 1 N
- Air bearing for easy displacement on the granite plate.
- Measuring head mounted on a ball-bearing. Electro-motorised head displacement at varying speeds from 7,5 up to 40 mm/s. Manual displacement: ≤ 600 mm/s. Automatic value acquisition with a constant measuring force.
- RS232
- Rechargeable batteries, 6V
- ≈ 60 h, full charging takes 8 hours
- Fixed zero

Linear expansion (12 ± 1,5) x 10^{-6} K^{-1}

IP40, IP65 for the electronic control panel (IEC 60529)

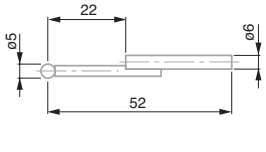
SCS calibration certificate

NO		mm	in
00730045	TESA-HITE plus M 400	405	16
00730046	TESA-HITE plus M 700	705	27
00730057	TESA-HITE plus M 400 + printer	405	16
00730058	TESA-HITE plus M 700 + printer	705	27
CONSISTING OF:		**400**	**700**
00760143	Standard probe insert holder	●	●
00760157	Rechargeable battery, 6V	●	●
00760219	Master piece for establishing the probe constant, nominal dimension to 6,350 mm / 0.250 in	●	●
00760226	Electric pump for creating the air-cushion beneath the gauge base, already mounted	●	●
00760227	Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide	●	●
04761054	Mains adapter 100 ÷ 200 VAC / 50 ÷ 60 Hz	●	●
04761055	Cable EU for mains adapter	●	●
04761056	Cable US for mains adapter	●	●
OPTIONAL ACCESSORIES:			
04760070	RS port, used to connect a digital sensor for perpendicularity measurement		
04761052	Extension cable, Sub-D 9p/f to 9p/m, 2 m		
04761063	Sub-D 9p/m to USB cable, 2 m		
04765008	Thermal paper 57 MM		

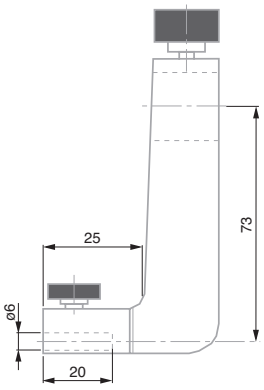
Technical Data

	Models		TESA-HITE plus M 400	TESA-HITE plus M 700
		mm in	405 16	705 27
	With standard accessory	mm in	0 ÷ 560 0 ÷ 22	0 ÷ 860 0 ÷ 33
	With probe insert holder No. 00760057	mm in	0 ÷ 615 0 ÷ 24	0 ÷ 915 0 ÷ 35
	With probe insert holder No. S07001622	mm in	0 ÷ 785 0 ÷ 31	0 ÷ 1085 0 ÷ 42
	With standard accessory	µm in	(2,5 + 3 L) µm (L in m) (0.0001 + 0.000003 L) in (L in in)	
	With standard accessory		On flat surfaces: 2 σ = < 1 µm / < 0.00005 in Into bores: 2 σ = < 2 µm / < 0.0001 in	
	Frontal, mecanical	µm in	8 0.00031	12 0.00047
		kg	27	32

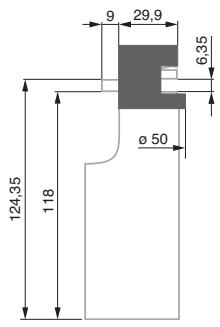
Standard Accessories



00760227



00760143

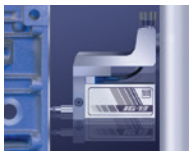


00760219

TESA MICRO-HITE 350 / 600 / 900







TESA IG-13

Autonomous instruments for measurement in one or two coordinate directions of inside dimensions, outside, step, height, depth and distance on geometric elements with flat, parallel or cylindrical surfaces.

The culmination point is automatically entered on the bores and shafts - With memory function "max.", "min." and "max.-min." as dynamic measurement. The use of digital probe TESA IG-13 can also capture perpendicularity, rectitude and parallelism differences, as well as errors of radial and axial runout. Operating results in accordance with ISO 1101.

- State-of-the-art concept associated with a high-quality design is the fruit of years of experience in the manufacture of electronic height gauges.
- Ideal for dimensional inspection close to the manufacturing cell. No cumbersome cables to clutter up the working area.
- Fast, simple and reliable probing of the workpiece or holes, especially.
- 3 main gauges available with either a 365, 615 or 920 mm measuring span.
- Numerical display to 0,0005, 0,001, 0,01 and 0,1 mm, or equivalent inch units.
- Extremely accurate measuring of deviations from length, straightness and perpendicularity due to the automatic correction of the bias errors through CAA (Computer Aided Accuracy).
- Coefficient of linear expansion identical to steel (11,5 x 10^{-6} K^{-1}).
- POWER PANEL for value processing and output with interactive display to guide the operator.
- No manual calculation.
- 99 workpiece oriented measurement cycles, programmable. Each cycle includes a number of 64 features with related limits of size.
- Built-in printer for result output or possible use of an external printer unit to get a hard copy in A4 format.
- RS232 data output.
- Every height gauge comes with a SCS calibration certificate.

TESA MICRO-HITE – Power and performance



- Factory standard
- Incremental glass scale with reference point, dividing period of 20 µm. Opto-electronic value capture (TESA patent).
- Fixed zero
- 1,6 ± 0,25 N
- 300 mm/s 12 in/s
- Air cushion usable for easy move of the height gauge over the surface plate.
- RS232, opto-electronic
- Rechargeable batteries, 6 V, 3,0 Ah or mains adapter
- ≈ 12 hours for one battery pack; ≈ 2 hours for the pump used to form the air cushion
- Linear expansion 11,5 x 10^{-6} K^{-1}
- IP40 (IEC 60529)
- Net weight (w/o panel nor battery pack) Main gauges 350: 33 kg 600: 38 kg 900: 45 kg
- SCS calibration certificate

No		mm	in
00730033	SET MICRO-HITE 350	365	14
00730034	SET MICRO-HITE 600	615	24
00730035	SET MICRO-HITE 900	920	36

CONSISTING OF:		**350**	**600**	**900**
00760141	Rechargeable battery pack	●	●	●
00760142	Electric pump for creating the air-cushion beneath the gauge base, already mounted	●	●	●
00760143	Standard probe insert holder	●	●	●
00760150	Master piece for establishing the probe constant, nominal dimension to 20,000 mm / 0.78740 in	●	●	●
00760151	Dust cover for TESA MICRO-HITE 350	●		
00760152	Dust cover for TESA MICRO-HITE 600		●	
00760153	Dust cover for TESA MICRO-HITE 900			●
00760227	Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide	●	●	●
04761054	Mains adapter 100 ÷ 200 VAC / 50 ÷ 60 Hz	●	●	●
04761055	Cable EU for mains adapter	●	●	●

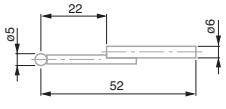
OPTIONAL ACCESSORIES:	
00760144	Add-on fine adjust device for extra fine movement of the measuring head, complete
00760157	Rechargeable battery, 6V
04761023	Cable: miniDIN 8p/m to Sub-D 9p/f, 2m for TT10 and MICRO-HITE manual versions 10/11/12
04761056	Cable US for mains adapter

Technical Data

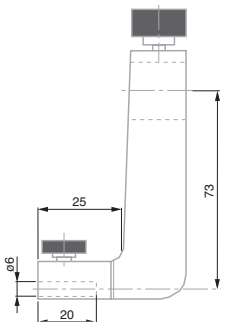
			MICRO-HITE 350	**MICRO-HITE 600**	**MICRO-HITE 900**
	Models				
		mm	365	615	920
		in	14	24	36
	With standard accessory	mm	0 ÷ 520	0 ÷ 770	0 ÷ 1075
		in	0 ÷ 20	0 ÷ 30	0 ÷ 42
	With probe holder No. 00760057	mm	0 ÷ 575	0 ÷ 825	0 ÷ 1130
		in	0 ÷ 22	0 ÷ 32	0 ÷ 44
	With probe holder No. S07001622	mm	0 ÷ 745	0 ÷ 995	0 ÷ 1300
		in	0 ÷ 29	0 ÷ 39	0 ÷ 51
	With standard accessory		(2 + 3 L) µm (L in m) (0.0001 + 0.000003 L) in (L in in)		
	With standard accessory		2 σ = ≤ 1 µm / ≤ 0.00005 in		
	Frontal, mechanical	µm	7	9	11
		in	0.00028	0.00035	0.00043
	Frontal and lateral with TESA IG-13 probe	µm	6	8	10
		in	0.00024	0.00031	0.00039

Standard Accessories

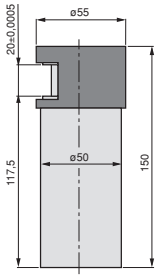
00760227

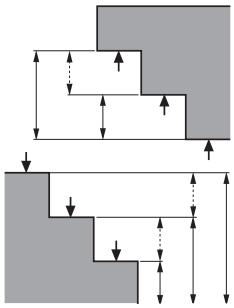


00760143

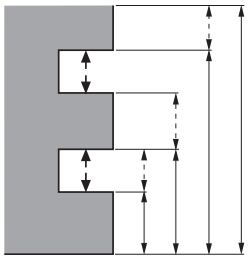


00760150

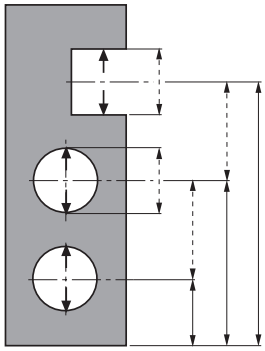




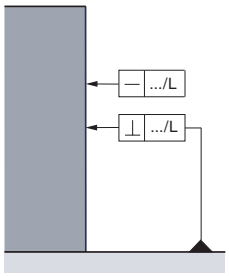
One-dimensional measurement



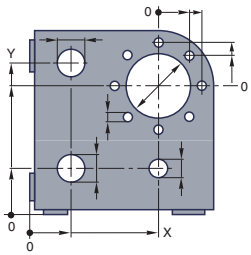
One-dimensional measurement



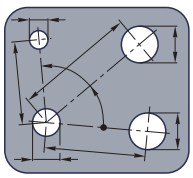
One-dimensional measurement



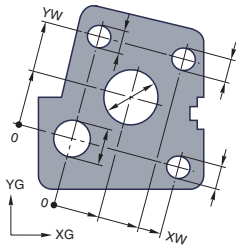
Programme functions for the detection of form and position errors.
With use of a TESA IG-13 digital probe.



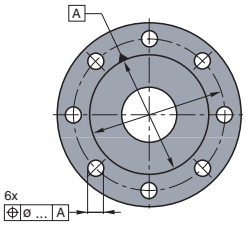
Two-Dimensional Measurement



Two-Dimensional Measurement



Two-Dimensional Measurement



Two-Dimensional Measurement

Main Display 12,7 x 6,4 mm, 6,3 x secondary display 4,2 mm.

Conversion mm/in

Through TESA MICRO-HITE

IP40 (CEI 60529)

Dual LCD display size 128 x 63 mm.
- Measurement of lengths value display (7 segments / sign) and function symbols (top).
- Measurement of squareness / rectitude display values and symbols (function keys, control by the operator display (points)
- Measured: 7 decades Reduce sign.

PRESET function for entering a given value.
Continuous displaying.
Manual or automatic triggering of data transfer.
Output of predefined report with headers in 5 languages plus A4 format using an external printer unit.

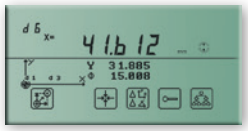
Control Panel for TESA MICRO-HITE 350 / 600 / 900











		mm	in
00760163	Power Panel	0,0005 / 0,001 / 0,01 / 0,1	0.00002 / 0.0001 / 0.001 / 0.01 / 0.1
OPTIONAL ACCESSORY:			
04765008	Thermal paper, 57 mm wide		



TESA MICRO-HITE Plus M 350 / 600 / 900

All TESA MICRO-HITE plus M height gauges are unique in that they have exceptional metrological capabilities and can be used intuitively with ease.

This method allows form and position error to be easily and quickly detected by means of a lever-type dial indicator – Check deviations from straightness or parallelism according to ISO 1101 when used in conjunction with TESA IG-13 linked to the Power panel plus M.

- Modular design descending from the successful TESA MICRO-HITE dynasty.
- Also equipped with the unique rotary power control located close to the rugged base. This feature serves for guiding the column that moves on an air cushion, commanding fast motion of the probe insert and triggering all main measuring functions. Its intuitive use allows accurate, easy handling of the column. A simple rotation causes the measuring head to move rapidly, approach the contact point quickly or slowly, probe up- or downward or execute bore measurement.
- Available in three different sizes with a measuring span of 365, 615 or 920 mm.
- Choice between two control panels for value processing and output.
- Metric and inch LC display with a resolution to 0,0001 and 0,001 mm, or inch equivalent.
- Autonomous run through batteries. No cumbersome cable.
- Built-in air bearing for easy displacement over the surface plate.
- Motorised measuring head for fast, accurate probing at each contact point with a constant measuring force.
- TESA µ system for matchless reliability and simplicity.
- High precision through CAA (Computer Aided Accuracy). All correction values stored in the memory still add to the mechanical precision.
- Coefficient of linear expansion matching that of steel (11,5 x 10^{-6} K^{-1}).
- RS232 data output.
- SCS calibration certificate delivered with every height gauge.

Factory standard

Incremental glass scale with opto-electronic data acquisition. Grating period: 20 µm. Opto-electronic input (TESA Patent)

1 N

Built-in air-bearing for easy move of the column over the surface plate

Measuring head mounted on a ball-bearing. Motorised head displacement at a varying speed from 7,5 up to 40 mm/s. Manual displacement: ≤ 600 mm/s. Automatic value capture with a constant measuring force.

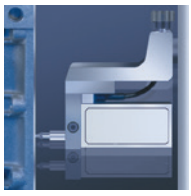
Rechargeable 6 V, 3.0 Ah or network adapter 100 ÷ 240 Vac/50 ÷ 60 Hz

≈ 12 h after 8 h of charging

Fixed zero



TESA µ System



Perpendicularity using TESA IG-13



Perpendicularity using TESATAST



Linear expansion 11,5 x 10^{-6} K^{-1}

IP40 (CEI 60529)

Net weight without desks or block batteries. Basic instrument 350: 33 kg, 600: 38 kg, 900: 45 kg

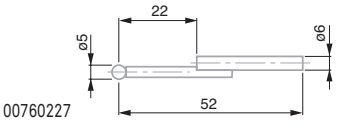
Calibration certificate SCS

NO		mm		in
00730063	Set MICRO-HITE plus M 350	365		14
00730064	Set MICRO-HITE plus M 600	615		24
00730065	Set MICRO-HITE plus M 900	920		36
CONSISTING OF:		**350**	**600**	**900**
00760141	Rechargeable battery pack	●	●	●
00760142	Electric pump for creating the air-cushion beneath the gauge base, already mounted	●	●	●
00760143	Standard probe insert holder	●	●	●
00760219	Master piece for establishing the probe constant, nominal dimension to 6,350 mm / 0.250 in	●	●	●
00760151	Dust cover for TESA MICRO-HITE 350	●		
00760152	Dust cover for TESA MICRO-HITE 600		●	
00760153	Dust cover for TESA MICRO-HITE 900			●
00760227	Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide	●	●	●
04761054	Mains adapter 100 ÷ 200 VAC / 50 ÷ 60 Hz	●	●	●
04761055	Cable EU for mains adapter	●	●	●
04761056	Cable US for mains adapter	●	●	●
OPTIONAL ACCESSORY:				
00760157	Rechargeable battery, 6V			

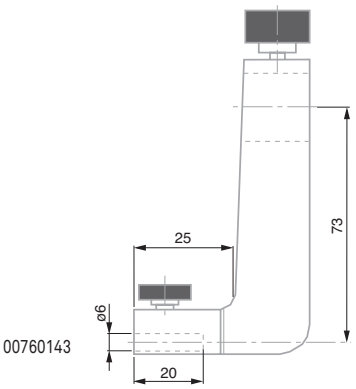
Technical data

	Models		MICRO-HITE plus M 350	MICRO-HITE plus M 600	MICRO-HITE plus M 900
		mm	365	615	920
		in	14	24	36
	With standard accessory	mm	0 ÷ 520	0 ÷ 770	0 ÷ 1075
		in	0 ÷ 20	0 ÷ 30	0 ÷ 42
	With probe insert holder No. 00760057	mm	0 ÷ 575	0 ÷ 825	0 ÷ 1130
		in	0 ÷ 22	0 ÷ 32	0 ÷ 44
	With probe insert holder No. S07001622	mm	0 ÷ 745	0 ÷ 995	0 ÷ 1300
		in	0 ÷ 29	0 ÷ 39	0 ÷ 51
	With standard accessory		(1,9 + 1,5 L) µm (L in m) (0.0001 + 0.0000015 L) in (L in in)		
	With standard accessory		On flat surfaces: 2 σ = ≤ 0,5 µm / ≤ 0.000025 in Into bores: 2 σ = ≤ 1 µm / ≤ 0.00005 in		
	Frontal, mechanical	µm	5	7	9
	Frontal and lateral using TESA IG-13	in	0,00020	0,00028	0,00035

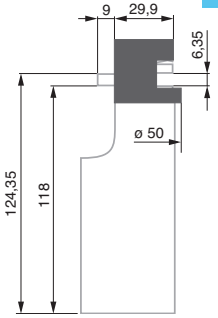
Standard Accessories



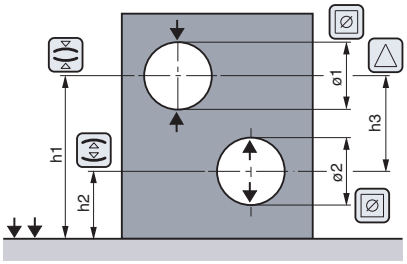
00760227



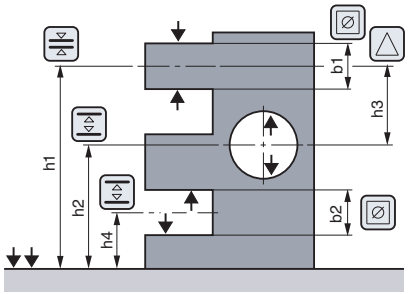
00760143



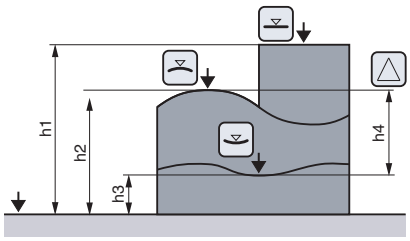
00760219



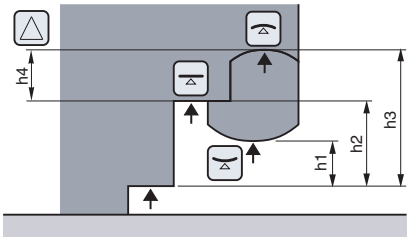
Measurement with change of the probe direction
Probe constant included, considering the culmination point



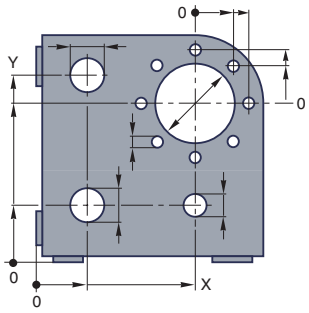
Measurement with change of the probe direction
Probe constant included, disregarding the culmination point



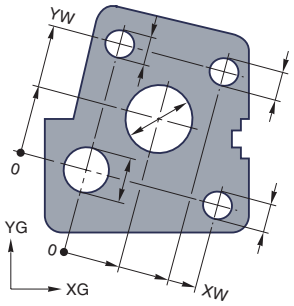
Measurement without change of the probe direction
Probe constant excluded



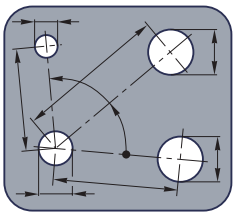
Measurement without change of the probe direction
Probe constant excluded



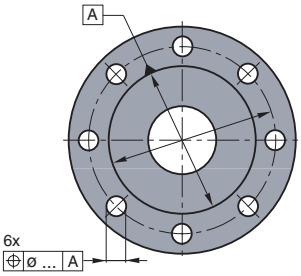
Two-Dimensional Measurement



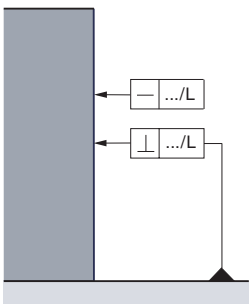
Two-Dimensional Measurement



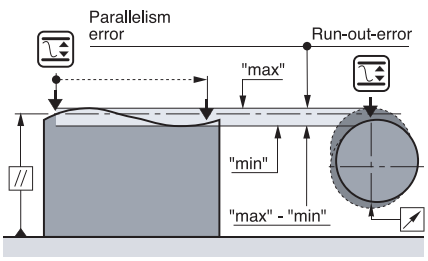
Two-Dimensional Measurement



Two-Dimensional Measurement



Measurement of form and position errors



Measurement of form and position errors

12,7 x 6,4 mm main display, 6,3 x 4,2 or 3,8 x 2,9 mm auxiliary display

mm/in conversion

Via TESA MICRO-HITE plus M

IP50 (IEC 60529)

Bidirectional RS232, optoelectronic and Centronics

LC dual display, 128 x 63 mm in size.
- Length measurement: 7-segment/ digit upper display field for values plus symbols for the functions.
- Straightness or perpendicularity measurement: display field for values plus symbols (function keys). Operator controlled operations (full dot display).
- Measured values: 7-decade display plus minus sign.

PRESET function for entering a given value. Acoustic signal. Manual or automatic triggering of data transfer. Output of predefined reports with headers in 5 languages (plus a programmable one) using an external printer unit (A4 format).

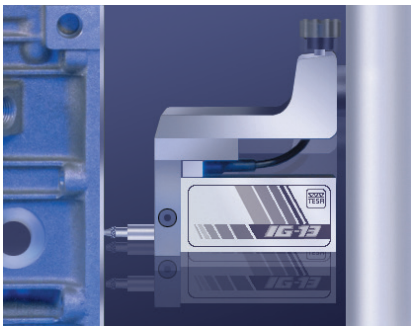
Control Panels for TESA MICRO-HITE Plus M 350 / 600 / 900

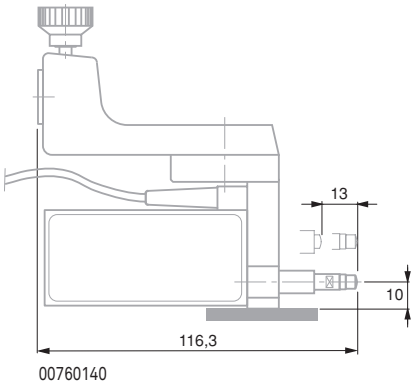


NO		mm	in
00760220	Power Panel for MICRO-HITE plus M with printer	0,0001 / 0,001 / 0,01	0.00001 / 0.0001 / 0.001
00760221	Power Panel for MICRO-HITE plus M	0,0001 / 0,001 / 0,01	0.00001 / 0.0001 / 0.001
OPTIONAL ACCESSORIES:			
04765008	Thermal paper, 57 mm wide		
04761052	Extension cable, Sub-D 9p/f to 9p/m, 2 m		
04761063	Sub-D 9p/m to USB cable, 2 m		

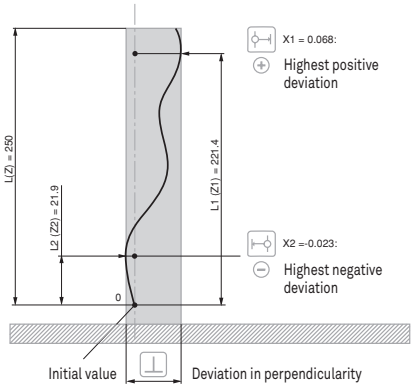
TESA IG-13 Probe Set for Perpendicularity Measurement

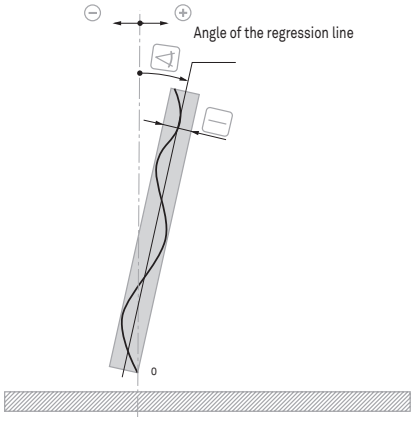
Factory standard
13 mm / 0.51 in
1 µm
0,45 N at zero
0,75 N at stop





00760140





NO		
00760140	TESA IG-13 Pobe set
CONSISTING OF:	
00760138	TESA IG-13 Attachment
00760139	TESA IG-13 Digital probe
OPTIONAL ACCESSORIES:	
01960005	Retraction lever
04761047	Connecting cable IG-13/Power Panel plus M 1 m (mini-DIN)

Factory standard

100 mm / 4 in

0 to 160 mm 0 to 6.3 in

0,0001 mm or 0.00001 in

Incremental glass scale with opto-electronic data acquisition. Grating period: 20 µm.

Accuracy class according to DIN 876, Part 1

finely lapped

Measuring table (L x P x H) 200 x 300 x 50 mm, Ø column 50 x 300 mm.

Granite measuring table; dull-chrome plated steel column, hardened and ground.

0,63 ± 0,1 N and 1 ± 0,1 N, switchable. Electromotorised activation.

Numerical interval to 0,001 mm/ 0,0001 in = 10 mm/s; to 0,0001 mm/ 0,00001 in = 5 mm/s; fast displacement = 30 mm/s

Electro-motorised gauge head displacement; can also be moved manually.

Via the control panel

Linear expansion 11,5 x 10^{-6} K^{-1}

Fixed zero

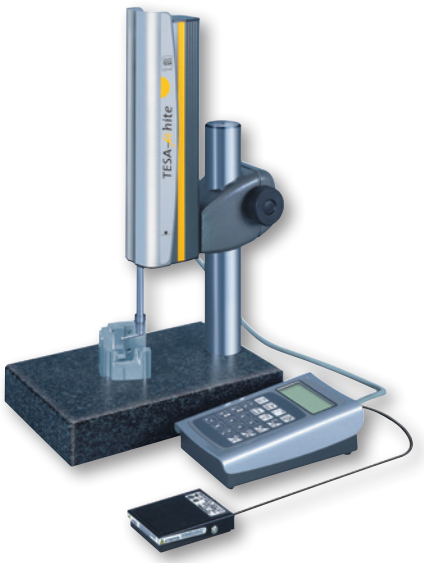
TESA-µHITE

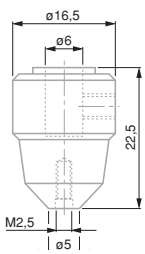
Compact design with measuring stand included – Sensor equipped with a system for coaxial measuring according to the Abbe principle or using an offset probe relative to the gauge axis. Measures internal, external, height, depth, step and distance dimensions on geometric elements having either a flat, parallel or cylindrical surface – Automatic detection of the culminating point on bores or shafts – Dynamic probing with memory functions "max.", "min." and "max.-min.". The whole system provides the best solution for measuring straightness, flatness and parallelism or inspecting axial and radial runouts depending on the chosen tool configuration.

- Ideal for workpiece inspection close to the production area.
- 100 mm measuring span.
- 0,001 mm and 0,0001 mm or 0.0001 in and 0.00001 in scales intervals.
- Max. perm. error as low as 2 µm (or 1 µm when checking coaxiality).
- Integrated temperature sensor so that the coefficient of linear expansion of each gauge unit matches that of steel (11,5 x 10^{-6} K^{-1}).
- Motorised measuring head for fast probing at each point.
- Automatic value capture, controlled over the stability of the measuring force, but also all measured values.
- Constant measuring force through the motor-driven actuator. Switchable.
- No manual calculation needed.
- RS232 data output with direct connection to TESA PRINTER SPC.
- Memory capacity for 99 single values.

