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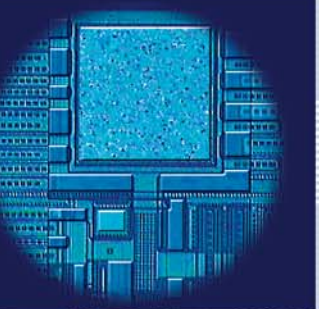
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TESA TECHNOLOGY

5 good reasons for choosing a TESA's product

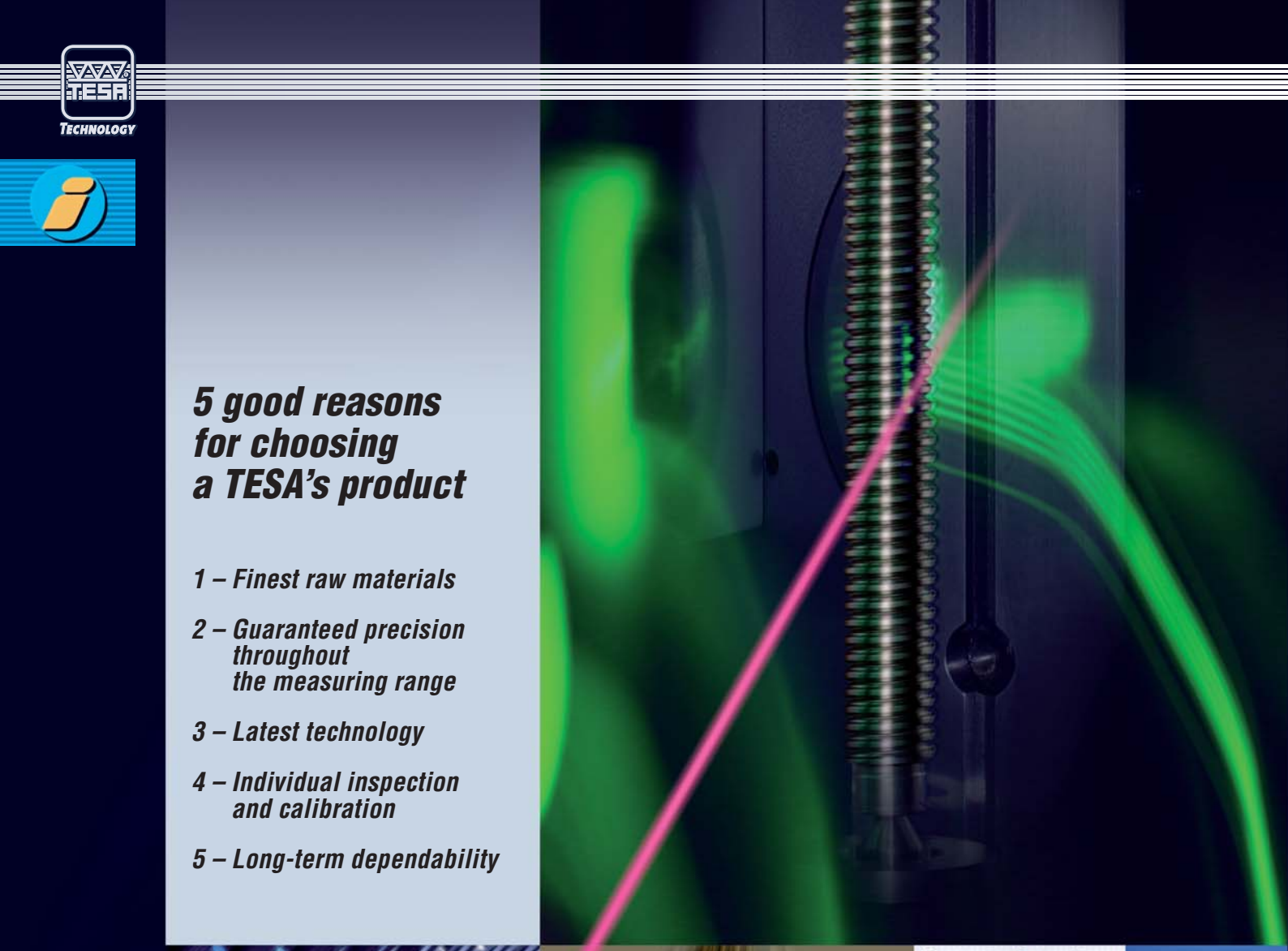
1 – Finest raw materials

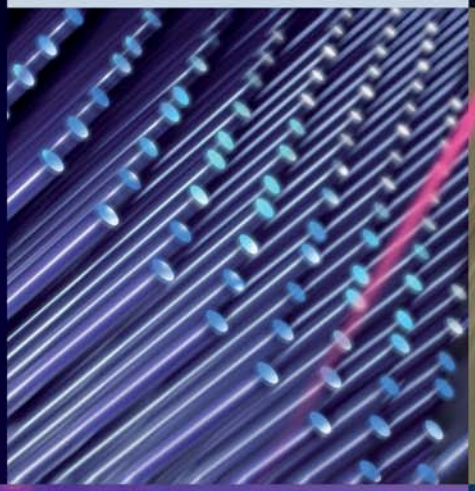
2 – Guaranteed precision throughout the measuring range

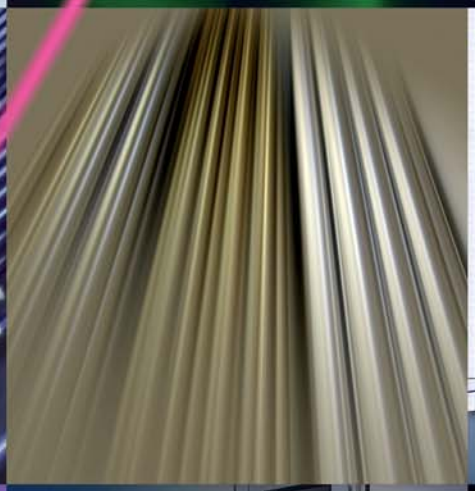
3 – Latest technology

4 – Individual inspection and calibration

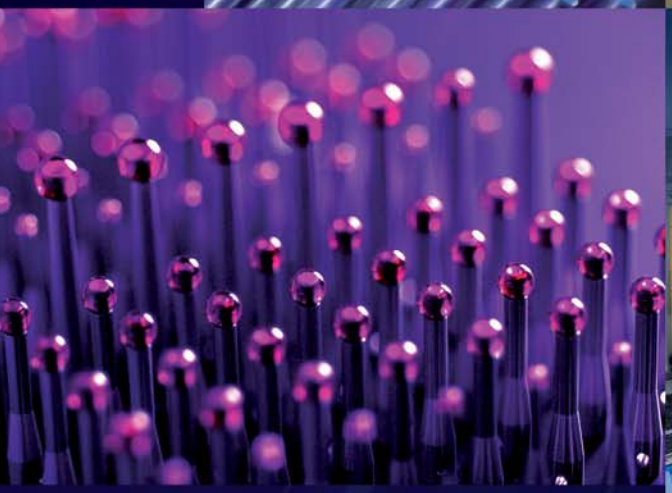
5 – Long-term dependability



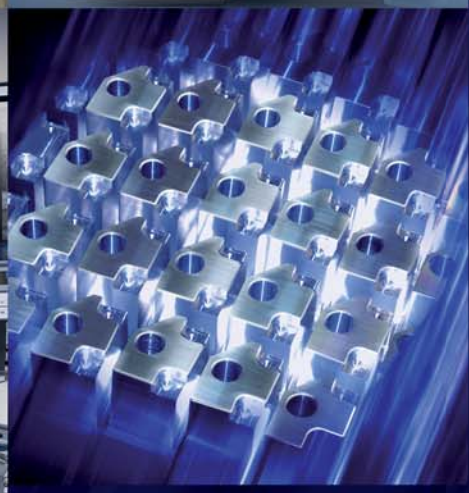










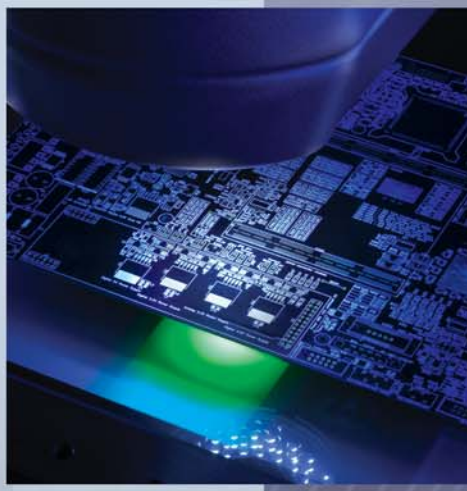


Dear customer,

We invite you to browse the pages of this general catalogue, which not only offers a large range of inspection tools from the smallest gauge to the coordinate measuring machine, but also delivers a vast amount of information and advice with regard to dimensional metrology.

For this new edition, our engineers have worked towards solving the equation of providing higher performance besides greater ease of use. For comfort of the operator and reliability of the measurements, TESA intends to play a pioneering role in applying this trend seen in other industrial fields, to metrology.

Our catalogue from the year 2010 has been deeply modified to make room next to the traditional precision instruments and systems that forged our reputation, to the many innovations that reflect this new direction. You will no doubt find among this diversified range the instrument that fits your needs and meets your most stringent requirements.



Because the accuracy of your measurements is your guarantee for quality, our priority is to ensure the reliability of our metrology products, from design to final inspection certificate.

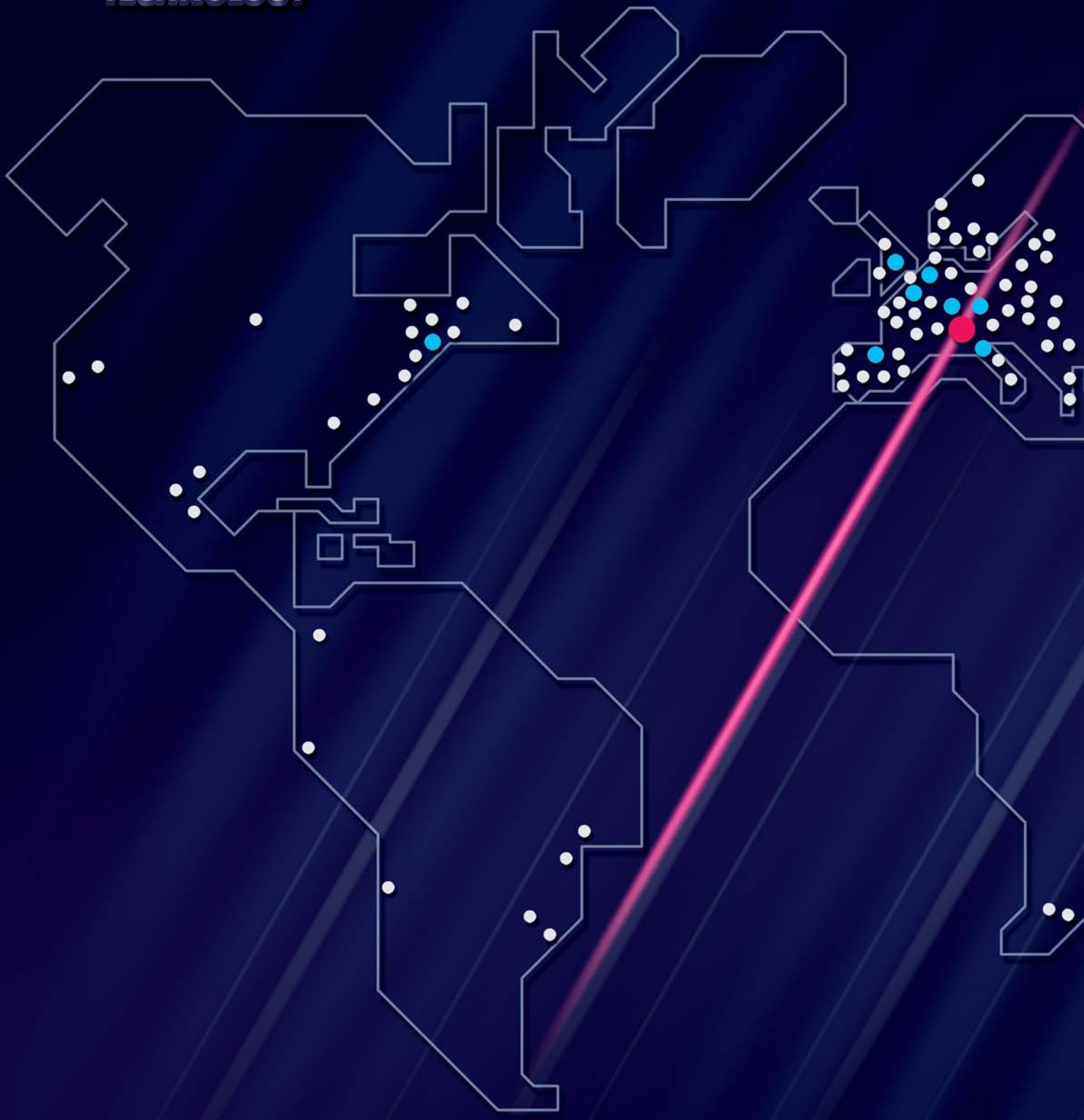
We thank you for the trust you place in us.

Martin Hedman
General Manager

Marcel Bila
Sales & Marketing Director

TESA TECHNOLOGY

www.tesabs.ch





Sales – Customer Service and Support

TESA SA is headquartered in Renens (Switzerland).
Products are distributed through a wide distribution network worldwide.
The company also provides a comprehensive customer service and support.

- *TESA SA international headquarters*
- *Subsidiaries – Customer Service and Support*
- *Regional distributors*

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- Individual instruments D-13
- Full sets D-14

W-X-Y-Z

Work bench accessories

- Hand-held magnifier I-20
- Magnifier with ring light I-20

Quantities and Units

International System of Units (SI)

F: Système international d'unités (SI)
D: Internationales Einheitensystem (SI)

	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	mol
luminous intensity	candela	cd

Derived units (of measurement)

F: Unités dérivées
D: Abgeleitete Einheiten

	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}

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 at 20°C.

The temperature of 20°C is assumed to be valid for any size, material measure, measurement result etc., unless otherwise specified.

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.

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

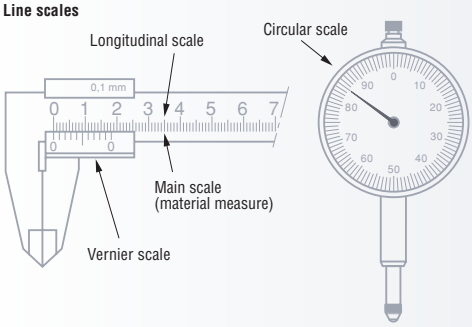
Scale substrat with a number of graduations following one another.

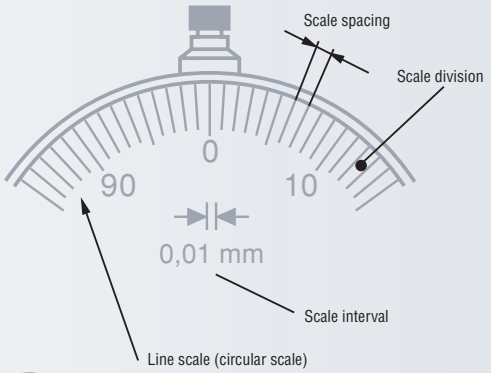
Scale spacing

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

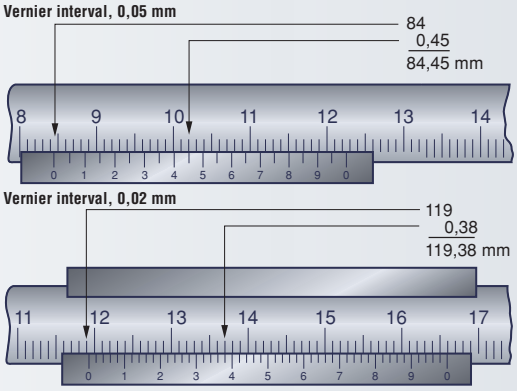
F: Echelon, valeur d'une division (d'échelle)
D: Skalenteilungswert

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.



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 both highest and smallest 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.

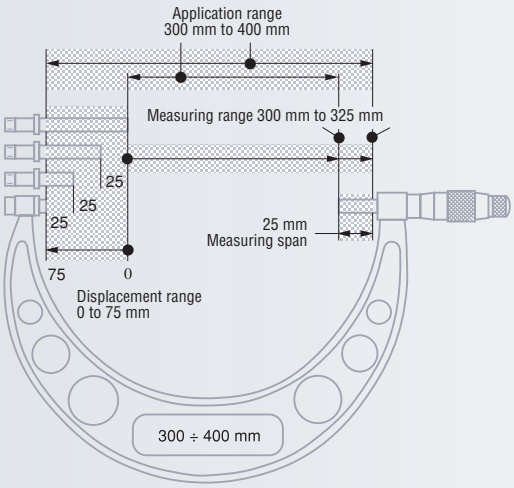
Application range

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.

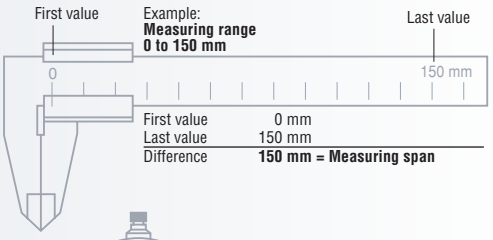
The measured value includes the true value plus the random and systematic errors of the relevant tool.

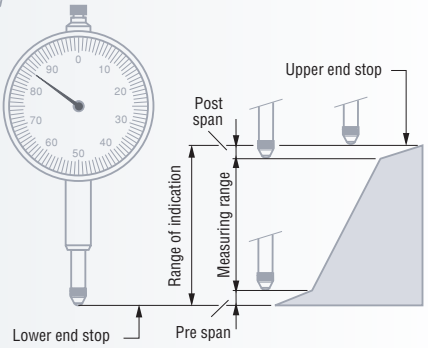
Result of measurement

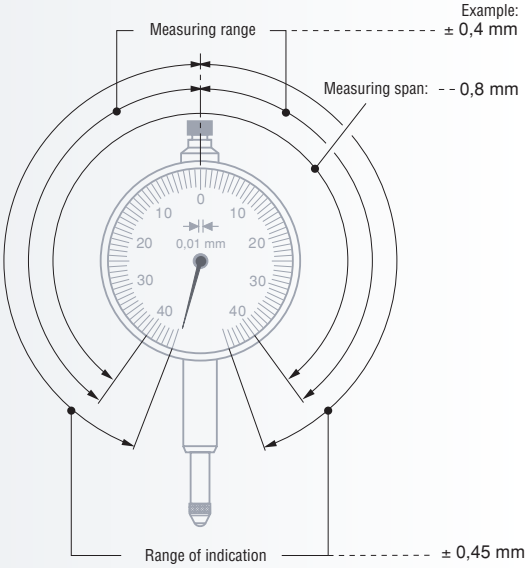
F: Résultat de mesure – D: Messergebnis

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 proper to 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 proper to 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 an 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

Extrem 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.

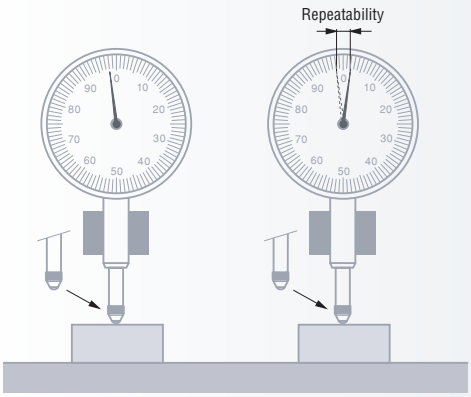
All needed measurements are carried out in one direction (without reversal of the measuring force) - i.e. with upward plunger movement for a dial gauge. For those needed to establish the whole deviation span, they are performed in both directions (with reversal of the measuring force) - i.e. with upward and downward movement of the plunger for a dial gauge.

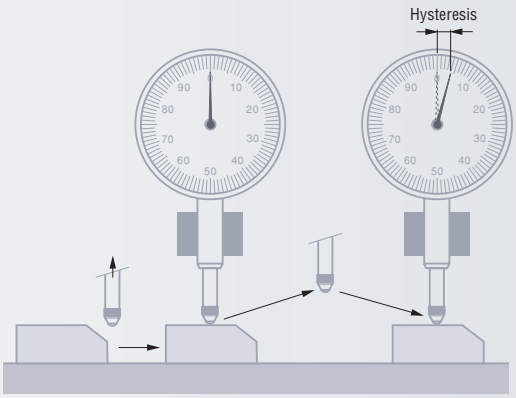
Hysteresis

F: Hystérésis
D: (Messwert-) Umkehrspanne

Hysteresis expresses the difference between various indications of a measuring instrument. This value is achieved trough measurements of the increasing/decreasing value of a 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 in its whole.





Decision Rules for Proving Conformance or Non-Conformance 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 conformance or non-conformance with specifications». These rules are valid for «Inspection by measurements of work pieces 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 conformance or non-conformance 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 the conformance or non-conformance zone depends on the size of the effective expanded uncertainty *U*.

Rule for proving conformance

Conformance 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 conformance with the specification is proved by the manufacturer (supplier).

Rule for proving non-conformance

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

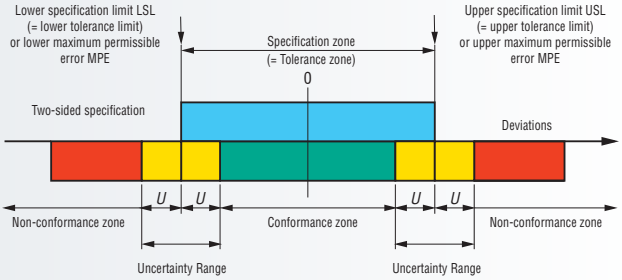
Conformance or non-conformance can neither be proven

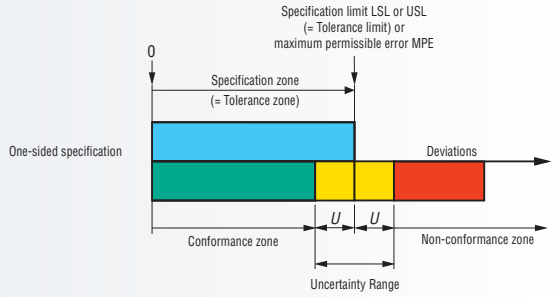
This often happens when the **measurement result *y* associated with the expanded uncertainty *U* includes either of both LSL and USL specification limits**. As a result, work pieces or measuring instruments can neither be automatically accepted nor rejected.

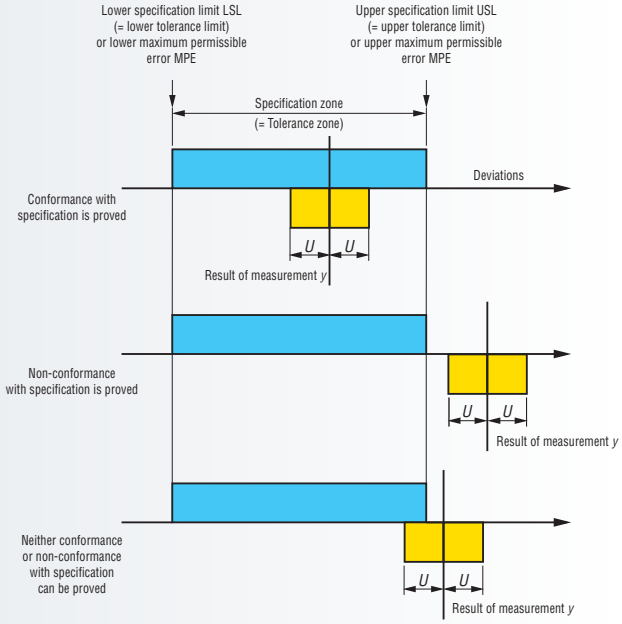
For such «dead end cases», it is advissable to follow the rule below.