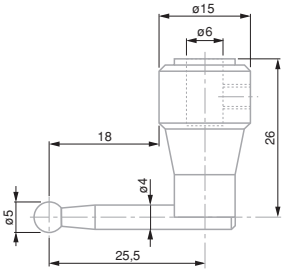
Accuracy

	µm	in	µm	in
Insert's position relative to the axis of the measuring bolt				
Coaxial	1,0	0.00005	0,5	0.00002
Offset	2,0	0.0001	1,0	0.00004
Applicable with used standard accessory				

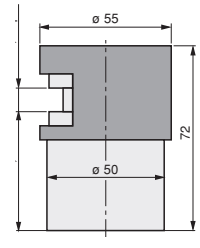




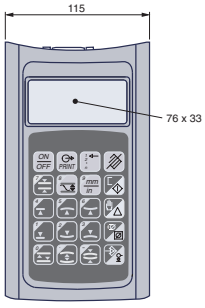
00760195



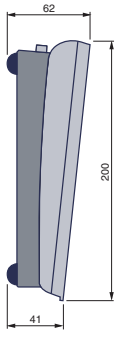
00760197



00760192



00760204

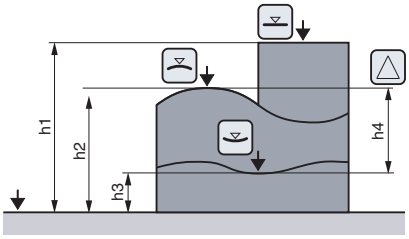


		mm	in	µm	µm / in
00730049	TESA-µHITE	0 ÷ 160	0 ÷ 6,3	Coaxial tip: 1,0 off-centre tip 2,0	Coaxial tip: 0,5 / 0.00002; off-centre tip 1,0 / 0,00004
CONSISTING OF:					
00760203	TESA measuring support, granite measuring table, size 200 x 300 x 50 mm				
00730054	TESA-µHITE electronic measuring equipment				
	CONSISTING OF:				
	038407 1 plastic case				
	00730050 TESA-µHITE probe				
	00760191 Connecting cable Panel / TESA-µHITE				
	00760192 Master piece for establishing the probe constant, nominal dimension 10 mm / 0.39370 in				
	00760195 Axial insert holder M2,5				
	00760197 Probe insert with a 5 mm dia. tungsten carbide ball tip, offset				
	00760204 Control panel, to be connected to TESA-µHITE				
	03510002 Measuring insert TN10W				
	04761054 Mains adapter 100 ÷ 200 VAC / 50 ÷ 60 Hz				
	04761055 Cable EU for mains adapter				
	04761056 Cable US for mains adapter				
OPTIONAL ACCESSORIES:					
00760186	Set of probe inserts for TESA-µHITE				
04761052	Extension cable, Sub-D 9p/f to 9p/m, 2 m				
04761063	Sub-D 9p/m to USB cable, 2 m				

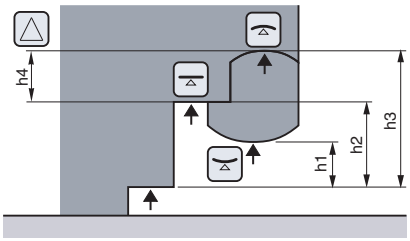
IP50 (IEC 60529)

Net weight 16,2 kg (measuring support No. 00760203), net weight 2,6 kg (TESA-µHITE No. 00730050), net weight 1,45 kg (control panel No. 00760204 with cable No. 00760191)

SCS calibration certificate

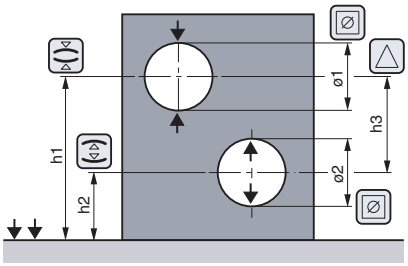


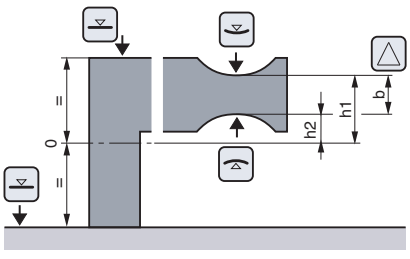
Measurement without change of the probe direction
Probe constant excluded



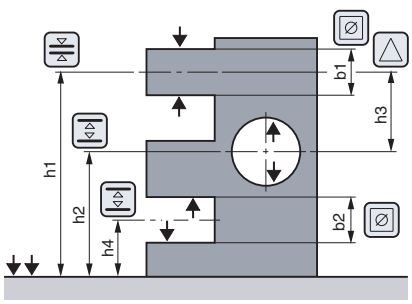
Measurement without change of the probe direction
Probe constant excluded

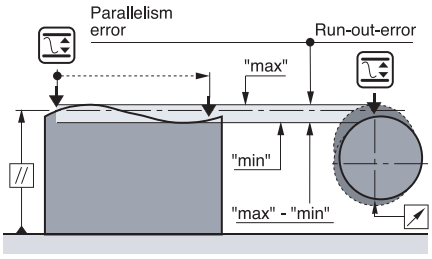
Measurement with change of the probe direction
Probe constant included, considering the culmination point





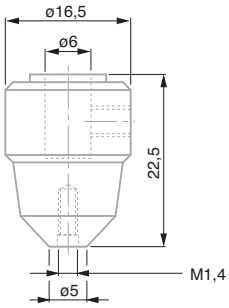
Measurement with change of the probe direction
Probe constant included, disregarding the culmination point



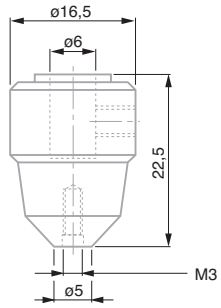


Optional Accessories for TESA-µHite

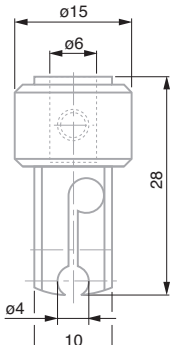
NO	=
00760194	Axial probe holder for probe inserts with a M1,4 thread
00760196	Axial probe holder for probe inserts with a M3 thread
00760198	Radial probe holder with a 4 mm dia. mounting bore
00760199	Universal probe insert holder with a 4 mm dia. clamping shank (used in conjunction with radial probe holder No. 00760198). M1,4 plus M3 threads (2 x 2) for the probe inserts
00760200	Probe insert with a 5 mm dia. tungsten carbide ball tip. Also with a 4 mm dia. fixing rod for use with radial probe holder insert No. 00760198.
00760201	Probe insert with a 3 mm dia. tungsten carbide ball tip. Also with a 4 mm dia. fixing rode for use with radial probe holder No. 00760198.
00760202	Spare batteries for control panel No. 00760204, 6 Vdc/1,2 Ah.
00760207	Swivel support for control panel



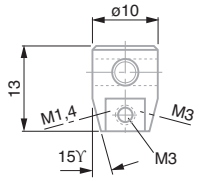
00760194



00760196



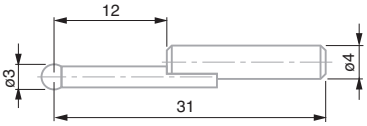
00760198



00760199



00760200

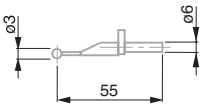


00760201

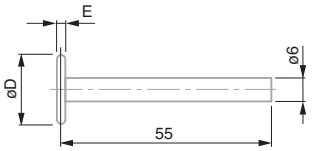
Sets of Accessories for Height Gauges



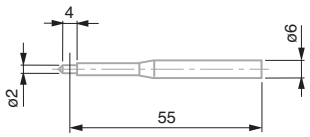
00760232	Starter accessory kit with 4 elements for TESA Height Gauges
CONSISTING OF:	
00760061	Probe insert with a 3 mm dia. carbide ball tip
00760075	Probe insert with a carbide disc tip E = 2 mm / Ø 14 mm for grooves, slots, centering shoulders etc.
00760082	2 mm dia. probe insert with a small cyl. carbide face
00760094	Probe inserts with a stainless steel shank, hardened. Also with one flat and one spherical carbide measuring face. Interchangeable shank.
059215	Plastic box



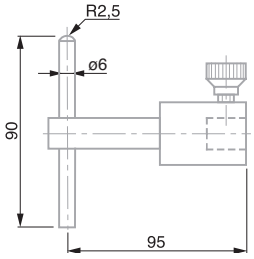
00760061



00760075

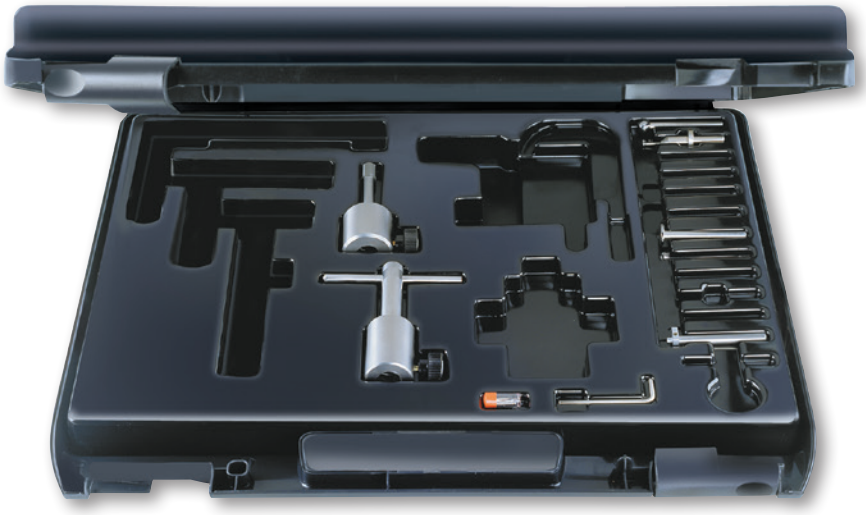


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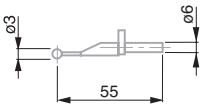


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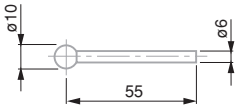
Sets of Accessories for Height Gauges



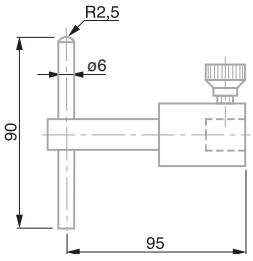
00760173	Starter accessory kit with 8 elements for TESA Height Gauges
CONSISTING OF:	
00760061	Probe insert with a 3 mm dia. carbide ball tip
00760060	Probe insert with a 10 mm dia. carbide ball tip
00760075	Probe insert with a carbide disc tip E = 2 mm / Ø 14 mm for grooves, slots, centering shoulders etc.
00760093	Probe insert with a cylindrical, tungsten carbide measuring face (10 mm dia., 12 mm long). Steinless steel body, handened.
00760094	Probe inserts with a stainless steel shank, hardened. Also with one flat and one spherical carbide measuring face. Interchangeable shank.
00760228	Probe insert dia. 1 mm with shank and ball tip in tungsten carbide
00760229	Probe insert dia. 2 mm with shank and ball tip in tungsten carbide
00760230	Probe insert dia. 3 mm with shank and ball tip in tungsten carbide



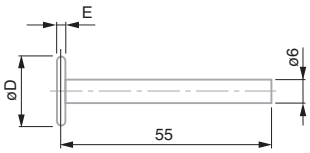
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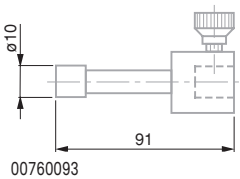
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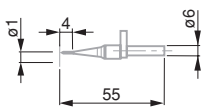
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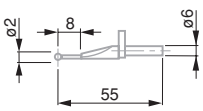
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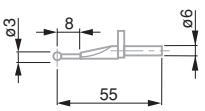
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00760228



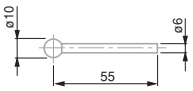
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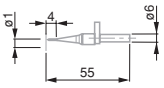
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Sets of Accessories for Height Gauges

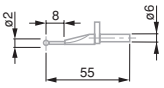
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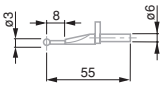
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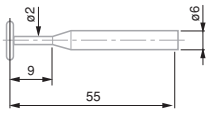
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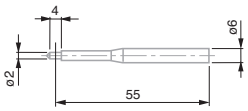
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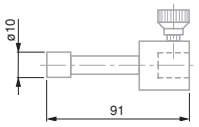
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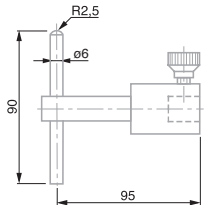
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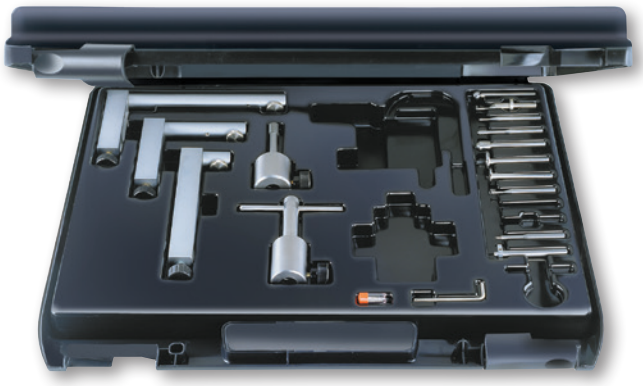
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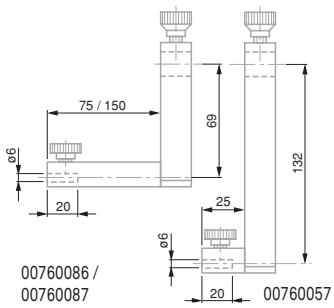
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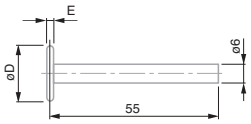
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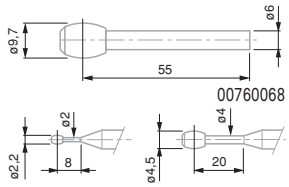
00760148	Full accessory set with 17 elements for TESA Height Gauges
CONSISTING OF:	
00760057	Probe insert holder for extending the application range
00760060	Probe insert with a 10 mm dia. carbide ball tip
00760061	Probe insert with a 3 mm dia. carbide ball tip
00760066	Probe insert Ø 2,2 mm (for M3 to M16 threads) with carbide, barrel-shaped measuring faces for cylindrical bores as well as for determining the position of metric inside threads (or similar).
00760067	Probe insert Ø 4,5 mm (for M6 to M48 threads) with carbide, barrel-shaped measuring faces for cylindrical bores as well as for determining the position of metric inside threads (or similar).
00760068	Probe insert Ø 9,7 mm (for M12 to M150 threads) with carbide, barrel-shaped measuring faces for cylindrical bores as well as for determining the position of metric inside threads (or similar).
00760074	Probe insert with a carbide disc tip E = 1 mm / Ø 4,5 mm for grooves, slots, centering shoulders etc.
00760075	Probe insert with a carbide disc tip E = 2 mm / Ø 14 mm for grooves, slots, centering shoulders etc.
00760076	Probe insert with a carbide disc tip E = 3 mm / Ø 19 mm for grooves, slots, centering shoulders etc.
00760082	2 mm dia. probe insert with a small cyl. carbide face
00760086	Probe insert holder for depth up to 110 mm (L = 75 mm)
00760087	Probe insert holder for depth up to 185 mm (L = 150 mm)
00760093	Probe insert with a cylindrical, tungsten carbide measuring face (Ø 10 mm, length 12 mm); stainless steel body, hardened
00760094	Probe inserts with a stainless steel shank, hardened. Also with one flat and one spherical carbide measuring face. Interchangeable shank.
00760228	Probe insert dia. 1 mm with shank and ball tip in tungsten carbide
00760229	Probe insert dia. 2 mm with shank and ball tip in tungsten carbide
00760230	Probe insert dia. 3 mm with shank and ball tip in tungsten carbide



00760086 / 00760087 — 00760057



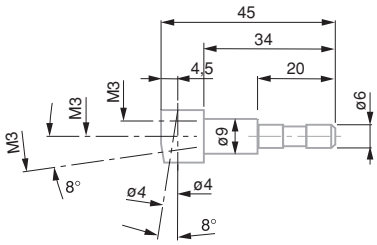
00760075/ 00760076



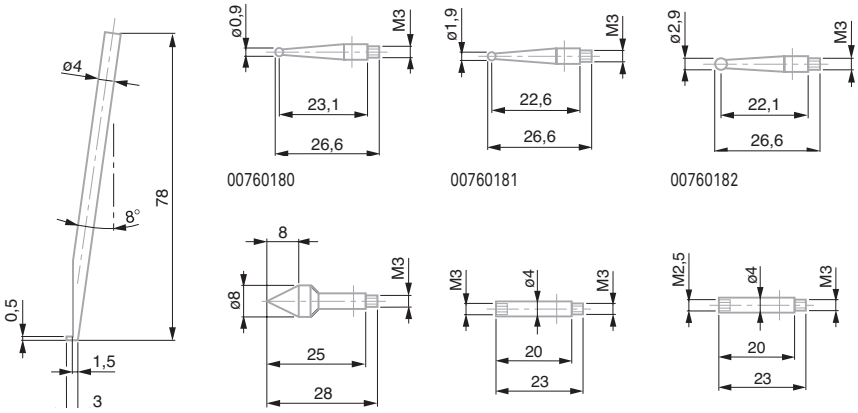
00760066 — 00760067

Sets of Accessories for Height Gauges

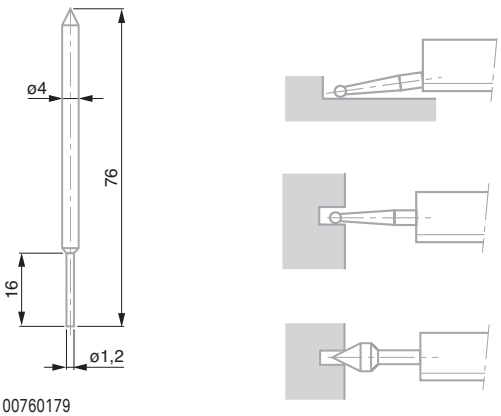
00760175	Set of pobe inserts for TESA-HITE, TESA-HITE plus M, TESA-HITE magna, MICRO -HITE and MICRO-HITE plus M
CONSISTING OF:	
00760177	Probe insert holder
00760178	Hardened steel rod for grooves, centring shoulders, blind bores etc, angled through 8°
00760179	Tungsten carbide cylindrical rod for depth measurement
00760180	Probe inserts with a 0,9 mm dia. hardened steel ball tip
00760181	Probe inserts with a 1,9 mm dia. hardened steel ball tip
00760182	Probe inserts with a 1,9 mm dia. hardened steel ball tip
00760183	Hardened steel probe insert with a cone-shaped measuring face, 8 mm dia.
00760184	Extension, 20 mm, with a M3 thread for inserts with M3 thread
00760185	Extension, 20 mm, with a M3 thread for inserts with M2,5 thread



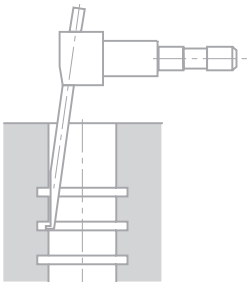
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00760178 00760180 00760181 00760182 00760183 00760184 00760185

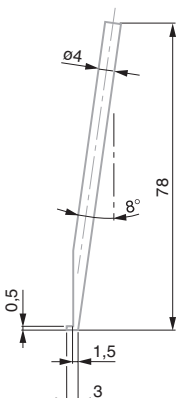


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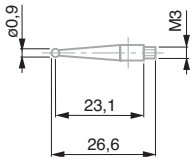


Sets of Accessories for Height Gauges

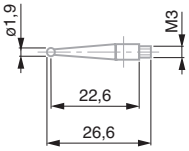
00760186	Set of probe inserts for TESA-µHITE
CONSISTING OF:	
00760178	Hardened steel rod for grooves, centring shoulders, blind bores etc, angled through 8°
00760179	Tungsten carbide cylindrical rod for depth measurement
00760180	Probe inserts with a 0,9 mm dia. hardened steel ball tip
00760181	Probe inserts with a 1,9 mm dia. hardened steel ball tip
00760182	Probe inserts with a 2,9 mm dia. hardened steel ball tip
00760183	Hardened steel probe insert with a cone-shaped measuring face, 8 mm dia.
00760184	Extension, 20 mm, with a M3 thread for inserts with M3 thread
00760185	Extension, 20 mm, with a M3 thread for inserts with M2,5 thread
00760187	Probe insert holder



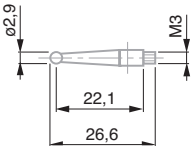
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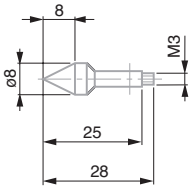
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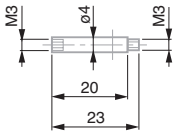
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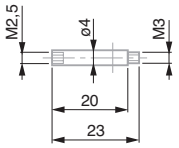
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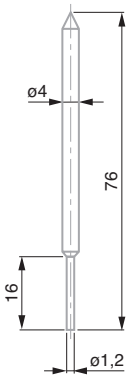
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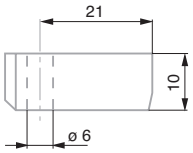
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00760185

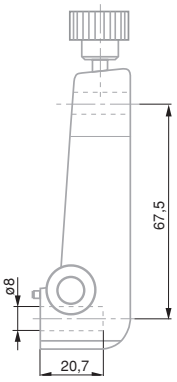


00760179



00760187

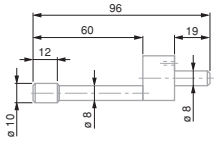
Probe Holder No. 00760223 for Inserts with 8 mm Diameter



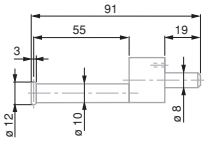
NO	=
00760223	Probe holder for inserts with 8 mm diameter

Optional Accessories for Use with Insert Holder No. 00760223

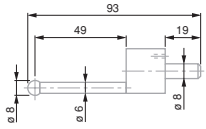
NO	=
0071684815	Probe insert with a 4 mm dia. tungsten carbide ball tip
0071684816	Probe insert with a 6 mm dia. tungsten carbide ball tip
0071684817	Long probe insert with a 10 mm dia. tungsten carbide ball tip
0071684818	Probe insert with a 1 mm dia. steel tip, hardened. Also with adjustable shank for depth measurement.
0071684819	Probe insert with cone-shaped measuring face in hardened steel for Ø 5 ÷ 20 mm
0071684820	Probe insert with cylindrical measuring face in hardened steel, Ø 10 mm, 12 mm long
0071684822	Probe insert with cone-shaped measuring face in hardened steel, Ø 0,5 ÷ 5,5 mm
0071684825	Probe insert with a 6 mm dia. tungsten carbide ball tip
0071684826	Attachment for interchangeable inserts with M1,4 thread. Supplied with 1 insert No. 01860201 having a 1 mm dia. carbide ball tip.
0071684827	Probe insert with disc-shaped face Ø 12 mm, 3 mm wide
0071684828	Attachment for interchangeable insert with M1,4 thread. Supplied with 2 probe inserts No. 0186020 having a 2 mm dia. carbide ball tip
0071684829	Probe insert with a 10 mm dia. tungsten carbide ball tip
0071684832	Probe insert with a 8 mm dia. tungsten carbide ball tip



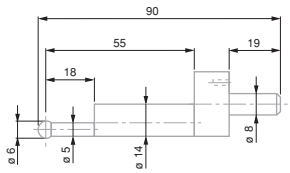
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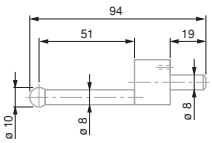
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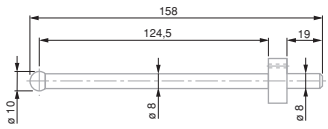
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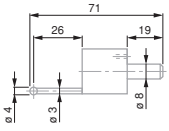
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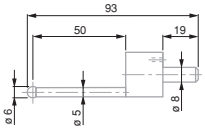
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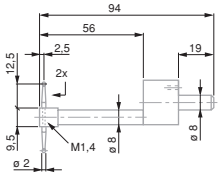
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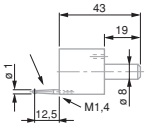
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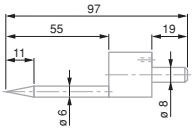
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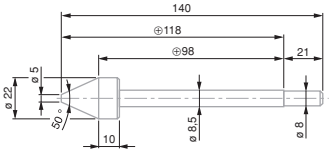
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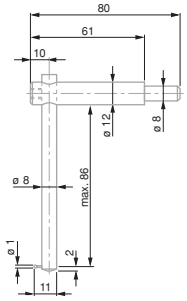
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0071684822



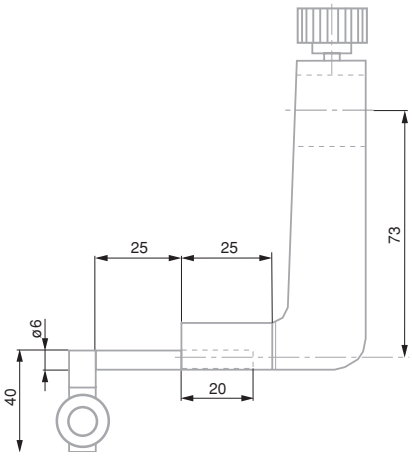
0071684819



0071684818

Accessories for Measuring Perpendicularity by Means of a Dial Test Indicator

Used with TESA MICRO-HITE plus M, TESA MICRO-HITE, TESA-HITE 400/ 700 and TESA-HITE plus M 400/ 700.





NO	=	
00760222		Probe insert holder for a dial test indicator (lever-type)

Factory standard

Floating zero

DIN 862
For lengths up to
600 mm = 30 µm
1000 mm = 40 µm

Steel base, hardened

Slider with inter-changeable scriber. Also with back mounted clamping holder having a 8 mm diameter. Slider with locking screw and fine adjust device. Base has a ground face with dust grooves. Top face also ground.