– Repeat all measurements based on a reduced uncertainty, so that conformance or non-conformance can clearly be demonstrated. Usually, proceeding in this way benefit 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.





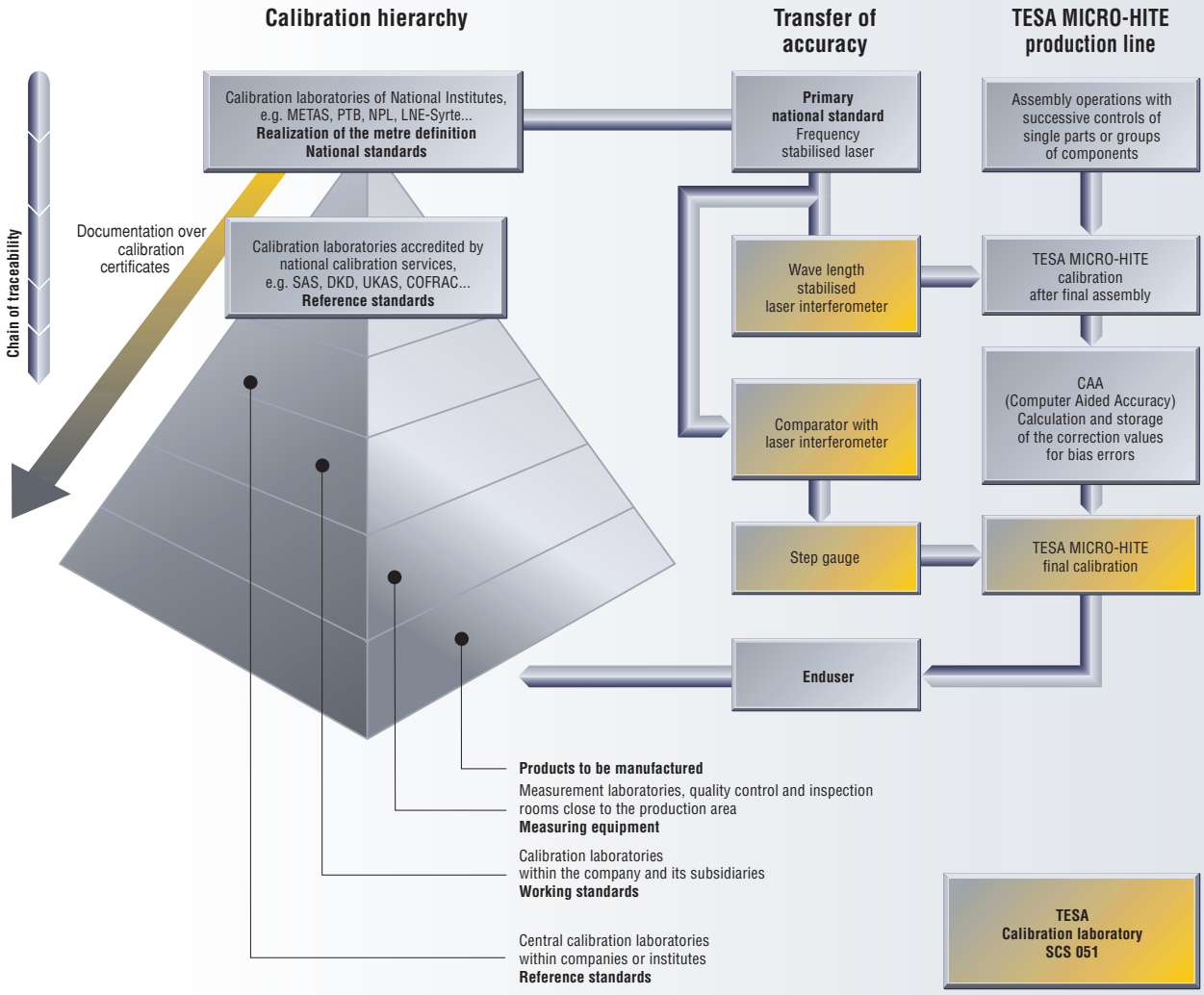


Traceability to National Standards

All measuring equipment consistently used on our production site are 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 officially accredited by the Swiss Calibration Service.



Connectivity







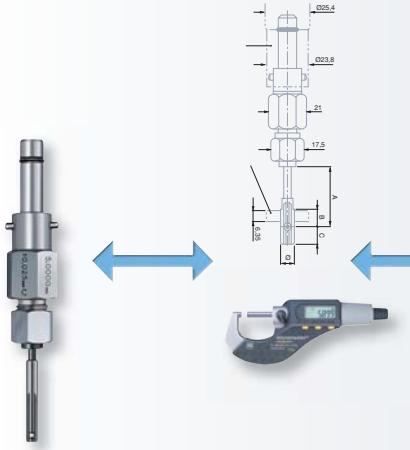




TESA LINK

Inspection, traceability and cost reduction have a growing significance in all industrial sectors. This involves high quality metrology products, but also a suitable evaluation and further application of the measurements carried out.

Manufacturing *Inspection* *Evaluation* *Documentation*







TESA DataDirect
Listed measurements, data storage, user-defined calculations, PC-based traceability.





TESA StatExpress
Statistical data processing, control chart, handling and traceability of the measured values.



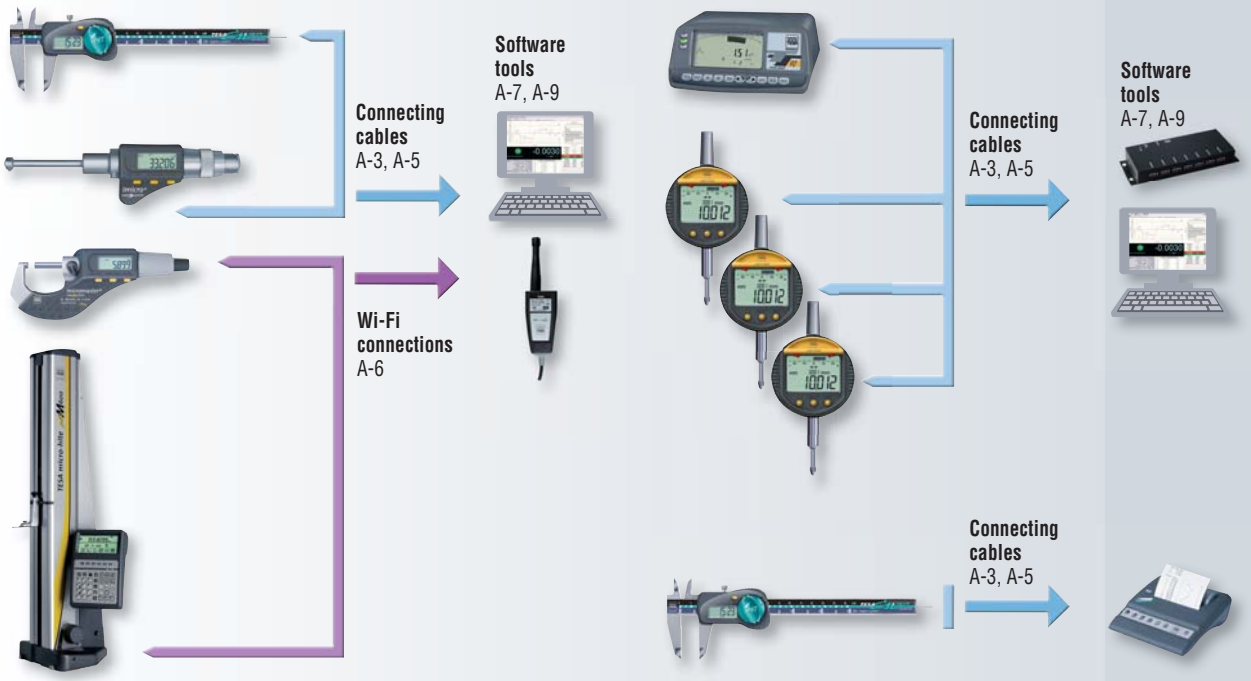
TESA Printer SPC
Simple statistical data processing (no PC required), documented traceability.

Measuring instrument

Software or printer

Data file or printed report

Besides Software tools, TESA also offers a wide variety of cable links between the precision tool and the computer in order to optimize your manufacturing processes, improve quality and help you originate any document needed for traceability.



OPTO and Sub-D standard connections

Any cable connection is defined through both connectors fitted at each cable end to link the computer, but mainly the measuring instrument being used.

To achieve highest compatibilities, TESA uses standardized and proven connectors essentially.

Common systems **Compatible connectors**



TESA Printer SPC



Sub-D 9p/f



Ansley 10p/f



Computer*



USB



Sub-D 9p/f

*Some computers are provided with other interfaces or do no longer have a serial port (Sub-D 9p).

OPTO Connection

RS 232 opto-coupled, monodirectional or bidirectional



The table below contains the cables convenient for precision tools fitted with an OPTO connector, such as TESA-CAL IP67, IP65, INTERAPID Light, TESA Micromaster, TESA Imicro, TESA Alesometer, TESA Digico 10 - 11 - 205 - 305 - 400 - 500 - 600 - 705, TESATRONIC TT20-60-80-90, among others.



		L in m	System
04761062	Opto-USB DUPLEX Comes with drivers and software in DEMO version on CD.	2	USB
04761046	Opto-RS Simplex For data transfer from handtool t to host computer. Allows a single request only.	2	Sub-D 9p/f Simplex
S47010022	Same as item 04761046, except for the length.	5	
04761049	Opto-RS Duplex avec possibilité d'envoi de Setting commands can be sent to the precision tool.	2	Sub-D 9p/f Duplex
S47010024	Same as item 04761049, except for the length.	5	
04761027	Connecting cable alone	2	w/o connector

Sub-D Connexion

RS 232, Sub-D 9p/m connector





Connecting cables for the following CMMs or precision handfool:

TESA Micro-Hite, TESA-Hite, TESA μHite, TESA TG.

No	=	L in m	System
04761063	Sub-D USB Comes with drivers and software in DEMO version on CD	2	USB
04761052	Uncrossed cable.	2	Sub-D 9p/f
S47010025	Same as item 04761052, except for the length.	10	Sub-D 9p/f

USB Accessories

No	=	L in m
S47120002	**USB Adapter** Comes with drivers on CD, USB Sub-D connector, 9p/m	0,1
S47120003	**Multiplexer, 7 USB ports 2.0** Robust steel housing, external powering using a C-type AUX connector, 4 pins. (4 ports for 04761062 and 04761063) *Furnished with:*	
	DC mains adapter (EU) Connecting cable to PC. Recommended highest number of ports: 49 USB ports connectable on 2 levels.	1,5
04761071	**USB Foot Switch** Direct connection to any USB port. Takes DataDirect or StatExpress into account when transferring the measured values from all connected measuring tools.	2



S47120002



S47120003



04761071

Connecting cables and cable adapters

No		L in m	System		Instrument
04761023	Conneting cable for TT10 – TESA Micro-Hite, versions 10/11/12	2	Sub-D 9p/f		MiniDIN 8p/m
04761024	Connecting cable to matrix printer for TT10 – TESA Micro-Hite, versions 10/11/12	2	Sub-D 25p/m		
04761038	Connecting cable for TESA Digico 1 and 2, also with power outlet	3	Sub-D 25p/f		Special Digico 1-2
S47078588	Connecting cable for TESA Digico 1 and 2 – TESA Printer SPC	2	Ansley 10p/f		
04761060	Connecting cable for TESA Digico 12 – Electronic dial test indicator	2	Sub-D 9p/f		Special Digico 12
03969007	Connecting cable, RS232 serial for TESA-SCOPE – Reflex 1 – Readouts TS100 – 300	3	Sub-D 9p/f		
04761017	Cable adapter		Sub-D 25p/m Sub-D 9p/m		
S47001891	Cable adapter for **OPTO simplex** used to link DIGIMATIC	0,2	Sub-D 9p/m Ansley 10p/f		
S53300165	Connecting cable for Clinobevel 1	1,8	USB		Special Clinobevel
S53070174	Connecting cable for Clinobevel 2	2,5	Sub-D 9p/f		

Accessories

No		L in m	Connectors
04761054	Mains adapter, 100 to 240 VAC 50 to 60 Hz, 6,6 Vdc, 750 mAh (provided w/o mains cable)	2	DC-Jack
04761055	EU cable for mains adapter N° 04761054	1,5	
04761056	US cable for mains adapter N° 04761054	1,5	
04761037	Mains adapter, 230 VAC, 9 Vdc, 22 mAh, 1,8 VA – TESA Digico 1 or 2	2	Special
04761057	Mains adapter, 110 VAC, 9 Vdc, 22 mAh, 1,8 VA – TESA Digico 1 or 2	2	Digico 1-2
04761058	Adapter cable with mini-jack cable entry for hand switch or foot switch		Sub-D 9p/m Sub-D 9p/f
04768000	Hand switch for triggering data transfer – Adapter cable 04761058 – TESA Printer SPC	2	
04768001	Foot switch for triggering data transfer – Adapter cable 04761058 – TESA Printer SPC	2	



047681058



04768000



04768001

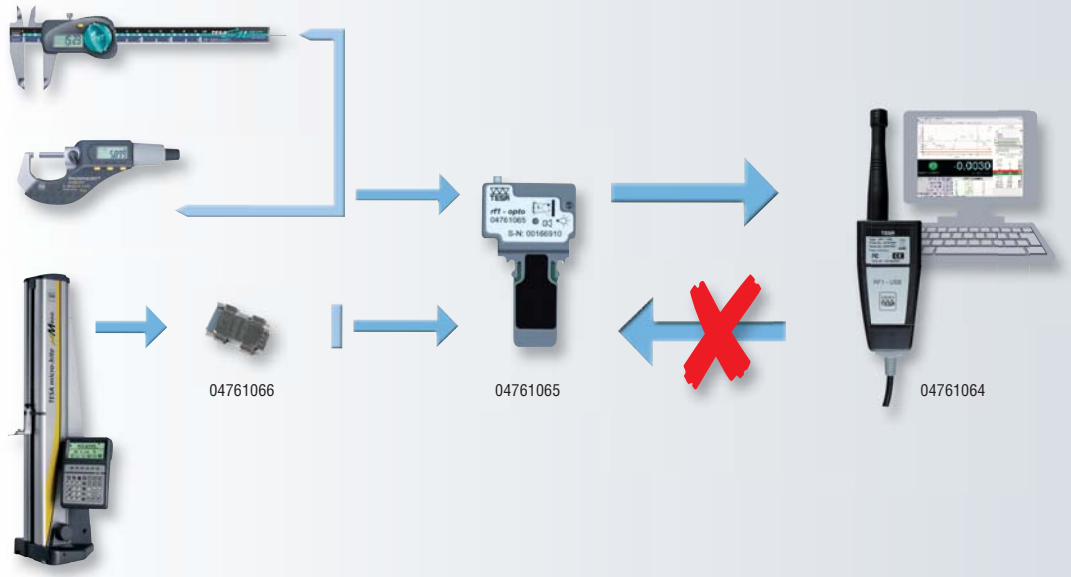
Wireless Connection

The solution for a freely move. The use of this technology ensures full flexibility and makes the measuring instrument easily traceable owing to a distinct address with acknowledgment.



Scale 1:1

Possible connection of up to 120 precision handtools to a single or several host computers (max. distance 150 m). Where data transmission cannot visually be checked for correctness, the combined acoustic/optical signal lets you get a confirmation that data transfer has occured, so that no data can be lost.



✓
≤ 150 m
2 x 1,5V SR920W or as per model 1 x 3V CR2032
≈ 100'000 data transfers
0°C to 50°C
–30°C to 60°C
EN 300 220

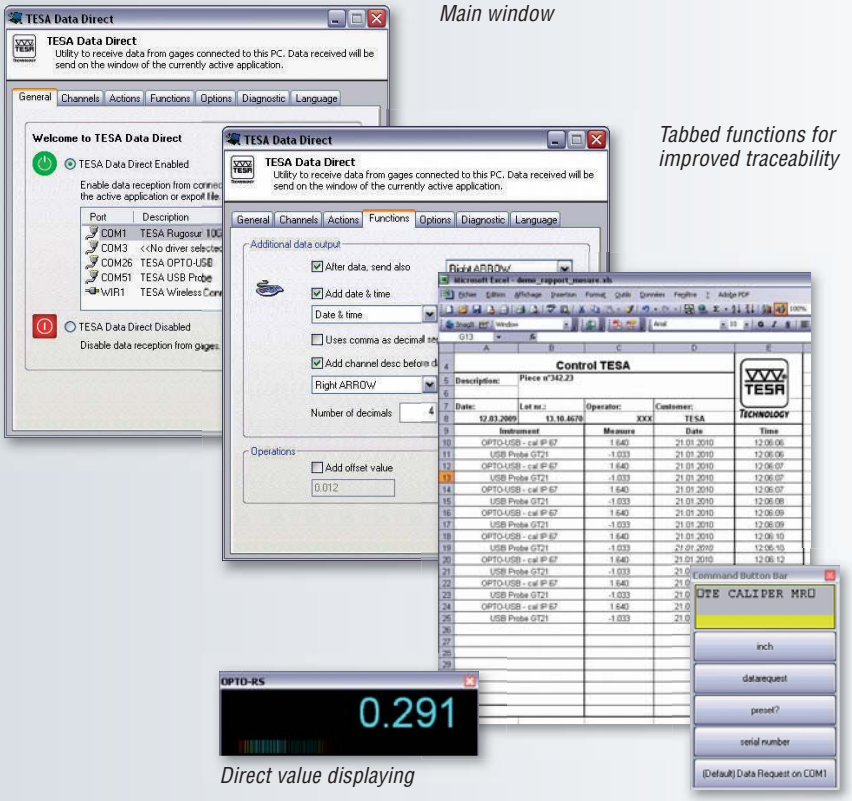
No			mm	g
04761064	**Rf-USB** Receiver, type rf-USB, for host computer, provided with utility for setting purpose (SimKey)	USB	47 x 275 x 30	≈ 175
04761065	**Opto-rf1** Transmitter, type rf, for Opto connector (except for TESA Digico and calipers >500 mm)	OPTO	25 x 42 x 12	≈ 8
04761066	**Opto – Sub-D** Opto-adapter Sub-D for serial interface (Sub-D)	Sub-D 9p/m	31 x 51 x 17	≈ 10
04761067	**RS 232 – rf** Transmitter, type Sub-D, for CMMs along with mains supply	Sub-D 9p/m	47 x 275 x 30	≈ 175
04761068	**Digico 12 – rf** Transmitter specially designed for TESA Digico 12 and electronic dial test indicator	Special	35 x 49 x 11	≈ 10
04761069	**Opto – rf Digico** Transmitter, type rf, for TESA Digico 205, 305, 400, 500, 600, 705	OPTO	30 x 50 x 11	≈ 8

DataDirect

This software solution is an easy way to collect and report in real time all measured values taken with nearly any TESA's precision tools featuring an RS 232 data output.

DataDirect is provided with serial input/output drivers specially configured for TESA's products, but also for those purchased from other manufacturers. It works effectively for data transfer to 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 the relevant part inspection.



Main window

Tabbed functions for improved traceability

Listed measurements within a third-party software, e.g. MS Excel

User-defined commands

Direct value displaying

04981001	**TESA DataDirect**
Software including:	
	CD for installation USB dongle Instruction manual (PDF)

For information on functionalities and compatibilities, see page A-9.

StatExpress

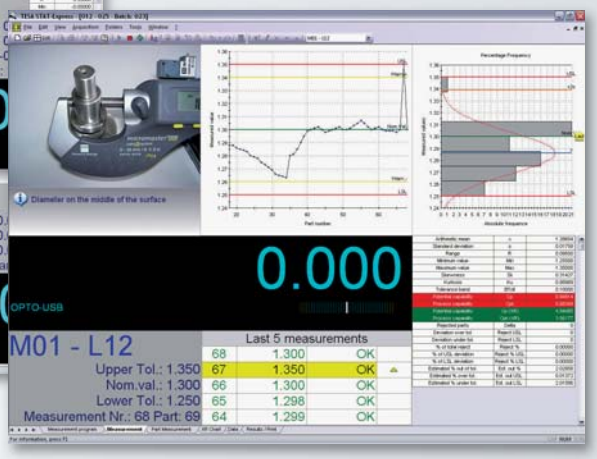
This dedicated software lets quality assurance enter into your manufacturing processes in that it makes it possible for your quality-oriented control charts to be conveniently downloaded, reported, swapped and stored.

StartExpress is compatible with all TESA's products – from the caliper up to the CMM or Vision machine. As integrated component, DataDirect provides the needed flexibility for easy data transfer to most of the electronic gauges currently available on the market.

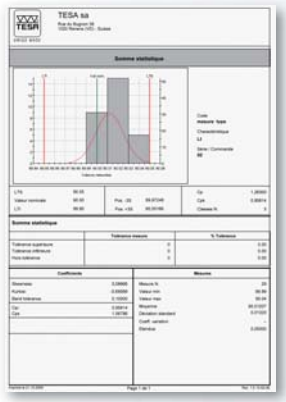
Running StatExpress you will have the ability to create protocols including the measured values obtained from a single or several handtools, assign tolerances, calculate statistics, print out various measurement reports, compute XR control charts, and much more.



Simultaneous measuring of multiple parts.



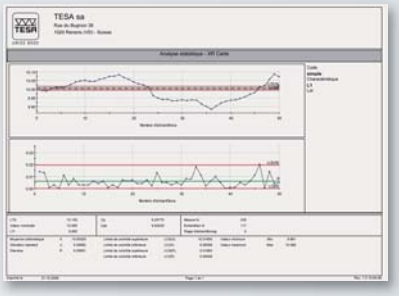
Main window with or without instructions



Detailed report for each measured part features



Report by measured parts with number of the part series



XR control chart

04981002	**TESA StatExpress**	
	Extended programme version	
04981003	**TESA StatExpress Light**	
	Lightened programme version (see next page)	
provided with:		
	CD for installation – USB dongle – Instruction manual (PDF)	

For information on fonctionnalities and compatibilities, report to page A-9.

TESA Software Tools

This overview shows the main fonctionalities and compatibilities using a TESA's software for data acquisition and data processing.

Ask your local disributor or visit our web site **www.tesabs.ch** and get access to the free software version available for evaluation.

Minimum requirements :
Pentium 4 or alike – 512 MB RAM – 10 GB HD – Windows XP or 7 (32 bits).