Preset and Hold functions



ETALON Height and Scribing Gauges with Digital Display

Electronic height and scribing gauges

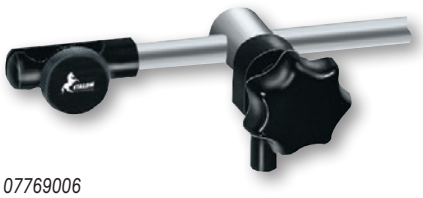
- Resolution to 0,01 mm/0.005 in
- RS232 interface

NO	mm	in	Column, mm	Base (L x H x W) mm
07739001	0 ÷ 300	0 ÷ 12	25 x 6	60 x 40 x 100
07739002	0 ÷ 600	0 ÷ 24	30 x 12	110 x 50 x 160
07739003	0 ÷ 1000	0 ÷ 40	30 x 12	110 x 50 x 160

Accessories for ETALON Height and Scribing Gauges with Digital Display



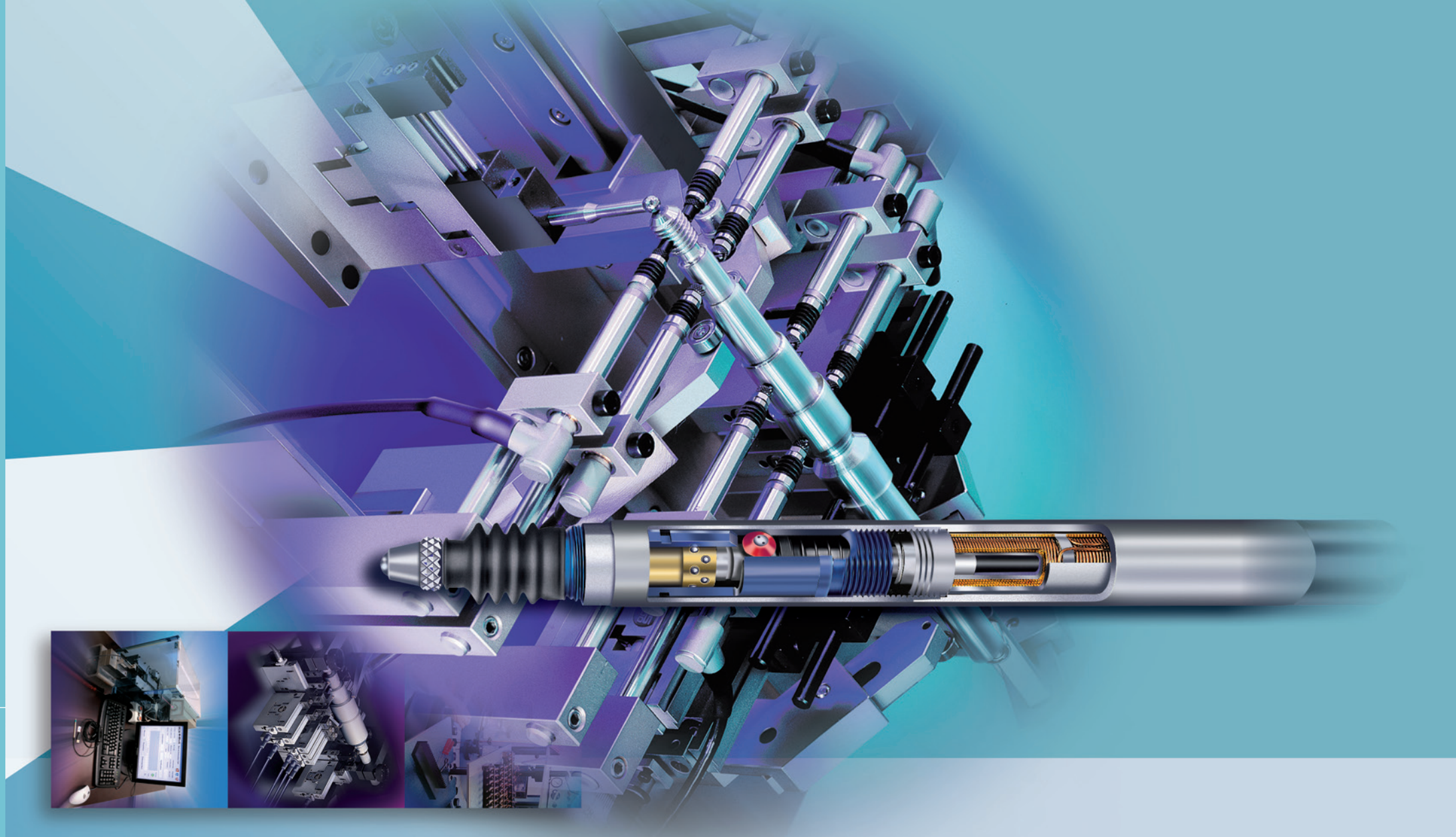
07769005



07769006

NO	=	Suitable for models	Length, mm
07769001	Scriber for 300 mm length 65 mm	300	65
07769003	Scriber for 6 to 1000 mm, length 75 mm	600, 1000	75
07769005	Holder to replace the scriber		
07769006	Rotating and tilting version with a 8 mm dia. shank. To be used with No. 07769005		





Electronic Length Measuring Equipment

TESA INDUCTIVE PROBES AND ELECTRONIC EQUIPMENT

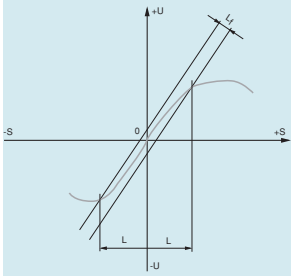
TESA probes: At the cutting edge of technology

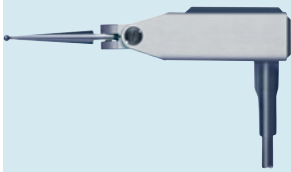
TESA develops, manufactures and remains a leader in the inductive probe sector with an experience of more than 40 years. It offers a complete and unique line of probes designed to meet the requirements of varied as well as demanding applications.

Dimensional inspection of medium and large batches of parts in multigauging fixtures represents a major application area where measuring speed coupled with a high level of accuracy is needed.

High precision inductive probes (type GTL-21 HP) are, for example, also suited for the measurement of gauge blocks. The display resolution can reach a digital step of 0,01 µm !

On request, TESA probes can be supplied in versions compatible with the electronic equipment of other suppliers.





GT-31

Typical qualities of TESA inductive probes : excellent repeatability, durability and longevity

All TESA inductive axial movement are mounted on a ball bearing with the exception of miniature models.

The ball bearing guidance system is insensitive to any radial force exerted on the probe housing. An anti-rotation guiding system ensures perfect movement of the mechanical guide.

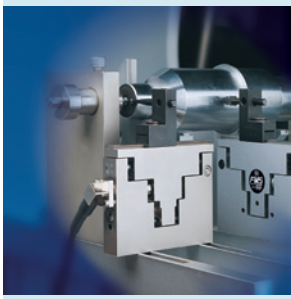
The axial probe guide system is effectively protected against penetration of liquids (oils) or solids (dust) by sealing bellows of high elastic quality. Under normal conditions, the standard nitrile elastomer bellows provide sufficient protection against oils and solvents. For applications where the probes remain in prolonged contact with coolants or lubricants and aggressive chemicals, Viton bellows are recommended. Viton is a fluoreleastomer resistant to the heat of oils and aggressive chemicals.

The retraction (lifting) of the measuring bolt rod can be made by the suction of air (vacuum) accumulated within the probe thanks to the airtightness provided by the sealing bellows. This method of working principle does not use any mechanical device ensures the operation of the guidance system in an optimal manner. Similarly, the probe can be moved into its measuring position by a pneumatic activation (pressure), depending on the probe model.

Inserts (measuring inserts) can be replaced or exchanged. A wide choice of geometrical forms and sizes are available

The measuring force can be adjusted by changing the spring, depending on the probe model.

The probes integrate an electronic amplifier of the signal without relying on any mechanical conversion device. Thus, these probes are distinguished by their high repeatability and very low hysteresis errors.



Probe FMS



TT20



USB probe



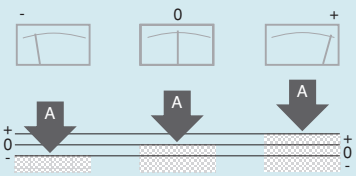
Wireless probe

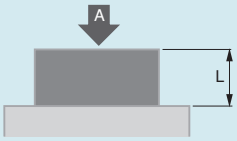


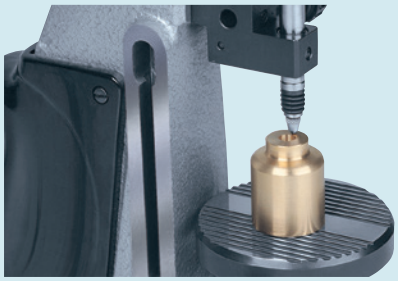
Application examples of measuring functions

Single measurements with positive polarity sign (+A)

Measuring external dimensions with use of a measuring stand, snap gauge etc.

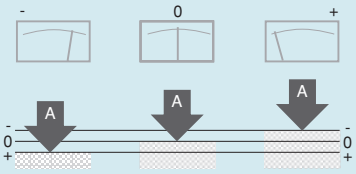


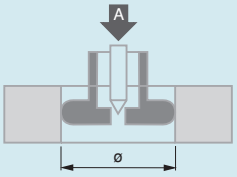


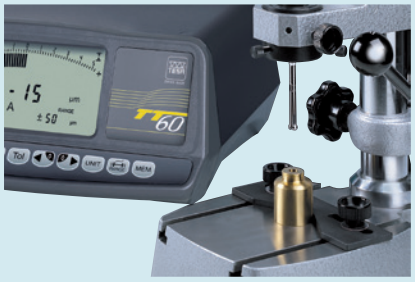


Single measurements with negative polarity sign (-A)

Inversion of polarity with displayed value equal to bore or diameter

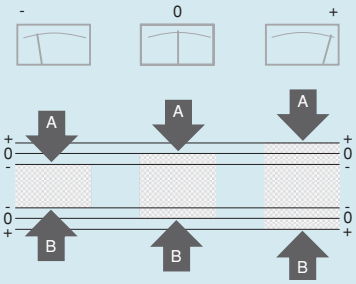


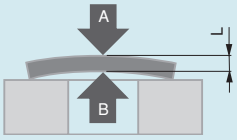




Sum measurements with positive polarity signs (+A +B)

Measuring external dimensions regardless of form and position errors

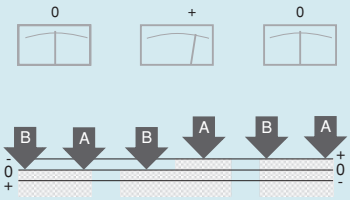


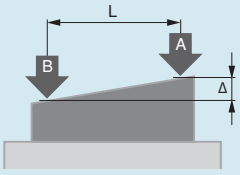


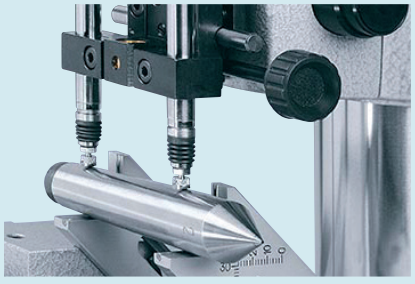


Difference measurements with opposite polarity signs (+A -B)

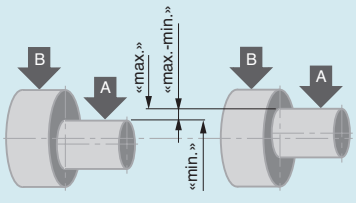
Cone, inclination and step measurements.

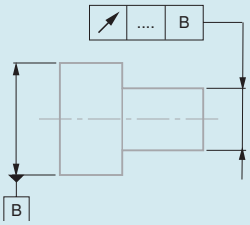


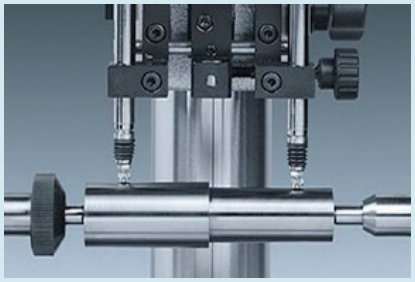




Establishing form and position errors with "max - min" memory function as in the example for runout errors





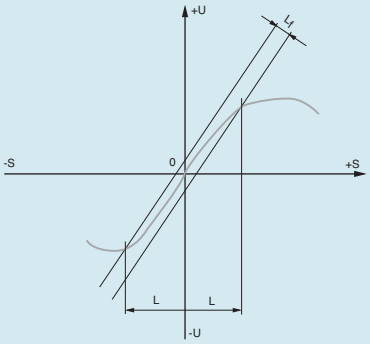


For the acquisition of measured values, TESA offers a complete family of probes and measuring instruments for the most demanding applications. The probes, supplied in standard execution, do not need any form of adaptation. They function on the inductive half-bridge principle.
The market offers other equipment using probes that partly operate on the principle of a differential transformer and these are known as LVDT (Linear Variable Differential Transformer) probes.
TESA also offers a range of probes compatible with other electronic equipment, using an adaptor and a connector depending on the origin of the equipment. A description of TESA standard half-bridge and LVDT probes is provided below.

Standard half-bridge probes for TESA equipment

OPERATING PRINCIPLE

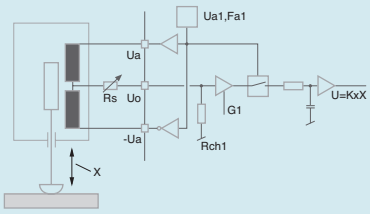
All TESA electronic probes (value sensors) work based on the inductive principle with mechanical contact of the workpiece.
They are fitted with a coil system inducing an alternating output voltage that depends on the the position of the ferro magnetic core. When symmetrically positioned – i.e. at electrical zero – no voltage is impressed.
A move of the core, which may be attached to the measuring bolt while the measurand is being taken, causes the inductance to change. This change generates a signal that is amplified and rectified before being displayed and further output. Depending on the instrument type, the analogue signal will be shown on a voltmetre or a numerical display after a digital transformation.
Unambiguous assessment of the measurand (at bolt position) to the signal (displayed value) is the main characteristic of analogue value acquisition. One of its distinct advantages lies in the value primarily displayed, which will be reproduced in the event of a power cut (switch-off or power failure).



Inductive measuring
S: Travel
U: Output current
0: Electrical zero
L: Linearity range
Lf: Linearity error

TESA Standard Half-Bridge Probes for TESA Electronic Equipment

These probes have two serial coils with middle output mounted side by side, which are energized by a sinusoidal alternation signal at 13 kHz. Both are linked together to a Wheatstone bridge over an additional half-bridge.

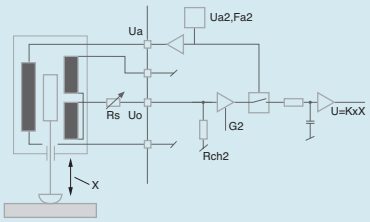


Wiring plan of half-bridge probes

TESA LVDT Probes

These probes are based on a Linear Variable Differential Transformer (LVDT). They have three coils, i.e. one primary coil being energized by a sinusoidal alternation at 5 kHz, and two secondary coils connected in opposite phase, which generate the output current proportional to the measuring travel.

Available upon request.



Wiring plan of LVDT probes

Multiple application possibilities

TESA probes have been designed for applications for use with instruments for internal and external measurements, measuring supports or special measuring systems. For such applications, different probe executions can be supplied such as probes with an axial measuring bolt or parallel guides, refer also to angle lever probes. In addition, there are also special executions developed for multi-gauging inspection fixtures or 'in-process' inspection stations, which enable an economy in the number of components needed. Apart from a few exceptions, the measuring operations executed are always comparative measurements with reference to a standard such as a gauge block, a setting ring or any other component that can be used as a master.

The measurements are extremely accurate. Bias error influence is negligible compared to the budget for measuring uncertainty given the fact that the comparison is being established between two almost practically equal values

Random errors also lose their influence in a procedure where the display setting is made under the same conditions as the subsequent probing measurements

TESA measuring instruments are equipped with an analogue and/or digital display, depending on the model.

Internal processing of measured values

Depending on the application, the electrical signals are processed in different ways within the instrument.

Mathematical Data Processing

The signals can be processed with positive polarity sign as well as negative polarity sign. The use of a single probe enables single measurement of internal or external dimensions while the combination of the signals of two probes produces either a "sum measurement" or a "difference measurement".

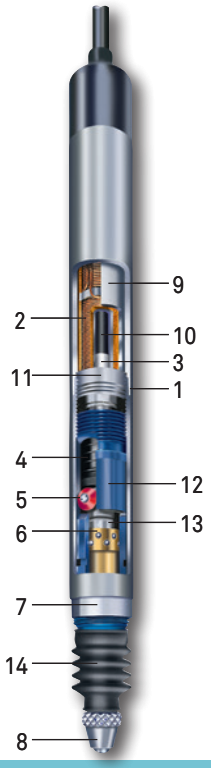
Value Storage

The storage of measured values in the memory ensures the reliability of dynamic measuring cycles. The characteristic values are the two minimum and maximum values or the difference between the smallest and largest value acquired while measuring form or position errors.

Classification of Values

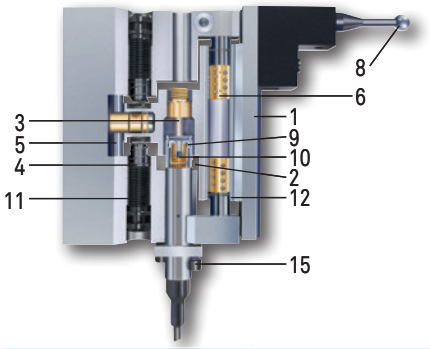
The measured values can be classified after the entering of limit deviations. In this case, the control signals can be used by an external peripheral unit.

Components of a TESA inductive probe



1 Mounting stem or probe housing
2 Coil system
3 Element mounted between the ferromagnetic core and the measuring bolt for the correction of varying coefficients of thermal expansion
4 Force compression spring
5 Anti-rotation guiding system
6 Ball cage
7 Setting element for limiting the measuring bolt travel
8 Probe insert
9 In-between tube being part of the coil system
10 Ferro-magnetic core
11 Force spring stop
12 Ball-bearing guiding tube
13 Measuring bolt
14 Sealing bellow
15 Mechanical device for zero-setting

Sensivity of TESA half-bridge probes for TESA electronic interfaces and electronic displays



Sensitivity	73,75 mV/V/mm 29,50 mV/V/mm (GT 61, GT 62) 7,375 mV/V/mm (GT 61S, GT 62S) 49,17 mV/V/mm (FMS 130, FMS 132)
All given values are valid for the following reference conditions :	
Drive voltage	3 V
Drive frequency	13 kHz
Adjustment load	2 kΩ

Probes with Axial Movement, Ø 8 mm

	No	=	Measuring range, mm	Measuring bolt travel, mm	Cable output	Measuring bolt retraction	Sealing bellows
	**03210904**	GT 21	± 1 mm	4,3	Axial	Mechanical	Nitrile
	**03210924**	GT 22	± 1 mm	4,3	Radial	Mechanical / vacuum	Nitrile
	**03230057**	GTL 21	± 2 mm	4,3	Axial	Mechanical	Viton
	**03230072**	GTL 211	± 2 mm	4,3	Axial	Mechanical / vacuum	Viton
	**03230056**	GTL 22	± 2 mm	4,3	Radial	Mechanical / vacuum	Viton
	**03230027**	GT 27	± 2 mm	10,3	Axial	Mechanical	Viton
	**03230073**	GT 271	± 2 mm	10,3	Axial	Mechanical / vacuum	Viton
	**03230026**	GT 28	± 2 mm	10,3	Radial	Mechanical / vacuum	Viton
	**03230041**	GT 61	± 5 mm	10,3	Axial	Mechanical	Viton
	**03230042**	GT 62	± 5 mm	10,3	Radial	Mechanical / vacuum	Viton
	**03230036**	GT 21 HP	± 0,2 mm	4,3	Axial	Mechanical	Nitrile
	**03230021**	GT 22 HP	± 0,2 mm	4,3	Radial	Mechanical / vacuum	Nitrile

* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Nominal measuring force*, N	Moble weight, g	Mechanical limit max frequency** (Hz)	Partially removable	Répeatability, µm	Max. permissible error for deviations in linearity, µm (L in mm)	Hysteresis, µm	Protection level (IP XX), as per IEC 60529
0,63	6	60	Yes	0,01 µm	0,2 + 3 · L^3 µm	0,02	IP65
0,63	6	60	Yes	0,01 µm	0,2 + 3 · L^3 µm	0,02	IP65
0,63	6	60	Yes	0,01 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8 · L µm	0,02	IP65
0,63	6	60	Yes	0,01 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8 · L µm	0,02	IP65
0,63	6	60	Yes	0,01 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8 · L µm	0,02	IP65
0,63	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
0,63	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
0,63	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
0,90	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP65
0,90	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8 · L µm	0,05	IP65
0,63	6	60	No	0,01 µm	0,07 + 0,4 · L µm	0,01	IP64
0,63	6	60	No	0,01 µm	0,07 + 0,4 · L µm	0,01	IP64

Probes with Axial Movement, Ø 8 mm, with Activation of the Measuring Bolt by Pneumatic Pressure

	NO	=	Measuring range, mm	Measuring bolt travel, mm	Cable output	Sealing bellows
	**03230060**	GTL 212	± 1,5 mm	3,2	Axial	Viton
	**03230054**	GTL 222	± 1,5 mm	3,2	Radial	Viton
	**03230067**	GTL 212-A	± 1,5 mm	3,2	Axial	Without belllows
	**03230063**	GTL 222-A	± 1,5 mm	3,2	Radial	Without bellows
	**03230061**	GT 272	± 2 mm	10,3	Axial	Viton
	**03230053**	GT 282	± 2 mm	10,3	Radial	Viton
	**03230068**	GT 272-A	± 2 mm	10,3	Axial	Without bellows
	**03230069**	GT 282-A	± 2 mm	10,3	Radial	Without bellows
	**03230062**	GT 612	± 5 mm	10,3	Axial	Viton
	**03230055**	GT 622	± 5 mm	10,3	Radial	Viton
	**03230070**	GT 612-A	± 5 mm	10,3	Axial	Without bellows
	**03230071**	GT 622-A	± 5 mm	10,3	Radial	Without bellows

* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Measuring force, nominal*, N	Mobile weight, g	Max. mechanical frequency limit** (Hz)	Partially removable	Repeatability, µm	Max. permissible error for deviations in linearity, µm (L in mm)	Hysteresis, µm	Protection level (IP XX), as per IEC 60529
1,2	6	60	Yes	0,015 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8· L µm	0,02	IP65
1,2	6	60	Yes	0,015 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8· L µm	0,02	IP65
0,2	6	60	Yes	0,015 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8· L µm	0,02	IP50
0,2	6	60	Yes	0,015 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8· L µm	0,02	IP50
1,0	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
1,0	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
0,85	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP50
0,85	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP50
2,0	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP65
2,0	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP65
1,0	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP50
1,0	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP50

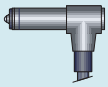
USB, DC, Wireless Probes

	NO	=	Measuring range, mm	Max. plunger travel, mm	Cable output	Bolt retraction	Sealing bellows
	**03230500**	GTL 21 W	± 2 mm	4,3	Without cable	Mechanical	Viton
	**03230502**	GT61 W	± 5 mm	10,3	Without cable	Mechanical	Viton
	03230501	GTL 212 W	± 1,5 mm	4,3	Without cable	Pressure (bolt activation), bellow spring (bolt retraction)	Viton
	03230503	GT 612 W	± 5 mm	10,3	Without cable	Pressure (bolt activation), bellow spring (bolt retraction)	Viton
	03230201	GTL 22 USB	± 2 mm	4,3	Radial	Mechanical / vacuum	Viton
	03230200	GTL 21 USB	± 2 mm	4,3	Axial	Mechanical	Viton
	03230204	GT 61 USB	± 5 mm	10,3	Axial	Mechanical	Viton
	03230205	GT 62 USB	± 5 mm	10,3	Radial	Mechanical / vacuum	Viton
	03230202	GTL 222 USB	± 1,5 mm	3,1	Radial	Pressure (bolt activation), bellow spring (bolt retraction)	Viton
	03230058	GTL 22 DC	± 2 mm	4,3	Radial	Mechanical / vacuum	Viton
	03230059	GTL 21 DC	± 2 mm	4,3	Axial	Mechanical	Viton
	03230087	GT 62 DC	± 5 mm	10,3	Radial	Mechanical / vacuum	Viton
	03230086	GT 61 DC	± 5 mm	10,3	Axial	Mechanical	Viton
	03230085	GT 44 DC	± 1 mm	2,1	Radial	Mechanical / vacuum	Viton
	03230081	GT 31 DC	± 0,3 mm	0,7	Angled	Without retraction	Without bellows

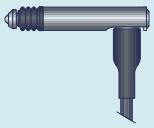
* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Nominal measuring force*, N	Mobile weight, g	Max. mechanical frequency limit**, (Hz)	Partially removable	Repeatability, µm	Maximum permissible error, µm (L in mm)	Hysteresis, µm	Level of protection (IP XX), as per IEC 60529
0,63	6	60	No	0,10 µm	0,4 + 0,8 · L µm	0,5	IP54
0,9	8	60	No	0,24 µm	0,8 + 0,8 · L µm	0,5	IP54
1,2	6	60	No	0,10 µm	0,4 + 0,8 · L µm	0,5	IP54
2,0	8	60	No	0,24 µm	0,8 + 0,8 · L µm	0,5	IP54
0,63	6	60	No	0,1 µm	0,4 + 0,8 · L µm	0,5	IP65
0,63	6	60	No	0,1 µm	0,4 + 0,8 · L µm	0,5	IP65
0,90	8	60	No	0,24 µm	0,8 + 0,8 · L µm	0,5	IP65
0,90	8	60	No	0,24 µm	0,8 + 0,8 · L µm	0,5	IP65
1,2	6	60	No	0,1 µm	0,4 + 0,8 · L µm	0,5	IP64
0,63	6	60	Yes	0,1 µm	0,2 + 3,5 · L^2 µm		IP65
0,63	6	60	Yes	0,1 µm	0,2 + 3,5 · L^2 µm		IP65
0,9	8	60	No	0,1 µm	1 + 4 · L µm		IP65
0,9	8	60	Yes	0,1 µm	1 + 4 · L µm		IP65
0,4	2	60	No	0,1 µm	0,2 + 5 · L^2 µm		IP65
0,1	12	25	No	0,1 µm	0,2 + 50 · L^2 µm		IP50

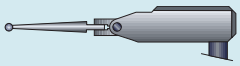
Probes with Axial Movement,Ø 8 mm

	NO		Measuring range, mm	Measuring bolt travel, mm	Cable output	Bolt retraction	Sealing bellows
	**03230001**	GT 41	± 0,3 mm	0,7	Axial	None	Nitrile
	**03230002**	GT 42	± 0,3 mm	0,7	Radial	Vacuum	Nitrile
	**03230035**	GT 43	± 1 mm	2,1	Axial	Mechanical	Viton
	**03230017**	GT 44	± 1 mm	2,1	Radial	Vacuum	Viton

Unbranded Axial Probes with Measuring Bolt Mounted on a Ball-bearing

	**96410012**	410	± 1 mm	2,5	Axial and radial	Mechanical	Nitrile
	**96160013**	160	± 1 mm	3,3	Axial	Mechanical	Viton
	**96430029**	430	± 0,5 mm	1,25	Axial	Mechanical	Nitrile
	**96441041**	451	± 0,5 mm	2,10	Radial	Mechanical	Nitrile

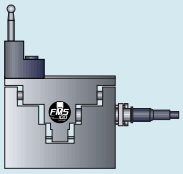
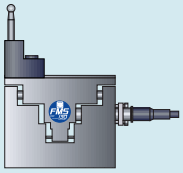
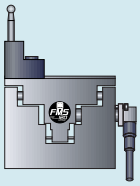
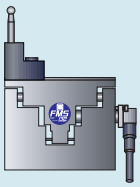
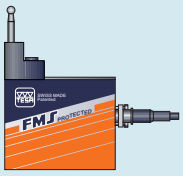
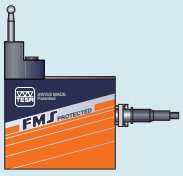
Probe with Inclinable Lever

	**03210802**	GT 31	± 0,3 mm	0,7	Angled	Without	Without bellows

* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Nominal measuring force*, N	Mobile weight, g	Max. mechanical frequency limit**, (Hz)	Partially removable	Repeatabilty, µm	Max. permissible error for deviations in linearity, µm (L en mm)	Hysteresis, µm	Level of protection (IP XX), as per IEC 60529
0,63	2	60	No	0,01 µm	$0,2 + 5 \cdot L^2$ µm	0,01	IP65
0,63	2	60	No	0,01 µm	$0,2 + 5 \cdot L^2$ µm	0,01	IP65
0,4	2	60	No	0,1 µm	$0,2 + 5 \cdot L^2$ µm	0,15	IP65
0,4	2	60	No	0,1 µm	$0,2 + 5 \cdot L^2$ µm	0,15	IP65
0,60	3,1	60	No	0,1 µm	0,2 % (for a measuring span of ± 1 mm) µm		IP62
0,60	2,5	60	No	0,1 µm	0,2 % (for a measuring span of ± 1 mm) µm		IP62
0,75	1,9	60	No	0,2 µm	0,2 % (for a measuring span of ± 0,5 mm) µm		IP62
0,60	3,0	60	No	0,1 µm	0,2 % (for a measuring span of ± 0,5 mm) µm		IP62
0,1	12	25	No	0,1 µm	$0,2 + 50 \cdot L^2$ µm	0,25	IP40

Universal FMS Probes

	NO	=	Measuring range, mm	Measuring bolt travel, mm	Cable output	Bolt retraction	Sealing bellows
	**03230019**	FMS 100	± 2 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230049**	FMS 130	± 2,9 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230028**	FMS 102	± 2 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230050**	FMS 132	± 2,9 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230037**	FMS100-P	± 2 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230051**	FMS130-P	± 2,9 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230038**	FMS102-P	± 2 mm	5,8	Angled	Retraction through air pressure (optional)	Without bellows
	**03230052**	FMS132-P	± 2,9 mm	5,8	Angled	Retraction through air pressure (optional)	Without bellows

* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Nominal measuring force*, N	Mobile weight, g	Max. mechanical frequency limit**, Hz	Partially removable	Repeatabilty, µm	Max.permissible error for deviation in linearity, µm (L in mm)	Hysteresis, µm	Protection level (IP XX), as per IEC 60529
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP50
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP50
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP50
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP50
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP54
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP54
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP54
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP54

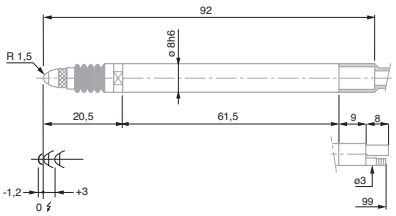
Standard Probes, ± 1 mm, 4,3 mm Travel (GT21)

Universal probes for standard and continuous use applications.