	04981001 DataDirect	04981003 StatExpress Light	04981002 StatExpress
Compatible instruments and systems			
OPTO-RS / USB	●	●	●
Height gauges (TESA-HITE, MICRO-HITE)	●	●	●
USB probes	●	●	●
Rugosurf 10, 10G, 90G	●	–	●
Micro-Hite 3D Reflex, TS 300	●	–	●
TPS	●	●	●
BPI intelligent probe boxes	–	–	●
Custom made instruments, type RS 232	●	●	●
Instruments from other makers (Mitutoyo, DMX3 - DMX8, Steinwald single 6, etc.)	●	●	●
Wireless TESA systems	●	●	●
Options available			
Export CSV data files	●	●	●
ASCII commands	●	–	–
Dynamic displaying (Direct displaying of the measured value on used monitor - Not available with a wireless system)	●	–	–
TESA DataDirect included	–	–	●
Import CSV data files	–	–	●
Table with all measured values included	–	●	●
XR control chart	–	–	●
Report by measured parts	–	–	●
Report by measured feature	–	●	●
Simultaneous data acquisition	–	–	●
Overall report	–	●	●
Protection according to Users skills level	–	●	●
Inspection report in PDF, HTML or other format.	–	●	●
Setting option for USB type inductive probes, BPI probe boxes. Zero-setting procedure and plausibility test.	–	–	●

TESA Portable Printer

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



TESA PRINTER SPC

Can be connected to TESA measuring instruments, but also to those provided with a DIGIMATIC output – Your TESA PRINTER SPC is capable to recognise the plug in tool and will execute the appropriate configuration, automatically.

	«Normal»	«Tolerance»
Statistical features		
Lower limit of size (LSL)	–	●
Upper limit of size (USL)	–	●
Tolerance	–	●
Number of captured values:		
– sampling extent	●	●
– < lowest size	–	●
– > highest size	–	●
– out of tolerances in per-cent	–	●
Lowest list value	●	●
Highest list value	●	●
Value dispersion R	●	●
Arithmetical mean $\bar{x}$	●	●
Standard deviation σ_n, σ_{n-1}	●	●
Process capability Cp, Cpk	–	●
Graphical Representations		
Position of each single value within the tolerance range (10 classes)	–	●
Histogramme	–	●
Display (luminous LEDs)		
Sorting of each single value with green for *Good*, yellow for *Rework* and red for *Reject*	–	●

- 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 fly (optional).

✓

Matrix printer using thermal paper roll

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 battery pack, rechargeable

10°C to 40°C

–10°C to 60°C

IP40 (IEC 60529)

EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2

180x180x84 mm (W x D x H)

0,55 kg

Shipping packaging

Identification number

Declaration of conformity

06430000	**TESA PRINTER SPC** Printer with SPC capability, value classification and memory; prints all results with graphical representations using the matrix printer provided with a 110 mm wide thermal paper roll; RS232 interface.
Supplied with the following accessories:	
04765013	1 Thermal paper roll, 110 mm in width
04761054	1 Adapter 100 to 240 Vac, 50 to 60 Hz, 6,6 Vdc, 750 mA
04761055	1 EU adapter cable
Optional accessories	
04768035	Battery pack, 6V
04761056	US adapter cable

Calipers









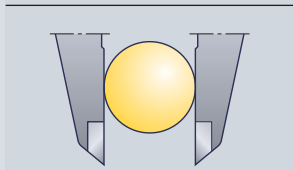
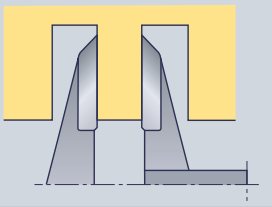
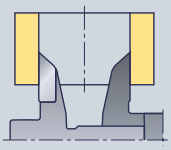
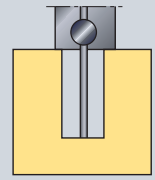
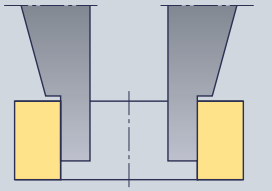
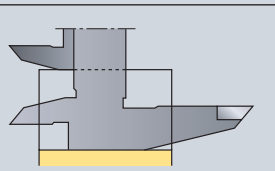
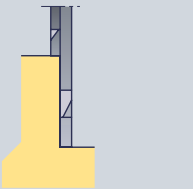
THE FAVOURITES

Calipers are the most popular length measuring instruments used worldwide. Owing to their simple construction, ease of handling and quick operation, they are the favourites in dimensional measurement. The wide variety of forms and shapes available with exclusive measuring faces make them the universal hand-held tools.

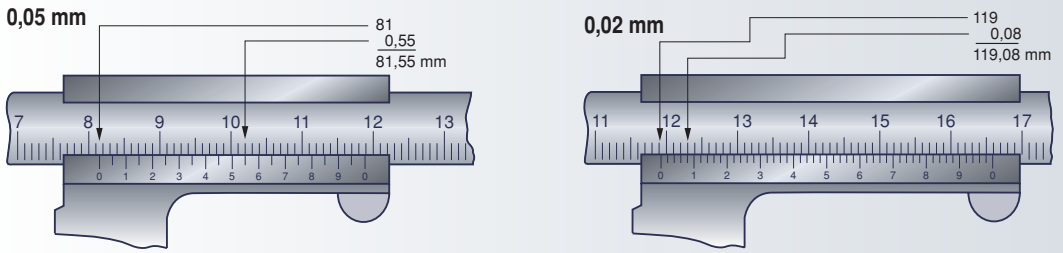
All calipers of the famous TESA, ETALON, INTERAPID and ROCH brand names are recognised for their superior quality – the guarantee for precise measurement. The flawless guide of the slider on the beam ensures silky-smooth operation while also preventing the measuring jaws from tilting.

The choice of the material with exactly 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 your measured values – a condition that's essential in the certainty of any measurement – we offer dial calipers for a comfortable reading or more sophisticated digital models for error-free reading besides regular vernier calipers.

Vernier Calipers



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

Max. Permissible Errors

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).

They apply in measurement taken under the same measuring force. For all other measurements, including those perform with use of the depth foot, the values obtained has to be increased by 20 µm.

Calipers with scale or vernier reading to 0,1 or 0,05 mm:
G = (20 + l / 10 mm) µm ≥ 50 µm

Calipers with analogue indication (scale or vernier reading to 0,02 mm) or numerical indication:
G = (22 + l / 50 mm) µm



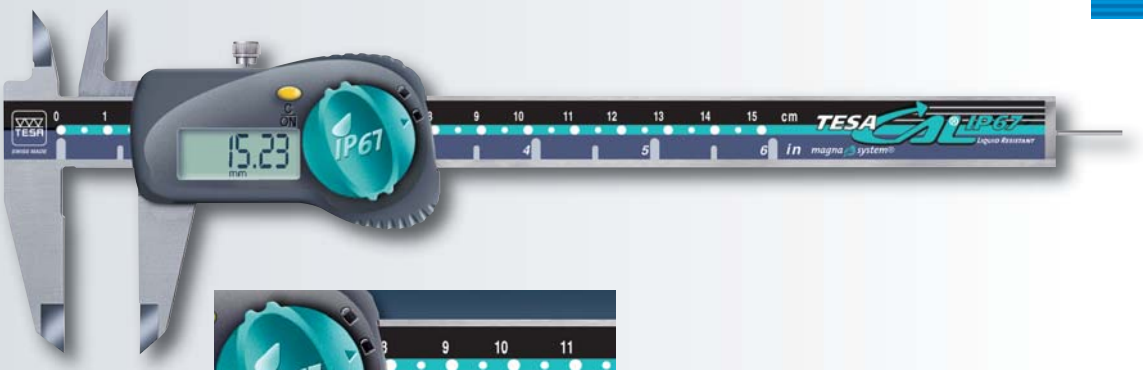
TESA CAL IP67 magna µ system

Patented measuring system – TESA magna µ system

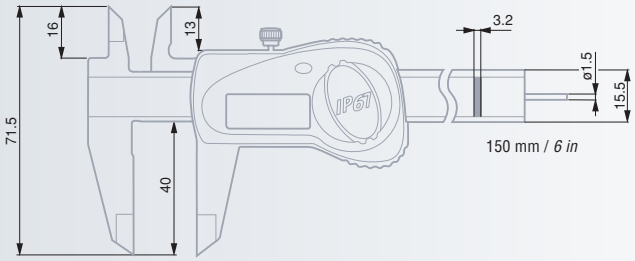
New electronic caliper – The highest degree of protection ever achieved with hand-held tools of this type – Totally immune to the penetration of liquids and particles of metal.

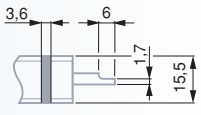
Magnetic measuring system – a TESA's technology guaranteeing full reliability and accuracy, even in the thoughest conditions of use – SWISS MADE.

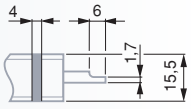
- ✓
- DIN 862 (Style 1A-ZS)
- 0,01 mm 0.0005 in
- LCD, 7 mm
- Floating zero
- Conversion mm / in
- ≤100 mm = 20 µm >100 mm = 30 µm
- 10 µm
- Steel scale with incremental divisions, magnetic
- > 1,8 m / s
- RS232 opto-coupled, mono- and bi-directional
- Hardened stainless steel
- 3V lithium battery, CR 2032
- ≈ 1,5 a (≈ 2000 h / a)
- Idle mode after 10 min, automatic switch off after 2 h.
- 10°C to 40°C
- -10°C to 60°C
- 100%
- IP67 (IEC 60529)
- EN 50081-1 EN 50082-1
- Suited plastic case
- Identification number
- Inspection report with a declaration of conformity













	mm / *in*	RS232	Thumb roller	**A** mm	**B** mm	**C** mm	g
00530300	150 / *6*	–	–	40	16	71,5	140
00530301	150 / *6*	–	●	40	16	71,5	140
00530302	200 / *8*	–	●	50	20	89,5	200
00530303	300 / *12*	–	●	64	22	105,5	270
00530311	150 / *6*	●	●	40	16	71,5	140
00530312	200 / *8*	●	●	50	20	89,5	200
00530313	300 / *12*	●	●	64	22	105,5	270

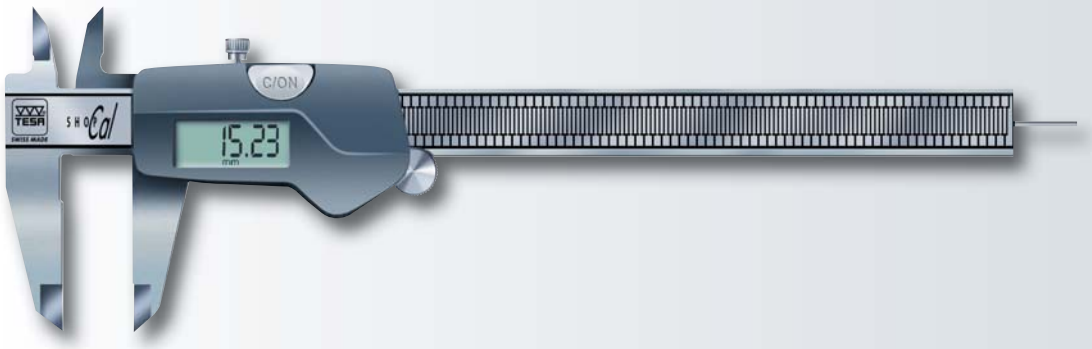
Optional Accessories

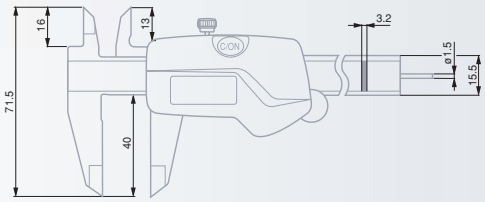
01961000	3 V lithium battery, 190 mAh, type CR 2032
00560013	Depth foot for calipers having a 150 mm measuring span (also see on page B-24)
	For connecting cables, see section A

TESA SHOP-CAL

Patented measuring system – TESA magna µ system

- ABSOLUTE or DIFFERENCE measurements
- High quality precision mechanics
- Large LC display
- Easy-to-use
- Best Price/Performance relationship







No	mm / *in*	Thumb roller	**A** mm	**B** mm	**C** mm	g
00530090	150 / *6*	●	40	16	71,5	140

Optional Accessories

01961000	3 V lithium battery, 190 mAh, type CR 2032
00560013	Depth foot for calipers having a 150 mm measuring span (also see on page B-24)

- ✓
- DIN 862 (Style 1AZ)
- 0,01 mm 0.0005 in
- LCD, 7 mm
- Floating zero
- «ABS» and «DIFF»
- Conversion mm / in
- ≤100 mm = 20 µm >100 mm = 30 µm
- 10 µm
- Capacitive glass scale with incremental divisions
- > 2 m / s
- Hardened stainless steel
- 3V lithium battery, CR 2032
- ≈ 2 a (≈ 2000 h / a)
- Idle mode after 10 min, automatic switch off after 2 h.
- 10°C to 40°C
- -10°C to 60°C
- 80%
- IP40 (IEC 60529)
- EN 50081-1 EN 50082-1
- Suited plastic case
- Identification number
- Inspection report with a declaration of conformity

✓

DIN 862 (Style 1AR)

≤100 mm = 20 µm
>100 mm = 30 µm

Hardened stainless steel

32 mm diameter rotating dial with lock

Slider with locking screw

Steel gear mechanism, hardened and ground

Patented shockproof design

Suited plastic case

Identification number

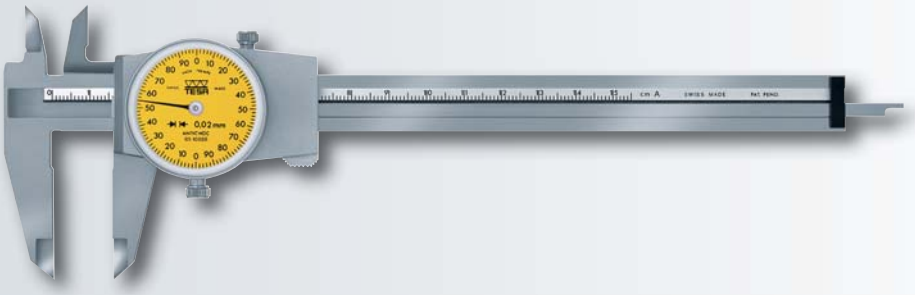
Inspection report with a declaration of conformity

Dial Calipers

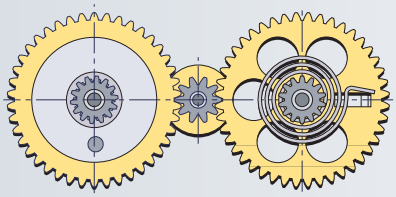
Rugged construction – High accuracy – Patented shockproof design – Ideal for use in the workshop.

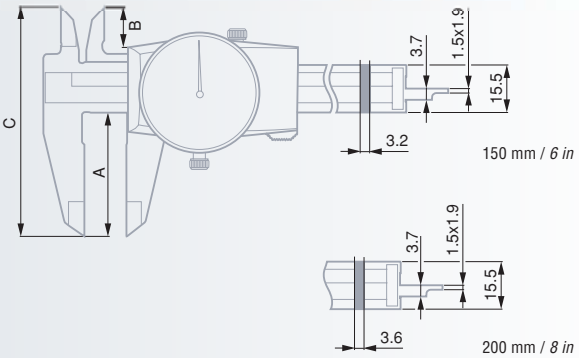
Models TESA CCMA-M

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











				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

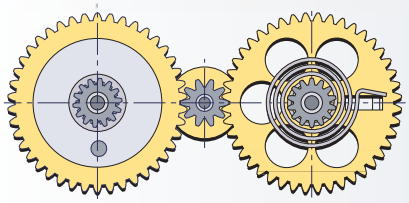
Optional Accessory

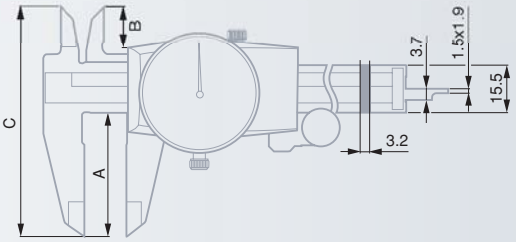
00560013 Depth foot for models 150 mm/*6 in* (also see page B-24)

Model ETALON 125

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







075115821	0 ÷ 150 mm	0,02 mm	1 mm	without thumb roller

Optional Accessory

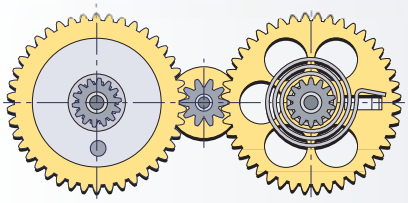
00560013	Depth foot (also see page B-24)

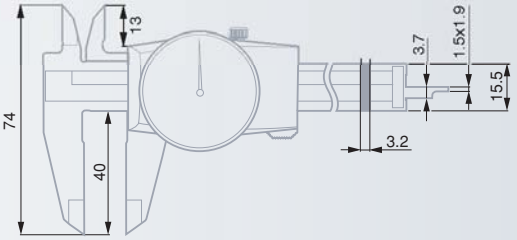
- ✓
- DIN 862 (Style 1AR)
- ≤100 mm = 20 µm >100 mm = 30 µm
- Hardened stainless steel
- 32 mm diameter rotating dial with lock
- Slider with locking screw
- Steel gear mechanism, hardened and ground
- Patented shockproof design
- Suited plastic case
- Identification number
- Inspection report with a declaration of conformity

Model TESA CCMA-M, 0,01 mm

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







00510050	0 ÷ 150 mm	0,01 mm	1 mm

Optional Accessory

00560013	Depth foot (also see page B-24)

- ✓
- DIN 862 (Style 1AR)
- ≤ 100 mm = 20 µm > 100 mm = 30 µm
- Hardened stainless steel
- 32 mm dia. rotating dial with lock
- Slider with locking screw
- Steel gear, hardened and ground
- Patented shockproof design
- Suited plastic case
- Identification number
- Inspection report with a declaration of conformity

✓

DIN 862
(Style 1AR)

≤100 mm = 20 µm
>100 mm = 30 µm

Hardened
stainless steel

32 mm dia.
rotating dial
with lock

Slider
with plastic dial
housing plus
locking screw

Steel gear,
hardened
and ground

Patented
shockproof
design

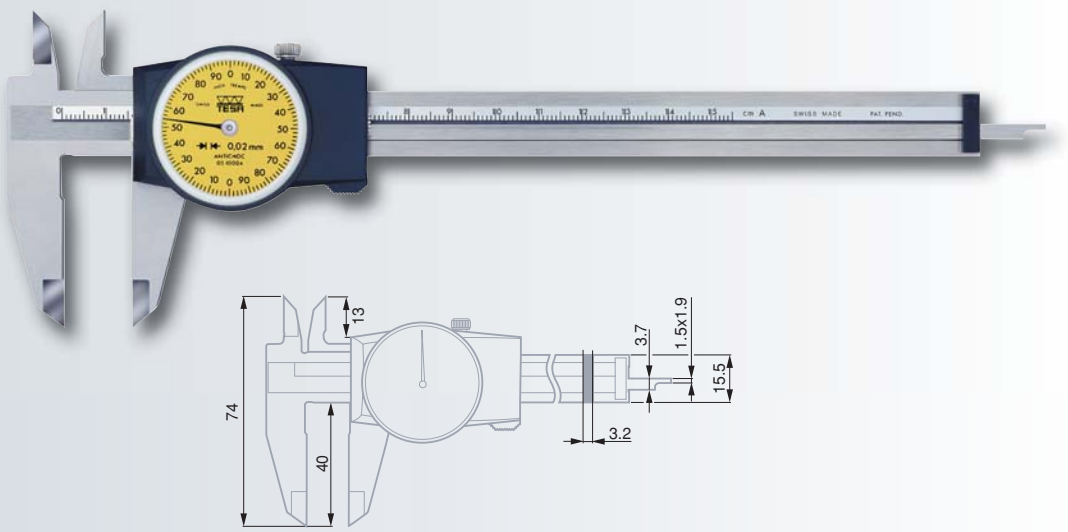
Suited
plastic case

Identification
number

Inspection report
with a declaration
of conformity

Model TESA CCMA-P

Quick and easy reading – Slider with plastic dial housing.





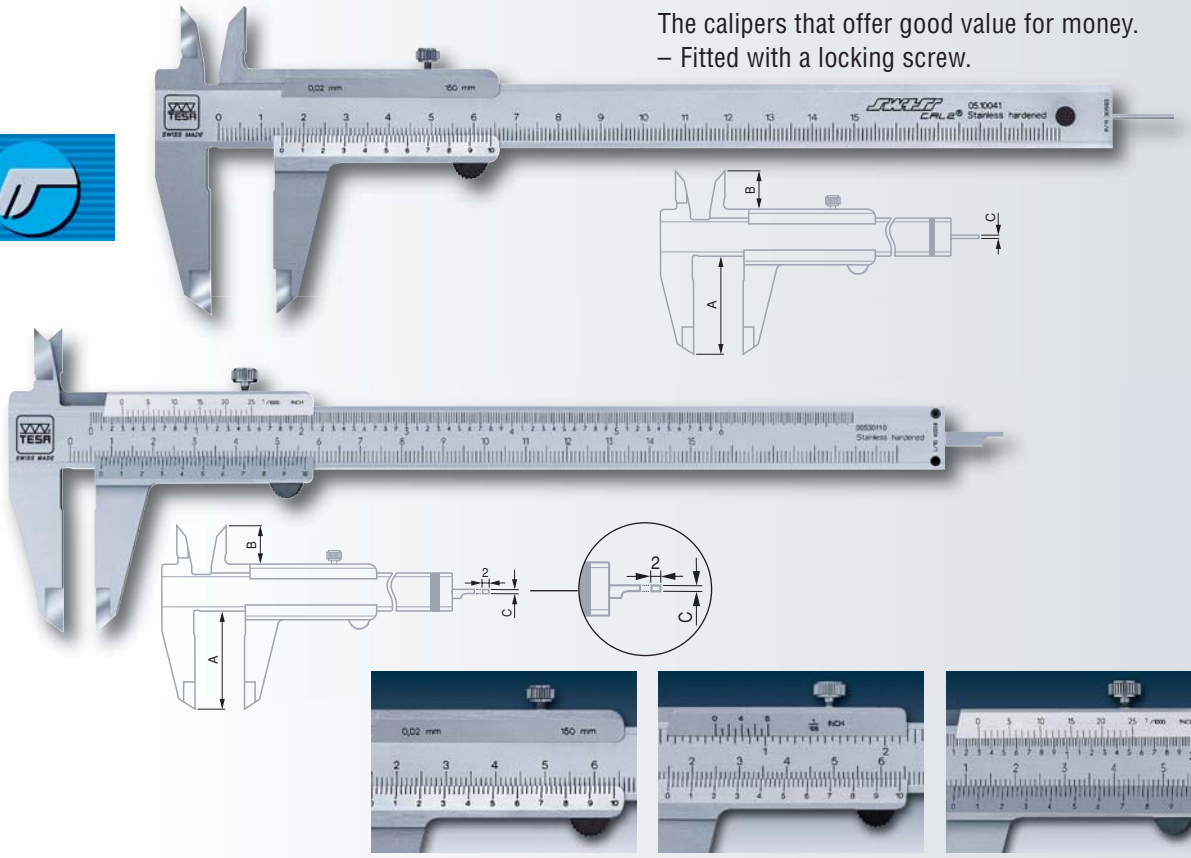
00510004	0 ÷ 150 mm	0,02 mm	2 mm
00520001	*0 ÷ 6 in*	*0.001 in*	*0.1 in*

Optional Accessory

00560013 Depth foot (also see page B-24)

TESA Calipers with Vernier Reading

The calipers that offer good value for money.
– Fitted with a locking screw.