- 8 mm diameter probe housing. Can be clamped over its entire length.
- Measuring bolt mounted on a ball bearing.
- Both the probe housing and ball-bearing guide are separate from one another, so that the measuring bolt moves easily even if the probe is not clamped appropriately.
- Degree of protection IP65 according to IEC 60529.
- Wide range of accessories including measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other makers available on request.



GT21



GT 21

NO		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03210904	**GT 21**	± 1	0,63	Mechanical	Nitrile
03210905	**GT 21**	± 1	1,00	Mechanical	Nitrile
03210906	**GT 21**	± 1	1,60	Mechanical	Nitrile
03210907	**GT 21**	± 1	2,50	Mechanical	Nitrile
03210908	**GT 21**	± 1	4,00	Mechanical	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of the lower bolt stop***, mm (factory setting)	Cable output	Data Sheet No.
GT 21	4,3	$0,2 + 3 \cdot L^3$	0,01	0,02	-2,2 to 0,1 (factory setting -1,2)	Axial	03200249

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Nitrile sealing bellows = resistant elastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %). Max mechanical frequency** 60 Hz.

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Nitrile sealing bellows = resistant elastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %). Max mechanical frequency** 60 Hz.

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

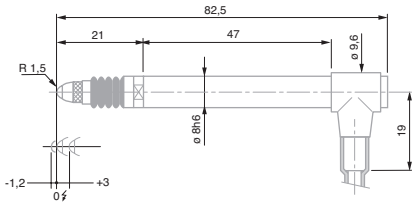
Standard Probes, ± 1 mm, 4,3 mm Travel (GT22)

Universal probes for common but constraining applications.

- 8 mm diameter probe housing. Can be clamped over its entire length.
- Measuring bolt mounted on a ball bearing.
- Both the probe housing and ball-bearing guide are separate from one another, so that the measuring bolt moves easily even if the probe is not clamped appropriately.
- Degree of protection IP65 according to IEC 60529.
- Wide range of accessories including measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other makers available on request.



GT 22



GT 22

NO		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03210924	**GT 22**	± 1	0,63	Mechanical / vacuum	Nitrile
03210921	**GT 22**	± 1	0,16	Mechanical / vacuum	Nitrile
03210922	**GT 22**	± 1	0,25	Mechanical / vacuum	Nitrile
03210923	**GT 22**	± 1	0,40	Mechanical / vacuum	Nitrile
03210925	**GT 22**	± 1	1,00	Mechanical	Nitrile
03210926	**GT 22**	± 1	1,60	Mechanical	Nitrile
03210927	**GT 22**	± 1	2,50	Mechanical	Nitrile
03210928	**GT 22**	± 1	4,00	Mechanical	Nitrile

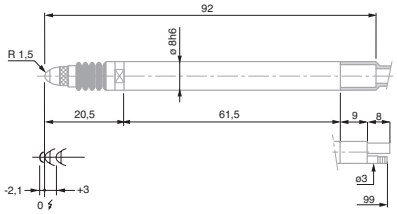
	Measuring travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of the lower bolt stop***, mm (factory setting)	Cable output	Data Sheet No.
GT 22	4,3	$0,2 + 3 \cdot L^3$	0,01	0,02	-2,2 to 0,1 (factory setting -1,2)	Radial	03200250

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

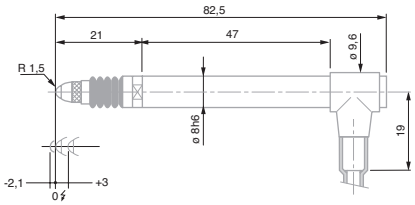
Standard Probes ± 2 mm, 4,3mm Bolt Travel, Linear Travel

Universal probes for standard and continual usage applications.

- Probe housing Ø 8 mm with possibility of clamping over its entire length.
- Measuring bolt mounted on a ball bearing.
- Both the probe housing and ball-bearing guide are separate from one another, so that the measuring bolt moves easily even if the probe is not clamped appropriately.
- Degree of protection IP65 according to IEC 60529.
- Wide range of accessories including measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other makers available on request.



GTL 21
GTL 211



GTL 22



GTL 21
GTL 211



GTL 22

		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03230057	**GTL 21**	± 2	0,63	Mechanical	Viton
03230072	**GTL 211**	± 2	0,63	Mechanical / vacuum	Viton
03230056	**GTL 22**	± 2	0,63	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error for deviation in linearity, µm (L in mm)	Repeata-bilty, µm	Hysteresis, µm	Setting of measuring bolt lower stop***, mm (factory setting)	Cable output	Data Sheet No.
GTL 21	4,3	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,01	0,02	-2,2 to 0,1 (factory setting -2,1)	Axial	03200391
GTL 211	4,3	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,01	0,02	-2,2 to 0,1 (factory setting -2,1)	Axial	03200435
GTL 22	4,3	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,01	0,02	-2,2 to 0,1 (factory setting -2,1)	Radial	03200392

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastometer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency** 60 Hz.

0,2 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton bellows = high-resistance fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency** 60 Hz.

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 8 g

Inspection report with a declaration of conformity

Standard Probes, ± 2 mm, 10,3 mm Travel, with Long Retraction Travel

Universal inductive probes for various applications, especially for use with multi-gauging inspection fixtures.

- Long retraction travel to prevent the probe from being damaged.
- Protection level IP65 as per IEC 60529.
- Large choice of accessories: measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other suppliers also available on request.



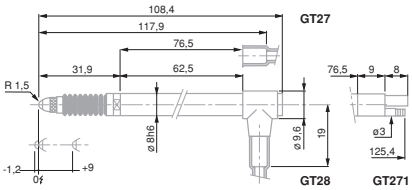
GT 27



GT 271



GT 28



GT 27/ 28
GT 271

NO		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03230027	**GT 27**	± 2	0,63	Mechanical	Viton
03230073	**GT 271**	± 2	0,63	Mechanical / vacuum	Viton
03230026	**GT 28**	± 2	0,63	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repatability, µm	Hysteresis, µm	Setting of measuring bolt lower stop***, mm (factory setting)	Cable output	Data Sheet No.
GT 27	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	-2,2 to 0,1 (factory setting -1,2)	Axial	03200251
GT 271	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	-2,2 to 0,1 (factory setting -1,2)	Axial	03200436
GT 28	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	-2,2 to 0,1 (factory setting -1,2)	Radial	03200252

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero

Standard Probes ± 5 mm, 10,3 mm Bolt Travel, Extended Range

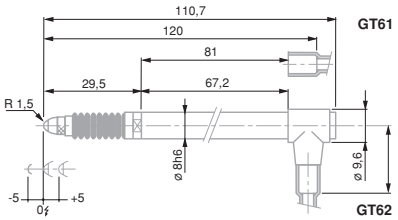
- Designed for long measuring travels and low resolution of values
- Specially suited for use on multigauging inspection fixtures.
- Correction factor appplied to get the true value is 2,5x (10x for the S probe version).
- Protection level IP 65 as per IEC 60529.
- Large choice of accessories: Measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other suppliers also available on request.



GT 61



GT 62



GT 61 / GT 62

		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03230041	**GT 61**	± 5	0,90	Mechanical	Viton
03230042	**GT 62**	± 5	0,90	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max.permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Measuring bolt***, mm (factory setting)	Cable output	Data Sheet No.
GT 61	10,3	1 + 4 · L (BPX: 0,2 + 0,8 · L)	0,05	0,05	Lower - 5,1 upper + 5,2 (factory setting -5)	Axial	03200294
GT 62	10,3	1 + 4 · L (BPX: 0,2 + 0,8 · L)	0,05	0,05	Lower - 5,1 upper + 5,2 (factory setting -5)	Radial	03200295

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton bellows = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency** 60 Hz.

0,09 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 8 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Nitrile sealing bellow = resistant elastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency** 60 Hz.

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

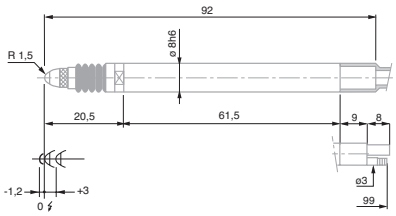
Inspection report with a declaration of conformity

GT 21 HP High Precision Probes, ± 0,2 mm, 4,3 mm Travel

- Universal probe for common and continuous use applications.
- Very high precision probe suited for the measurement of gauge blocks.
- 8 mm diameter probe housing. Can be clamped over its entire length.
- Measuring bolt mounted on a ball bearing.
- Both the probe housing and ball-bearing guide are separate from one another, so that the measuring bolt moves easily even if the probe is not clamped appropriately.
- Level of protection IP65 according to IEC 60529.
- Wide range of accessories including measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other makers available on request.



GT 21 HP



GT 21 HP

		Measuring range, mm	Measuring force, nominal*, N	Bolt retraction	Sealing bellows
03230036	**GT 21 HP**	± 0,2	0,63	Mechanical	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm (factory setting)	Cable output	Data Sheet No.
GT 21 HP	4,3	07 + 0,4 · L	0,01	0,01	-2,2 to +0,1 (factory setting -1,2)	Axial	03200264

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

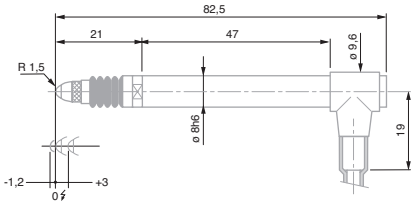
GT 22 HP High Precision Probe, ± 0,2 mm, 4,3 mm Travel

Universal probe for standard and continuous use applications.

- Very high precision probe suitable for the measurement of gauge blocks.
- 8 mm diameter probe housing. Can be clamped over its entire length.
- Measuring bolt mounted on a ball bearing.
- Both the probe housing and ball-bearing guide are separate from one another, so that the measuring bolt moves easily even if the probe is not clamped appropriately.
- Level of protection IP65 according to IEC 60529.
- Wide range of accessories including measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other makers available on request.



GT 22 HP



GT 22 HP

		Measuring range, mm	Measuring force, nominal*, N	Bolt retraction	Sealing bellows
03230021	**GT 22 HP**	± 0,2	0,63	Mechanical / vacuum	Nitrile

	Measuring travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repatability, µm	Hystersis, µm	Setting of lower stop of the measuring bolt***, mm (factory setting)	Cable output	Data Sheet No.
GT 22 HP	4,3	0,07 + 0,4 · L	0,01	0,01	-2,2 to +0,1 (usine -1,2)	Radial	03200265

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Nitrile sealing bellows = resistant elastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency*** 60 Hz.

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellow = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency** 60 Hz.

0,2 µm/°C

20 ± 0,5°C

Protection level: IP65 (IEC 60529) or IP50 for GTL 212-A and GTL 222-A

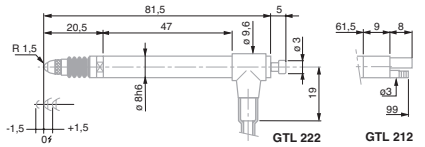
Mobile weight: 6 g

Inspection report with a declaration of conformity

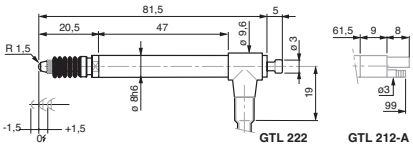
Pneumatic Probes ± 1,5 mm, 3,2 mm Bolt Travel, Linear

Probes for use with measuring fixtures or inspection machines integrating semi-automated or automated measuring routines.

- 8 mm diameter probe housing. Can be clamped over its entire length.
- Measuring bolt mounted on a ball bearing.
- Both the probe housing and ball-bearing guide are separate from one another, so that the measuring bolt moves easily even if the probe is not clamped appropriately.
- Degree of protection IP65 according to IEC 60529.
- Wide range of accessories including measuring inserts, etc.
- LVDT probes compatible with measuring equipment from other makers available on request.



GTL 212 / GTL 222



GTL 212-A / GTL 222-A



GTL 222



GTL 212



GTL 212-A



GTL 222-A

NO		Measuring range, mm	Measuring force, nominal*, N	Measuring bolt retraction	Sealing bellows	Nominal/ Maximal pressure, bar
03230060	**GTL 212**	± 1,5	1,2	Pressure (bolt activation), spring (bolt retraction)	Viton	0,7 / max 1,0
03230054	**GTL 222**	± 1,5	1,2	Pressure (bolt activation), spring (bolt retraction)	Viton	0,7 / max 1,0
03230067	**GTL 212-A**	± 1,5	0,2	Pressure (bolt activation), spring (bolt retraction)	Without belllows	0,25 / max 6,0
03230063	**GT 222-A**	± 1,5	0,2	Pressure (bolt activation), spring (bolt retraction)	Without bellows	0,25 / max 6,0

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Cable output	Data Sheet No.
GTL 212	3,2	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,015	0,02	Axial	03200413
GTL 222	3,2	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,015	0,02	Radial	03200393
GTL 212-A	3,2	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,015	0,02	Axial	03200430
GT 222-A	3,2	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,015	0,02	Radial	03200422

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.

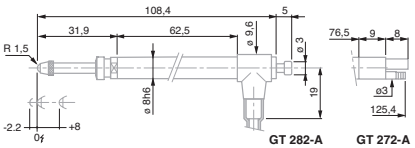
Pneumatic Probes ± 2 mm, 10,3 mm Bolt Travel, with Long Retraction Travel

These probes are intended for use with measuring fixtures or machines integrating automated and semi-automated measuring routines.

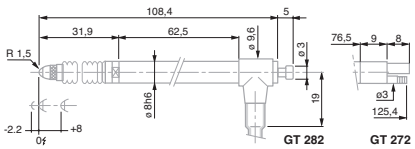
- 8 mm diameter probe housing. Can be clamped over its entire length.
- Measuring bolt mounted on a ball bearing.
- Both the probe housing and ball-bearing guide are separate from one another, so that the measuring bolt moves easily even if the probe is not clamped appropriately.
- Degree of protection IP65 according to IEC 60529.
- Wide range of accessories including measuring inserts, etc.
- LVDT probes compatible with measuring equipment from other makers available on request.



GT 282-A



GT 282-A / GT 272-A



GT 282 / GT 272



GT 282



GT 272



GT 272-A

No		Measuring range, mm	Measuring force, nominal*, N	Bolt retraction	Sealing bellows	Nominal/ Maximal pressure, bar
03230061	**GT 272**	± 2	1,0	Pressure (bolt activation), spring (bolt retractiom)	Viton	1,1 / max 1,5
03230053	**GT 282**	± 2	1,0	Pressure (bolt activation), spring (bolt retraction)	Viton	1,1 / max 1,5
03230068	**GT 272-A**	± 2	0,85	Pressure (bolt activation), spring (bolt retraction)	Without bellows	1,0 / max 6,0
03230069	**GT 282-A**	± 2	0,85	Pressure (bolt activation), spring (bolt retraction)	Without bellows	1,0 / max 6,0

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repatability, µm	Hysteresis, µm	Cable output	Data Sheet No.
GT 272	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	Axial	03200414
GT 282	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	Radial	03200390
GT 272-A	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	Axial	03200431
GT 282-A	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	Radial	03200432

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency** 60 Hz.

0,15 µm/°C

20 ± 0,5°C

Protection level: IP65 (IEC 60529), IP64 for GT 21 HP

Mobile weight: 8 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency** 60 Hz.

0,09 µm/°C

20 ± 0,5°C

Protection level: IP65 (IEC 60529),

Mobile weight: 8 g

Inspection report with a declaration of conformity

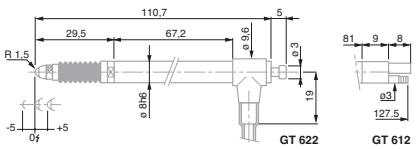
Pneumatic Probes ± 5 mm, 10,3 mm Bolt Travel, Long Travel

These probes are designed for use with measuring fixtures and machines with integrated automatic or semi-automatic measuring routines.

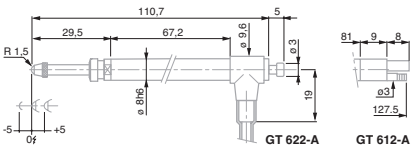
- Probes with long measuring travel and low resolution of values 8 mm dia. fixing shank.
- Suitable for multi-gauging inspection fixtures.
- Protection level IP65 ou IP50 as per IEC 60529.
- Wide range of accessories including measuring inserts, etc.
- LVDT probes compatible with measuring equipment from other suppliers available on request.



GT 622



GT 622 / GT 612



GT 622-A / GT 612-A



GT 622-A



GT 612



GT 612-A

		Measuring range, mm	Measuring force, nominal*, N	Bolt retraction	Sealing bellows	Nominal/ Maximal pressure, bar
03230062	**GT 612**	± 5	2,0	Pressure (bolt activation), spring (bolt retraction)	Viton	1,1 / max 1,5
03230055	**GT 622**	± 5	2,0	Pressure (bolt activation), spring (bolt retraction)	Viton	1,1 / max 1,5
03230070	**GT 612-A**	± 5	1,0	Pressure (bolt activation), spring (bolt retraction)	Without bellows	1,0 / max 6,0
03230071	**GT 622-A**	± 5	1,0	Pressure (bolt activation), spring (bolt retraction)	Without bellows	1,0 / max 6,0

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Cable output	Data sheet No.
GT 612	10,3	1 + 4 · L (BPX: 0,6 + 0,8· L)	0,05	0,05	Axial	03200415
GT 622	10,3	1 + 4 · L (BPX: 0,6 + 0,8· L)	0,05	0,05	Radial	03200394
GT 612-A	10,3	1 + 4 · L (BPX: 0,6 + 0,8· L)	0,05	0,05	Axial	03200433
GT 622-A	10,3	1 + 4 · L (BPX: 0,6 + 0,8· L)	0,05	0,05	Radial	03200434

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.

Wireless Probe ± 2 mm

Probes developed for devices requiring a greater freedom of movement during the measurement or for parts with large dimensions.

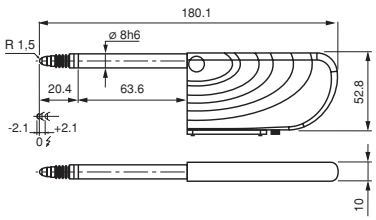
Bidirectional and wireless communication synchronized with the TWIN-STATION Receiver.

- Resolution 0,1 µm.
- Range of 8 m, depending on environment.
- TESA wireless communication protocol independent of WiFi or Bluetooth.
- Autonomy 40 hours (rechargeable battery).
- Mounting stem Ø 8 mm with clamping possible over entire length.
- Measuring bolt mounted on ball bearing.
- Ball bearing guide separated from mounting stem in order not to negatively influence the movement of the measuring bolt in the event of improper clamping of the probe body.
- Level of protection IP54 according to IEC 60529.
- Wide range of measurement inserts.
- The TWIN-STATION (part number 05030012) manages and synchronizes up to 8 wireless probes.
- Interface Software TIS included in delivery content of the TWIN-STATION (part number 05030012): display of measured values, possibility to indicate tolerances, simple functions +A, -A, +A+B, +A-B, and export of values as a .csv file.

Note: The sales is limited to EU countries, Switzerland, USA, Canada and China.



GTL 21 W



GTL 21 W

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230500	**GTL 21 W**	± 2	0,63	Mechanical	Viton

OPTIONAL ACCESSORY:

05030012	TWIN-STATION Interface for wireless probes

	Max. plunger travel, mm	Maximum permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of the measuring bolt***, mm	Cable output	Data sheet No.
GTL 21 W	4,3	0,4 + 0,8· L	0,10	0,5	Fixed stops: lower -2,1 upper +2,1	Without cable	03200602

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

- DIN 32876 Part 1
- Nickel-plated housing
  Stainless steel measuring bolt, hardened
  Viton sealing bellows = highly resistant fluoroelastomer
- Fixing body nickel Ø 8 mm
  Stainless steel measuring bolt, hardened and ball bearing guided
  Fixed upper and lower stops
  Interchangeable inserts
  M2, 5 thread
  Carbide ball Ø 3 mm
  Mini jack connector for charger.
- Mechanical max. frequency**: 60 Hz
  Power supply: 100 ÷ 240 VAC, 50 ÷ 60 Hz; 240 mAh
  Rechargeable battery: 3,7 V, min. 550 mAh or 800 mAh
  Frequency band: 2,4 GHz Range: 8 m, depending on environment.
- Wireless transmission, TWIN-STATION Receiver (05030012)
- ± 0,2 µm/°C
- 20 ± 0,5°C
- Protection level IP54 (IEC 60529)
- GTL 21 W: 6g
- Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing Stainless steel measuring bolt, hardened. Viton = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. Connector Mini-jack for charger.

Mechanical max. frequency**: 60 Hz Power supply: 100 ÷ 240 VAC, 50 ÷ 60 Hz; 240 mAh Rechargeable battery: 3,7 V, min. 550 mAh or 800 mAh Frequency band: 2,4 GHz Range: 8 m, depending on environment.

Wireless transmission, TWIN-STATION Receiver (05030012)

± 0,2 µm/°C

20 ± 0,5°C

Protection operating enevelope IP54 (IEC 60529)

GT 61 W: 8 g

Inspection report with a declaration of conformity

Wireless Probe ± 5 mm, Large Measuring Range

Probes developed for devices requiring a greater freedom of movement during the measurement or for parts with large dimensions.

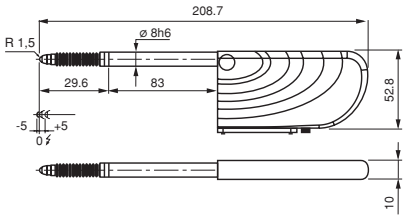
Bidirectional and wireless communication synchronized with the TWIN-STATION Receiver.

- Resolution 0,1 µm.
- Range of 8 m, depending on environment.
- TESA wireless communication protocol independent from WiFi or Bluetooth.
- Autonomy 40 hours (rechargeable battery).
- Mounting body Ø 8 mm with possoboilty of clamping over entire length.
- Measuring bolt mounted on ball bearing.
- Separate guide bearing on the mounting body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping on the probe body.
- Level of protection IP54 according to IEC 60529.
- Wide range of measurement probes.
- The TWIN-STATION (part number 05030012) manages and synchronizes up to 8 wireless probes.
- Interface Software TIS included in supply content of the TWIN-STATION (part number 05030012): display of measured values, possibility to indicate tolerances, simple functions +A, -A, +A+B, +A-B, and export of values in a .csv file.

Note: The sales is limited to EU countries, Switzerland, USA, Canada and China.



GT 61 W



GT 61 W

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230502	**GT 61 W**	± 5	0,9	Mechanical	Viton
OPTIONAL ACCESSORY:					
05030012	TWIN-STATION Interface for wireless probes				

	Max. bolt travel, mm	Maximum permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm	Cable output	Data sheet No.
GT 61 W	10,3	0,8 + 0,8· L	0,24	0,5	Fixed stops lower -5 upper +5	Without cable	03200621

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

Wireless Pneumatic Probe ± 1,5 mm

Probes developed for devices requiring a greater freedom of movement during the measurement or for parts with large dimensions.

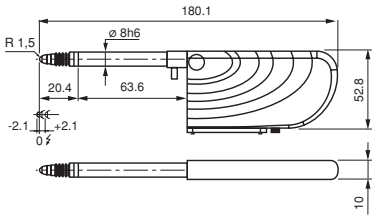
Bidirectional and wireless communication synchronized with the TWIN-STATION Receiver.

- Resolution 0,1 µm.
- Range of 8 m, depending on environment.
- TESA wireless communication protocol independent from WiFi or Bluetooth
- Autonomy 40 hours (rechargeable battery).
- Support structure Ø 8 mm with enhanced clamping over its entire length
- Measuring rod mounted on ball bearing.
- Separate guide bearing on the holding body in order not to negatively influence the movement of the measuring rod in the event of improper clamping of the probe beads.
- Level of protection IP54 according to IEC 60529.
- Wide range of measurement probes.
- The TWIN-STATION (part number 05030012) manages and synchronizes up to 8 wireless probes.
- Interface Software TIS included in delivery content of the TWIN-STATION (art. 05030012): display of measured values, possibility to indicate tolerances, simple functions +A, -A, +A+B, +A-B, and export of values in a .csv file.

Note: The sales is limited to EU countries, Switzerland, USA, Canada and China.



GTL 212 W



GTL 212 W

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Nominal/maximal pressure, bar
03230501	**GTL 212**	± 1,5	1,2	Pressure (bolt activation), spring (bolt retraction)	Viton	0,7 / max. 1,0

OPTIONAL ACCESSORY:

05030012	TWIN-STATION Interface for wireless probes

	Max. measuring bolt travel, mm	Maximum permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of the measuring bolt***, mm	Cable output	Data sheet No.
GTL 212 W	4,3	0,4 + 0,8· L	0,10	0,5	Fixed stops: lower -2,1 upper +2,1	Without cable	03200620

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

- DIN 32876 Part 1
- Nickel-plated housing Stainless steel measuring bolt, hardened Viton sealing bellows = highly resistance fluoroelastomer
- Fixing body nickel Ø 8 mm Stainless steel measuring bolt, hardened and ball bearing guided Fixed upper and lower stops Probe interchangeable M2,5 thread Carbide ball Ø 3 mm Mini jack connector for charger.
- Mechanical max. frequency**: 60 Hz Power supply: 100 ÷ 240 VAC, 50 ÷ 60 Hz; 240 mAh Rechargeable battery: 3,7 V, min. 550 mAh or 800 mAh Frequency band: 2,4 GHz Range: 8 m, depending on environment.
- Wireless transmission, TWIN-STATION Receiver (05030012)
- ± 0,2 µm/°C
- 20 ± 0,5°C
- Protection IP54 (IEC 60529)
- GTL 212 W: 6g
- Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing
Stainless steel measuring bolt, hardened
Viton sealing bellows = highly resistance fluoroelastomer

Fixing body nickel Ø 8 mm
Stainless steel measuring bolt, hardened and ball bearing guided
Fixed upper and lower stops
Probe interchangeable
M2, 5 thread
Carbide ball Ø 3 mm
Mini jack connector for charger

Mechanical max. frequency**: 60 Hz
Power supply: 100 ÷ 240 VAC, 50 ÷ 60 Hz; 240 mAh
Rechargeable battery: 3,7 V, min. 550 mAh or 800 mAh
Frequency band: 2,4 GHz Range: 8 m, depending on environment.

Wireless transmission, TWIN-STATION Receiver (05030012)

± 0,2 µm/°C

20 ± 0,5°C

Protection level IP54 (IEC 60529)

GT 612 W: 8 g

Inspection report with a declaration of conformity

Wireless Pneumatic Probe ± 5 mm, Large Measuring Range

Probes developed for devices requiring a greater freedom of movement during the measurement or for pieces with large dimensions.

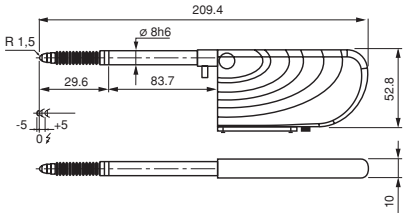
Bidirectional and wireless communication synchronized with the TWIN-STATION Receiver.