NO		mm	mm	*in*	*in*	**A** mm	**B** mm	**C** mm
00510041	SWISSCAL 2	0 ÷ 150	0,02	–	–	40	15,5	Ø1,5
00510047	Standard model	0 ÷ 150	0,05	–	–	40	15,5	Ø1,5
00530103	Standard model	0 ÷ 150	0,05	*0 ÷ 6*	*1/128*	40	15,5	Ø1,5
00530104	Standard model	0 ÷ 200	0,05	*0 ÷ 8*	*1/128*	50	18	1,5 x 2
00530105	Standard model	0 ÷ 300	0,05	*0 ÷ 12*	*1/128*	64	22	–
00530110	Standard model	0 ÷ 150	0,02	*0 ÷ 6*	*0.001*	40	15,5	Ø1,5
00530111	Standard model	0 ÷ 200	0,02	*0 ÷ 8*	*0.001*	50	18	1,5 x 2
00530112	Standard model	0 ÷ 300	0,02	*0 ÷ 12*	*0.001*	64	22	–
00530120	Self-locking model	0 ÷ 150	0,05	*0 ÷ 6*	*1/128*	40	15,5	1,5 x 2
00530121	Self-locking model	0 ÷ 150	0,02	*0 ÷ 6*	*0.001*	40	15,5	1,5 x 2
00530130	Self-locking model with parallax-free readout	0 ÷ 150	0,05	*0 ÷ 6*	*1/128*	40	15,5	1,5 x 2
00530131	Self-locking model with parallax-free readout	0 ÷ 150	0,02	*0 ÷ 6*	*0.001*	40	15,5	1,5 x 2

Optional Accessories

00560013	Depth measuring foot (also see page B-24)
0051610365	Magnetic magnifying glass, 3x magnification

✓
DIN 862 (Style 1AN-2) NF E 11-091
Satin-chrome scale background; main scale slightly set back for wear protection
See page B-2
Hardened stainless steel
Suited plastic case
Identification number
Inspection report with a declaration of conformity

Magnetic Magnifying Glass



Can be mounted on calipers and the like for easier vernier reading.

NO		
0051610365		3x magnification

✓
Plastic pocket bag
2 permanent magnets

✓

DIN 862 and factory standard

See table

0,01 mm 0.0005 in

LCD, 8,5 mm

Floating zero

Display lock

mm / in conversion

Scale with incremental divisions, magnetic

> 1,5 m / s

RS232 opto-coupled, mono- and bi-directional

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, CR 2032

≈ 1,5 a (≈ 3300 h / a)

5°C to 40°C

–10°C to 60°C

IP40 (IEC 60529)

EN 50081-1
EN 50082-1

Shipping packaging

Identification number

Inspection report for models up to 1500 mm

Declaration of conformity

INTERAPID Light

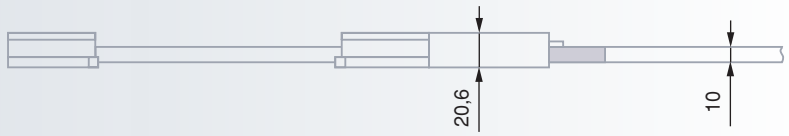
Measuring functions

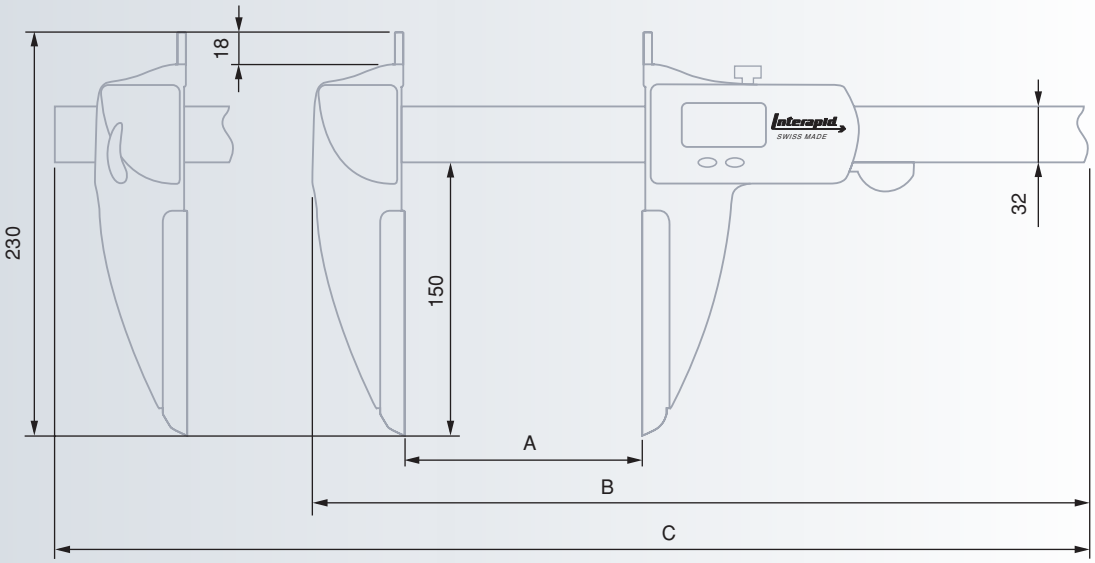
- Zero setting
- Metric/Inch conversion
- Hold function for displayed value
- OPTO-RS data transfer, mono- and bi-directional
- Two adjustable points of origin (Ref I / Ref II)
- PRESET function
- MIN/MAX mode
- Two limit values for the classification



№		µm	µm	**A** mm	**B** fixed	**C** movable	kg
00590061	INTERAPID Light 300	30	20	330	618	–	1,1
00590062	INTERAPID Light 600	40	20	630	918	–	1,3
00590063	INTERAPID Light 1000	60	20	1025	–	1306	1,6
00590064	INTERAPID Light 1500	150	20	1525	–	1806	2
00590065	INTERAPID Light 2000	250	30	2040	–	2306	2,3
00590066	INTERAPID Light 2500	350	30	2545	–	2806	2,6
00590067	INTERAPID Light 3000	450	40	3050	–	3306	3

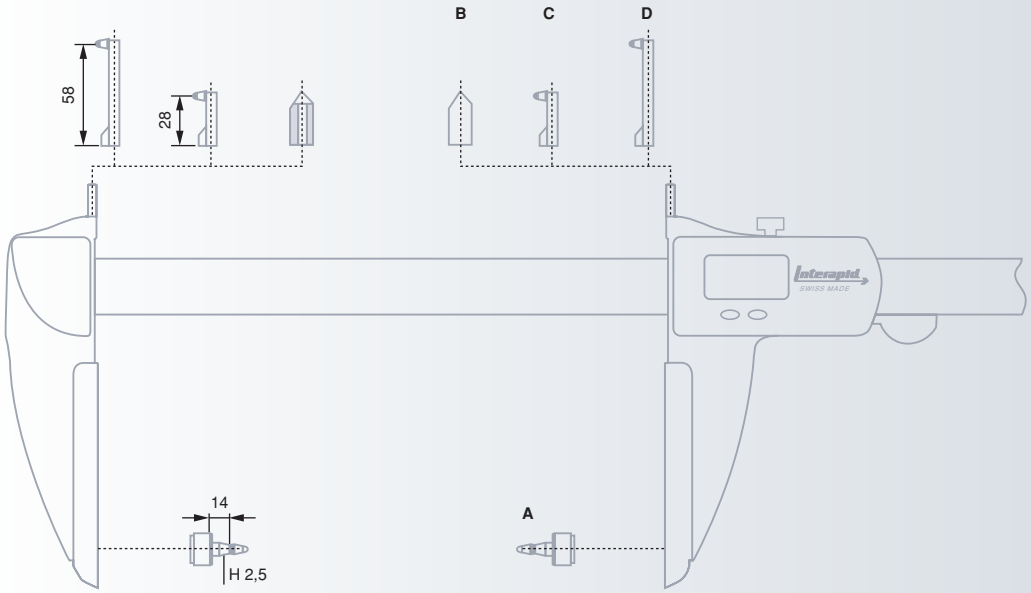
Models 300 and 600 mm with a fixed jaw (left), any other model with a movable one.





Standard Accessories

00560095	**A**	Insert-holder with a M2,5 thread
00560096	**B**	60° conical steel pin, hardened steel for measuring centre distances >10 mm
00560097	**C**	Holder for dial gauge inserts used for groove measurement, L = 28 mm
00560098	**D**	Holder for dial gauge inserts used for groove measurement, 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
01961000		3V lithium battery, 190 mAh, type CR 2032
		For connecting cables, see section A



✓

DIN 862
(Style E-ZS/B-ZS)

See table

0,01 mm
0.0005 in

LCD, 7 mm

Floating zero

Display
lock

mm / in
conversion

See page B-2

Steel scale with
incremental
divisions, magnetic

> 1,8 m / s

RS232
opto-coupled,
mono- and
bi-directional

Hardened
stainless steel

3V lithium
battery, CR 2032

≈ 1,5 a
(≈ 2000 h / a)

Idle mode
after 10 min.,
automatic switch
off after 2 h.

10°C to 40°C

-10°C to 60°C

100%

IP67
(IEC 60529)

EN 50081-1
EN 50082-1

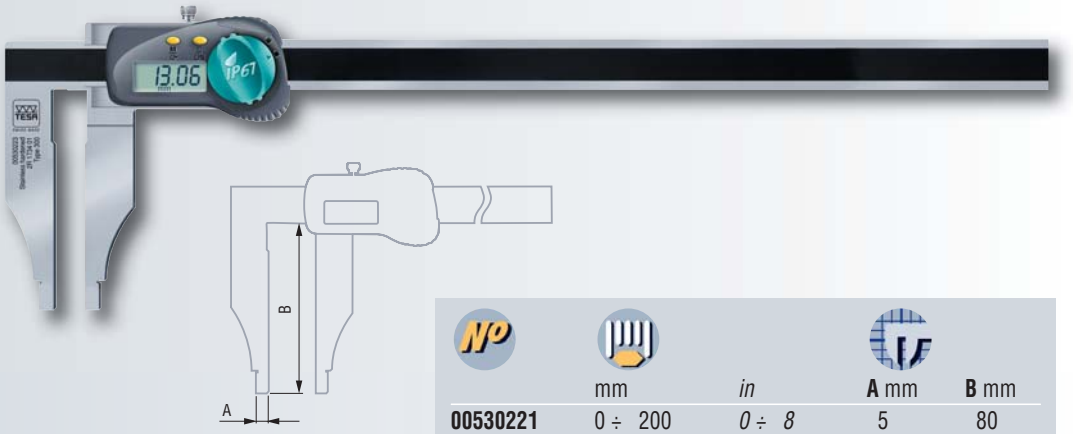
Wooden or
plastic case
depending on
the model

Identification
number

Inspection
report with a
declaration of
conformity

TESA IP67

Models with rounded measuring faces for internal dimensions

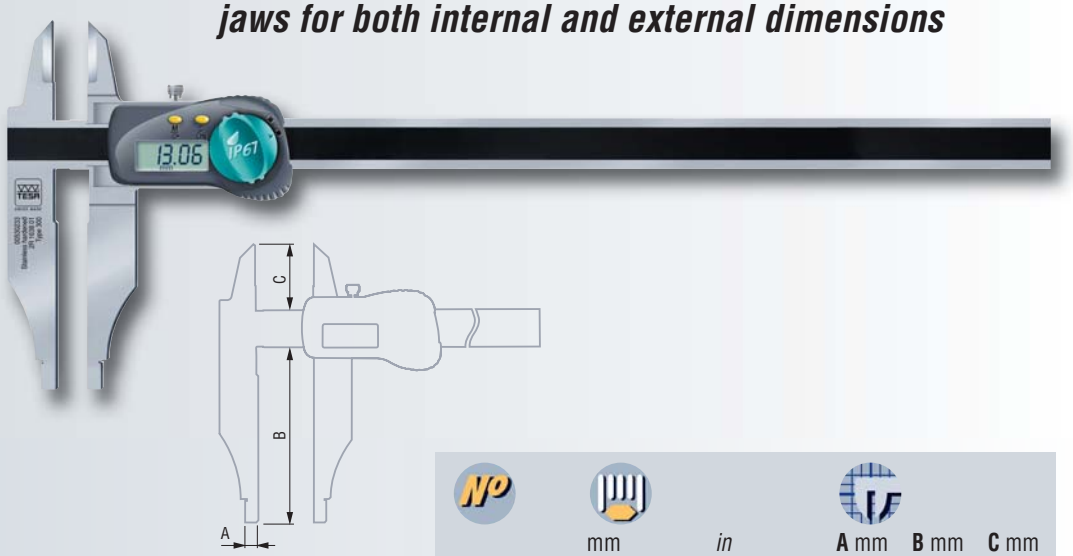


No	mm	in	A mm	B mm
00530221	0 ÷ 200	0 ÷ 8	5	80
00530222	0 ÷ 250	0 ÷ 10	5	80
00530223	0 ÷ 300	0 ÷ 12	5	90
00530224	0 ÷ 500	0 ÷ 20	10	150
00530225	0 ÷ 600	0 ÷ 24	10	150
00530226	0 ÷ 800	0 ÷ 32	10	150
00530227	0 ÷ 1000	0 ÷ 39	10	150

Optional Accessory

01961000	3V lithium battery, 190 mAh, type CR 2032
	For connecting cables, see section A

Models with rounded measuring faces and knife-edge jaws for both internal and external dimensions



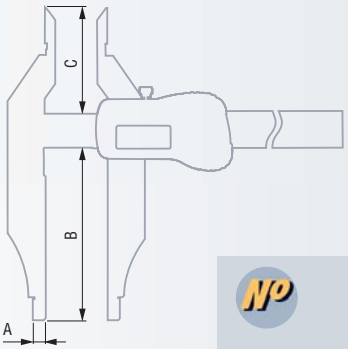
No	mm	in	A mm	B mm	C mm
00530231	0 ÷ 200	0 ÷ 8	5	80	30
00530232	0 ÷ 250	0 ÷ 10	5	80	37
00530233	0 ÷ 300	0 ÷ 12	5	90	37
00530234	0 ÷ 500	0 ÷ 20	10	150	60
00530235	0 ÷ 600	0 ÷ 24	10	150	60
00530236	0 ÷ 800	0 ÷ 32	10	150	56
00530237	0 ÷ 1000	0 ÷ 39	10	150	56

Optional Accessory

01961000	3V lithium battery, 190 mAh, type CR 2032
	For connecting cables, see section A

Model with rounded measuring faces and knife-edge jaws for internal dimensions





	mm	*in*	**A** mm	**B** mm	**C** mm
00530230	0 ÷ 250	*0 ÷ 10*	5	80	54

Optional Accessory

01961000	3V lithium battery, 190 mAh, type CR 2032
	For connecting cables, see section A

- ✓
- DIN 862 (Style D-ZS)
- 0,01 mm 0.0005 in
- LCD, 7 mm
- Floating zero
- Display lock
- mm / in conversion
- See page B-2
- Steel scale with incremental divisions, magnetic
- > 1,8 m / s
- RS232 opto-coupled, mono- and bi-directional
- Hardened stainless steel
- 3V lithium battery, CR 2032
- ≈ 1,5 a (≈ 2000 h / a)
- Idle mode after 10 min., automatic switch off after 2 h.
- 10°C to 40°C
- -10°C to 60°C
- 100%
- IP67 (IEC 60529)
- EN 50081-1 EN 50082-1
- Wooden case or plastic case depending on the model
- Identification number
- Inspection report with a declaration of conformity

✓

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

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

See page B-2

Hardened stainless steel

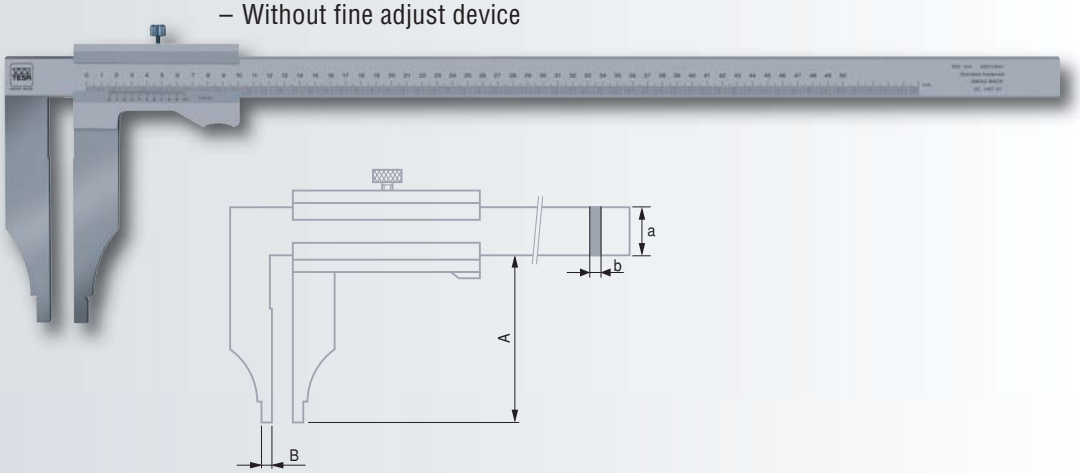
Wooden case or plastic case depending on the model

Identification number

Inspection report with a declaration of conformity

Models with rounded measuring faces for internal dimensions

– Without fine adjust device



	mm	mm	*in*	*in*	mm **a**	**b**	**A**	**B**
00510509*	0 ÷ 200	0,02	–	–	17	3,5	80	5
00530509	0 ÷ 200	0,02	*0 ÷ 8*	*0.001*	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	0,02	*0 ÷ 12*	*0.001*	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	0,02	*0 ÷ 15*	*0.001*	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

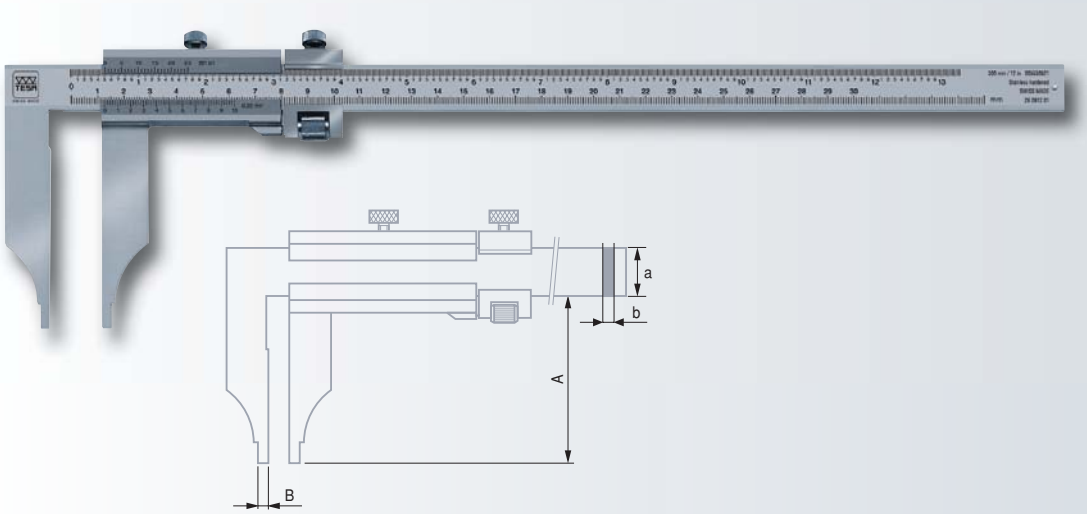
Optional Accessory

0051610365 Magnetic magnifying glass, 3x magnification

* Provided with a stainless steel rule No. 0951750181, 200 mm long.

Models with rounded measuring faces for internal dimensions

– With fine adjust device



✓

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

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

See page B-2

Hardened stainless steel

Wooden case or plastic case depending on the model

Identification number

Inspection report with a declaration of conformity

					mm			
	mm	mm	*in*	*in*	**a**	**b**	**A**	**B**
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

✓

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

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

See page B-2

Hardened stainless steel

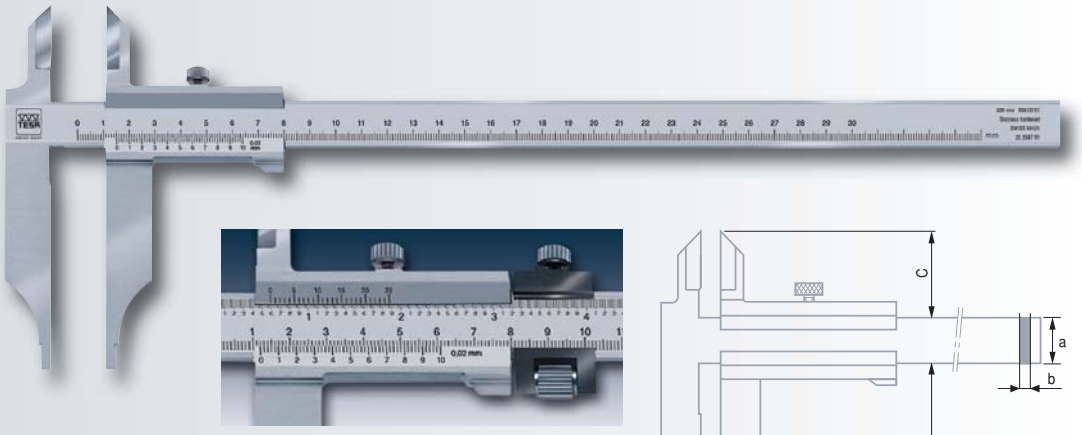
Wooden case or plastic case depending on the model

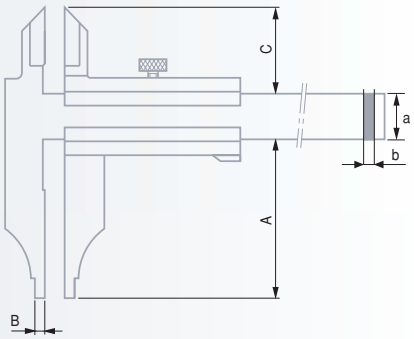
Identification number

Inspection report with a declaration of conformity

Models with knife-edge jaws and rounded measuring faces for both external and internal dimensions

– With or without fine adjust device

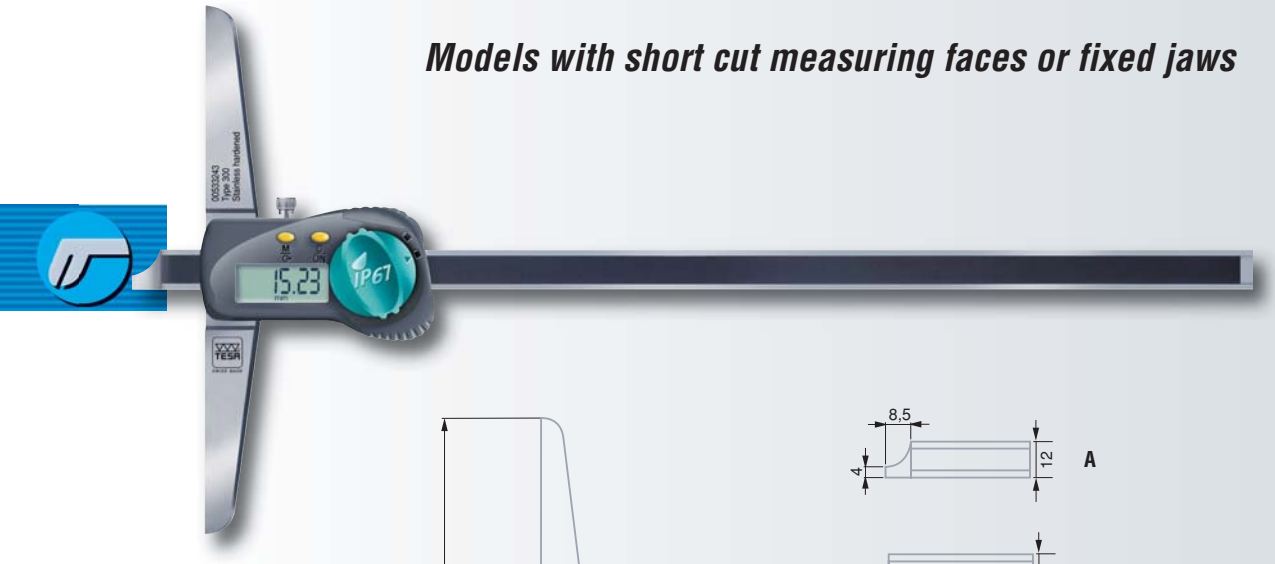


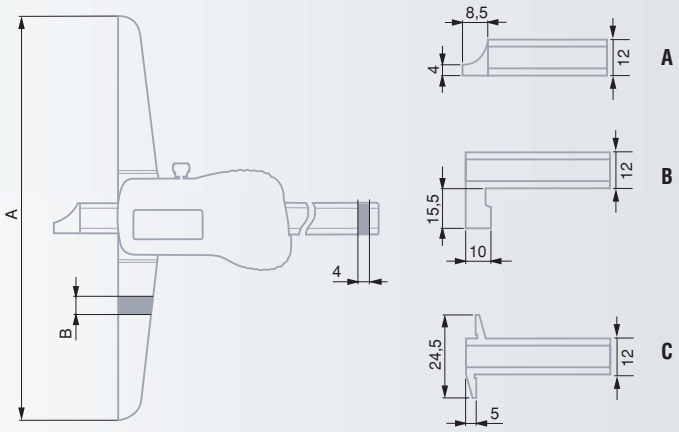


№	mm	mm	in	in	a	b	A	B	C
					mm				
Without fine adjust device									
00510701	0 ÷ 200	0,02	–	–	17	3,5	80	5	30
00530701	0 ÷ 200	0,02	*0 ÷ 8*	*0.001*	17	3,5	80	5	30
00510711	0 ÷ 250	0,02	–	–	20	4	80	5	38
00510721	0 ÷ 300	0,02	–	–	20	4	90	5	38
00530721	0 ÷ 300	0,02	*0 ÷ 12*	*0.001*	20	4	90	5	38
00510722	0 ÷ 300	0,05	–	–	20	4	90	5	38
00510741	0 ÷ 500	0,02	–	–	28	6	150	10	60
00530741	0 ÷ 500	0,02	*0 ÷ 20*	*0.001*	28	6	150	10	60
00510751	0 ÷ 600	0,02	–	–	28	6	150	10	60
With fine adjust device									
00510801	0 ÷ 200	0,02	–	–	17	3,5	80	5	30
00510821	0 ÷ 300	0,02	–	–	20	4	90	5	38
00530821	0 ÷ 300	0,02	*0 ÷ 11*	*0.001*	20	4	90	5	38
00510822	0 ÷ 300	0,05	–	–	20	4	90	5	38
00510841	0 ÷ 500	0,02	–	–	28	6	150	10	60
00530841	0 ÷ 500	0,02	*0 ÷ 20*	*0.001*	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								

TESA IP67

Models with short cut measuring faces or fixed jaws



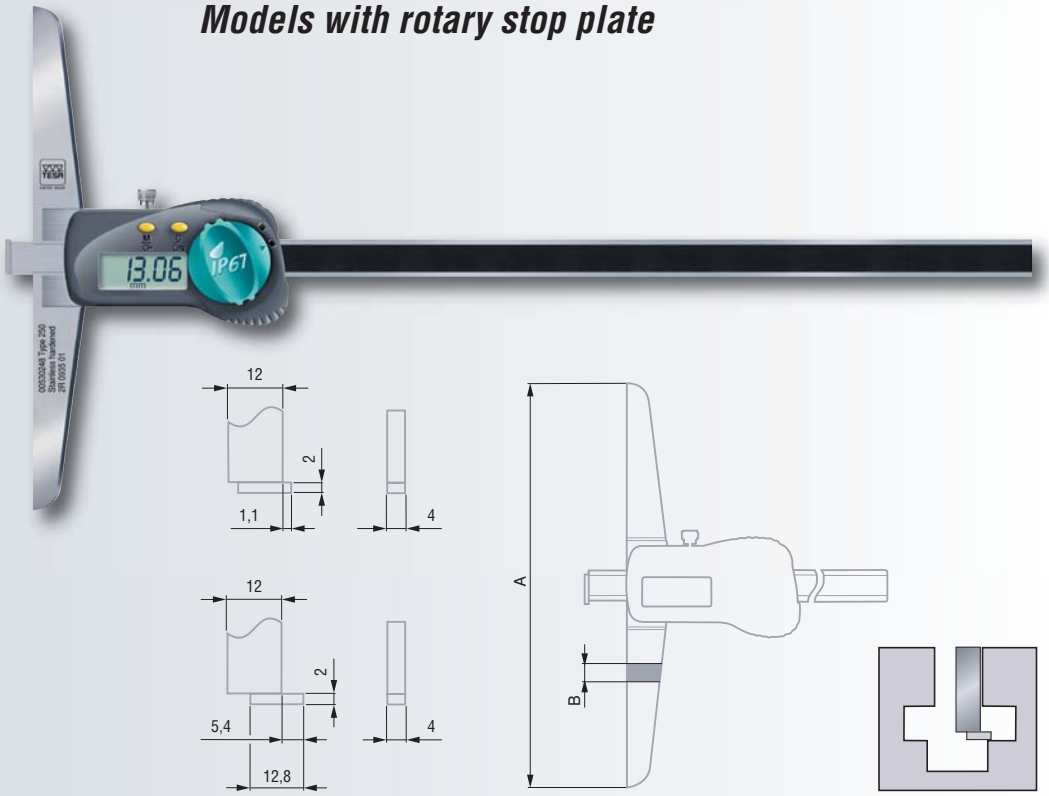


№	mm	in	A mm	B mm
Models A *with a short cut measuring face*				
00530241	0 ÷ 200	*0 ÷ 8*	100	8
00530242	0 ÷ 250	*0 ÷ 10*	100	8
00530243	0 ÷ 300	*0 ÷ 12*	150	8
00530244	0 ÷ 500	*0 ÷ 20*	150	8
Models B *with one fixed jaw*				
00530245	0 ÷ 300	*0 ÷ 12*	150	8
00530246	0 ÷ 500	*0 ÷ 20*	150	8
Models C *with two fixed jaws*				
00530247	0 ÷ 300	*0 ÷ 12*	150	8
Optional Accessories				
	200, 300 or 400 mm removable bridge (see page B-19)			
01961000	3V lithium battery, 190 mAh, type CR 2032			
	For connecting cables, see section A			

- ✓
- DIN 862 (Style C-ZS)
- See table
- 0,01 mm 0.0005 in
- LCD, 7 mm
- Floating zero
- Display lock
- mm / in conversion
- See page B-2
- Glass scale with incremental divisions,magnetic
- > 1,8 m / s
- RS232 opto-coupled, mono- and bi-directional
- Hardened stainless steel
- 3V lithium battery, CR 2032
- ≈ 1,5 a (≈ 2000 h / a)
- Idle mode after 10 min., automatic switch off after 2 h.
- 10°C to 40°C
- -10°C to 60°C
- 100%
- IP67 (IEC 60529)
- EN 50081-1 EN 50082-1
- Wooden case or plastic case depending on the model
- Identification number
- Inspection report with a declaration of conformity

✓
DIN 862 (Style C-ZS)
See table
0,01 mm 0.0005 in
LCD, 7 mm
Floating zero
Display lock
mm / in conversion
See page B-2
Steel scale with incremental divisions, magnetic
> 1,8 m / s
RS232 opto-coupled, mono- and bi-directional
Hardened stainless steel
3V lithium battery, CR 2032
≈ 1,5 a (≈ 2000 h / a)
Idle mode after 10 min, automatic switch off after 2 h.
10°C to 40°C
-10°C to 60°C
100%
IP67 (IEC 60529)
EN 50081-1 EN 50082-1
Wooden case or plastic case depending on the model
Identification number
Inspection report with a declaration of conformity

Models with rotary stop plate



	mm	*in*	**A** mm	**B** mm
00530248	0 ÷ 250	*0 ÷ 10*	150	8,5
00530249	0 ÷ 350	*0 ÷ 14*	150	8,5
00530250	0 ÷ 500	*0 ÷ 20*	150	8,5

Optional Accessories

	200, 300 or 400 mm removable bridge (also see page B-19)
01961000	3V lithium battery, 190 mAh, type CR 2032
	For connecting cables, see section A

Small-sized caliper with measuring tip

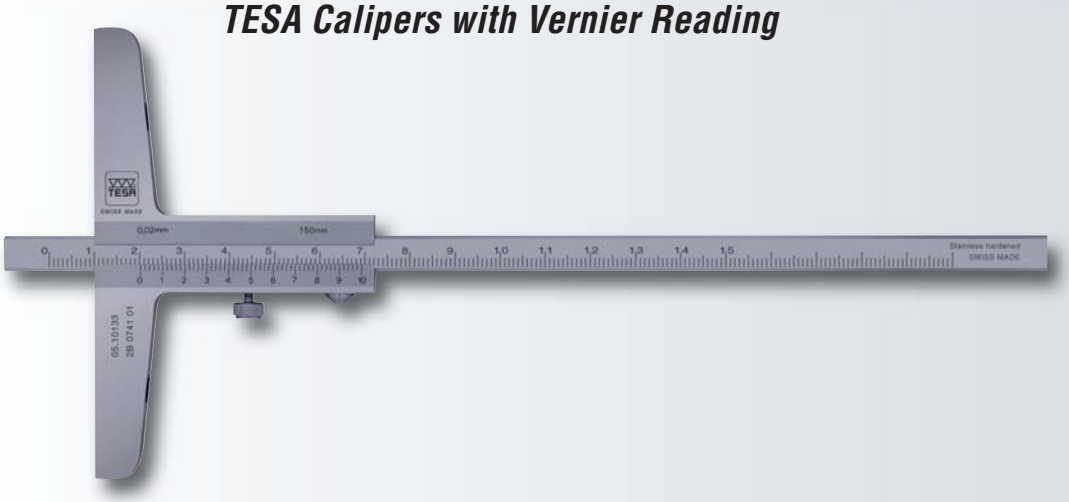


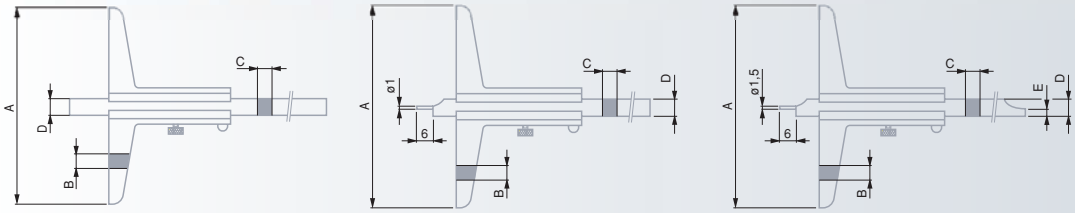
	mm	*in*
00530251	0 ÷ 25	*0 ÷ 1*

Optional Accessory

01961000	3V lithium battery, 190 mAh, type CR 2032
	For connecting cables, see section A

TESA Calipers with Vernier Reading





A B C

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

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

See page B-2

Hardened stainless steel

Plastic case

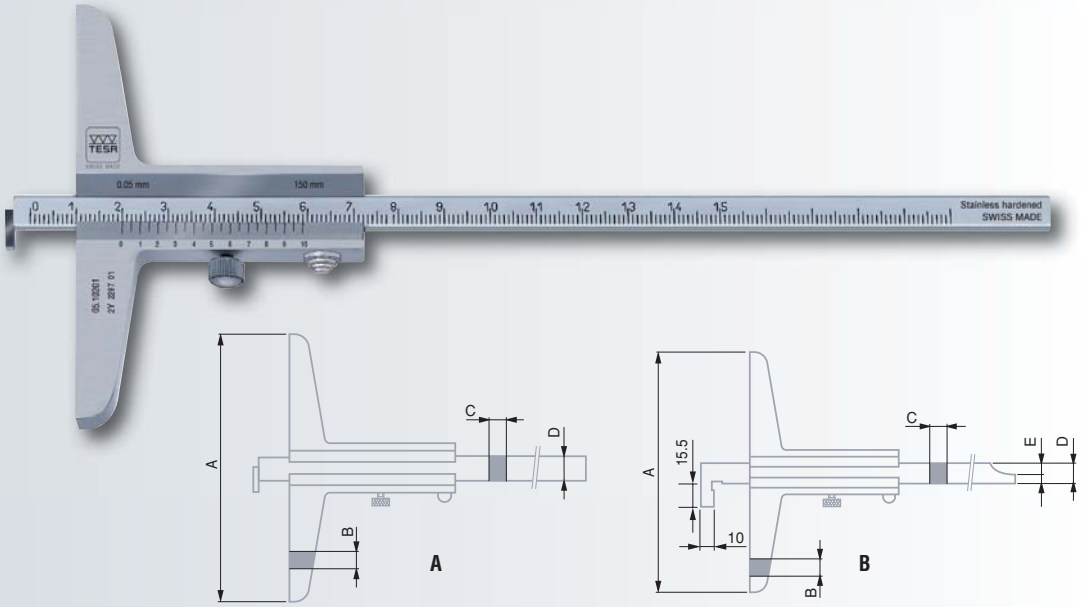
Identification number

Inspection report with a declaration of conformity

	mm	mm	mm A	B	C	D	E
Models A *with a flat measuring face*							
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	–
00510144	0 ÷ 250	0,05	100	7,5	3	8	–
00510163	0 ÷ 500	0,02	100	8,5	4	12	–
00510164	0 ÷ 500	0,05	100	8,5	4	12	–
00510173	0 ÷ 600	0,02	150	8,5	4	12	–
Model B *with a steel tip*							
00510111*	0 ÷ 80	0,02	50	7,5	3	8	–
Models C *with both a short cut measuring face and steel tip. Convertible models*							
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
00510126	0 ÷ 250	0,05	100	7,5	3	8	4
Optional Accessories							
0051610365	Magnetic magnifying glass, 3x magnification						
	200, 300 or 400 mm removable bridge (see page B-19)						

* The removable bridges available as an option is not convenient for this model.

✓
DIN 862 (Style C-2) NF E 11-096
Satin-chrome scale background; main scale slightly set back for wear protection
See page B-2
Hardened stainless steel
Plastic case
Identification number
Inspection report with a declaration of conformity



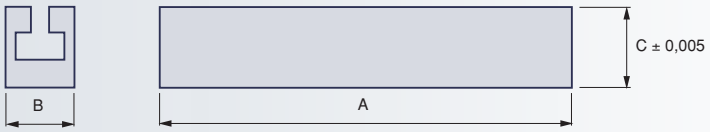
			mm				
	mm	mm	A	B	C	D	E
Models A *with rotary stop plate*							
00510202	0 ÷ 150	0,02	130	8,5	4	12	–
00510201	0 ÷ 150	0,05	130	8,5	4	12	–
00510212	0 ÷ 250	0,02	130	8,5	4	12	–
00510211	0 ÷ 250	0,05	130	8,5	4	12	–
00510222	0 ÷ 500	0,02	130	8,5	4	12	–
Models B *with both a fixed stop plate and short cut measuring face. Convertible models*							
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						
	200, 300 or 400 mm removable bridge (see the table below)						

Removable Bridge

✓
Factory standard
See table
Suited carrying case
Identification number
Inspection report with a declaration of conformity

		A mm	B mm	C mm	mm	mm	µm
00560103	Removable bridge	200	8	10	± 0,005	0,02	8
00560104	Removable bridge	300	8	16	± 0,005	0,02	10
00560105	Removable bridge	400	8	16	± 0,005	0,03	10

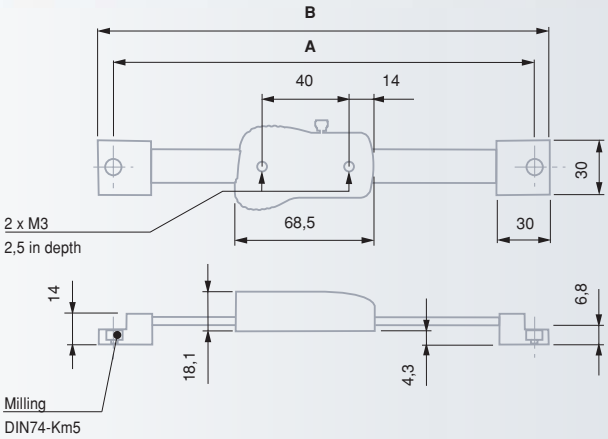
Each bridge comes with suited attachment.



Horizontal or Vertical Scale Unit

Lets you measure and position any assembly on fixtures, presetting devices for tooling or machines. Flexible mounting for use in any position.





№	mm	in	A mm	B mm
00530271	0 ÷ 150	*0 ÷ 6*	265	278
00530273	0 ÷ 300	*0 ÷ 12*	415	428
00530274	0 ÷ 600	*0 ÷ 24*	725	738
00530275	0 ÷ 1000	*0 ÷ 40*	1135	1148

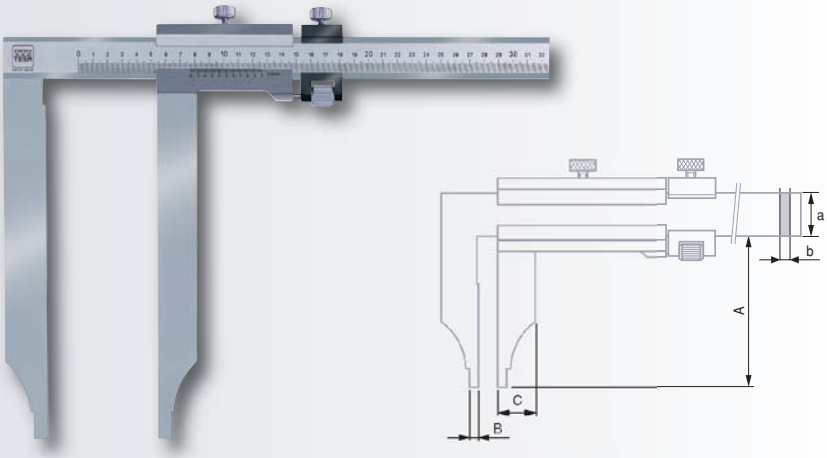
Optional Accessory

01961000	3V lithium battery, 190 mAh, type CR 2032
	For connecting cables, see section A

✓
Factory standard
See table
0,01 mm 0.0005 in
LCD, 7 mm
Floating zero
Display lock
mm / in conversion
See page B-2
Steel scale with incremental divisions, magnetic
> 1,8 m / s
RS232 opto-coupled, mono- and bi-directional
Hardened stainless steel
3V lithium battery, CR 2032
≈ 1,5 a (≈ 2000 h / a)
Idle mode after 10 min., automatic switch off after 2 h.
10°C to 40°C
-10°C to 60°C
100%
IP67 (IEC 60529)
EN 50081-1 EN 50082-1
Suited carrying case
Identification number
Inspection report with a declaration of conformity

TESA Calipers

– With extra long jaws and fine adjust device



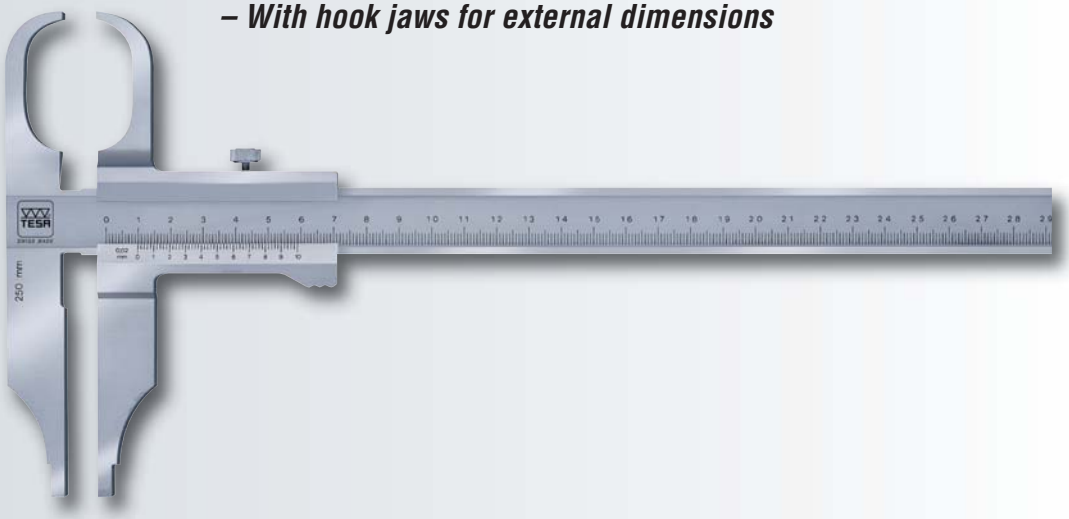
- ✓
- Factory standard
- Satin-chrome scale background; main scale slightly set back for wear protection.
- Hardened stainless steel
- Wooden case
- Identification number
- Inspection report with a declaration of conformity

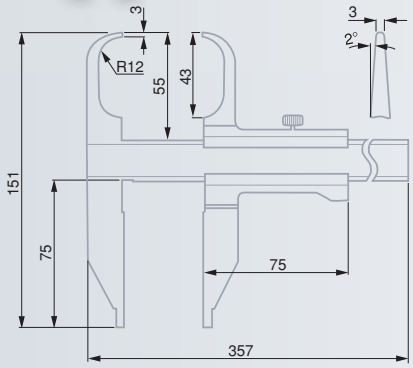
	mm	mm	a	b	A	B	C
00510921	0 ÷ 500	0,02	28	6	250	10	30
00510922	0 ÷ 500	0,05	28	6	250	10	30
00510941	0 ÷ 1000	0,02	32	8	300	10	30
00510942	0 ÷ 1000	0,05	32	8	300	10	30