- Resolution 0,1 µm.
- Range of 8 m, depending on environment.
- TESA wireless communication protocol independent from WiFi or Bluetooth.
- Autonomy 40 hours (rechargeable battery).
- Mounting body Ø 8 mm with enhanced clamping over its entire length.
- Measuring bolt mounted on ball bearing.
- Separate guide bearing on the holding body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping on the probe body.
- Level of protection IP54 according to IEC 60529.
- Wide range of measurement probes.
- The TWIN-STATION (part number 05030012) manages and synchronizes up to 8 wireless probes.
- Interface Software TIS included in delivery content of the TWIN-STATION (art. 05030012): display of measured values, possibility to indicate tolerances, simple functions +A, -A, +A+B, +A-B, and export of values in a .csv file.

Note: The sales is limited to EU countries, Switzerland, USA, Canada and China.



GT 612 W



GT 612 W

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Nominal/maximal pressure, bar
03230503	**GT 612 W**	± 5	2,0	Pressure (bolt activation), spring (bolt retraction)	Viton	1,1 / max. 1,5
OPTIONAL ACCESSORY:						
05030012	TWIN-STATION Interface for wireless probes					

	Max. bolt travel, mm	Maximum permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm	Cable output	Data sheet No.
GT 612 W	10,3	0,8 + 0,8· L	0,24	0,5	Fixed stops: lower -5 upper +5	Without cable	03200622

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

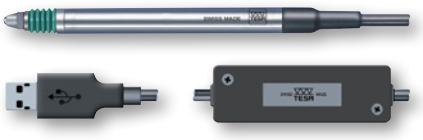
USB Probes ± 2 mm, 4,3 mm Range

Universal probes for applications aided by a USB connection.

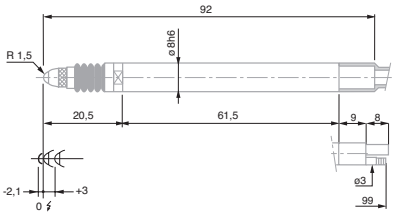
- Probe mounting body Ø 8 mm with enhanced clamping over its entire length.
- Measuring bolt mounted on ball bearing.
- Separate guide bearing on the mounting body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping of the probe beads.
- Level of protection IP65 according to IEC 60529.
- Wide range of measurement inserts.
- TSIP software interface included in supply 1 to 4 USB probes display. Possibility of indicating tolerances and simple functions + A,-A, + A + B + AB.
- To manage more than 4 probes USB, use the DATA-DIRECT (part number 04981001) or STAT-EXPRESS software (part number 04981002), available as an option.



TSIP Software



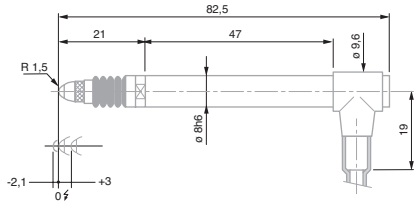
GTL 21 USB



GTL 21 USB



GTL 22 USB



GTL 22 USB

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

Fixing body Ø 8 mm. Measuring bolt guided on ball bearing. Fixed upper and lower stops. Interchangeable inserts. M 2,5 thread. Carbide ball Ø 3 mm. Cable length: 2,9 m. USB Type A plug connector

Max. mechanical frequency** 60 Hz. Consumption: 70 mAh, 5V Normal measuring interval = 80ms (optimal accuracy) Minimal measuring interval = 20ms (most rapid transfer of data) Stabilisation time after switching power on = 12 min.

0,2 µm/°C

20 ± 0,5°C

IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230200	**GTL21 USB**	± 2	0,63	Mechanical	Viton
03230201	**GTL 22 USB**	± 2	0,63	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt*** mm	Cable output	Data sheet No.
GTL21 USB	4,3	0,4 + 0,8· L	0,1	0,5	Fixed stops: lower -2,0 upper +2,0	Axial	03200587
GTL 22 USB	4,3	0,4 + 0,8· L	0,1	0,5	Fixed stops: lower -2,0 upper +2,0	Radial	03200588

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt on ball bearing guide. Fixed lower and upper stops. Interchangeable measuring insert. Thread M2,5. Carbide ball Ø 3 mm Cable length: 2,9 m USB type A connector

Max. mechanical frequency** 60 Hz. Consumption: 70 mAh, 5V Normal measuring interval = 80ms (optimal accuracy) Minimal measuring interval = 20ms (most rapid transfer of data) Stabilisation time after switching power on = 12 min. Remark: Compressed air supply must be generated through a filter and precision regulator. The air should have a humidity of < 60 % and be filtered to < 0,5 µm.

0,2 µm/°C

20 ± 0,5°C

IP65 (IEC 60529) or IP50 for GTL 222-A

Mobile weight: 6 g

Inspection report with a declaration of conformity

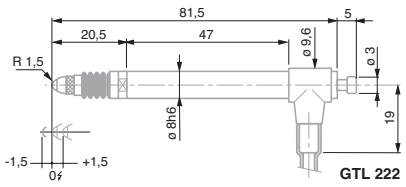
USB Pneumatic Probes ± 1,5 mm, 3,1 mm Bolt Travel

Universal probes for applications facilitated by a USB connection

- Mounting body Ø 8 mm with possibility of clamping over its entire length.
- Measuring rod mounted on ball bearing.
- Separate guide bearing on the holding body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping of the probe beads.
- Level of of protection IP65 or IP50 according to IEC 60529.
- Wide range of measurement inserts.
- TSIP software interface included in supply: display 1 to 4 USB probes. Possibility of indicating tolerances and simple functions + A,-A, + A + B + AB.
- To manage more than 4 probes USB, use the DATA-DIRECT (part number 04981001) or STAT-EXPRESS software (part number 04981002), available as an option.



GTL 222 USB



GTL 222 USB



TSIP Software

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Nominal/ Maximal Pressure, bar
03230202	**GTL222 USB**	± 1,5	1,2	Pressure (bolt activation), spring (bolt retraction)	Viton	0,7 / max 1,0

	Measuring bolt travel, mm	Max. permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Cable output	Data sheet No.
GTL222 USB	3,1	0,4 + 0,8· L	0,1	0,5	Radial	03200589

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.

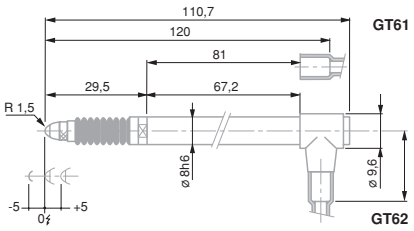
USB Probes ± 5 mm, 10,3 mm Bolt Travel, Extended Measuring Range

USB universal probes for applications facilitated by a USB connection.

- Probes designed for long measuring travel and low resolution measurement values.
- Probe mounting body Ø 8 mm with possibility of clamping over its entire length.
- Measuring bolt mounted on ball bearing.
- Separate guide bearing on the holding body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping of the probe beads.
- Level of protection IP65 according to IEC 60529.
- Wide range of measurement inserts.
- TSIP software interface included in supply 1 to 4 USB probes display. Possibility of indicating tolerances, simple functions + A,-A, + A + B + AB.
- To manage more than 4 USB probes, use the DATA-DIRECT (part number 04981001) or STAT-EXPRESS software (part number 04981002), available as an option.



GT 61 USB



GT 61 USB / GT 62 USB



TSIP Software

No		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230204	**GT61 USB**	± 5	0,90	Mechanical	Viton
03230205	**GT62 USB**	± 5	0,90	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Settings of lower stop of bolt***, mm	Cable output	Data sheet No.
GT61 USB	10,3	0,8 + 0,8· L	0,24	0,5	Fixed stops: lower -5,0 upper +5,0	Axial	03200591
GT62 USB	10,3	0,8 + 0,8· L	0,24	0,5	Fixed stops: lower -5,0 upper +5,0	Radial	03200592

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. Cable length 2,9 m. USB type A connector. 5-pin DIN 45322 connector.

Max. mechanical frequency 60 Hz
Power consumption: 70 mAh
Normal measurement interval = 80ms (maximum accuracy)
Minimum measurement interval = 20ms (fastest transfer data).
Stabilisation time after power on = 12 min

0,09 µm/°C

20 ± 0,5°C

IP65 (IEC 60529)

Mobile weight: 8 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

See standard probes technical data

Cable length: 2 m. DIN 45322 plug connector, 5 poles. Use to connect to a device with an analogue input. For more information, refer to technical data for standard probes

Supply voltage: ±15 V Consumption: 15 mA Adjustable load: > 1 kΩ. Can be used in any position. Special versions on request: Sensitivity: 2 V/mm, 5 V/mm, 10 V/mm output: 0 V to +10 V (max +10 V)

See standard probes technical data

See standard probes technical data

See standard probes technical data

See standard probes technical data

See standard probes technical data

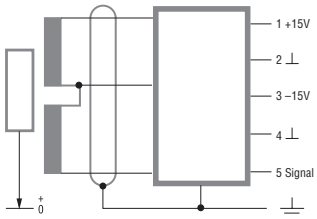
DC Probes ± 2 mm (Output Signal in V)

Probe provided with an electronic box which converts the signal to obtain an output DC voltage

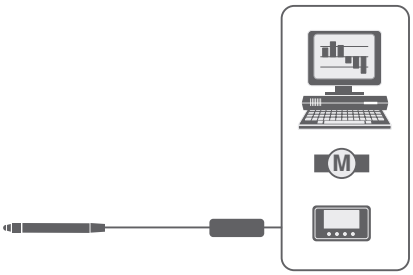
Typically used for direct connection to a computer unit or interface equipped with an analogue input



GTL 21 DC



DIN 5 pin connection schematic



Connection of DC probe to a computer, an interface or a tracker

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Output voltage, V	Sensitivity, V/mm
03230059	**GTL 21 DC**	± 2	0,63	Mechanical	Viton	± 2	1
03230058	**GTL 22 DC**	± 2	0,63	Mechanical / vacuum	Viton	± 2	1

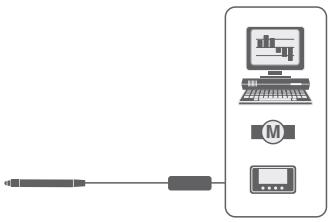
	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Data sheet No.
GTL 21 DC	4,3	$0,2 + 3,5 \cdot L^2$	0,1	03200396
GTL 22 DC	4,3	$0,2 + 3,5 \cdot L^2$	0,1	03200397

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.

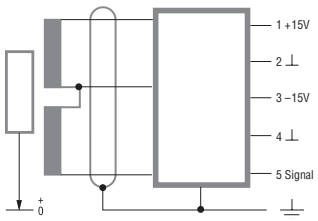
DC Probes ± 5 mm (Output Signal in V), with Extended Measuring Range

Probe provided with an electronic box which converts the signal to obtain an output DC voltage

Typically used for direct connection to a computer unit or an interface equipped with an analogue input



Connection of DC probe to a computer, an interface or a plotter



DIN 5 pin connector schematic

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Output voltage, V	Sensitivity, V/mm
03230086	**GT 61 DC**	± 5	0,9	Mechanical	Viton	± 5	1
03230087	**GT 62 DC**	± 5	0,9	Mechanical / vacuum	Viton	± 5	1

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Data sheet No.
GT 61 DC	10,3	1 + 4· L	0,1	03200519
GT 62 DC	10,3	1 + 4· L	0,1	03200520

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.

DIN 32876 Part 1

See standard probes technical data

Cable length: 2 m. DIN 45322 plug connector, 5 poles. Use to connect to a device with an analogue input. For more information, refer to technical data on standard probes

Supply voltage: ± 15 V
Consumption: 15 mA
Adjustment load: > 1 kΩ
Can be used in any position. Special versions on request.
Sensivity: 2 V/mm, 5 V/mm, 10 V/mm
Output: 0 V to +10 V (max +10 V).

See standard probes technical data
See standard probes technical data
See standard probes technical data
See standard probes technical data
See standard probes technical data

DIN 32876 Part 1

See standard probes technical data

Cable length: 2 m. DIN 45322 plug connector, 5 poles. Use to connect to a device with an analog input. For more information, refer to technical data for standard probes

Drive voltage: ± 15 V Consumption: 15 mA Adjustment load: > 1 kΩ. Can be used in any position. Special versions on request. Sensivity: 2 V/mm, 5 V/mm, 10 V/mm Output: 0 V à +10 V (max +10 V)

See standard probes technical data

See standard probes technical data

See standard probes technical data

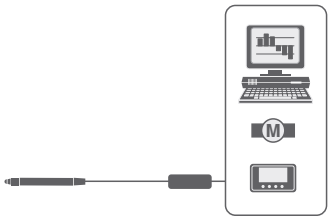
See standard probes technical data

See standard probes technical data

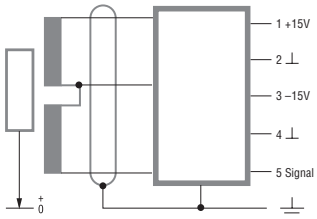
DC Miniature Probes ± 1 mm (Output Signal in V)

Probe provided with an electronic box which converts the signal to obtain an output DC voltage

Typically used for direct connection to a computer unit or an interface equipped with an analogue input



Connection of a DC probe to a computer, an interface or a plotter



DIN 5 pin connection schematic

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Output voltage, V	Sensitivity, V/mm
03230085	**GT 44 DC**	± 1	0,4	Mechanical / vacuum	Viton	± 1	1

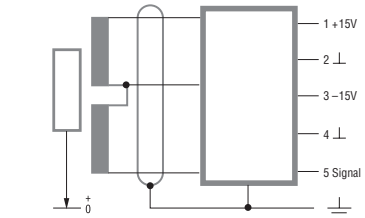
	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L en mm)	Repeatability, µm	Data sheet No.
GT 44 DC	2,1	$0,2 + 5 \cdot L^3$	0,1	03200518

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.

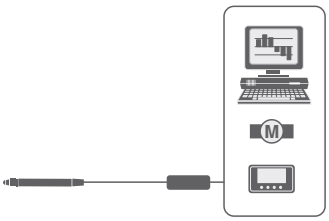
DC Miniature Probes ± 0,3 mm (Output Signal in V)

Probe provided with an electronic box which converts the signal to obtain an output DC voltage

Typically used for direct connection to a computer unit or an interface equipped with an analogue input



DIN 5 pin schematic


Connection of DC probe to a computer or an interface or a plotter

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Output voltage, V	Sensitivity, V/mm
03230081	**GT31 DC**	± 0,3	0,1	Without retraction	Without bellows	± 0,3	1

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatabailty, µm	Data sheet No.
GT31 DC	0,7	$0,2 + 50 \cdot L^2$	0,1	03200484

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.

DIN 32876 Part 1

See standard probes technical data

Cable length: 2 m. DIN 45322 plug connector, 5 poles. Use to connect to a device with an analog input. For more information, refer technical data on standard probes

Drive voltage: ± 15 V
Consumption: 15 mA
Adjustment load: > 1 kΩ. Can be used in any measuring position. Special versions on request.
Sensivity: 2 V/mm, 5 V/mm, 10 V/mm
Output: 0 V to +10 V (max +10 V)

See standard probes technical data
See standard probes technical data
See standard probes technical data
See standard probes technical data
See standard probes technical data

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Sealing bellows: Nitrile = resistant elastomer. Viton = highly resistant fluoroelastomer.

Fixing shank Ø 8 mm. Ball-bearing measuring bolt. Both lower and upper stops are fixed. Interchangeable insert. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency** 60 Hz.

0,1 µm/°C

20 ± 0,5°C

Level of protection: IP65 (IEC 60529)

Mobile weight: 2 g

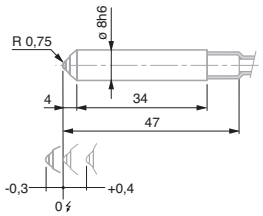
Inspection report with a declaration of conformity

GT 41 / GT 42 Miniature Probes, ± 0,3 mm, 0,7 mm Bolt Travel

Compact probes for use in small spaces – Designed to be mounted on a measuring head for the inspection of bores and similar features.



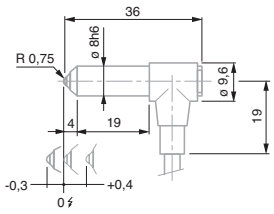
GT 41



GT 41



GT 42



GT 42

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230001	**GT 41**	± 0,3	0,63	None	Nitrile
03230002	**GT 42**	± 0,3	0,63	Vacuum	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L en mm)	Repeatabilty, µm	Hysteresis, µm	Setting of lower stop of meauring bolt***, mm	Cable output	Data sheet No.
GT 41	0,7	$0,2 + 5 \cdot L^2$	0,01	0,01	Fixed stops: lower -0,3 upper +0,4	Axial	03200258
GT 42	0,7	$0,2 + 5 \cdot L^2$	0,01	0,01	Fixed stops: lower -0,3 upper +0,4	Radial	03200259

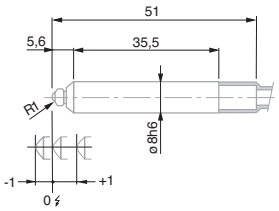
* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

GT 43 / GT 44 Miniature Probes ± 1,0 mm, 2,1 mm Bolt Travel

Compact probes for use in small spaces – Designed to be mounted on a measuring head for the inspection of bores and similar features.



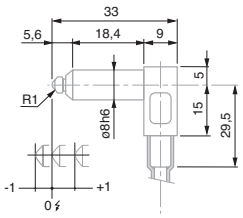
GT 43



GT 43



GT 44



GT 44

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230035	**GT 43**	± 1	0,4	Mechanical	Viton
03230017	**GT44**	± 1	0,4	Vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L en mm)	Repeatabilty, µm	Hysteresis, µm	Setting of lower stop of bolt***, mm	Cable output	Data sheet No.
GT 43	2,1	$0,2 + 5 \cdot L^2$	0,1	0,15	Fixed stops: lower -1,05 upper +1,05	Axial	03200260
GT44	2,1	$0,2 + 5 \cdot L^2$	0,1	0,15	Fixed stops: lower -1,05 upper +1,05	Radial	03200261

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Sealing bellows: Nitrile = resistant elastomer. Viton = highly resistant fluoroelastomer.

Fixing shank Ø 8 mm. Ball-bearing measuring bolt. Both lower and upper stops are fixed. Interchangeable insert. M2 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 60 Hz.

0,1 µm/°C

20 ± 0,5°C

Level of protection: IP65 (IEC 60529)

Mobile weight: 2 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Sealing bellows: Nitrile = resistant elastomer

Fixing shank Ø 8 mm. Ball-bearing measuring bolt. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable measuring insert with a 3 mm dia. tungsten carbide ball tip plus M2,5 thread. 2 m long cable. DIN 45322 5-pin connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 60 Hz.

0,025 µm/°C

20 ± 0,5°C

IP65 (IEC 60529)

Mobile weight: 3,1 g

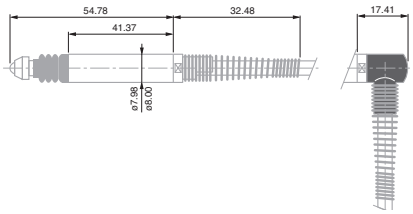
Probes, Unbranded Execution, Series 410 ± 1 mm, 2,5 mm Range, Short Body

Universal probes for common but constraining applications.

- 8 mm diameter probe body that can be clamped over its entire length.
- Ball bearing measuring bolt.
- Hardened steel body, hard-chrome plated.
- Degree of protection to IP62.
- Flexible axial cable exit fitted with a steel spring to prevent the cable from breaking.
- Other probes compatible with measuring equipment from other makers also available on request.



410



410 and accessory with radial cable exit (delivered with probe)

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
96410012	**410**	± 1	0,60	Mechanical	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L en mm)	Repeatabilty, µm	Setting of lower stop of the measuring bolt***, mm (factory setting)	Cable output	Data sheet No.
410	2,5	0,2 % (for a measuring span of ± 1 mm)	0,1	Adjustable from -1,2 to 0 (factory setting -1,08)	Axial and radial	F96410012

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

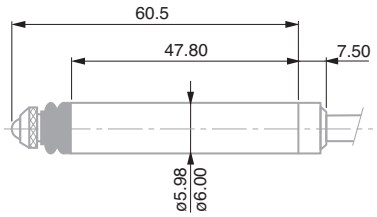
Probes, Unbranded Execution, Series 160 ± 1 mm, 3,3 mm Bolt Travel, Short Body, Ø 6 mm

Compact size and robust construction makes these probes ideal for continuous use.

- Probe body Ø 6 mm.
- Clamping possible over entire length.
- Measuring bolt guided on ball bearing.
- Hard-chrome plated probe body, hardened steel.
- Protection level: IP62 as per IEC 60529.
- Executions compatible with measuring equipment from other suppliers available on request.



160



160

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
96160013	**160**	± 1	0,60	Mechanical	Viton

	Measuring bolt travel, mm	Max. permissible error for deviation in linearity, µm (L in mm)	Repeatability, µm	Setting of lower stop of measuring bolt***, mm (factory setting)	Cable output	Data sheet No.
160	3,3	0,2 % (for a measuring span of ± 1 mm)	0,1	Adjustable from -1,2 to 0 (factory setting -1,08)	Axial	F96160013

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Sealing bellows: Viton = highly resistant fluoroelastomer.

Probe body Ø 6 mm. Measuring bolt guided on ball bearing.Distance between the lower stop and electrical zero adjustable. Interchangeable measuring insert. Thread M2. Carbide ball tip Ø 3 mm. 2 m long cable. DIN 45322 5-pin connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 60 Hz.

0,025 µm/°C

20 ± 0,5°C

Protection level: IP62 (IEC 60529)

Mobile weight: 2,5 g

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Sealing bellows: Nitrile = resistant elastomer.

Probe body Ø 8 mm. Measuring bolt guided on ball bearing.. Adjustable distance between lower bolt and electrical zero. Interchangeable measuring insert. Thread M2,5. Carbide ball tip Ø 3 mm. Cable length: 2 m DIN 45322 5-pin connector.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 60 Hz..

0,025 µm/°C

20 ± 0,5°C

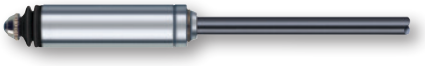
Level of protection: IP65 (IEC 60529)

Mobile weight: 1,9 g (Series 439) Mobile weight: 3,0 g (Series 451)

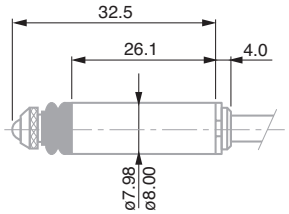
Probes, Unbranded Execution, Series 430 and 451, ± 0,5 mm, 1,25 et 2,10 mm Measuring Bolt Travel, Miniature

Their compact size and robust construction make them the ideal probes for a frequent use.

- Probe body Ø 8 mm.
- Clamping possible over its entire length.
- Measuring bolt on ball bearing guide.
- Hard chrome-plated probe body, hardened steel.
- Level of protection: IP62 as per IEC 60529.
- Probes compatible with measuring equipment from other suppliers also available on request.



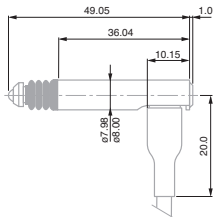
430



430



451



451

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
96430029	**430**	± 0,5	0,75	Mechanical	Nitrile
96441041	**451**	± 0,5	0,60	Mechanical	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Setting of lower stop of measuring bolt***, mm (factory setting)	Cable output	Data sheet Nb
430	1,25	0,2 % (for a measuring span of ± 0,5 mm)	0,2	Adjustable from -0,7 to 0 (factory setting -0,58)	Axial	F96430029
451	2,10	0,2 % (for a measuring span of ± 0,5 mm)	0,1	Fixed stops (factory setting: -0,58)	Radial	F96441041

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

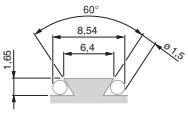
GT31 Lever Probes ± 0,3 mm, 0,3 mm Measuring Travel, Inclinable Lever

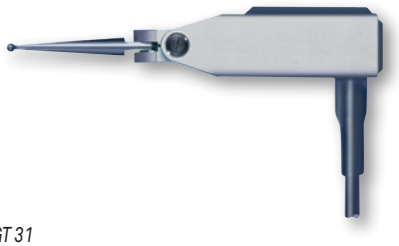


GT 31 with lever in perpendicular position

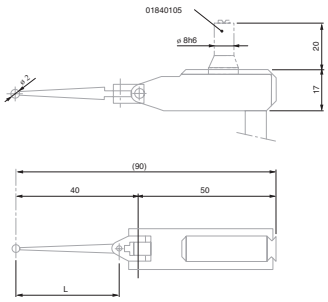
Well suited for use where probes with axial movement measuring bolts are inconvenient for measurements.

- Inclinable lever for measuring in two directions.
- Balanced lever system on ball-bearing.
- Interchangeable measuring insert, with carbide ball tip, inclinable through to 180°.
- Automatic reversal of the probing direction while the indication remains unchanged.
- Protected against shocks by 2 safety clutches.
- One-piece housing provided with 2 dovetails.
- Level of protection: IP40 as per IEC 60529.

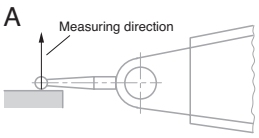




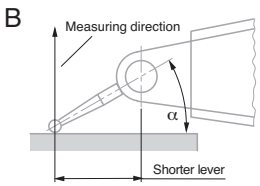
GT 31



GT 31 side view and top view



GT 31
Figure A - the leverage matches 1:1, no correction of the measured value needed



GT 31
Figure B - the leverage is no longer 1:1, correction of the measured value is needed.

Note
(Fig. A) With the insert lying parallel to the workpiece surface, the leverage matches 1:1. Therefore, no correction of the measured values is needed.
(Fig. B, angle α) Any other position will change the effective lever length, so that read values must be corrected. In this connection, please consult the instruction manual.

		Measuring range, mm	Nominal measuring force*, N	Lever retraction	Sealing bellows
03210802	**GT 31**	± 0,3	0,1	Without	Without bellows
03210801	**GT 31**	± 0,3	0,02	Without	Without bellows
03210803	**GT 31**	± 0,3	0,2	Without	Without bellows

	Measuring lever travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of the measuring insert***, mm	Cable output	Data sheet No.
GT 31	0,7	$0,2 + 50 \cdot L^2$	0,1	0,25	Fixed lower and upper stops	Angled	03200266

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

DIN 32876 Part 1

All-metal housing, matt-chromium finish

2 dovetail attachments for clamping. Both lower and upper stops are fixed. Stainless steel measuring stem. Interchangeable measuring inserts. Carbide ball tip Ø 2 mm. Cable length: 2 m. DIN 45322, 5 pin connector. Other measuring inserts available as optional accessories..

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 25 Hz.

20 ± 0,5°C

Protection level: IP40 (IEC 60529)

Mobile weight: 12 g

DIN 32876 Part 1

Hardened steel probe body, nickel-plated

Linear guidance on ball bearing. 4 M6 mounting threads. Fixed mechanical stops. Interchangeable inserts. Dovetail.clamp for mounting holder. Cable length: 2 m. 5-pin connector DIN 45322.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 25 Hz.

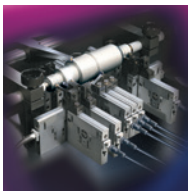
-0,14 µm/°C

20 ± 0,5°C

IP50 (IEC 60529)

Mobile weight: 110 g

Inspection report with a declaration of conformity



Application: Minimal space usage with FMS units placed side by side



Application: small component measuring thanks to offset inserts

Probes with Parallel Guidance, ± 2 mm or ± 2,9 mm, 5,8 mm Measuring Travel

Modular construction enables the combination of elements, for example, such as springs, pneumatic cylinders and stops.

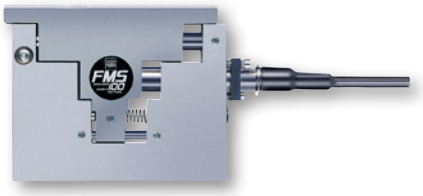
These universal probes are suited for multigauging fixtures as well as machines equipped with integrated inspection routines.

Versatility of applications:

- Probe can be used in any position for measuring.
- Measuring direction is adjustable.
- Retraction of the measuring insert is adjustable.
- Measuring force is adjustable depending on the accessory used.
- Possibility of using off-centre measuring inserts.