Optional Accessory

0051610365 Magnetic magnifying glass, 3x magnification

– With hook jaws for external dimensions





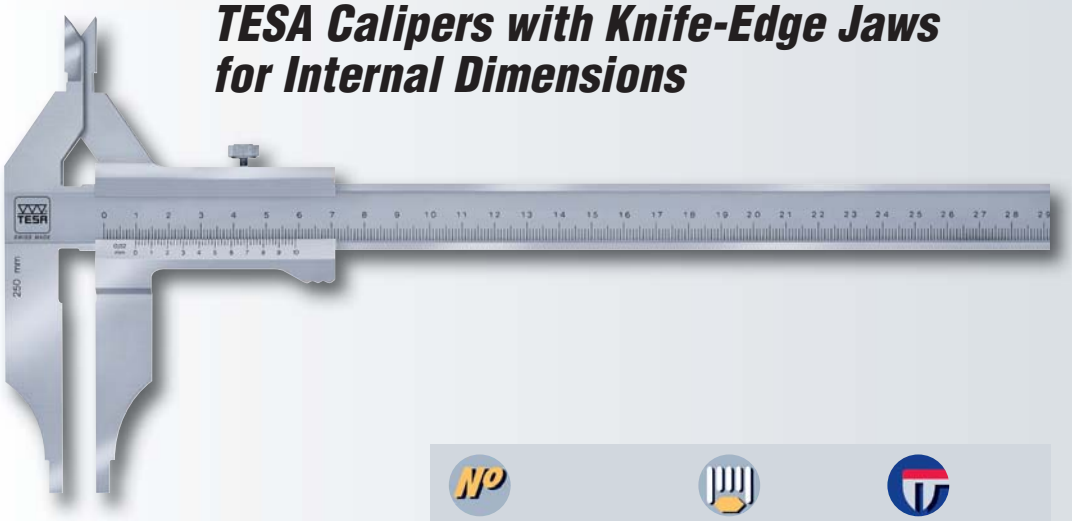
- ✓
- NF E 11-096
- Satin-chrome scale background; main scale slightly set back for wear protection.
- Hardened stainless steel
- Wooden case
- Identification number
- Declaration of conformity

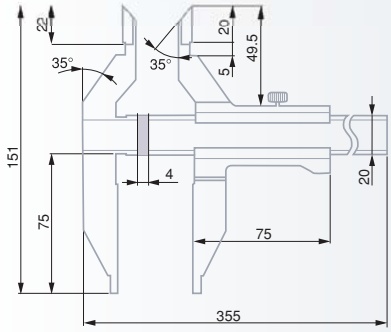
	mm	mm
00510911	0 ÷ 250	0,02

Optional Accessory

0051610365 Magnetic magnifying glass, 3x magnification

TESA Calipers with Knife-Edge Jaws for Internal Dimensions





	mm	mm
00510915	0 ÷ 250	0,02

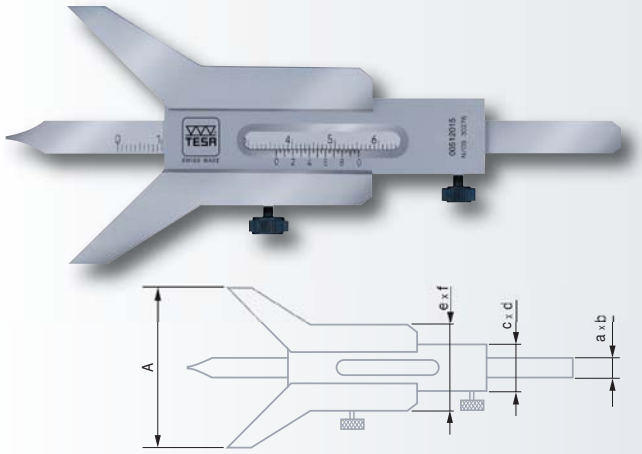
Optional Accessory

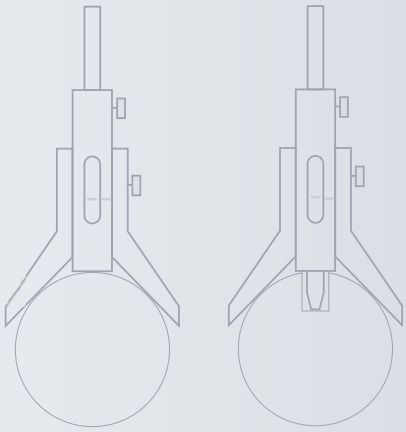
0051610365 Magnetic magnifying glass, 3x magnification

✓
DIN 862 (Style DN-2) NF E 11-091
Satin-chrome scale background; main scale slightly set back for wear protection.
Hardened stainless steel
Wooden case
Identification number
Inspection report with a declaration of conformity

TESA Calipers with Vee Bridge

Made to measure groove and slot depths on cylindrical shafts.





	mm	mm	a	b	c	d	e	f	A
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

Optional Accessory

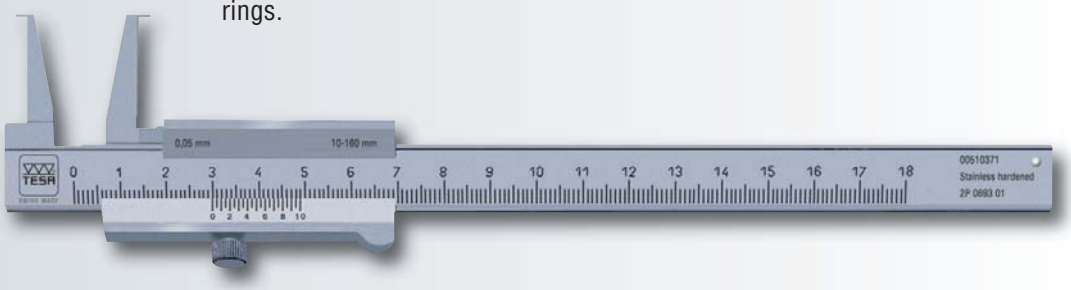
0051610365 Magnetic magnifying glass, 3x magnification

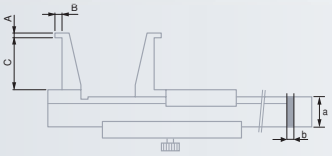
✓
NF E 11-096
Satin-chrome scale background; main scale slightly set back for wear protection.
Hardened stainless steel
Wooden case
Identification number
Inspection report with a declaration of conformity

✓
Factory standard
Satin-chrome scale background; main scale slightly set back for wear protection.
Hardened stainless steel
Wooden case
Identification number
Inspection report with a declaration of conformity

TESA Calipers for Turned Grooves

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





			mm				
	mm	mm	a	b	A	B	C
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
00510385	26 ÷ 200	0,05	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

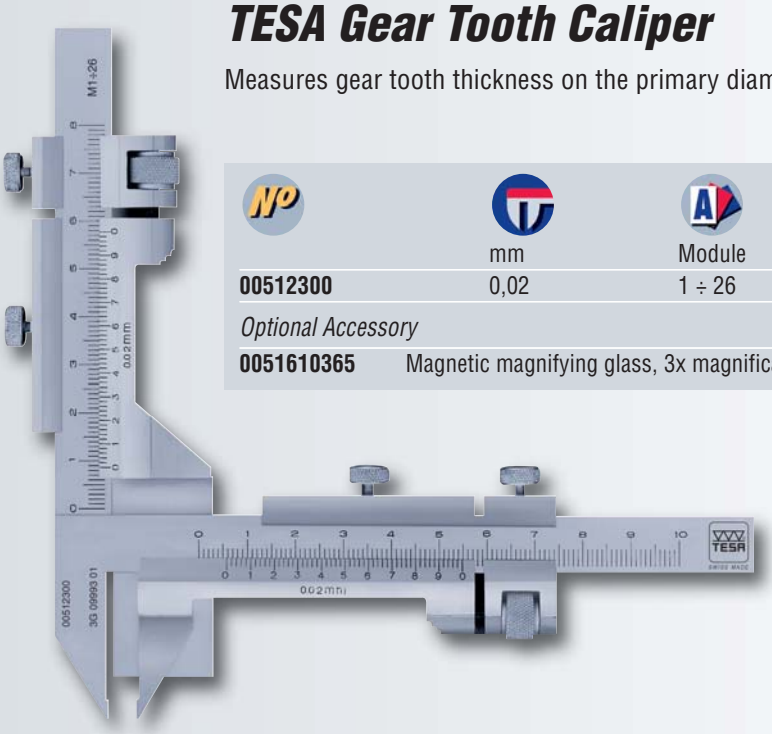
Optional Accessory

0051610365 Magnetic magnifying glass, 3x magnification

✓
Factory standard
Each slider with fine adjust device
Hardened stainless steel. Tungsten carbide coated measuring faces
Wooden case
Identification number
Declaration of conformity

TESA Gear Tooth Caliper

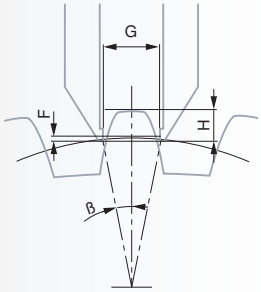
Measures gear tooth thickness on the primary diameter.



	mm	Module
00512300	0,02	1 ÷ 26

Optional Accessory

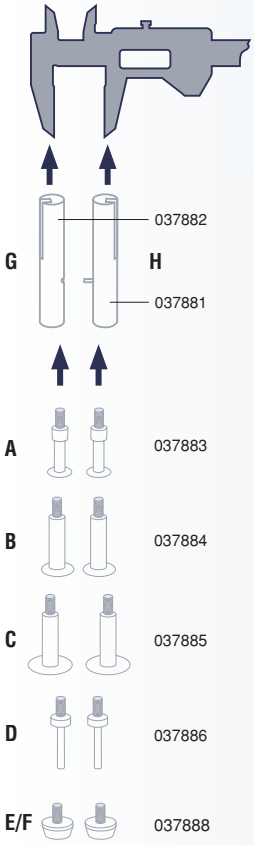
0051610365 Magnetic magnifying glass, 3x magnification



Brown & Sharpe Accessory Sets CENTERLINE

Each set includes practical accessories for measuring undercuts, grooves, slots, centre distances of bores, etc. – Fits all calipers with analogue or digital indication covering the measuring range 0 to 150 mm or 0 to 6 in.



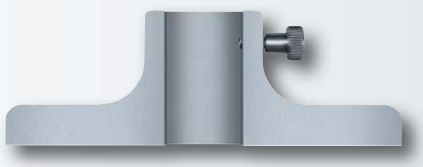


		mm	mm
CENTERLINE Accessory Sets			
06769001	Full accessory set provided in a custom wooden case		
06739000	Full accessory set provided in a fitted wooden case including one TESA Shop-Cal mit capa µ system (No. 00530090)		
06769008	Full accessory set in a fitted wooden case. Includes a free space arranging for a caliper covering the measuring range 0 to 150 mm / 0 to 6 in to be stored (must be ordered separately).		
Complete Sets Including:			
A	1 Pair of disc-shaped measuring inserts	6	0,8
B	1 Pair of disc-shaped measuring inserts	10	0,8
C	1 Pair of disc-shaped measuring insert	12,5	0,8
D	1 Pair of cylindrical measuring inserts	1,5	9,5
E	1 Pair of cone-shaped measuring inserts	9	60°
F	1 Pair of cone-shaped measuring inserts	12,5	60°
G	1 Insert-holder (left)		
H	1 Insert-holder (right)		
	1 Socket head key		1,2

✓
Steel with black oxide plating
Inserts with M2,5 threaded coupling.
Lowest centre distance of the mounted insert holder: 10 mm.

Depth Measuring Foot

For use with TESA or ETALON universal calipers with measuring ranges from 0 to 150 mm/0 to 6 in as listed on pages B-3 to B-8.



	mm
00560013	75 x 6

✓
Factory standard
Hardened stainless steel
Ground measuring face



External Measurement

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 calliper 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 by 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 called to the Palmer's invention, which greatly interested them. After some improvements of the Palmer design, the product was manufactured on a large scale and marketed successfully by the two partners.

The story repeated in the past as TESA SA decided to manufacture external micrometers making them the first products produced by the company.

Yet no matter what you measure – internal or external dimensions – all TESA and ETALON micrometers are world-class products in design and quality.

With a very few exceptions (e.g. external micrometers for gear tooth measurements), our micrometers respect the Abbe principle, i.e. the comparator's one (also read in the General Information). Their spindle are ground on modern grinding machines and the profile of the screw is accurately restored with negligible pitch deviations. Such manufacturing conditions are the guarantee for very low measurement uncertainties.

The micrometers of both TESA and ETALON premium brands are robust with ergonomic design.

Besides external micrometers in standard or special versions, we also offer micrometer heads, depth micrometers, full micrometer sets as well as a wide number of accessories plus all what you need for your calibrations. Each model provides either an analogue or a digital indication according to the execution. The models with electrical measuring system also include an RS 232 digital interface.

Max. permissible errors

Measuring range/mm	Max. perm. 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

* The max. perm. errors include the errors of the measuring element as well as any deviations in flatness and parallelism of the measuring faces plus the errors due to the flexure of the frame.

✓
DIN 863 T1
0,001 mm
0.00005 in
Metric/Inch conversion
Tungsten carbide tipped
≤100 mm: Ø 6,5 mm
> 100 mm: Ø 8 mm
0,5 mm
Max. 10 N
LCD, digit height: 7 mm
Floating zero
Display lock (except for model EASY)
RS 232 interface, opto-coupled
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.
10°C to 40°C
–10°C to 60°C
80%, non-condensing
✓
Protection as per IEC 60529): IP40 (also valid with used RS data output) or IP54
Plastic case
Identification number
Measuring range 0 to 100: with SCS calibration certificate
Measuring range over 100 mm: inspection report along with a declaration of conformity



TESA MICROMASTER
Electronic Micrometers with Digital Display

With patented TESA capa µ system

- Measuring span of 30 mm or 25 mm.
- Large easy-to-read digital display.
- Models: – EASY with a single function key.
  – IP54 with water spray protection as well as IP54 RS with added RS 232 interface.





No	mm	mm	in	in		
MICROMASTER EASY						
06030010	0 ÷ 30	0 ÷ 30	0 ÷ 1.2	0 ÷ 1.2	IP40	–
MICROMASTER IP54						
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	–
MICROMASTER IP54 RS						
06030030	0 ÷ 30	0 ÷ 30	0 ÷ 1.2	0 ÷ 1.2	IP54	RS 232
06030031	25 ÷ 50	23 ÷ 53	1 ÷ 2	0.9 ÷ 2.1	IP54	RS 232
06030032	50 ÷ 75	48 ÷ 78	2 ÷ 3	1.9 ÷ 3.1	IP54	RS 232
06030033	75 ÷ 100	74 ÷ 104	3 ÷ 4	2.9 ÷ 4.1	IP54	RS 232
06030071	100 ÷ 125	98 ÷ 127	4 ÷ 5	3.9 ÷ 5.01	IP54	RS 232
06030072	125 ÷ 150	123 ÷ 152	5 ÷ 6	4.9 ÷ 6.01	IP54	RS 232
06030073	150 ÷ 175	149 ÷ 178	6 ÷ 7	5.9 ÷ 7.01	IP54	RS 232
06030074	175 ÷ 200	174 ÷ 203	7 ÷ 8	6.9 ÷ 8.01	IP54	RS 232
06030075	200 ÷ 225	199 ÷ 229	8 ÷ 9	7.9 ÷ 9.01	IP54	RS 232
06030076	225 ÷ 250	224 ÷ 254	9 ÷ 10	8.9 ÷ 10.01	IP54	RS 232
06030077	250 ÷ 275	250 ÷ 279	10 ÷ 11	9.9 ÷ 11.01	IP54	RS 232
06030078	275 ÷ 300	275 ÷ 304	11 ÷ 12	10.9 ÷ 12.01	IP54	RS 232

MICROMASTER Set

No		
06030029	Micromaster Set IP54 RS	0 ÷ 75

Consisting of:

No		mm		
06030030	Micromaster IP54, RS	0 ÷ 30	IP54	RS232
06030031	Micromaster IP54, RS	25 ÷ 50	IP54	RS232
06030032	Micromaster IP54, RS	50 ÷ 75	IP54	RS232
02119021	Setting standard, 50 mm			

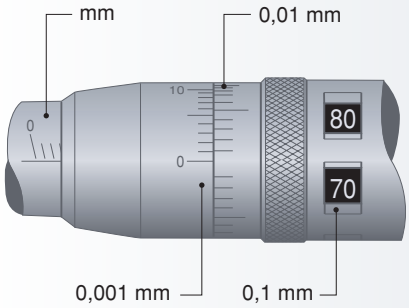
Optional Accessory

01961000	1 Lithium battery 3 V, 190 mAh, type CR 2032 – Connecting cables etc., see chapter A.

TESAMASTER Precision Micrometers with Digital Counter to 0,1 mm

Analogue indication of the full millimetres, hundredths and fractions of hundredth – Accurate, fast reading of the tenths of millimetres – Parallax-free reading of the thousandths of millimetres on vernier.





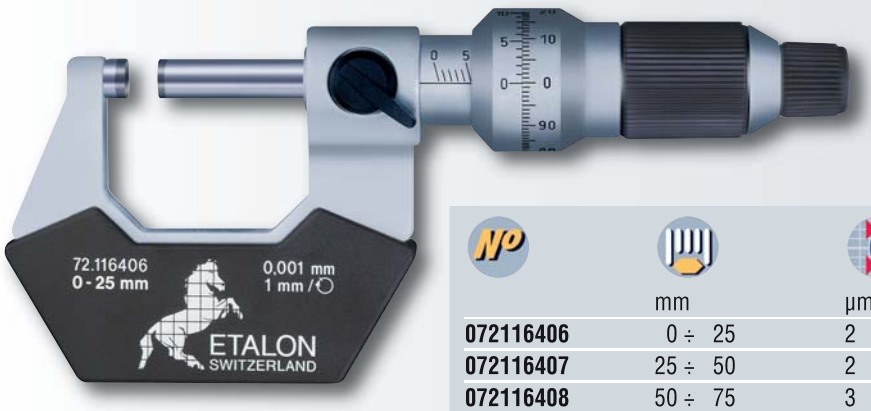
No	mm	µm	µm
00310001	0 ÷ 25	2	1
00310002	25 ÷ 50	2	1,5
00310003	50 ÷ 75	3	1,5
00310004	75 ÷ 100	3	1,5
00310005	100 ÷ 125	4	2
00310006	125 ÷ 150	4	2,5
00310007	150 ÷ 175	5	3
00310008	175 ÷ 200	5	3
00310009	200 ÷ 225	6	3,5
00310010	225 ÷ 250	6	3,5

No	*in*	µm	µm
00320001	*0 ÷ 1*	2	1

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

ETALON MICRORAPID 226 with 1 mm Revolution

High precision micrometers – Fast, accurate reading – No reading error of the half millimetres – Barrel with pitch to 1 mm – Thimble with 100 graduations – Vernier reading to 0,001 mm.



No	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
Parallax-free vernier reading to 0,001mm
Tungsten carbide tipped
Ø 6,5 mm
1 mm
Max. 10 N
Plastic case
Identification number
Inspection report with a declaration of conformity

ETALON 260
Standard Models with Analogue Indication

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



- ✓
- DIN 863 T1 NF E 11-095
- 0 to 100 mm resp. 0 to 4 in with vernier
- Tungsten carbide tipped
- ≤ 100 mm: Ø 6,5 mm, > 100 ≤ 200 mm: Ø 8 mm
- 0,5 mm
- Max. 10 N
- Plastic case
- Identification number
- Measuring range 0 to 100 mm with inspection report and declaration of conformity
- Measuring range smaller than 100 mm with a declaration of conformity

No	mm	mm	µm	µm
071115887	0 ÷ 25	0,002	2	2
071115888	25 ÷ 50	0,002	2	2
071115889	50 ÷ 75	0,002	3	3
071115890	75 ÷ 100	0,002	3	3
071115891	100 ÷ 125	0,01	4	3
071115892	125 ÷ 150	0,01	4	3
071115893	150 ÷ 175	0,01	5	4
071115894	175 ÷ 200	0,01	5	4

No	*in*	*in*	µm	µm
071115899	*0 ÷ 1*	*0.0001*	2	2
071115900	*1 ÷ 2*	*0.0001*	2	2
071115901	*2 ÷ 3*	*0.0001*	3	3
071115902	*3 ÷ 4*	*0.0001*	3	3

ETALON Basic to 0,01 mm



- ✓
- DIN 863 T1 NF E 11-095
- 0,01 mm
- Tungsten carbide tipped
- Ø 6,5 mm
- 0,5 mm
- Max. 10 N
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

No	mm
00119046	0 ÷ 25
00119047	25 ÷ 50
00119048	50 ÷ 75
00119049	75 ÷ 100

Set of 4 ETALON Basic to 0,01 mm

No	mm
00119050	0 ÷ 100

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 be reversed to render the friction drive built into the thimble inactive.



	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
	in	*in*
00120101	*0 ÷ 1*	*0.0001*

✓
DIN 863 T1
NF E 11-095
Tungsten carbide tipped
≤ 100 mm: Ø 6,5 mm
> 100 ≤ 300 mm: Ø 8 mm
0,5 mm
Max. 10 N
Plastic case
Identification number
Measuring range 0 to 100 mm with inspection report and declaration of conformity
Measuring range smaller than 100 mm with a declaration of conformity

Set of 4 TESA ISOMASTER

Same execution as above.

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



	mm
00110113	0 ÷ 100

✓
Plastic case

✓

DIN 863 T3 (Style D16)

0,001 mm 0.00005 in

Metric/Inch conversion

30 mm measuring span

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

Tungsten carbide tipped

Ø 8 mm

0,5 mm

Max. 10 N

LCD, digit height: 7 mm

RS 232

Additional technical data: see page C-3

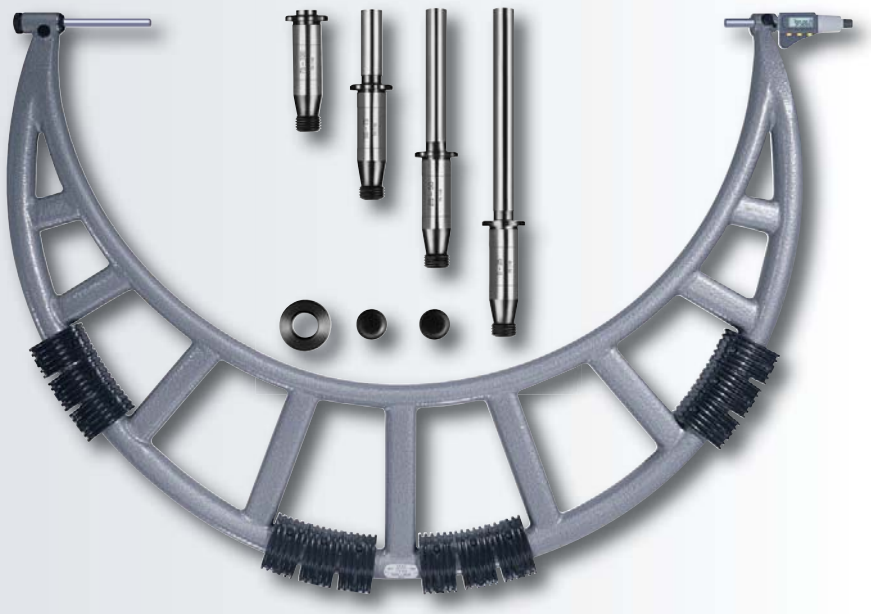
Wooden case

Identification number

Inspection report with a declaration of conformity

MICROMASTER with interchangeable Anvils

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



№	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
06030052	500 ÷ 600	*19.69 ÷ 23.62*	11	9
06030053	600 ÷ 700	*23.62 ÷ 27.56*	12	10
06030054	700 ÷ 800	*27.56 ÷ 31.50*	13	12
06030055	800 ÷ 900	*31.50 ÷ 35.43*	14	12
06030056	900 ÷ 1000	*35.43 ÷ 39.37*	15	16

Measuring range up to 1500 mm also available upon request.