Unique design:

- Compact assembly noted for its robustness.
- Ball bearing guided movement.
- Wide variety of measuring inserts, holders and other accessories for measuring applications.
- LVDT execution versions compatible with melectronic equipment from other suppliers available on request.



FMS 100

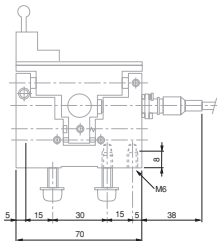


FMS 102

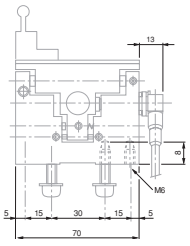
NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230019	**FMS 100**	± 2	2	Retraction by air pressure (optional)	Without bellows
03230049	**FMS 130**	± 2,9	2	Retraction by air pressure (optional)	Without bellows
03230028	**FMS 102**	± 2	2	Retraction by air pressure (optional)	Without bellows
03230050	**FMS 132**	± 2,9	2	Retraction by air pressure (optional)	Without bellows

	Measuring bolt travel, mm	Max.permissible error for deviation in linearity, µm (L in mm)	Repeatabilty, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm	Cable output	Data sheet No.
FMS 100	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200253
FMS 130	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200342
FMS 102	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200254
FMS 132	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 lower +2,9	Parallel	03200343

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.



FMS 100



FMS 102

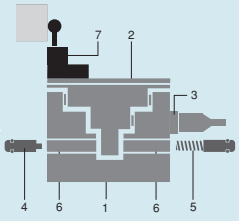
Configuration and Application of TESA FMS Probes

Shown below are the different possibilities for the activation and retraction of the probe insert during measurement cycles.

APPLICATION EXAMPLE A

- Activation of the probe insert in the direction of the part to be inspected using the measuring force produced by the spring set.
- Without retraction of the insert.

Result A
During the placing of a new part to be measured, the measuring insert remains in its contact position thanks to the measuring force produced by the spring set.

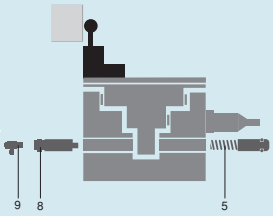


1 Static probe body
2 Mobile probe body
3 Measuring element with fine adjust
4 Adjustable stop
5 Spring set for producing measuring force
6 M6 mounting thread
7 Holder

APPLICATION EXAMPLE B

- Activation of the probe insert in the direction of the part to be measured using the measuring force of the spring set.
- Retraction of the insert by pneumatic pressure through a pneumatic connection.

Result B
During the placing of a new part to be measured, the measuring insert is retracted through activation of pressure via the pneumatic actuator.



5 Spring set for producing measuring force
8 Pneumatique actuator (Part No. 03260440)
9 Connector (Part No. 024388))

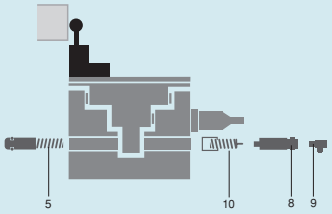
APPLICATION EXAMPLE C

- Activation of the probe insert in the direction of the part to be inspected by pneumatic pressure and the measuring force of the spring set.
- Retraction of the insert by disabling the pneumatic pressure.

ATTENTION !
The force of the spring set (5) must be equal to that of the auxiliary spring element (10).

Result C
During the placing of a new part to be measured, the measuring insert is automatically retracted due to the disabling of the pneumatic pressure. which guarantees about security during the measuring cycle.

This configuration is typically preferred when there is lack of space for connecting a pneumatic actuator (left side of example B).



5 Spring set for producing measuring force
8 Pneumatic actuator (Part No. 03260440)
9 Connector (Part No. 024388)
10 Auxiliary spring element (Part No. 03260445)

DIN 32876 Part 1

Hardened steel probe body, nickel-plated

Linear guidance on ball bearing. 4 M6 mounting threads.. Fixed mechanical stops. Interchangeable inserts. Holder with dovetail clamping. Cable length: 2 m. 5-pin connector DIN 45322.

Supply frequency: 13 kHz (± 5 %). Max. mechanical frequency**: 25 Hz.

-0,14 µm/°C

20 ± 0,5°C

IP54 (IEC 60529)

Mobile weight: 110 g

Inspection report with a declaration of conformity



Application: mesurement with a protected FMS



FMS 102-P



FMS 100-P

Probes with Parallel Guidance, ± 2 mm or ± 2,9 mm, 5,8 mm Measuring Travel – Protected Version

– FMS 100-P, 102 -P, 130-P, 132-P provide dust protection of the 2 side faces.

Modular concept for combining elements, for example, such as springs, pneumatic actuators and stops.

These universal probes are suitable for mutigauging inspection fixtures as well as machines with integrated automated inspection routines.

Versatility of applications:

– Probe can be used in any position for measuring
– Measuring direction can be changed
– Retraction of the measuring insert is adjustable
– Measuring force is adjustable, depending on the accessory used
– Possibility of using off-centre measuring inserts

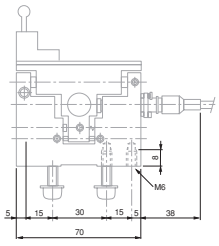
Unique design:

– Compact assembly noted for its robustness
– Ball bearing guided movement
– Wide variety of measuring inserts, holders and other accessories for
– measuring applications
– LVDT execution versions compatible with melectronic equipment from other suppliers available on request.

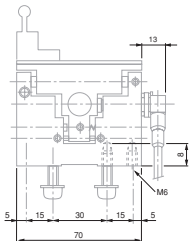
NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230037	FMS100-P	± 2	2	Retraction by air pressure (optional)	Without bellows
03230051	FMS130-P	± 2,9	2	Retraction by air pressure (optional)	Without bellows
03230038	FMS102-P	± 2	2	Retraction through air pressure (optional)	Without bellows
03230052	FMS132-P	± 2,9	2	Retraction through air pressure (optional)	Without bellows

	Measuring bolt travel, mm	Max. permissible errors for deviations in linearity, µm (L en mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm	Cable output	Data sheet No.
FMS100-P	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200283
FMS130-P	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200344
FMS102-P	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Angled	03200289
FMS132-P	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Angled	03200345

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.



FMS 100-P



FMS 102-P

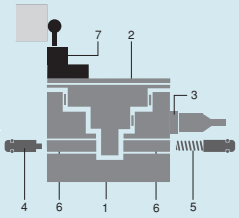
Configuration and Application of TESA FMS Probes

Shown below are the different possibilities for the activation and retraction of the probe insert during measurement cycles.

APPLICATION EXAMPLE A

- Activation of the probe insert in the direction of the part to be inspected using the measuring force produced by the spring set.
- Without retraction of the insert.

Result A
During the placing of a new part to be measured, the measuring insert remains in its contact position thanks to the measuring force produced by the spring set.

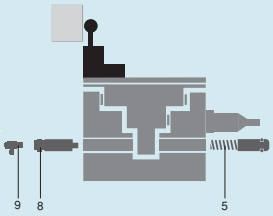


1 Static probe body
2 Mobile probe body
3 Measuring element with fine adjust
4 Adjustable stop
5 Spring set for producing measuring force
6 M6 mounting thread
7 Holder

APPLICATION EXAMPLE B

- Activation of the probe insert in the direction of the part to be measured using the measuring force of the spring set.
- Retraction of the insert by pneumatic pressure through a pneumatic connection.

Result B
During the placing of a new part to be measured, the measuring insert is retracted through activation of pressure via the pneumatic actuator.



5 Spring set for producing measuring force
8 Pneumatique actuator (Part No. 03260440)
9 Connector (Part No. 024388))

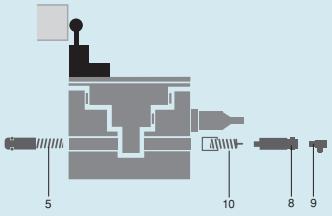
APPLICATION EXAMPLE C

- Activation of the probe insert in the direction of the part to be inspected by pneumatic pressure and the measuring force of the spring set.
- Retraction of the insert by disabling the pneumatic pressure.

ATTENTION !
The force of the spring set (5) must be equal to that of the auxiliary spring element (10).

Result C
During the placing of a new part to be measured, the measuring insert is automatically retracted due to the disabling of the pneumatic pressure. which guarantees about security during the measuring cycle.

This configuration is typically preferred when there is lack of space for connecting a pneumatic actuator (left side of example B).



5 Spring set for producing measuring force
8 Pneumatic actuator (Part No. 03260440)
9 Connector (Part No. 024388)
10 Auxiliary spring element (Part No. 03260445)

ROHS 2 according to 2011/65/EU
REACH according to EC 1907/2006
WEEE according to 2002/96/EC

10 x 5 mm

For a temperature of 20°C and a relative humidity of ≤ 50 %:
Analogue and digital response time: ≤ 100 ms. Holding of digital display: ≥ 100 ms.

Supply: 4 batteries AA 1,5 V, type LRC 6.
Power consumption: ≈ 7 mW/3,5 V.
Probe supply voltage: 0,7 V.
Supply frequency: 13 ± 0,65 kHz

For a temperature of 20°C and a relative humidity of ≤ 50 %:
Zero drift and signal amplification: ≤ 0.005 %/° C.
Display frequency limit with respect to input signal: 10 Hz

IP63 (IEC 60529)

2004/ 108/EC
EN 61326-1
annex A

RS232 via TLC connector

100 x 170 x 38 mm (W x D x H)

LCD display size: 70 x 62 mm

500 g (including batteries)

5 decades plus minus sign

± 1 digital step

Value limit for a temperature of 20°C and a relative humidity of ≤ 50 %:
Analogue display: 1 %
Digital display: 1 %

TESATRONIC TWIN-T10 probe display unit

- Portable display TESATRONIC TWIN-T10 for TESA inductive probe.
- Autonomous instrument used during assembly, on an inspection workstation of a production line, for final inspection or directly on a machine on the shop floor.
- Frequently used with a GT 31 lever probe for geometry measurements: form tolerances (straightness, flatness etc.) or orientation tolerances (parallelism, perpendicularity, etc.).
- Function TOL for measurements with tolerances.
- Memory function for values MAX, MIN or MAX-MIN for dynamic measurements.
- Function for zero-setting of the display, for easy comparative measurements with a reference part.
- Special ZOOM mode for a more detailed visualization of the analogue scale. This mode simplifies the alignment and fine adjustement during assembly.

Other features:

- 4 or 7 measuring ranges from ± 5 µm to ± 5 mm, or switchable automatically depending on the measured value.
- Access to functions by direct keys.
- Millimetre/inch conversion.
- 1 probe signal input.
- Power supply by standard AA batteries.
- RS232 digital output (TLC connector).



TWIN-T10

NO	Designation	Number of probe inputs	Automatic conversion of range	Analogue scale zoom x5	Memory function for values MAX, MIN, MAX-MIN
04430013	TESATRONIC TWIN-T10	1	●	●	●



Run-out measurement with TWIN-T10 and GT 31 lever probe

STANDARD ACCESSORIES:	
03210802	GT31 lever probe, ± 0, 3 mm, F = 0,10 N, standard version
04768000	Hand switch for manually triggering data transfer. Jack plug connector, 1,8 m - TESA SPC PRINTER printer - TESATRONIC TT display units
04768001	Foot switch for triggering data transfer. Jack plug, 1,8 m - TESA SPC PRINTER printer - TESATRONIC (TT) display units
04760181	TESA TLC-USB CABLE for instruments with a TLC connector
04760182	TLC-DIGIMATIC CABLE for instruments with a TLC connector
04760180	TESA TLC-TWIN wireless transceiver. Compatible with any instrument equipped with a TLC connector (TESA Link Connector)
05030012	TWIN-STATION Receiver for wireless TLC-TWIN transceiver
04981001	DATA-DIRECT software and dongle
04981002	STAT-EXPRESS Software and dongle
01460008	Back with central lug
01460009	Back with offset lug

DIN 32876 Part 1

110 mm scale length

6-decade display plus minus sign

12,5 x 6,6 mm

126 x 62 mm LCD display, with 50 scale divisions

Value limit for a temperature of 20°C and a relative humidity of ≤ 50 %
TT20:
Analogue display: 2%
Digital display 0,3 %
Digital output: 0,3 %
TT60:
Analog display: 2 %
Digital display: 0,3 %
Analogue output: 0,3%
Digital output: 0,3%

± 1 numerical interval

255 x 235 x 120 mm (W x D x H)

Resistant plastic material

For a temperature of 20°C and a relative humidity of ≤ 50 %:
TT20:
Response time of analogue, digital and LED classification displays:: ≤ 80 ms.
Maintenance of digital display: 80 ms.
TT60:
Response time of analogue, digital and LED classification displays: ≤ 80 ms.
Holding of digital display: 80 ms.
Response time of the analogue output signal in relation to analogue display: ≤ 30 ms.

TESATRONIC TT20 and TT60 Probe Display Units

- Functional reliability.
- User-friendly.
- Essential for inspection in production or metrology laboratory.

TESATRONIC TT20

Combined digital and analogue indication

2 probe inputs for single measurements, sum and difference measurements

- Large LC display for comfortable and error-free reading.
- Pseudo-analogue bargraph indication for a better repeatability and negligible hysteresis.
- Choice between pointer or bargraph indication.
- LCD display for all functions.
- 7 measuring ranges, switchable manually or automatically according to the measured value.
- Direct conversion from metric to inch units.
- Touch button for the indication setting of of each measuring channel.
- Keys for introducing limit values.
- Classification of values (3 classes) and display through colour LEDs with signal outputs.
- Locking of displayed values for step by step measurement routines.
- Automatic recognition of the type of connected TESA probe with adaptation of the measurement signals to the value of output connected (valid only for TESA probes produced from 1997 onwards).
- Opto-coupled RS232 output, bidirectional.
- Power supply through mains adapter.

TESATRONIC TT60

Same features as TESATRONIC TT20, but with following added functions:

- Memory for retaining extreme values "max.", "min.", "max.-min." along with mean value obtained from "max." minus "min.".
- Dynamic measurement with acquisition of >100 single values.
- Value classification with output signals through contact relay for 5, 10, 20 or 40 acceptable classes.
- Analogue output for exterior processing of signals.



TT60



TT20

NO		Measuring range zoom x5	Memory
04430009	**TESATRONIC TT20 Display unit for 1 or 2 inductive probes**	–	–
04430010	**TESATRONIC TT60 Display unit for 1 or 2 inductive probes**	–	●

	Number of probe inputs	Automatic switching of range
TESATRONIC TT60 Display unit for 1 or 2 inductive probes	2	●
TESATRONIC TT20 Display unit for 1 or 2 inductive probes	2	●

DELIVERED WITH THE FOLLOWING ACCESSORIES:	
04761054	Battery charger 100 ÷ 200 VAC 50 ÷ 60 Hz, 6,6 V DC, 750 mAh supplied without power cable
04761055	Mains cable EU for charger 0471054

OPTIONAL ACCESSORIES:	
04768000	Hand switch for manually triggering data transfer. Jack plug connector, 1,8 m – TESA SPC PRINTER printer – TESATRONIC TT display units
04768001	Foot switch for triggering data transfer. Jack plug, 1,8 m – TESA SPC PRINTER printer – TESATRONIC (TT) display units
04761062	Opto-USB cable, Duplex, 2m Bidirectional communication
04761049	Opto-RS cable, Duplex, 2m Bidirectional communication

For a temperature of 20°C and a relative humidity of ≤ 50 %: TT20: Response time of analogue, digital and LED classification displays: ≤ 80 ms. Maintenance of digital display: 80 ms. TT60: Response time of analogue, digital and LED classification displays: ≤ 80 ms. Holding of digital display: 80 ms. Response time of the analogue output signal in relation to analogue display: ≤ 30 ms.

RS232 opto-coupled output

TT60: Voltage Range: ± 2 V to ± 10 V. Output current: ≤ 2 mA. Load adjustment: ≥ 5 kΩ. Background noise (probe at electrical zero) ≤ 1 mV. Reference potential: ground 0 V.

Supply: 6,5 V DC up to 7,3 V DC. Supply frequency: 13 ± 0,65 kHz. Power consumption: 2 W. Monitored voltage variations. Probe supply voltage: 3 V.

Protection of frontal face: IP54 (IEC 60529, DIN 40 050)

IEC/EN 61326-1 USA: CFR47, Part 15, Subpart B, Class B, Digital Device

1,1 kg

DIN 32876 Part 1

110 mm scale length

6-decade display plus minus sign

12,5 x 6,6 mm

126 x 62 mm LCD display, with 50 scale divisions

Limit value for a temperature of 20°C and a relative humidity of ≤ 50 %:
Analog display: 2 %
Digital display: 0,15 %
Analog output: 0,3 %
Digital output: 0,15 %

± 1 digital interval

255 x 235 x 120 mm (W x D x H)

Resistant plastic

TESATRONIC TT 80 and TT 90 Probe Display Units

High resolution display units

Combined analogue/digital display

Two probe inputs for single, sum and difference measurements.

In addition to TESATRONIC TT60 funczions, TT 80 has the following additional functions:

- 9 measuring ranges with digital steps of 0,01 µm or 0.000001 in.
- Memorisation of extreme values "max.", "min.", "max. minus min." as well as the mean of the two values "max." and "min.".
- Dynamic measurement with acquisition of more than 10 single values per second.
- Classification of measured values with a contact relay providing output signals for 5, 10, 20 or 40 acceptable classes.
- Analogue output for external processing of signals.

In addition to TESATRONIC TT60 functions, TT 90 has the following additional functions:

- 9 measuring ranges with digital step of 0,01 µm or 0.000001 in.
- Memorisation of extreme values "max.", "min.", "max. minus min." plus the mean of both values "max." and "min.".
- Dynamic measurement with acquisition of more than 10 single values per second.
- Classification of measured values with output signals through contact relay for 5, 10, 20 or 40 acceptable classes.
- Analogue output for external signal processing.
- Output for bolt retraction control.
- Selection of stabilisation time for measuring cycles.
- RS digital output for values to the micron.



TT 90



TT 80



Application: TT 80 with a SIP (Société genevoise d'instruments de physique) high precision measuring bench

NO		Measuring range zoom x5	Memory
04430011	**TESATRONIC TT80 High precision electronic display**	–	●
04430012	**TESATRONIC TT90 High precision electronic display**	–	●

	Number of probes inputs	Automatic conversion of range
TESATRONIC TT80 High precision electronic display	2	●
TESATRONIC TT90 high precision electronic display	2	●

DELIVERED WITH THE FOLLOWING ACCESSORIES:	
04761054	Battery charger 100 ÷ 200 VAC / 50 ÷ 60 Hz, 6,6 V DC, 750 mAh, supplied without power cable
04761055	Mains cable EU for charger 0471054

OPTIONAL ACCESSORIES:	
04768000	Hand switch for manually triggering data transfer. Jack plug connector, 1,8 m - TESA SPC PRINTER printer - TESATRONIC TT display units
04768001	Foot switch for triggering data transfer. Jack plug, 1,8 m - TESA SPC PRINTER printer - TESATRONIC (TT) display units
04761062	Opto-USB cable, Duplex, 2m Bidirectional communication
04761049	Opto-RS cable, Duplex, 2m Bidirectional communication

For a temperature of 20°C and a relative humidity of ≤ 50 %: Response time analogue, digital and LED displays classification: ≤ 100 ms. Holding of digital display: 100 ms. Response time of the analogue output signal in relation to analogue display: ≤ 30 ms.

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift and signal amplification: ≤ 0,005 %/°C. No drift of stored values. Frequency limit for all displays frequency, analog output and memory in relation to input signal: 10 Hz

RS232 opto-coupled output

Voltage range of ± 2 V to ± 10 V. Output current: ≤ 2 mA. Load adjustment: ≥ 5 kΩ. Background noise (probe to 0 electric) ≤ 1 mV. Reference potential: analog ground 0 V

6,5 Vdc up to 7,3 V DC. Consumption: 2 W. Monitored voltage fluctuation. Supply voltage for probe: 3 V

Protection of frontal face: IP54 (IEC 60529, DIN 40 050)

IEC/EN 61326-1 USA: CFR47, Part 15, Subpart B, Class B, Digital Device

1,1 kg

DIN 32876 Part 1

Length: 100 mm

Limit value for a temperature of 20°C and a relative humidity of ≤ 50 %: Analog Display: 1,5 % Analog output: 0,3 %

Display: negligible. Classification signals: 5 %

258 x 190 x 158 mm (W x D x H)

Die-cast aluminum case, designed for the workshop

For a temperature of 20°C and a relative humidity of ≤ 50 %: Response time of the analogue display: ≤ 1 ms. Response time of the analogue output signal from the analog display: 20 ms. Response time for classification signals: 10 ms.

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift: ≤ ± 0,005 % /°C. No drift of stored values. Frequency limit for analogue display: 1 Hz. Frequency limit for analogue output: 50 Hz. Frequency limit for classification: 30 Hz

TESATRONIC TTA20 Probe Display Unit

Compact design with analogue indication and value classification of measured values.

Aluminium housing, designed for shop floor applications, user-friendly.

- Easy-to-read analogue display with mirror strip in order to avoid parallax error.
- 6 measuring ranges.
- Metric/Inch conversion.
- Zero setting potentiometer for display.
- 2 probe inputs for single, sum or difference measurements.
- 1 auxiliary signal input, e.g. for all correction values.
- Colour LEDs of green for "Good", yellow for "Rework" and red for "Scrap".
- Potentiometer for setting limit tolerances.
- Polarity reverse switch for classification signals (internal or external dimensions).
- Switch for locking or unlocking a displayed value.
- Analogue output for a display unit or external recording.



TTA20

		Number of measuring ranges Min range / Max range max (µm)	Measuring range zoom x5	Memory	Power supply
04430003	**TTA20**	6 / min ± 3 max ± 1000	–	–	Network

DELIVERED WITH THE FOLLOWING ACCESSORIES:	
03160015	Mains cable CH 2 m
03160016	Mains cable, EU, 2 m
03160017	Mains cable without plug, 2 m for TTA20

OPTIONAL ACCESSORY:	
04460004	Connector 15 pins for analogue output and classification signal of TTA20

µm	µm	*in*	*in*
± 1000	50	*± 0.1*	*0.005*
± 300	10	*± 0.03*	*0.001*
± 100	5	*± 0.01*	*0.0005*
± 30	1	*± 0.003*	*0.0001*
± 10	0,5	*± 0.001*	*0.00005*
± 3	0,1	*± 0.0003*	*0.00001*

Number of probe inputs	Automatic conversion of range
2	–

Accessories for TESATRONIC TT Units



04761055



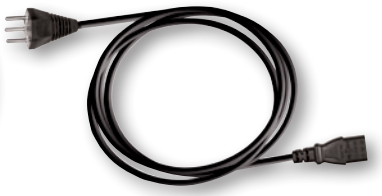
047610556



04761054



03160017



03160015



03160016

NO	
04761054	Battery charger 100 ÷ 200 VAC 50 ÷ 60 Hz, 6,6 V DC, 750 mAh supplied without power cable
04761055	Mains cable EU for charger 0471054
04761056	Mains cable US for charger 0471054
03160015	Mains cable CH, 2 m for TTA20
03160016	Mains cable EU, 2 m for TTA20
03160017	Mains cable without plug, 2 m for TTA20
04460004	Connector 15 pins for analogue output and classification signal of TTA20

Voltage: ± 1 V. Output current ≤ 3 mA. Adjustment load ≥ 2 kΩ. Residual ripple (at electrical zero): ≤ 1 mV. Reference potential: analogue ground 0 V

Supply voltage 230 or 115 V -10 % to +20 %, 50-60 Hz. Virtual power: 20 VA. Supply voltage for probe: 1,5 Vrms -10 % to +5 %. Frequency: 13 kHz ± 0,5 %.

Level of protection: IP40 (IEC 60529)

EN 50081-1
EN 50081-2
EN 50082-1
EN 50082-2

3,4 kg

±2 mm, ±5 mm

0,1 µm

Field error indication (pictogram / text) to a temperature of 20°C and a relative humidity of ≤ 50 %: Digital output: ± (0,05 + 0,15 % of range)

55 x 172 x 155 mm (H x W x D)

Housing in aluminium

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift: ≤ ± 0,05 %/°C. Sensitivity drift: ≤ ± 0,05 %/°C. Acquisition time: 10 ms (between two consecutive measurements) 1 ms (timing window) time data transfer of digital serial output (USB): depends on the operating system of the computer.

USB port (USB Hub) Communication: USB 2.0, 3 external ports (≤ 100 mAh)

Supply voltage of the charger: 115 to 230 Vrms, charger frequency 50 ÷ 60 -10 to +15 % Hz

IP40 (IEC 60529) (DIN 40050)

IEC/EN 61326-1 U.S. 47 CFR part 15, subpart B, Class B digital device

1 kg (BPX) 0,85 kg (TWIN-STATION)

Power supply 100 ÷ 240 V, 50 ÷ 60 Hz (04761054) EU Cable, CH (04761055) U.S. Cable (04761056)

ELECTRONIC INTERFACE UNITS

Electronic interfaces to manage, synchronize inductive probes and allow data transfer to a computer or an automatic inspection machine.

TESA Probe Interface Boxes - BPX Series

Modular system available in 2 versions (BPX and TWIN-STATION) for the conversion of measured signals to digital values and transmission of these values to a computer. These units are key components for multigauging inspection fixtures for centralised process control systems.

Signal inputs – 1 to 4 TESA standard half-bridge probes.

Signal output – digital, RS232 through USB port.

- Direct connection to the computer's USB port.
- Stand Alone operating mode: program routine via the computer, enabling the BPX box to execute a simple measuring function with classification signal relay via connector Sub-D 15P.
- Optimal adaptation for various measuring applications, for example, connection of 16 probes thanks to serial USB connections on 4 BPX boxes.
- Increased functional reliability and high precision.
- Increased immunity to negative environmental effects, whether of electrical origin or provoked by liquid and solid contaminants.
- BPX is compatible and can be used with TWIN-STATION.
- TIS interface software is included in the BPX (part number 05030012) for display of measured values. Possibility of indicating tolerance values, and simple functions +A, -A, +A+B, +A-B, export of values to a .csv file.



BPX Front



BPX Rear



TIS software included in the BPX supply

NO	Number of probe inputs	Number of I / O (In / Out) controllers	Connector
05030010	4	1 / 3	Sub-D 15 p/f (for In/ Out signals)

TWIN-STATION Receiver for TESA Wireless Probes

Modular system available in 2 executions (TWIN-STATION and BPX) for the conversion of inductive probe signals into digital values for transmission to a computer.

These units are important components for measuring fixtures requiring freedom of movement without any constraints and without any cables, a wireless transmission

Signal inputs – 1 to 8 TESA half-bridge wireless probes*

Signal outputs – digital, RS232 through USB port

- Direct connection to the USB port of the computer.
- Perfect fit for your metrology applications through the connection of up to 16 wireless probes by means of serial USB to 2 TWIN-STATION units.
- Great functional reliability and high accuracy.
- TWIN-STATION is compatible and can be used with BPX.
- TIS interface software TIS included in supply of TWIN-STATION (part no. 05030012): display of measured values. Possibility of indicating tolerances, simple functions +A, -A , +A+B, +AB , and export of values to a .Csv file.

Note: The sale of TWIN-STATION is limited to EU countries, Switzerland, USA and Canada.

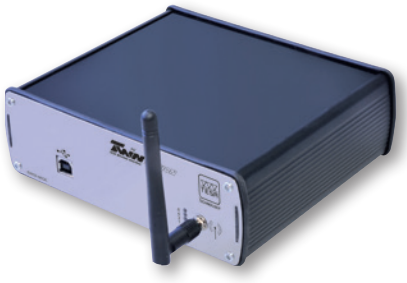
* The sale of wireless probes is limited to EU countries, Switzerland, USA, Canada and China.