Dial Gauge Element for MICROMASTER

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

Supplied as standard accessory with the ABY series micrometers.

№
00140301

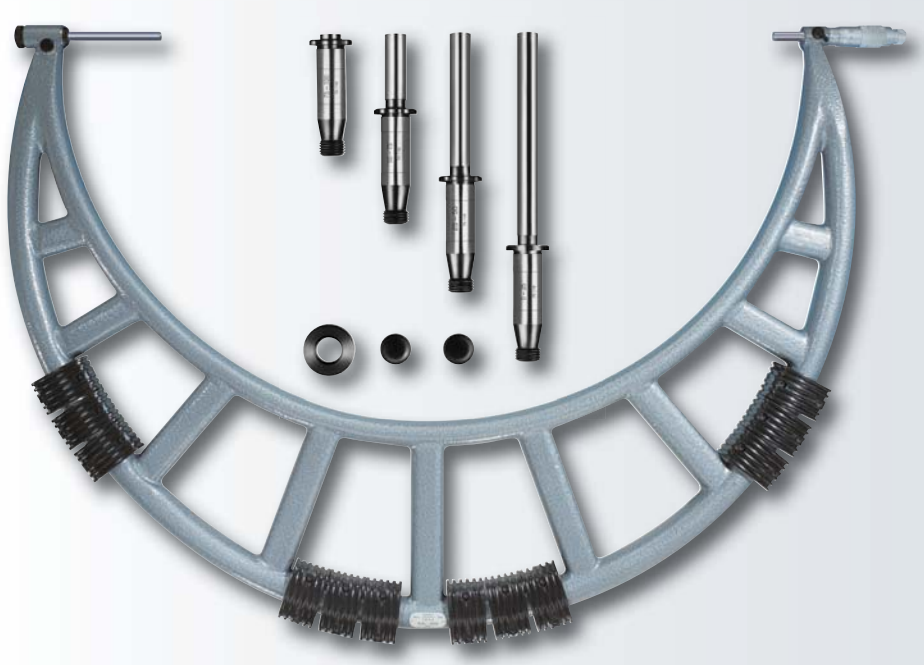


✓

See next page

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
00111906	500 ÷ 600	11	9
00111907	600 ÷ 700	12	10
00111908	700 ÷ 800	13	12
00111909	800 ÷ 900	14	12
00111910	900 ÷ 1000	15	16

Measuring range up to 1500 mm also available upon request.

- ✓
- DIN 863 T3 (Style D16) NF E 11-090
- 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
- Tungsten carbide tipped
- 8 mm dia.
- 0,5 mm
- Max. 10 N
- Wooden case
- Identification number
- Declaration of conformity

Dial Gauge Element for AB Series Micrometers

Can replace the interchangeable anvils on these micrometers. Make finding the culmination point easier. Ensures a constant measuring force.

Supplied as standard accessory with the ABY series micrometers.

No
00140301



- ✓
- ± 1,5 mm
- 0,01 mm
- Tungsten carbide tipped
- 8 mm dia.
- Max. 10 N
- Meas. element: 11 mm dia., 100 mm long. Dial gauge No. 01410211: 40 mm dial diameter, two-way dial reading.
- Identification number
- With dial gauge and clamp
- Declaration of conformity

✓

DIN 863 T3 (Style D15) NF E 11-090

0,01 mm

0 ≤ 500 mm: malleable cast iron; > 500 ≤ 800 mm: steel tube with insulating grips. Max. flexure of the frame under a measuring force of 10 N: see the table opposite

Tungsten carbide tipped

8 mm dia.

0,5 mm

Max. 10 N

Dial gauge: see on page C-8

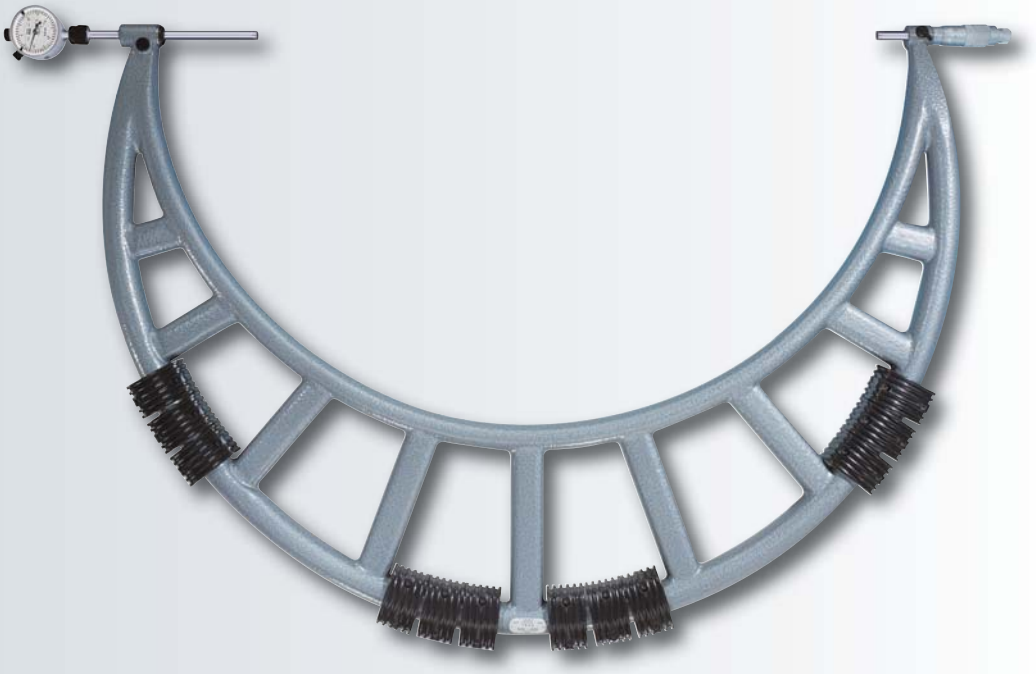
Wooden case

Identification number

Declaration of conformity

Series ABY ISOMASTER with Adjustable Dial Gauge Element

Similar to the AB series micrometers, but equipped with the adjustable dial gauge element No. 00140301 that helps you to find the culmination point easier with a constant measuring force.



№			
	mm	µm	µm
00112001	0 ÷ 100	6	3
00112002	100 ÷ 200	7	4,5
00112003	200 ÷ 300	8	7
00112004	300 ÷ 400	9	9
00112005	400 ÷ 500	10	9
00112006	500 ÷ 600	11	9
00112007	600 ÷ 700	12	10
00112008	700 ÷ 800	13	12

Measuring range up to 1500 mm also available upon request.

✓

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

Tungsten carbide tipped

8 mm dia.

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

Identification number

Interchangeable Anvils for ABY Series ISOMASTER

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.

№
00140101

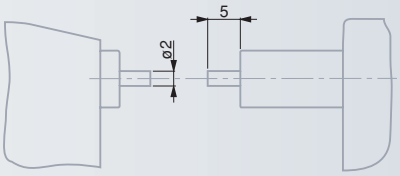


MICRO-ETALON 225
Micrometers with a Dial Indicator

Feature a mobile anvil along with a built-in dial indicator – Ideal for comparative measurements on small part series – 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.







Dial indicators to 0,001 mm	mm
072108669	0 ÷ 25
072108691	25 ÷ 50
Model with small measuring faces	
072108722	0 ÷ 20

✓

DIN 863 T3 (Style D13)

Tungsten carbide tipped

6,5 mm dia. Model with small measuring faces: 2 mm dia., 5 mm long.

0,5 mm

Anvil: 4,5 to 5,5 N

Micrometer with vernier reading to 0,002 mm. Dial indicator: 0,001 mm.

Dial indicator: ± 0,025 mm

Micrometer: max. perm. error of 2 µm. Dial indicator: 1 µm.

Dial indicator: repeatability limit of 0,5 µm.

Plastic case

Declaration of conformity

Protective Cover

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.

072110978



✓

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

Vernier reading to 0,002 mm

Tungsten carbide tipped

6,5 mm dia. Models with small measuring faces: 2 mm dia., 5 mm long.

0,5 mm

Anvil: 2 up to 8 N, adjustable

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

Mobile anvil: repeatability limit of 0,5 µm.

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

Plastic case

Declaration of conformity

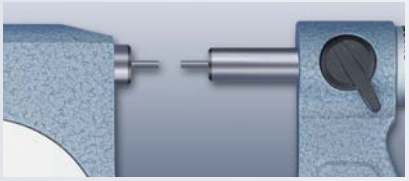
ETALON MICROSPEL 280

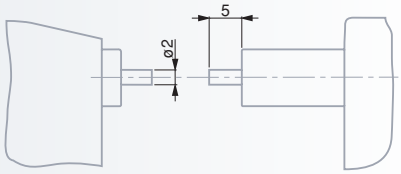
These micrometers have a mobile anvil along with a 8 mm diameter clamping bore for mounting a sensor with linear action such as the TESA GT 21/22 electronic probe (also refer to section O).

Specially designed for batch inspection of small precision parts.









NP	mm
072110816	0 ÷ 25
Model with small measuring faces	
072110853	0 ÷ 20

Important

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

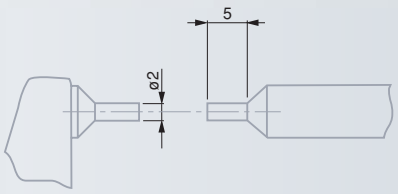
Micrometers with Small Measuring Faces

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

Models MICROMASTER



No	mm	in
06030034	0 ÷ 30	*0 ÷ 1.2*
06030035	30 ÷ 60	*1.2 ÷ 2.3*
06030036	60 ÷ 90	*2.3 ÷ 3.5*
06030037	90 ÷ 120	*3.5 ÷ 4.7*
Optional Accessory		
01961000	1 Lithium battery 3 V, 190 mAh, type CR 2032. For information on cables etc., see section A.	

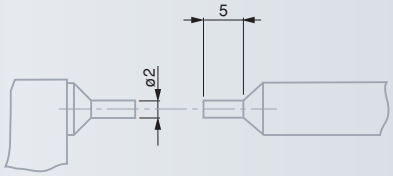


✓
DIN 863 T3 (Style D3)
0,001 mm 0.00005 in
Metric/Inch conversion
Fixed measuring faces: tungsten carbide.
Max. 10 N
RS 232 interface, opto-coupled.
Degree of protection (IEC 60529): IP54 or IP40 with use of the digital output
For additional technical data: see page C-3.
Plastic case
Identification number
Measuring range 0 to 100: with a SCS calibration certificate.
Measuring range > 100 mm: inspection report with a declaration of conformity.

Models ISOMASTER AD



No	mm
00210101	0 ÷ 25
00210102	25 ÷ 50

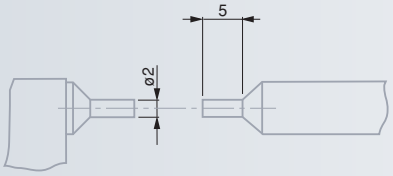


✓
DIN 863 T3 (Style D3) NF E 11-090
0,01 mm
Fixed measuring faces: tungsten carbide.
Max. 10 N
Plastic case
Identification number
Inspection report with a declaration of conformity

Model TESAMASTER AD

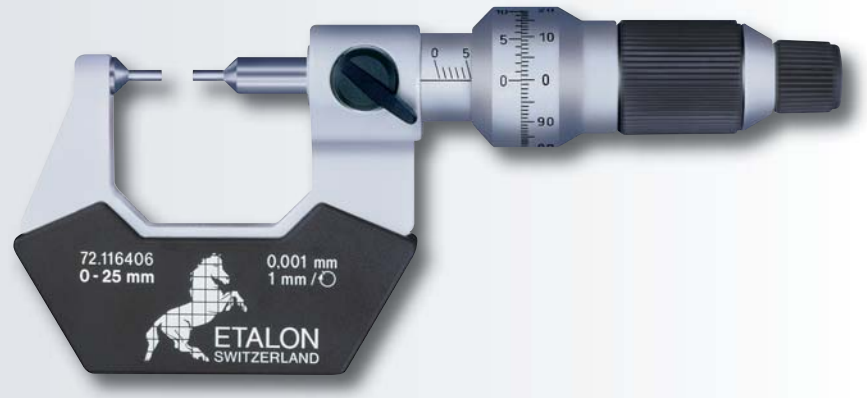


- ✓
- DIN 863 T3 (Style D3) NF E 11-090
- Vernier reading to 0,001 mm
- Scale division 0,1 mm
- Fixed measuring faces: tungsten carbide
- Max. 10 N
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

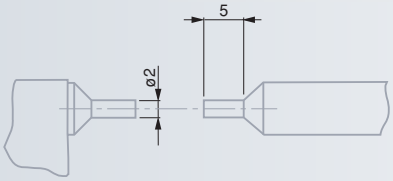


№	mm
00311301	0 ÷ 25

Model MICRORAPID



- ✓
- DIN 863 T3 (Style D3) NF E 11-090
- 0,001 mm. Parallax-free reading on vernier
- 100 divisions
- Fixed measuring faces: tungsten carbide.
- 1 mm
- Max. 10 N
- Plastic case
- Identification number
- Inspection report with a declaration of conformity



№	mm
072116410	0 ÷ 20

Micrometers with One Spherical Measuring Face

Measure wall thickness of tubing.

Models MICROMASTER



No	mm	in
06030079	0 ÷ 30	*0 ÷ 1.2*
06030080	25 ÷ 50	*1 ÷ 2*

Model ETALON



No	mm
071115940	0 ÷ 25

✓
- DIN 863 T3 (Style D1)
- MICROMASTER: 0,001 mm or 0.00005 in
- ETALON: 0,002 mm
- Anvil: tungsten carbide (MICROMASTER) or titanium carbide hard-coating (ETALON). Tungsten carbide spindle.
- Anvil with a 3,5 mm spherical face (MICROMASTER) or a 3,25 mm one (ETALON). Spindle with a flat measuring face.
- Max. 10 N
- RS 232 on MICROMASTER
- Other technical data on MICROMASTER: see page C-3.
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

Micrometers with Two Spherical Measuring Faces

Rounded Measuring faces on anvil and spindle for measuring concave surfaces of workpieces, e.g. ball-bearing guides or walls of tubing.

Models MICROMASTER



No	mm	in
06030081	0 ÷ 25	*0 ÷ 1*
06030082	20 ÷ 50	*0.8 ÷ 1.9*
06030083	45 ÷ 75	*1.8 ÷ 2.9*
06030084	70 ÷ 100	*2.8 ÷ 3.9*

✓
- DIN 863 T3 (Style D1)
- 0,001 mm 0.00005 in
- Tungsten carbide
- Spherical, 3,5 mm radius.
- Max. 10 N
- Additional technical data: see page C-3.
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

Series AAS ISOMASTER

Rounded measuring faces for checking concave surfaces such as ball-bearing guides and tubing walls.

- ✓
- DIN 863 T3 (Style D1) NF E 11-090
- 0,01 mm
- Measuring faces rounded to 3,25 mm
- Titanium carbide coated for model No. 00112106. Hardened steel for other models.
- 0,5 mm
- Max. 10 N
- Plastic case
- Identification number
- Inspection report with a declaration of conformity



N°	mm
00112106	0 ÷ 25 (TiC)
00110901	0 ÷ 25
00110902	25 ÷ 50
00110903	50 ÷ 75
00110904	75 ÷ 100

Spherical Element for External Micrometers

Holder with a ball tip that fits on measuring faces having a 6,5 mm diameter – Serve to measure tubing wall thickness or workpieces with concave surfaces and the like.

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



N°	Ball tip
072103522	5 mm

Micrometers for Soft Materials

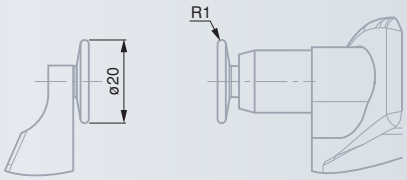
With two large, round-edge measuring faces – Measure the thickness of materials such as paper and plastic sheets, felt, cloth and other soft materials.

Model MICROMASTER

Non-rotating measuring spindle – Without spindle lock.



No	mm	in
06030085	0 ÷ 30	*0 ÷ 1.2*



- ✓
- DIN 863 T3 (Style D6)
- 0,001 mm 0.00005 in
- Metric/Inch conversion
- Hardened steel
- Non-rotating, 20 mm dia.
- Flatness tolerance: 3 µm
- Tolerance in Parallelism: 6 µm
- Max. perm. error: 4 µm
- Max. 10 N
- RS 232
- Additional technical data: see page C-3.
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

Model ISOMASTER AF



No	mm
00210301	0 ÷ 25

- ✓
- DIN 863 T3 (Style D6)
- 0,01 mm
- Hardened steel
- Ø 15 mm
- Flatness tolerance: 3 µm
- Tolerance in Parallelism: 6 µm
- Max. 10 N
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

Micrometers for Gear Pitch Measurement

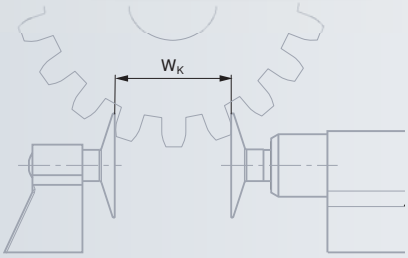
Flanges with ring-shaped measuring faces for root tangent lengths Wk on gear pitches, distance between grooves and slots as well as other hard-to-reach locations.

✓
DIN 863 T3 (Style D7)
0,001 mm 0.00005 in
Metric/Inch conversion
Hardened steel
Non-rotating spindle ≤85 mm: 25 mm dia. > 85 ≤ 115 mm: 30 mm dia.
Suitable from module 0,5
Max. 10 N
RS 232
Additional technical data: see page C-3.
Plastic case
Identification number
Inspection report with a declaration of conformity

Models MICROMASTER

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

Models ISOMASTER AE



✓
DIN 863 T3 (Style D7) NF E 11-090
0,01 mm
Hardened steel
≤ 100 mm: 25 mm dia. > 100 ≤ 150 mm: 32 mm dia.
Suitable from module 0,6
Max. 10 N
Plastic case
Identification number
Inspection report with a declaration of conformity

No	mm
00210201	0 ÷ 25
00210202	25 ÷ 50
00210203	50 ÷ 75
00210204	75 ÷ 100
00210205	100 ÷ 125
00210206	125 ÷ 150

Micrometers for Gear Tooth Measurement

	Max. perm. error* with partial contact of the measuring face µm	Max. perm. error with full contact of the measuring face (DIN 863-T1) µm	Flatness µm	Parallelism µm	Max. flexure of the frame 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

* Disregarding a rim of 1 mm as the measuring faces are being inspected.
For enhanced accuracy, the micrometer should be calibrated in the position of use.

MICROMASTER with 7 Pairs of Interchangeable Measuring Inserts

Non-rotating spindle – Without spindle lock.



No	mm	in
06030045	0 ÷ 30	*0 ÷ 1.2*

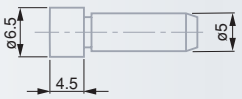
- ✓
- 0,001 mm 0.00005 in
- Metric/Inch conversion
- Micrometer element with a max. perm. error of 4 µm
- 7,5 mm dia., non-rotating spindle. With a fixing bore for a measuring insert. Adjustable attachment on anvil for a measuring insert, with lock.
- Hardened steel
- Max. 10 N
- RS 232
- Additional technical data on page C-3
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

Components of a Full Micrometer

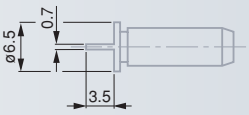
No	mm	in
Single Micrometer		
06030099	0 ÷ 30	*0 ÷ 1.2*
Full set of measuring inserts		
00269027		
Includes one pair of the following inserts		

No		mm
00269020	flat	Ø 6,5
00269021	small, flat	Ø 2
00269022	spherical	R = 5
00269023	large, flat	Ø 12
00269024	narrow, flat	0,7
00269025	cone-shaped	Ø 0,3/60°
00269026	knife-edged	0,3/60°

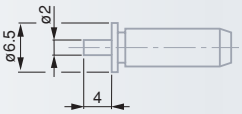
Specially designed measuring faces also available upon request.



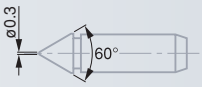
00269020



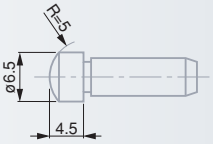
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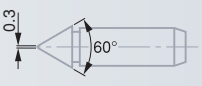
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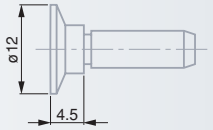
00269025



00269022



00269026



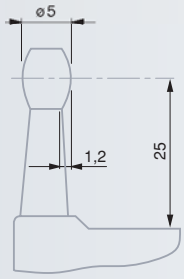
00269023

ETALON Basic for Tube Wall Thickness Measurement

Barrel-shaped anvil for measuring the tube wall thickness and other curved workpieces.

- ✓
- DIN 863 T3 (Style D12) NF E 11-090
- 0,01 mm
- Hardened steel anvil. Tungsten carbide spindle
- 5 mm dia. on anvil. 6,5 mm dia. on spindle
- 0,5 mm
- Max. 10 N
- Plastic case
- Identification number
- Inspection report with a declaration of conformity





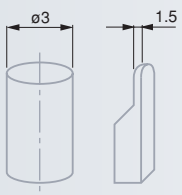
№	mm
00219066	0 ÷ 25

ETALON Basic with Two Interchangeable Anvils

Universal micrometer for assembly – Anvils have either a flat or a cylindrical measuring face.

- ✓
- Vernier reading to 0,002 mm
- Hardened steel anvils. Tungsten carbide spindle.
- Anvils: see drawing. Spindle: 6,5 mm dia.
- 0,5 mm
- Max. 10 N
- Plastic case
- Identification number
- Inspection report with a declaration of conformity





№	mm
00219067	0 ÷ 25

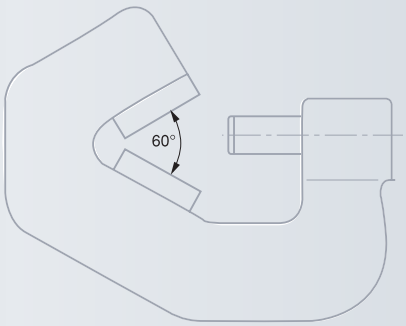
Micrometers with Prismatic Measuring Faces

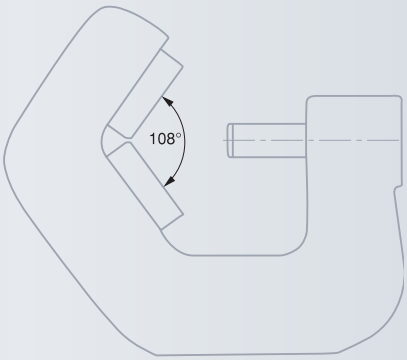
Measure test pieces with uneven number of grooves such as milling cutters, taps, drills and spline shafts as well as odd polygons. Determine roundness errors on cylindrical surfaces. Angle of the prism aperture is designed for workpieces having a number of 3 or 5 flutes.