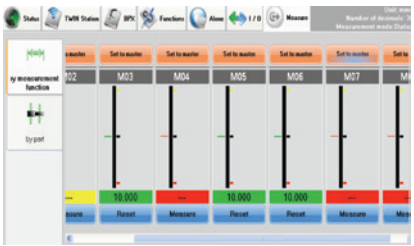
GTL 21 W wireless probe with VERIBOR (optional)



TWIN-STATION, front



TWIN-STATION, rear



TIS Software, inclued in the TWIN-STATION supply

± 2 mm, ± 5 mm

0,1 µm

For a temperature of 20°C and a relative humidity of ≤ 50 %: Digital output: ± (0,05 + 0,15 % of measuring range)

55 x 172 x 155 mm (H x W x D)

Housing case in aluminium

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift: ≤ ± 0,05 %/°C. Sensitivity drift: ≤ ± 0,05 %/°C. Acquisition time: 20 ms (between two consecutive measurements) 2 ms (timing window) Time for data transfer from digital serial output (USB): depends on the operating system of the computer

Power supply via USB cable connection
– directly to PC (USB port)
– to a USB-connected hub
– to a BPX probe interface (05030010)

IP40 (IEC 60529) (DIN 40050)

IEC/EN 61326-1 U.S. 47 CFR part 15, subpart B, Class B digital device

0,85 kg

USB cable, 1,80 m

NO	Number of wireless probes per TWIN-STATION	Power supply	Weight, kg
05030012	1-8	Power supply via: – USB port of PC – USB-connected hub – BPX	0,85

± 0,5 % with reference to the measuring span

± 10 to ± 15 V DC, 60 mA

≤ ±100 ppm/°C, stability at zero = ≤ ±0,2 µm/°C

IP50 (IEC 60529)

TESA Probe Interface Boxes with Analogue Output – Series M4P-2

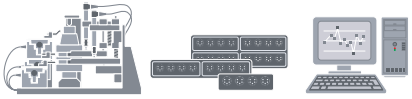
Signal inputs – TESA standard execution probes (Half-bridge)

Signal outputs – analogue (in ± V/mm)

- Connection of up to 32 TESA standard half-bridge probes.
- Connection possible to a PC through the A/D transducer.



Rack with 3 M4P-2 interfaces



Multi-gauging fixture with 1, 2 or 4 M4P-2 interfaces

NO		Sensivity (mV / V /mm)	Number of probe inputs	Dimensions (mm)	Analogue outputs	Weight (kg)
S48001721	M4P-2 interface 4 probe inputs with demodulator and analogue output in V/mm	73,75	4, including a demodulator	36 x 100 x 120	± 1 V/mm, ± 2,5 V/mm, ± 5 V/mm, ± 10V/mm	0,6
S48001722	R2M-1 rack for 2x M4P-2	–	8 (with 2x M4P-2)	55 x 212 x 144	–	0,9
S48001723	R4M-1 rack for 4x M4P-2	–	16 (with 4x M4P-2)	160 x 212 x 144	–	1,2
S48001724	Supply module MA4-2, 230V	–	Voltage: 230 ±10 % Vac, 50 Hz	85 x 222 x 146	Output voltage: ± 15V for 32 probes	1,1
S48001731	Power supply MA4-2, 110 V	–	Voltage: 110 ±10 % Vac, 60 Hz	85 x 222 x 146	Output voltage: ± 15V for 32 probes	1,1

Accessories for M4P-2 probe interface

NO	
S48001725	M4P-2 connecting cable to PC, 2m DB-37 pins m/f

Adaptor Cable: DIN 5p Connector to USB Type A Connector

Allows for quick and easy connection of any TESA standard half bridge probe to a PC USB port.

Signal inputs – TESA standard probes (Half-bridge)
Signal outputs – digital RS 323 through USB port

No		Measuring range, mm	Deviation span of indication	Zero drift
03260500	Cable adapter DIN 5p for USB. enables connection of TESA probes sensivity 73,75 mV/V/ mm directly to a USB port	± 2 mm	0,3 % ± 0,1 µm	± 0,01 %/°C
03260501	Cable adapter DIN 5p for USB. enables connection of TESA probes sensivity 29,50 mV/V/ mm directly to a USB port	± 5 mm	0,3 % ± 0,1 µm	± 0,01 %/°C



Cable adapter: DIN 5-pin connector to USB connector type A

DIN 32876 Part 1

0.1 µm

2 V effectively
13 kHz ± 0,5 %

At 20°C and relative humidity ≤ 50 %: error of 'indication = 0,3 % ± 0,1 µm zero drift ± 0,01 %/°C V. Standard refresh speed = 80 ms. Maximum refresh speed = 42 ms. Distance between the stops and the electrical zero cannot be adjusted. Length of cable: 1,2 m. Note: the total error should take into account the error of the probe and the error of the adapter.

USB 2.0 RS232, virtual COM port

20 ± 0,5°C

IP51 (IEC 60529)

Input impedance 970 ± 50Ω (13 kHz) or 2150 ± 50Ω (standard 0 µm) Phase (13 kHz): 71 ± 2°. Input resistance: 100 ± 5Ω. Output impedance at 13 kHz: 1000 ± 2Ω. Phase (13 kHz): 0,2° Dummy probe (half-bridge), sensivity 73,75 mV/V/m. Suitable for instruments with following features: Frequency: 13 ± 0,65 kHz, Voltage: 3 ± 0,015 Veff (2 symetrical voltages of 1,5 Veff) Input and output impedance: ≤ 0,2Ω et 2000Ω, respectively

Calibration: 40 % to 60 %. Operating: 20 % to 80 %. Storage: 5 % to 95 %. Without condensation.

IP40 (IEC 60529)

Inspection report

Ø 18 mm, length 118 mm

≈ 45 g

20 ± 0,5°C, stabilisation time = 8 h

± 3 ppm/°C. Ageing: ± 30 ppm/a

Calibration Standards – Dummy Probes

Calibration standards – also known as "dummy probes" – are resistance dividers. Each calibration standard simulates a given length dimension with high accuracy.

Each calibration standard has 2 values (positive and negative). The values indicated below are the nominal values.

These products are calibrated and supplied with an inspection report that shows the values (actual values) measured during calibration and the related measuring uncertainty.

The calibration standards are connected to the instrument in place of regular probes. For the calibration and all required setting operations of the instrument, certain criteria and conditions need to be respected.Consult the user manual or get in touch with our specialists for further information.



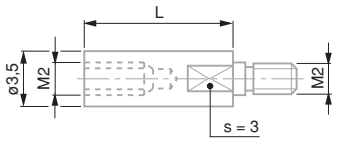
Set of 3 calibration standards (S41077249)

NO		Value of the calibration standard (microns)
S41078077	Dummy probe	± 0
S41078079	Dummy probe	± 3
S41078228	Dummy probe	± 100
S41078230	Dummy probe	± 190
S41078087	Dummy probe	± 300
S41078332	Dummy probe	± 500
S41078751	Dummy probe	± 1000
S41078752	Dummy probe	± 1900
S41077249	Set of 3 dummy probes	± 0 / ± 100 / ± 1000
S41078654	Set of 2 dummy probes	± 190 / ± 1900

INSERTS FOR AXIAL PROBES, WITH M2 THREAD

Extensions for Inserts with M2 Thread

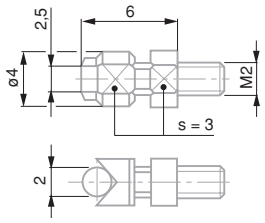
NO	L, mm
03540505	10
03540506	15



03540505, 03540506

Measuring Insert with Cylindrical Measuring Face, Lock Nut for Radial Alignment, M2 Thread

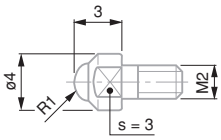
NO		L, mm
03510503	Carbide	6



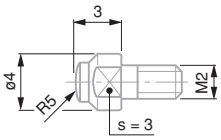
03510503

Hemispherical Measuring Inserts, M2 Thread

NO	R, mm	Material	L, mm
03510204	R 1	Carbide	3
03510103	R 5	Carbide	3



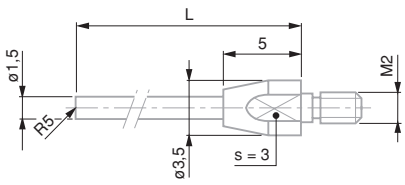
03510204



03510103

Spherical Measuring Inserts, R = 5 mm, M2 Thread

NO		L, mm
03510202	Carbide	16
03510203	Carbide	26

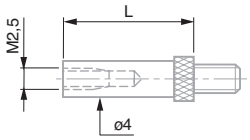


03510202, 03510203

INSERTS FOR AXIAL PROBES, WITH M2,5 THREAD

Extensions for Measuring Inserts, Ø 4 mm, 10 – 40 mm

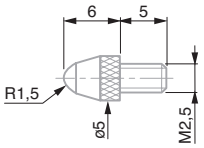
NO	L, mm
03540501	10
03540502	15
03540503	20
03540504	40



03540501 to 03540504

Standard Spherical Measuring Inserts, R = 1,5 mm, L = 6 mm

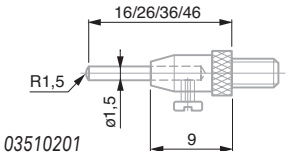
NO	=		L, mm
03510001	L=6 mm	Steel	6
03510002	L=6 mm	Carbide	6
03560001	L=6 mm	Sapphire	6



03510001, 03510002, 03560001

Spherical Measuring Insert with 4 Interchangeable Pins, R = 1,5 mm, Length 16-46 mm

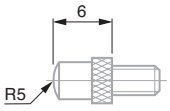
NO		L, mm
03510201	Steel	16, 26, 36, 46



03510201

Spherical Measuring Inserts, R = 5 mm, L = 6 mm

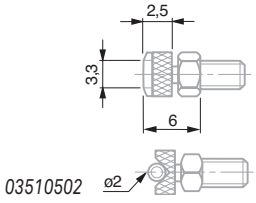
NO		L, mm
03510101	Steel	6
03510102	Carbide	6



03510101, 03510102

Insert with Cylindrical Measuring Face, Counter Nut for Radial Alignment

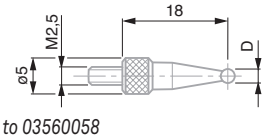
NO		L, mm
03510502	Carbide	6



03510502

Spherical Measuring Inserts, R 1 – 8 mm, L > 18mm

NO		Ø, mm
03560051	Carbide	1
03560052	Carbide	2
03560053	Carbide	3
03560054	Carbide	4
03560055	Carbide	5
03560056	Carbide	6
03560057	Carbide	7
03560058	Carbide	8

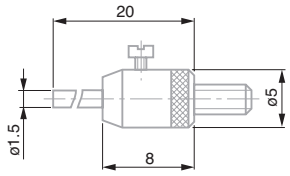


03560051 to 03560058

INSERTS FOR AXIAL PROBES, WITH M2,5 THREAD

Inserts with a Flat Measuring Face Ø 1,5 mm, Interchangeable Pin, Steel or Carbide

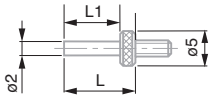
NO	Ø		L, mm
03560008	1,5	Steel	20
03560009	1,5	Carbide	20



03560008, 03560009

Inserts with Flat Measuring Face, Ø 2 mm, Steel

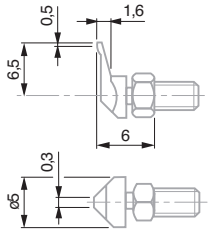
NO	Ø	L, mm	L1, mm
03560026	2	5	2,8
03560027	2	10	7,8
03560028	2	15	12,8
03560029	2	20	17,8



03560026 to 03560029

Insert with Offset (6,5 mm) Measuring Contact Point, Lock Nut for Radial Alignment

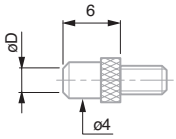
NO		L (offset), mm
03510401	Steel	6,5



03510401

Inserts with a Flat Measuring Face, Ø 2,5 – 3,4 mm

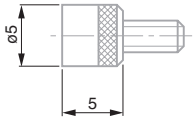
NO	Ø		L, mm
03510801	2,5	Steel	6
03510802	2,5	Carbide	6
03560022	3,4	Steel	8
03560023	3,4	Carbide	8



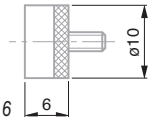
03510801, 03510802, 03560022, 03560023

Inserts with Flat Measuring Face, Ø 5 – 10 – 20 mm

NO	Ø		L, mm
03560012	5	Steel	5
03560013	5	Carbide	5
03560014	10	Steel	6
03560015	10	Carbide	6
03560016	20	Steel	3,6



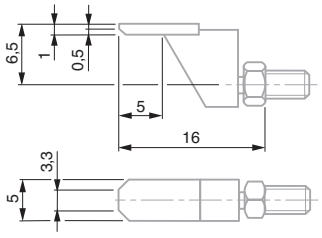
03560012, 03560013



03560016

Insert with Off-centre (6,5 mm) Narrow Face, Lock Nut for Radial Alignment

NO		B (measuring face contact), mm
03510602	Carbide	0,5

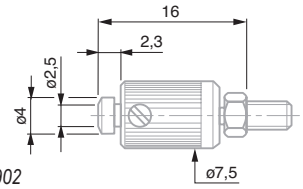


03510602

INSERTS FOR AXIAL PROBES, WITH M2,5 THREAD

Insert with a Flat Measuring Face, Ø 2,5 mm, Adjustable Parallelism, Counter-nut for Radial Alignment

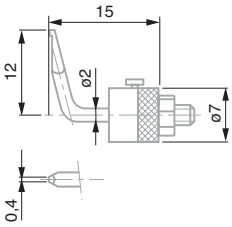
NO	Ø		
03510902	2,5	Carbide	16



03510902

Insert with Offset (12 mm) Contact Point, Lock Nut for Radial Alignment

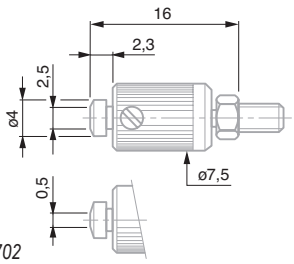
NO		
		L (offset), mm
03560063	Steel	12



03560063

Insert with Narrow Measuring Face, Adjustable Parallelism, Counter-nut for Radial Alignment

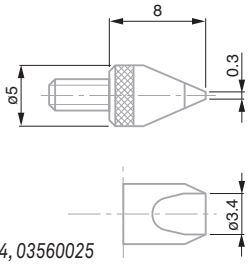
NO		
		B, mm
03510702	Carbide	0,5



03510702

Inserts with Blade-shaped Measuring Face, Lock Nut for Radial Alignment

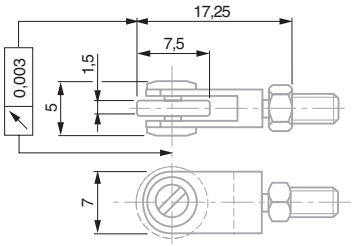
NO			
		L, mm	B (measuring face), mm
03560024	Steel	8	0,3
03560025	Carbide	8	0,3



03560024, 03560025

Measuring Inserts with Ball-bearing Rollers, Lock Nut for Radial Alignment

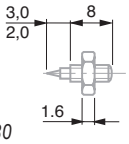
NO			
	Roller shape		L, mm
03560010	Cylindrical	Steel	17,25
03560011	Domed	Steel	17,25



03560010, 03560011

Insert with Needle Contact Point

NO
03560030



03560030

SPRING SETS, BELLOWS, CLAMPING ELEMENTS, MANUAL RETRACTION FOR AXIAL PROBES

Spring Sets for Axial Probes

All values given in the table for the measuring force equal nominal values at electrical zero; max. deviation ± 25 %. Valid for upright assembly position with downward oriented measuring bolt, and used in static measurement.

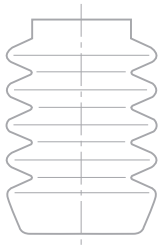
No		Measuring force (N)
03260419	Spring sets for GT22	0,16
03260420	Spring sets for GT22	0,25
03260457	Spring sets for GT21/22	0,63
03260422	Spring sets for GT21/22	1,0
03260423	Spring sets for GT21/22	1,6
03260424	Spring sets for GT21/22	2,5



Bellows for Axial Probes

Nitrile: resistant synthetic sealing for normal use. Viton: high-resistance synthetic sealing. Used in conditions where probes are permanently exposed to coolants and lubricants.

No		
03260468	For 4,3 mm bolt travel GT 21, 22, GTL 21, 211, 22	Nitrile
03260470	For 4,3 mm bolt travel GT 21, 22, GTL 21, 211, 22	Viton
03260489	For pressure probe 4,3 mm bolt travel GTL 212, 222	Viton
03260491	For 10,3 mm bolt travel GT 27, 271, 28, 61, 611, 62	Viton
03260490	For pressure probe 10,3 mm bolt travel GT 272, 282, 612, 622	Viton

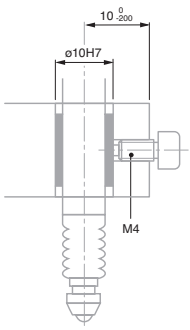


Protection bellow

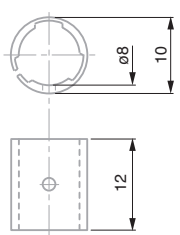
Clamping Elements for Axial Probes

Elements with 3 clamping faces – Prevents any deformation of the measuring bolt guiding system, thus preserving all the metrological properties of the probe.

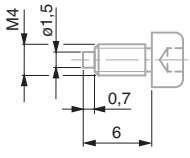
No		Ø	A mm
02611013	VKD clamping screw		M4
02611014	VKE clamping sleeve	Ø 8 mm	
01860401	Y61 fixing clamp	Ø 5,6 mm and Ø 9,5 with dovetail	
02660048	VDE 28 probe holder	Ø 8 mm	



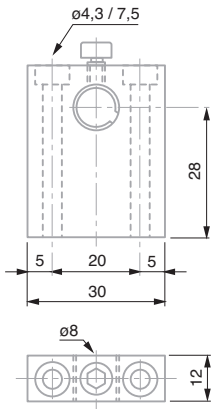
Fixing clamp for axial probe



VKE – clamping sleeve



VKD – clamping screw

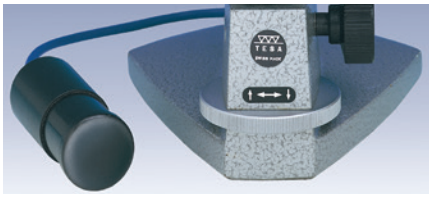


VDE – clamping élément with sleeve and clamping screw

Manual Measuring Bolt Retraction for Axial Probes

NO		
03540104	TB 11 retraction device components	Consisting of: – 1 Washer TB102 (03540102) – 1 Lifting Lever TB101 (03540101)
03260401	Manual pneumatic retraction device.	Suitable for GT 22, 271, 28, 42, 44, 611, 62 – GTL211, 22 probes Consisting of: – 1 hand-operated vacuum pump – 1 tube of 1m, Ø 4,7 mm (ref. 03540405)
03540405	TB311 flexible tube	



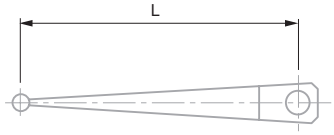


Stainless steel measuring insert, carbide ball tip

ACCESSORIES FOR GT 31 LEVER PROBES

Probe Inserts for GT 31 Lever Probes

NO	Ø	Lever – amplification	L, mm	
03260402	1	1 : 1	32	One-piece shaft
03260410	2	1 : 1	32	One-piece shaft
03260403	3	1 : 1	32	One-piece shaft
03590002	1	1 : 1	32	Two-piece shaft
03590003	2	1 : 1	32	Two-piece shaft
03590004	3	1 : 1	32	Two-piece shaft
03590005	4	1 : 1	32	Two-piece shaft



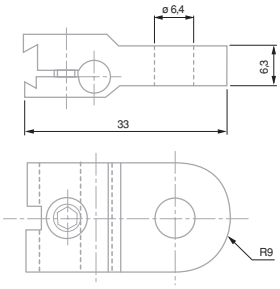
03260410



03260410

Fixing Bracket for TESA GT 31 Lever Probe

NO	
03240100	Fixing bracket with dovetail clamp or cylindrical bore for GT31 probe

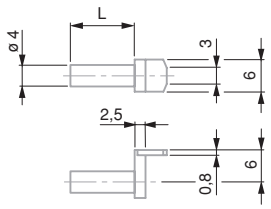


03240100

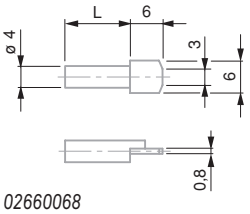
INSERTS WITH Ø 4 MM MOUNTING SHAFT, FOR FMS PROBES

Probe Inserts with a Flat Rectangular Face, Ø 4 mm Mounting Shaft for FMS Probes

NO		L, mm
02660066	Carbide	12
02660068	Carbide	25
02660067	Carbide	12
02660069	Carbide	25



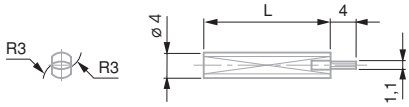
02660067, 02660069



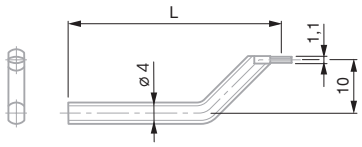
02660066, 02660068

Probe with 2 Cylindrical Measuring Faces with Ø 4 mm Mounting Shaft, for FMS Probes

NO		L, mm
02660070	Carbide	20
02660071	Carbide	40
02660072	Carbide	60
02660082	Carbide	40
02660083	Carbide	60



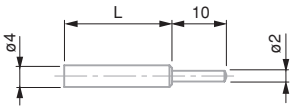
02660070, 02660071, 02660072



02660082, 02660083

Insert with Ø = 2 mm Diameter Contact Pin, Hemispherical Face with Ø 4 mm Diameter Mounting Shaft for FMS Probes

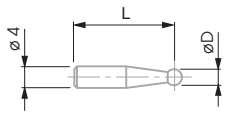
NO		L, mm
02660074	Carbide	40



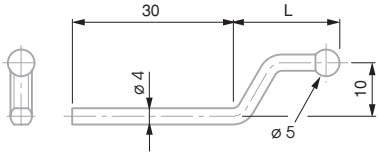
02660074

Probe with Ball Tip Ø 4 mm for FMS Probes

NO	Ø		L, mm
02660076	3	Carbide	20
02660077	3	Carbide	40
02660078	3	Carbide	60
02660079	5	Carbide	20
02660080	5	Carbide	40
02660081	5	Carbide	60
02660084	5	Carbide	20
02660085	5	Carbide	33



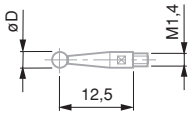
02660076 to 02660081



02660084, 02660085

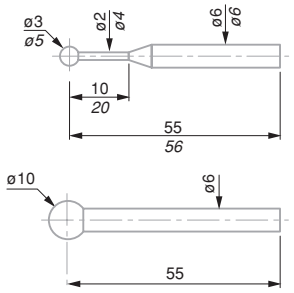
INSERTS WITH Ø 6 MM MOUNTING SHAFT, FOR FMS PROBES

Inserts with Ball Tip, Ø 6 mm Mounting Shaft, for FMS Probes



01860201, 01860202, 01860203

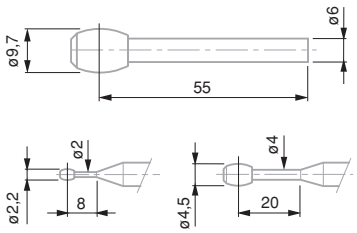
NO	Ø		L, mm
00760058	3	Carbide	55
00760059	5	Carbide	56
00760060	10	Carbide	55
01860201	1	Carbide	12,53
01860202	2	Carbide	12,53
01860203	3	Carbide	12,53
01860307	Wrench	–	–



00760058, 00760059, 00760060

Barrel Shaped Inserts for Bores, Ø 6 mm Mounting Shaft, for FMS Probes

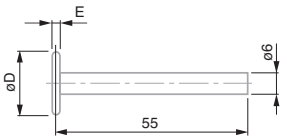
NO	Ø		Thread
00760066	2,2	Carbide	M3 to M16
00760067	4,5	Carbide	M6 to M48
00760068	9,7	Carbide	M12 to M150



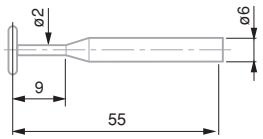
00760066, 00760067, 00760068

Disc Inserts for Grooves, Ø 6 mm Mounting Shaft, for FMS Probe

NO	Ø		Disc thickness, mm
00760074	4,5	Carbide	1
00760075	14	Carbide	2
00760076	19	Carbide	3



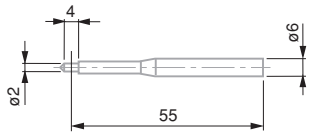
00760075/ 00760076



00760074

Special Inserts, Ø 6 mm Mounting Shaft, for FMS Probes

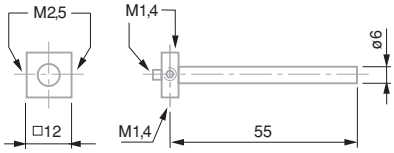
NO	Ø		L, mm
00760082	2	Carbide	55



00760082

Universal Probe Holder with Ø 6 mm Mounting Shaft, for FMS Probes

NO		L, mm
00760096	M1,4 and M2,5 threads	55



00760096

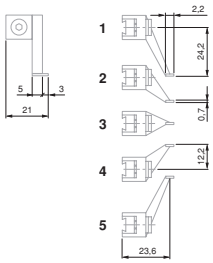
SPRINGS, PNEUMATIC ACTUATORS, HOLDERS, OFF-SET INSERTS, FOR FMS PROBE

Rectangular flat measuring face

Carbide

Inserts with Offset Measuring Faces, for FMS Probes

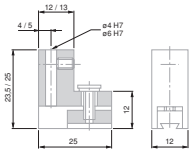
NO		Drawing
02630047	VBM offset insert	1
02630048	VBN offset insert	2
02630049	VBO offset insert	3
02630050	VBP offset insert	4
02630051	VBQ offset insert	5



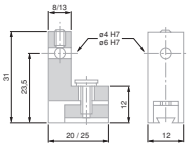
Inserts with offset faces for FMS probes

Fixed Holder, for FMS Probe

NO		Ø	A Number	A Position
02630042	VBH fixed holder	4	2	Horizontal
02630043	VBJ fixed holder	4	1	Vertical
02630045	VBK fixed holder	6	2	Horizontal
02630046	VBL fixed holder	6	1	Vertical



03230043
03230046



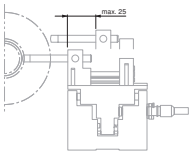
02630042
02630045

Holder with Fine Adjustment for FMS Probe

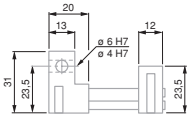
Helps greatly for setting a FMS probe.

Setting and locking screws remain accessible even when several probes are mounted side by side.

NO	mm	Ø	A Number	A Position
02630053	25	4	2	Horizontal
02630055	25	4	1	Vertical
02630052	25	6	2	Horizontal
02630054	25	6	1	Vertical



02630053

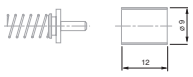


02630052
02630053

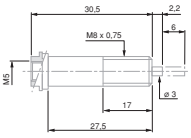
Auxiliary Springs and Pneumatic Retraction Jack, for FMS Probe

All values given in the table for the measuring force equal nominal values at electrical zero; max. deviation ± 25 %. Valid for probing movements executed horizontally as well as in static measuring.

NO		N
03260440	Pneumatic jack	11 (for 4 bars)
03260441	Spring element	0,4
03260442	Spring element	0,63
03260443	Spring element	1,0
03260444	Spring element	1,6
03260445	Spring element	2,0
03260446	Spring element	2,5
03260447	Spring element	4,0



Auxiliary sping element for FMS probe

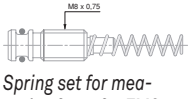


Pneumatic cylinder (jack) for FMS probe

Spring Set with Specific Measuring Force, for FMS Probe

All values given in the table for the measuring force equal nominal values at electrical zero; max. deviation ± 25 %. Valid for probing movements executed horizontally as well as in static measuring mode

NO		Meauring force, N
03260448	Spring set red	0,4
03260449	Spring set yellow	0,63
03260450	Spring set green	1,0
03260451	Spring set blue	1,6
03260452	Spring set brown	2,5
03260453	Spring set black	4,0



Spring set for measuring force for FMS probe

230 V 50 Hz

Maximum 20 probes type GT 22, GT 42 and GT 44, maximum force 0,63 N. Maximum 10 probes type GT 28 and GT 62, Maximum force 0,63 N.

Electro-pneumatic Pump for Measuring Bolt Retraction

Electro-pneumatic vacuum pump, controlled by external switch (03260433): requires an automatic external command (e.g. instrument display).

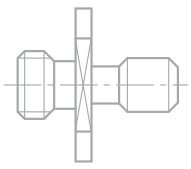
NO			
03260432	Electro-pneumatic vacuum pump with activation by connected foot switch	Electro-pneumatic vacuum pump. For the simultaneous retraction of a maximum number of 20 measuring bolts with a force up to 0,63 N	Activation by connected foot switch
03260433	Electro-pneumatic vacuum pump with activation by external control	Electro-pneumatic vacuum pump. For the simultaneous retraction of a maximum number of 20 measuring bolts with a force up to 0,63 N	Activation by external control



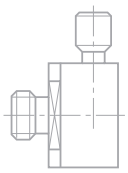
Electro-pneumatic vacuum pump

Connectors for Electro-pneumatic Pump for Measuring Bolt Retraction

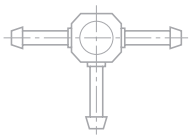
NO	
03540403	T-connector for tube Ø 4,7 / Ø 2 mm (03540405)
03560000	Straight connector, M4 thread for tube Ø 4,7 / Ø 2 mm (03540405)
03560002	Angled connector, M4 thread for tube Ø 4,7 / Ø 2 mm (03540405)



Straight connectors



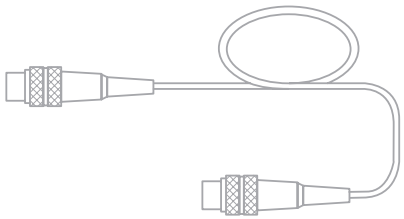
Angled connector



T-connector

Extension Cable for Probes, Lengths = 1 – 20m

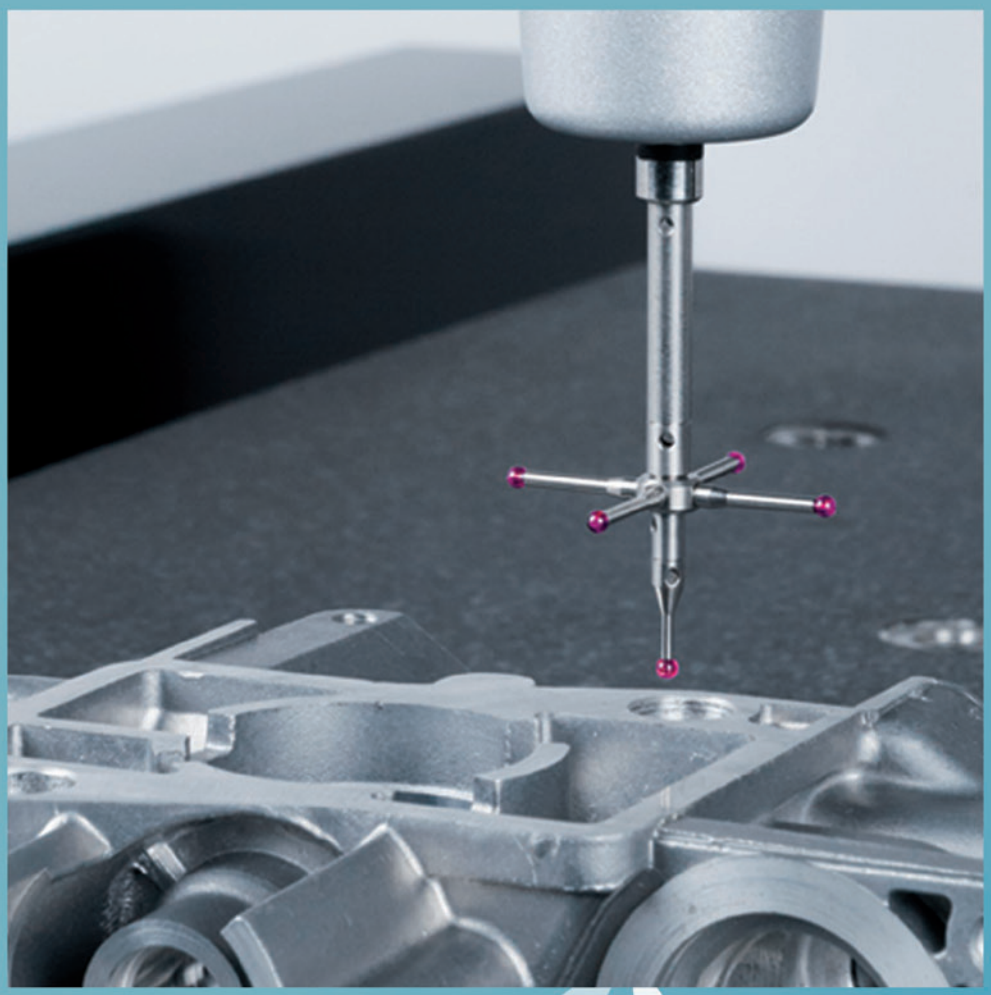
It is recommended to calibrate equipment (probe + extension) connected together to ensure the highest accuracy.



Cable extensions for TESA probes
DIN 453225, 5 pin connector

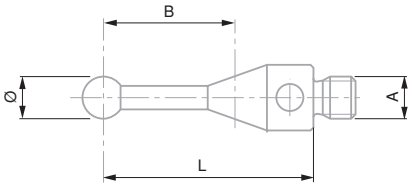
No	Length, m (feet)
03240201	1 m (3 ft)
03240202	2 m (6 ft)
03240203	3 m (9 ft)
03240205	5 m (16 ft)
03240210	10 m (32 ft)
03240215	15 m (49 ft)
03240220	20 m (65 ft)

Accessories



Ruby Ball Stylus, M2 Thread

These styli are used for the majority of probing applications.
Highly robust, thanks to their manufacture from industrial rubies, they are however very sensitive, thus avoiding any capture of unwanted points during the movements of a 3D machine.



1

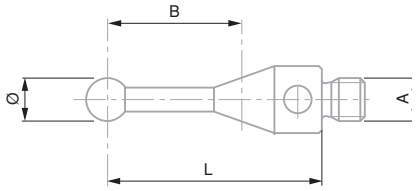


2

NO	Rod	Drawing N°	A mm	Ø mm	L mm	B mm	g
03969201	Inox	1	M2	1	10	4,5	0,3
03969202	Inox	1	M2	2	10	6	0,3
03969203	Inox	1	M2	3	10	7,5	0,4
03969204	Inox	1	M2	4	10	10	0,5
03969205	Inox	1	M2	5	10	10	0,7
03969206	Inox	1	M2	6	10	10	1
03969208	Inox	1	M2	8	11	11	1,5
03969212	Inox	1	M2	2	20	14	0,5
03969213	Inox	1	M2	3	20	17	0,5
03969214	Inox	1	M2	4	20	20,2	0,8
03969220	Tungsten carbide	1	M2	0,5	10	3	0,3
03969221	Tungsten carbide	1	M2	1	20	7	0,6
03969222	Tungsten carbide	1	M2	2	20	15	0,45
03969223	Ceramic	1	M2	3	50	42,5	0,83
03969224	Ceramic	1	M2	4	50	42,5	0,91
03969225	Inox	1	M2	2,5	10	6	0,3
03969226	Tungsten carbide	1	M2	2,5	20	14	0,4
03969259	Tungsten carbide	1	M2	1	27	20,5	0,4
03969260	Carbon	2	M2	4	50	3	1
03969261	Tungsten carbide	1	M2	1,5	30	25	0,58
03969262	Tungsten carbide	1	M2	2	30	25	0,99
03969263	Tungsten carbide	1	M2	3	30	25	1,49
03969267	Tungsten carbide	1	M2	0,7	10	4	0,3
03969268	Tungsten carbide	1	M2	0,3	10	2	0,3
03969269	Tuntgsten carbide	1	M2	0,5	20	7	0,48
03969271	Tungsten carbide	1	M2	1	20	12,5	0,41
03969272	Tungsten carbide	1	M2	1,5	20	12,5	0,5
03969276	Carbon	2	M2	6	50	50	1,2
03969282	Tungsten carbide	1	M2	2	40	35	1,29
03969283	Tungsten carbide	1	M2	3	40	35	1,97
03969284	Tungsten carbide	1	M2	3	40	35	2,04
03969286	Carbon	2	M2	6	30	30	0,96
03969293	Carbide	1	M2	3	50	42,5	2,44
03969294	Carbide	1	M2	4	50	42,5	2,52
03969295	Tungsten carbide	1	M2	5	50	42,5	3,75

Ruby Ball Stylus, M3 Thread

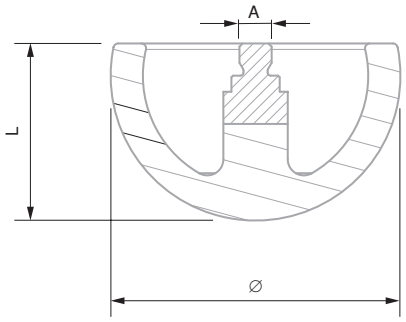
These styli are used for the majority of probing applications.
Highly robust, thanks to their manufacture from industrial rubies, they are however very sensitive, thus avoiding any capture of unwanted points during the movements of a 3D machine.



NO	Rod	A mm	Ø mm	L mm	B mm	g
03969301	Inox	M3	1	21	4	1,1
03969302	Inox	M3	2	21	8	1,1
03969303	Inox	M3	3	21	12	1,1
03969304	Inox	M3	4	21	17	1,4
03969305	Inox	M3	5	21	21	1,55
03969310	Tungsten carbide	M3	0,5	21	3	1,1
03969312	Tungsten carbide	M3	2	21	15	0,8
03969324	Inox	M3	3	10	–	–
03969326	Inox	M3	6	10	–	–
03969332	Tungsten carbide	M3	2,5	21	12,5	1,3
03969343	Tungsten carbide	M3	3	40	32,5	2,3
03969353	Tungsten carbide	M3	3	50	42,5	2,78

Hemispherical Styli, M2 Thread

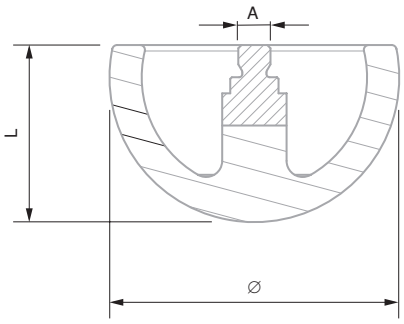
Styli usually made of ceramic are generally used to measure deep bores or to avoid taking into account the unwanted irregularities when measuring.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969218	Hemispherical stylus, Ø 18 mm	Ceramic	M2	18	11	–	3,3

Hemispherical Styli, M3 Thread

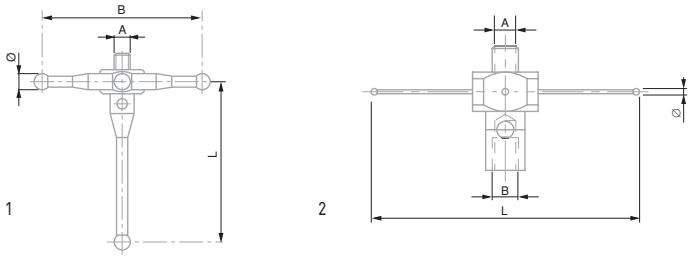
Styli usually made of ceramic are generally used to measure deep bores or to avoid taking into account the unwanted irregularities when measuring.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969330	Hemispherical stylus, Ø 30 mm	Ceramic	M3	30	17	–	13

Star Styli, M2 Thread

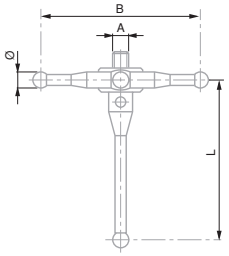
These styli are supplied with several ruby ball tips fixed in different directions. This feature allows a much faster measurement when inspecting internal features without time being wasted by changing the position of a probe.



NO		Rod	Drawing N°	A mm	Ø mm	L mm	B mm	g
03969055	Star stylus, 5 directions	Inox	1	M2	2	20	20	1,5
03969056	Star stylus, 5 directions	Inox	1	M2	2	20	30	1,8
03969081	Star stylus, 5 directions	Inox	1	M2	2	18	20	1,3
03969082	Star stylus, 5 directions	Inox	1	M2	2	18	30	1,7
03969210	Star stylus, 4 directions	Inox	2	M2	0,5	20	M2	0,7

Star Styli, M3 Thread

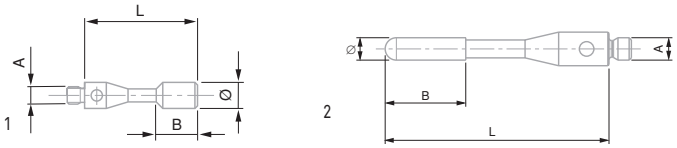
These styli are supplied with several ruby ball tips fixed in different directions. This feature allows a much faster measurement when inspecting internal features without time being wasted by changing the position of a probe.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969057	Star stylus, 5 directions	Inox	M3	2	20	20	2,2
03969058	Star stylus, 5 directions	Inox	M3	2	20	30	2,5
03969083	Star stylus, 5 directions	Inox	M3	2	18	20	2,2
03969084	Star stylus, 5 directions	Inox	M3	2	18	30	2,5

Cylindrical Styli, M2 Thread

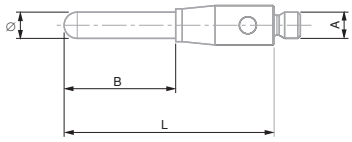
These styli are principally used for the measurement of threads.



NO	Rod	Drawing N°	A mm	Ø mm	L mm	B mm	g
03969251	Inox	1	M2	1,5	11	1,5	0,3
03969252	Inox	1	M2	3	13	3,8	0,6
03969253	Inox	1	M2	3	13	4	0,5
03969292	Tungsten carbide	2	M2	2	20	7,2	0,5

Parallel Styli, M2 Thread

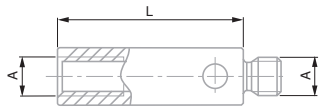
These styli are principally used for the measurement of threads.



NO	Rod	A mm	Ø mm	L mm	B mm	g
03969277	Carbide	M2	0,5	15,3	7,8	0,3
03969278	Carbide	M2	1	35,5	29,8	0,7
03969279	Carbide	M2	2	16	8,5	0,8
03969280	Carbide	M2	2	40	32	2
03969281	Carbide	M2	3	22,5	–	2

Extension M2

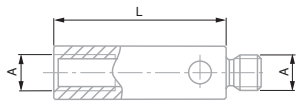
The extension allows to enlarge the distance between the probe and the tip of the stylus in order to avoid collision in the depth measurement (e.g. bore).
The use of extensions can greatly reduce the accuracy of the measuring system.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969230	Extension, L5 mm	Inox	M2	3	5	–	–
03969231	Extension, L10 mm	Inox	M2	–	10	–	0,5
03969232	Extension, L20 mm	Inox	M2	–	20	–	1
03969233	Extension, L30 mm	Inox	M2	–	30	–	1,6
03969234	Extension, L40 mm	Inox	M2	3	40	–	1,8
03969238	Extension, L50 mm	Carbon	M2	3	50	–	1
03969239	Extension, L70 mm	Carbon	M2	3	70	–	1,3
03969240	Extension, L90 mm	Carbon	M2	3	90	–	1,5
03969246	Extension, L40 mm	Ceramic	M2	3	40	–	1,22
03969247	Extension, L50 mm	Ceramic	M2	3	50	–	1,51
03969270	Extension, L40 mm	Carbon	M2	3	40	–	0,9

Extension M3

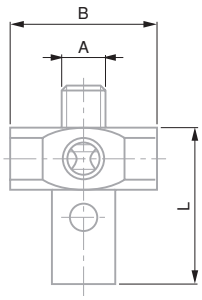
The extension allows to enlarge the distance between the probe and the tip of the stylus in order to avoid collision in the depth measurement (e.g. bore).
The use of extensions can greatly reduce the accuracy of the measuring system.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969044	Extension, L10 mm	Inox	M3	–	10	–	0,8
03969045	Extension, L20 mm	Inox	M3	–	20	–	1,8
03969320	Extension, L35 mm	Inox	M3	–	35	–	2,9

Cross-pieces, M2

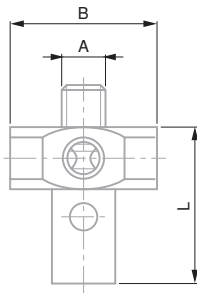
Base on which one or several identical or different kind of styli can be mounted. It can be converted into a star stylus or any other desirable configuration.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969054	5 way cross shaped stylus M2	Inox	M2	–	7,5	7	1,1

Cross-pieces, M3

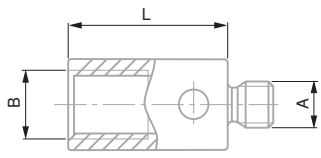
Base on which one or several identical or different kind of styli can be mounted. It can be converted into a star stylus or any other desirable configuration.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969046	5 way cross shaped stylus M3	Inox	M3	–	13	10	3,7

M2 Adaptors

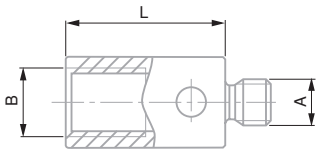
In some cases, accessories that are directly compatible with a probe are not suitable for specific applications. Therefore, it is possible to use an adaptor in order to mount other styli with different threads on it.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969061	Adapter M2-M3	Inox	M2	–	7	M3	0,5

M3 Adaptors

In some cases, accessories that are directly compatible with a probe are not suitable for specific applications. Therefore, it is possible to use an adaptor in order to mount other styli with different threads on it.



NO		Rod	A mm	Ø mm	L mm	B mm	g
03969062	ADAPTER M3-M2	Inox	M3	–	5	M2	0,5

Stylus Tightening Keys

Probes and styli are fragile and sensitive items.
A special key is provided for fixing a stylus on the probe in order to prevent any damages caused by over-thightening.



NO	
047866	Stylus key M2 or M3

Stylus Kit

In order to perform several types of measurement, it is often necessary to keep several models of styli. This is why TESA has created standard kits, comprising styli for a variety of dimensions as well as extensions to suit.

N°		Kit N° 1, M2 03969086	Kit N° 2, M2 03969087	Kit N° 3, M2 + rigid probe 03969089	Kit N° 1, M3 03969101	Kit N° 2, M3 + rigid probe 03969040
03969085	Case for accessories	1				
047866	Stylus key M2 or M3	2				
049652	Key	2				
050697	Tightening key for carbon fibre styli	2				
03969231	Extension, inox, M2, L = 10 mm	1	1	1		
03969232	Extension, inox, M2, L = 20 mm	1	1	1		
03969233	Extension, inox, M2, L = 30 mm		1			
03969270	Extension, carbone, M2, L = 40 mm	1				
03969044	Extension, inox, M3, L = 10 mm				1	1
03969045	Extension, inox, M3, L = 20 mm				1	1
03969054	5 way cross shaped stylus, inox, M2	1		1		
03969046	5 way cross shaped stylus, inox, M3				1	1
03969082	5 way cross shaped stylus, inox, M2	1				
03969201	Stylus, inox, ruby ball tip, M2, Ø 1 mm, L = 10 mm		1			
03969202	Stylus, inox, ruby ball tip, M2, Ø 2 mm, L = 10 mm	1	1			
03969203	Stylus, inox, ruby ball tip, M2, Ø 3 mm, L = 10 mm		1			
03969204	Stylus, inox, ruby ball tip, M2, Ø 4 mm, L = 10 mm	1	1			
03969212	Stylus, inox, ruby ball tip, M2, Ø 2 mm, L = 20 mm	2		1		
03969213	Stylus, inox, ruby ball tip, M2, Ø 3 mm, L = 20 mm	2		1		
03969221	Stylus, carbide, ruby ball tip, M2, Ø 1 mm, L = 20 mm	1				
03969260	Stylus,carbone ruby ball tip, M2, Ø 4 mm, L = 50 mm	1				
03969302	Stylus, inox, ruby ball tip, M3, Ø 2 mm, L = 21 mm				1	1
03969303	Stylus, inox, ruby ball tip, M3, Ø 3 mm, L = 21 mm				1	1
03969304	Stylus, inox, ruby ball tip, M3, Ø 4mm, L = 21 mm				1	1
03969214	Stylus, inox, ruby ball tip, Ø 4 mm, L = 20 mm			1		
03969047	Rigid probe, Ø 6.35 mm			1		1

PLASTIFORM

PLASTIFORM moulding pastes allow print molding of complex internal machined parts, which can then be viewed and checked using optical, non-contact measuring equipment. PLASTIFORM mixing pastess» consist of two components, which have to be mixed in equal proportion to ensure proper polymerization. The test object to be reproduced by print molding must be perfectly clean and grease-free before applying Plastiform.

BAD

Fluid consistency best suited for moulding internal and full prints of small and medium sizes. Medium elasticity (10 % of the core) allows prints to be removed in most cases. Reproduces the finest details and can be used for indirect inspection of the surface finish by sight comparison with use of master roughness specimens. Easily cut with the special cutter.

DAV

DAV of fluid consistency best suited for moulding internal and full prints of small and medium sizes. High elasticity (20 % of the core) allows hard prints to be removed such as large re-entrant angle, groove, complex internal shape. Reproduces fine details. Difficult to cut with the special cutter. Print will be preferably checked as a whole.

RGX80

RGX80 is the hardest product of the cartridge range. Pasty consistency best suited for moulding whole internal prints having varying sizes. Weak stretching property and elasticity make it appropriate for easily removable moulding prints.

LKAD

Malleable consistency best suited for moulding internal, external and sectorial prints of small and medium sizes. Applied by hand. Low elasticity (from 1 to 2% of the core) makes it convenient for moulding prints that are removed with ease. Also appropriate for prints held mechanically if desired. Easily cut with the cutter.

Shrinking: less than 1 µm/mm after removal of the mould Stability: physical properties allow to produce prints which do not deteriorate with time. They will neither be affected by surroundings – hence usable as master standards.

Components with additives free from chlorine, fluorine or sulfur. Being non-toxic and on-polluting can be used with no special restriction

Temperature 20°C

< 10°C: no more polymerization

PLASTIFORM Set

PLASTIFORM full case Consisting of:

- 1 DS50 injection handle
- 1 Cutter, special with two parallel blades
- 1 PLASTIN (200 g)
- 50 Mixer-Injectors
- 10 Injector end pieces
- 1 DN1 spot remover, 400 ml 21 Rings for mould removal
- 3 PLASTIFORM BAD 50 ml
- 3 PLASTIFORM DAV 50 ml
- 2 PLASTIFORM RGX80 50 ml



NO		
06869122	PLASTIFORM Full case	

Properties

	BAD	DAV	RGX80	LKAD
Consistency (max 15)	Fluid (2)	Fluid (4,5)	Pasty	Malleable
Hardness (shore A)	50	20	80	70
Cut using the dual-blade cutter	Easy	Uneasy	Easy	Easy
Check – With contact	●	–	●	●
– Without contact	●	●	●	●
– Roughness	–	–	●	–
Elasticity	Flexible	Highly flexible	Rigid	Rigid

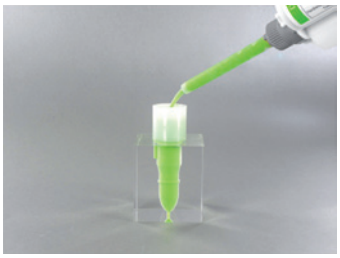
Accessories for PLASTIFORM

- BAD, DAV, RGX80, LKAD Cartridges
- Plastin
- Tests kits
- Mixers-injectors
- Cutter, special with two parallel blades
- Injector nozzles DS50
- DN1 spot remover, aerosol can, 400 ml



NO	=
06869101	PLASTIFORM BAD 8 x 50 ml
06869102	PLASTIFORM DAV 8 X 50 ml
06869106	Mixing injectors, box of 50 pcs
06869107	Mixing injectors, box of 100 pcs
06869108	Mixing injectors, box of 200 pcs
06869109	Fine nozzles box of 20 pcs
06869110	Plastincine, 200 gr
06869111	Special cutter with two parallel blades
06869112	Plastiform pistol DS50
06869113	Degreasing DN1, aerosol 400 ml
06869118	PLASTIFORM RGX8 50 ml
06869119	PLASTIFORM Lite KIT BAD
06869120	PLASTIFORM Lite KIT DAV
06869121	PLASTIFORM LK-AD







TRADEMARKS REGISTERED

- TESA
- TESA fig.
- ALESOMETRE
- CAPA µ SYSTEM fig.
- COMPAC
- COMPAC fig.
- COMPAC GENEVE fig.
- DIAMASTER
- DIGICO
- DIGIT-CAL
- DIGITMASTER
- DURA-CAL
- ETALON
- ETALON fig.
- ETALON SWITZERLAND fig.
- IMICRO
- INOTEST
- INTERAPID
- INTERAPID fig.
- ISOMASTER
- JUNIOR fig.
- MAGNA µ SYSTEM fig.
- MERCER
- MESOBOR
- MICRO-HITE
- MICROMASTER
- µHITE fig.
- ROCH FRANCE fig.
- RUGOSURF fig.
- SHOPCAL
- STANDARD GAGE fig.
- TESA DIGITMASTER
- TESA DUOTAST
- TESA EAGLE fig.
- TESA-HITE
- TESA MEMO-HITE
- TESA MICRO-HITE
- TESA SWISSCAL
- TESA SWISSTAST
- TESACAL
- TESADIA
- TESADIGIT
- TESAMASTER
- TESA-µHITE fig.
- TESANORM fig.
- TESA-SCOPE
- TESASTAR
- TESASTAR fig.
- TESATAST
- TESATRONIC
- TESATRONIC MULTILINE
- TRI-O-BOR
- TRIOMATIC
- UNIMASTER
- UNITEST
- UNITEST fig.
- VERIBOR

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Order number
Standard
Measuring range
Measuring span
Range of indication
Max. plunger travel
Displacement range
Application range
Analogue indication
Longitudinal scale
Upper vernier
Lower vernier
Circular scale
Dial
mm or in/revolution
Scale interval
Resolution
magnification
Numerical scale
Numerical interval
Height of signs/digits
Analogue/numerical
indication
Material measure
Measuring system
Capacitive measuring system
"CAPA µ SYSTEM", patented
Magnetic measuring system
"MAGNA µ SYSTEM", patented
Mm/in conversion
Maximum permissible errors
Limit deviations
Deviation span
of indication
Repeatability limit
Hysteresis
Maximum permissible
straightness error
Maximum permissible
flatness error
Maximum permissible
roundness error
Maximum permissible
parallelism error
Maximum permissible
cylindricity error
Maximum permissible
perpendicularity error
Maximum permissible
runout error
Quality grade
Uncertainty of
measurement accuracy
Frame
Measuring face or faces
Dimensions
Diameter
Thread pitch
Material hardness
Measuring force
Shockproof design
Maximum
displacement speed
Product designation
Execution
Special features
Notes
Function mode
Floating zero
Fixed zero
Blocking of display
Digital interface
Analogue interface
Power supply
Autonomy
Coefficient of
linear expansion
Working
temperature range
Operating
temperature range
Storage
temperature range
Maximum relative
humidity
Degree of protection
Electromagnetic
compatibility
Mass
Included in scope
of supply
Packaging
Identification number
Declaration
of conformity
Inspection report
Inspection report with a
declaration of conformity
SCS
calibration certificate
Certificate
of another type
Reverse
numbering or +left
Dial locking knob
Connectivity
TWIN
ABS
Height of signs/digits
11 mm

HEXAGON
MANUFACTURING INTELLIGENCE

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TESA
TECHNOLOGY

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Through its worldwide distribution network the company focuses on the mechanical engineering, micromechanical, automotive, aerospace, watchmaking and medical industries.

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