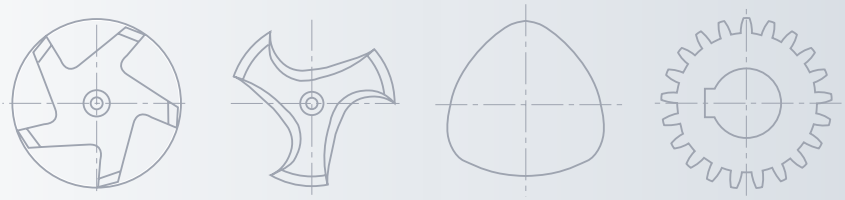
Models MICROMASTER



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







- ✓
- DIN 863 T3 (Style D 10)
- 0,001 mm 0.00005 in
- Metric/Inch conversion
- Tungsten carbide tipped
- Angle of the prism aperture: 60° for 3-flute test pieces or 108° for 5-flute test pieces.
- 0,75 mm for 3-flute test pieces or 0,559 mm for 5-flute test pieces.
- Max. 10 N
- RS 232
- Additional technical data on page C-3
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

Models ISOMASTER AS

✓

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

0,01 mm

Tungsten carbide tipped

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

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

Max. 10 N

Plastic case

Identification number

Declaration of conformity





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

Cylindrical Setting Standards

✓

Hardened steel

Fitted with plastic guard plates from nominal dimension of 20 mm.
Actual size engraved on the top face

Identification number

Declaration of conformity



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

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 – Spindle has a fixing bore for a cone-shaped measuring insert.

Models MICROMASTER AC



No	mm	in
06030062	0 ÷ 25	*0 ÷ 1*
06030063	25 ÷ 50	*1 ÷ 2*
06030064	50 ÷ 75	*2 ÷ 3*
06030065	75 ÷ 100	*3 ÷ 4*
06030066	100 ÷ 125	*4 ÷ 5*
06030067	125 ÷ 150	*5 ÷ 6*

Important

Measuring Inserts and setting standards must be ordered separately.

✓
- DIN 863 T3 (Style D18)
- 0,001 mm 0.00005 in
- Metric/Inch conversion
- 30 mm measuring span
- Max. 10 N
- RS 232
- Additional technical data on page C-3
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

Models ISOMASTER AC



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

Important

Measuring Inserts and setting standards must be ordered separately.

✓
- DIN 863 T3 (Style D 18) NF E 11-090
- 0,01 mm
- 0,5 mm
- Max. 10 N
- Plastic case
- Identification number
- Declaration of conformity

Interchangeable Thread Inserts for TESA Micrometers Series AC

With measuring faces specially designed for checking pitch diameters.

- ✓
- Hardened steel
- Fixing rod: 3,5 mm dia., 15,5 mm long
- Supplied in sets or pairs



No	Pitch in mm	No	Threads per in	No	Threads per in
ISO metric threads 60° flank angle		*Whitworth threads 55° flank angle*		*Unified inch-treads UN, UNC, UNF... 60° flank angle*	
00240000	0,4 ÷ 0,5	***00250100***	*60 ÷ 48*	***00250000***	*64 ÷ 42*
00240001	0,5 ÷ 0,6	***00250101***	*48 ÷ 40*	***00250001***	*42 ÷ 25*
00240002	0,6 ÷ 0,8	***00250102***	*40 ÷ 32*	***00250002***	*25 ÷ 17*
00240003	0,8 ÷ 1,0	***00250103***	*32 ÷ 24*	***00250003***	*17 ÷ 10*
00240004	1,0 ÷ 1,25	***00250104***	*24 ÷ 18*	***00250004***	*10 ÷ 6.5*
00240005	1,25 ÷ 1,5	***00250105***	*18 ÷ 14*	***00250005***	*6.5 ÷ 4*
00240006	1,5 ÷ 2,0	***00250106***	*14 ÷ 10*	***00250006***	*4 ÷ 2.5*
00240007	2,0 ÷ 2,5	***00250107***	*10 ÷ 7*		
00240008	2,5 ÷ 3,0	***00250108***	*7 ÷ 4.5*		
00240009	3,0 ÷ 4,0	***00250109***	*4.5 ÷ 3*		
00240010	4,0 ÷ 5,0				
00240011	5,0 ÷ 6,0				
Set of 12 pairs		*Set of 10 pairs*		*Set of 7 pairs*	
00240015	0,4 ÷ 6,0	***00250115***	*60 ÷ 3*	***00250015***	*64 ÷ 2.5*

Setting Standards for Screw Thread Micrometers

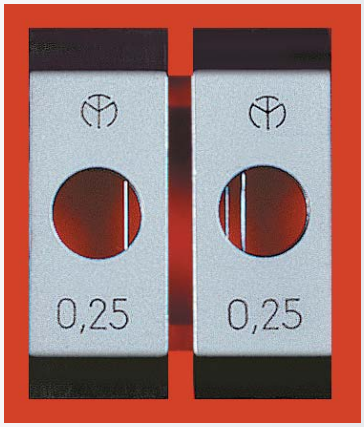
- ✓
- Hardened steel
- Insulating sleeve marked with actual size
- Identification number
- Declaration of conformity

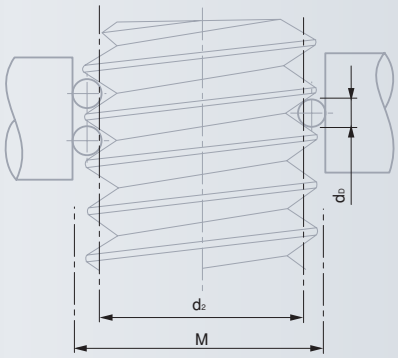


No	mm	No	in
60° flank angle			
00240501	25	***00250501***	*1*
00240502	50	***00250502***	*2*
00240503	75	***00250503***	*3*
00240504	100	***00250504***	*4*
00240505	125	***00250505***	*5*
55° flank angle			
00240601	25		
00240602	50		
00240603	75		

XB Wires for Screw Threads

For measuring pitch diameter of threads using the three-wire method. Actual flank diameter d_2 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 a measuring insert having a 6,5 mm diameter.





- Steel wires, hardened
- Wires are mounted on holders: 2-wire holder rests on anvil while the single wire holder is used on spindle side
- Single pairs are supplied in a plastic box, full set in a wooden case
- Declaration of conformity

No	Wires diameter	ISO metric threads	Whitworth threads	Unified inch-threads UN, UNC, UNF …
	d_D mm	Pitch in mm	*Number of threads per in*	*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*
Set of 16 pairs				
00240700	0,17 ÷ 3,20			

Micrometer Stands

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



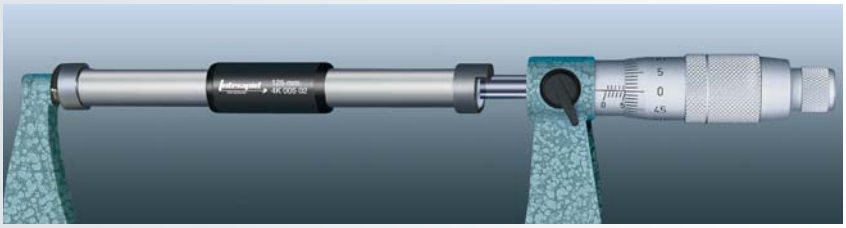


No
TESA
00160201
ETALON
072110123

- Clamp aperture: 16 mm (TESA) or 20 mm (ETALON)
- Lacquered cast iron base
- Tilt can be locked using a single bolt.

INTERAPID Setting Standards

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



№	mm	№	mm
02140001	25	**02140021**	525
02140002	50	**02140022**	550
02140003	75	**02140023**	575
02140004	100	**02140024**	600
02140005	125	**02140025**	625
02140006	150	**02140026**	650
02140007	175	**02140027**	675
02140008	200	**02140028**	700
02140009	225	**02140029**	725
02140010	250	**02140030**	750
02140011	275	**02140031**	775
02140012	300	**02140032**	800
02140013	325	**02140033**	825
02140014	350	**02140034**	850
02140015	375	**02140035**	875
02140016	400	**02140036**	900
02140017	425	**02140037**	925
02140018	450	**02140038**	950
02140019	475	**02140039**	975
02140020	500	**02140040**	1000

Guide Collars

Make the positioning of INTERAPID setting standards fast and easy.



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

ETALON Cylindrical Step Gauges

For display setting and calibration.



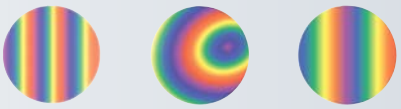
№	Ø mm
072112020	5 ÷ 100
072112021	5 ÷ 150

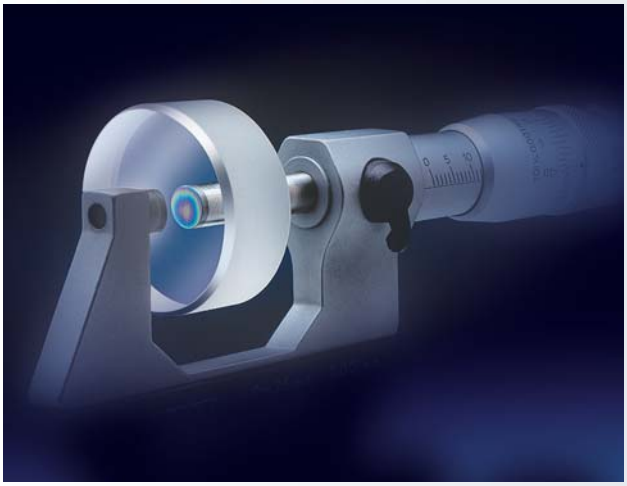
- ✓
- Alloyed steel, hardened
- Diameters in step of 5 mm (≤ 50 mm) or 10 mm (> 50 mm).
- Max. perm. errors for nominal diameters:
  ≤ 80 mm = 1,5 µm
  ≥ 90 ≤ 120 mm = 2,0 µm
  ≥ 130 mm = 2,5 µm
- Mounted on a wood base. Supplied with dust cover.
- Declaration of conformity

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.







№	mm
02510001	12,00
02510000	12,00 ÷ 12,375
02510101	27,00
02510100	27,00 ÷ 27,335
02510200	52,00 ÷ 52,335
02510300	77,00 ÷ 77,335

- ✓
- 31 mm
- Length tolerance with reference to the nominal dimension: ± 100 µm
- 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
- Each set is supplied in a wooden case
- Declaration of conformity



Micrometer Heads

Components commonly used for checking the various displacements on measuring fixtures, coordinate tables, microscopes, machines as well as other special appliances. Mounted on the cylindrical coupling shaft.

Models MICROMASTER

Without spindle lock.

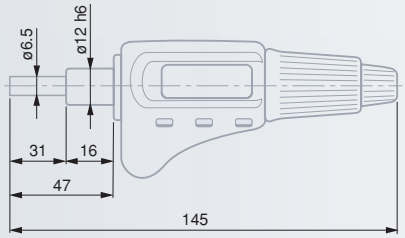
- ✓
- DIN 863 T2 (Style E)
- 0,001 mm 0.00005 in
- Metric/Inch conversion
- Tungsten carbide tipped
- 6,5 mm dia.
- 0,5 mm
- Max. perm. error of 4 µm
- Max. 10 N
- Additional technical data on page C-3
- RS 232 interface, opto-coupled
- Identification number
- Inspection report with a declaration of conformity



06030038/39



06030040



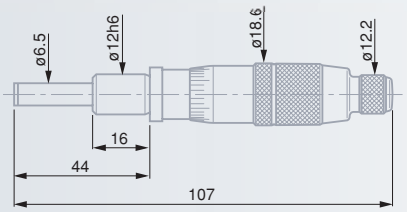
№	mm	mm
06030038	0 ÷ 30	12h6
06030039	30 ÷ 0	12h6
06030040	30 ÷ 0	12h6

Model ISOMASTER AR

Without spindle lock.

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



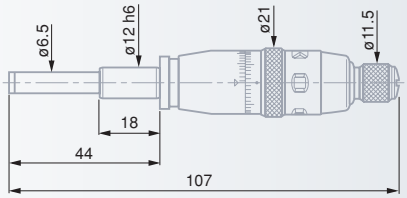


№	mm	mm
00211201	0 ÷ 25	12h6

Model TESAMASTER AR

Without spindle lock.





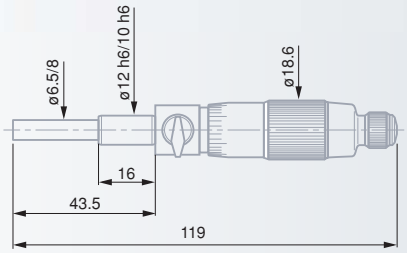
№	mm	mm
00312301	0 ÷ 25	12h6

- ✓
- DIN 863 T2 (Style E)
- Vernier reading to 0,001 mm
- Scale division to 0,1 mm
- Tungsten carbide tipped
- 6,5 mm dia
- 0,5 mm
- Max. perm. error of 2 µm
- Max. 10 N
- Identification number
- Declaration of conformity

ETALON 266 Micrometer Heads

With or without spindle lock.





№	mm	**D** mm	mm	Spindle lock
072115942	0 ÷ 25	Ø 6,5	12h6	–
072115943	0 ÷ 25	Ø 8	12h6	●
072116258	0 ÷ 25	Ø 6,5	10h6	●

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

Depth Micrometers

With interchangeable measuring rods provided in sets. The rods are adjusted in steps, each with a step length of 30 or 25 mm, thus eliminating the need for a new display setting when rods are exchanged.

- ✓
- DIN 863 T2 (Style T)
- 0,001 mm 0.00005 in
- Metric/Inch conversion
- Non-rotating spindle
- Measuring rods with hardened steel ends
- 3 mm dia. measuring rods
- 30 mm
- RS 232 data output
- 0,5 mm
- Max. perm. error (meas. element): 3 µm
- Plastic case
- Identification number
- Inspection report with a declaration of conformity



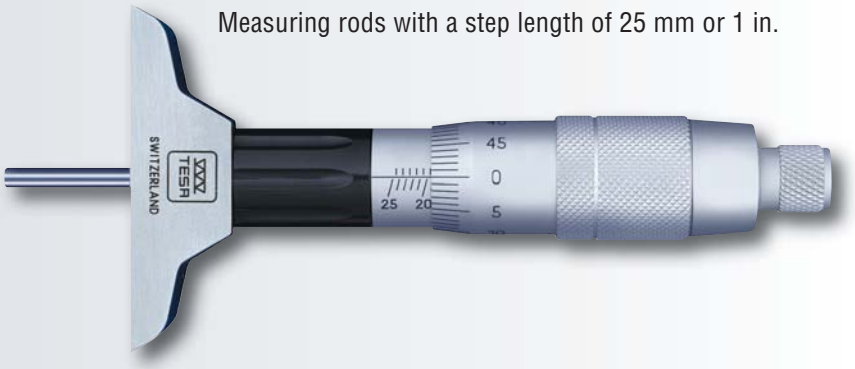
Models MICROMASTER

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
Optional Accessories			
06060021	6 pieces rod set	0 ÷ 180 mm	

Models ISOMASTER AQ

Measuring rods with a step length of 25 mm or 1 in.



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



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

Tool Sets



TESA Swiss Tool Set

No	=		
00510033	**TESA Swiss Tool Set**		
Consisting of:			
		mm	mm
00510041	1 Vernier caliper TESA SWISSCAL 2	0 ÷ 150	0,02
00560013	1 Depth foot		
00110101	1 External micrometer TESA ISOMASTER	0 ÷ 25	0,01
00560031	1 Suited plastic case		

✓

Caliper

DIN 862

Stainless steel, hardened

Technical data on page B-8

Depth foot

Stainless steel, hardened.

75 x 6 mm measuring faces

Micrometer

DIN 863 T1 NF E-11095

Tungsten carbide tipped

Technical data on page C-6

Additional data

Inspection report with a declaration of conformity

✓

Caliper

DIN 862

Stainless steel, hardened

Technical data on page B-5

Depth foot

Stainless steel, hardened

75 x 6 mm measuring face

Micrometer

DIN 863 T1 NF E 11-095

Tungsten carbide tipped

Technical data on page C-6

Additional data

Inspection report with a declaration of conformity



TESA Duo-Set 1

No		
00530020	TESA Duo-Set 1	

Consisting of:

No		mm	mm
00510008	1 Dial caliper TESA CCMA-M	0 ÷ 150	0,02
00560013	1 Depth foot		
00110101	1 External micrometer TESA ISOMASTER	0 ÷ 25	0,01
00560031	1 Suited plastic case		

✓

Caliper

DIN 862

Stainless steel, hardened

Technical data on page B-5

Depth foot

Stainless steel, hardened

75 x 6 mm measuring face

Micrometer

DIN 863 T1 NF E 11-095

Tungsten carbide tipped

Technical data on page C-4

Additional data

Inspection report with a declaration of conformity



TESA Duo-Set 2

No		
00530021	TESA Duo-Set 2	

Consisting of:

No		mm	mm
00510008	1 Dial caliper TESA CCMA-M	0 ÷ 150	0,02
00560013	1 Depth foot		
00310001	1 External micrometer TESAMASTER	0 ÷ 25	0,001
00560031	1 Suited plastic case		



TESA Duo-Set 8

No	=		
00531101	**TESA Duo-Set 8**		
Consisting of:			
No	=	mm	mm
00530090	1 Caliper TESA Shop-Cal capa µ system	0 ÷ 150	0,01
00560013	1 Depth foot		
00110101	1 External micrometer TESA ISOMASTER	0 ÷ 25	0,01
00560031	1 Suited plastic case		

✓

Caliper
DIN 862
Stainless steel, hardened
Technical data on page B-4

Depth foot
Stainless steel, hardened.
75 x 6 mm measuring face

Micrometer
DIN 863 T1
NF E 11-095
Tungsten carbide tipped
Technical data on page C-6

Additional data
Inspection report with a declaration of conformity



TESA Duo-Set 9

No	=		
00531102	**TESA Duo-Set 9**		
Consisting of:			
No	=	mm	mm
00530090	1 Caliper TESA TESA Shop-Cal capa µ system	0 ÷ 150	0,01
00560013	1 Depth foot		
00310001	1 External micrometer TESAMASTER	0 ÷ 25	0,001
00560031	1 Suited plastic case		

✓

Caliper
DIN 862
Stainless steel, hardened
Technical data on page B-4

Depth foot
Stainless steel, hardened
75 x 6 mm measuring face

Micrometer
DIN 863 T1
NF E 11-095
Tungsten carbide tipped
Technical data on page C-4

Additional data
Inspection report with a declaration of conformity

✓

Caliper

DIN 862

Stainless steel, hardened.

Technical data on page B-4

Inspection report with a declaration of conformity

Depth foot

Stainless steel, hardened.

75 x 6 mm measuring face

Micrometer

DIN 863 T1 NF E 11-095

Tungsten carbide tipped

Technical data on page C-3

SCS calibration certificate



TESA Duo-Set 16

00531007 TESA Duo-Set 16

Consisting of:

		mm	mm
00530090	1 Caliper TESA Shop-Cal capa µ system	0 ÷ 150	0,01
00560013	1 Depth foot		
06030010	1 External micrometer TESA MICROMASTER EASY	0 ÷ 30	0,001
00560090	1 Suited plastic case		

✓

Caliper

DIN 862

Stainless steel, hardened.

Technical data on page B-3

Inspection report with a declaration of conformity

Depth foot

Stainless steel, hardened.

75 x 6 mm measuring face

Micrometer

DIN 863 T1 NF E 11-095

Tungsten carbide tipped

Technical data on page C-3

SCS calibration certificate



TESA Duo-Set 13

00531004 TESA Duo-Set 13

Consisting of:

		mm	mm
00530300	1 Caliper TESA-Cal IP67	0 ÷ 150	0,01
00560013	1 Depth foot		
06030020	1 External micrometer TESA MICROMASTER IP54	0 ÷ 30	0,001
00560090	1 Suited plastic case		



TESA Duo-Set 14

№	=
00531005	TESA Duo-Set 14

Consisting of:

№	=	mm	mm
00530300	1 Caliper TESA-Cal IP67	0 ÷ 150	0,01
00560013	1 Depth foot		
06030010	1 External micrometer TESA MICROMASTER EASY	0 ÷ 30	0,001
00560090	1 Suited plastic case		

✓

Caliper
- DIN 862
- Stainless steel, hardened.
- Technical data listed on page B-4
- Inspection report with a declaration of conformity

Depth foot
- Stainless steel, hardened.
- 75 x 6 mm measuring face

Micrometer
- DIN 863 T1, NF E 11-095
- Tungsten carbide tipped
- Technical data listed on page C-3
- SCS calibration certificate



TESA Duo-Set 15

№	=
00531006	TESA Duo-Set 15

Consisting of:

№	=	mm	mm
00530311	1 Caliper TESA-Cal IP67, RS	0 ÷ 150	0,01
00560013	1 Depth foot		
06030030	1 External micrometer MICROMASTER IP54, RS	0 ÷ 30	0,001
00560090	1 Suited plastic case		

✓

Caliper
- DIN 862
- Stainless steel, hardened.
- Technical data listed on page B-3
- Inspection report with a declaration of conformity

Depth foot
- Stainless steel, hardened.
- 75 x 6 mm measuring face

Micrometer
- DIN 863 T1, NF E 11-095
- Tungsten carbide tipped
- Technical data listed on page C-3
- SCS calibration certificate



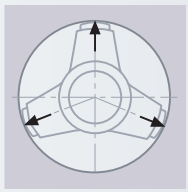
Internal Measurement

INTERNAL MEASUREMENT AND REQUIREMENTS

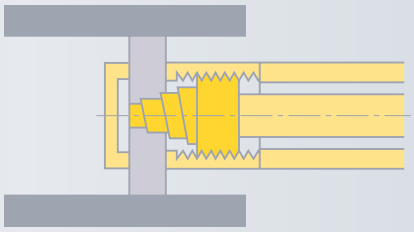
Bore measurement is more demanding than external measurement of workpieces. Besides the tight tolerances specificied for the current application, all measuring components having a direct influence on the uncertainty of measurement must be designed in such a way that they can go into the bore to be checked.

Benefit of the 3-Line contact

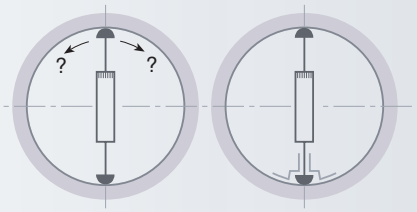
TESA IMICRO, TESA TRI-O-BOR, ALESOMETER as well as ETALON INTALOMETER are self-centring and self-aligning handtools that make bore measurement reliable, regardless of the operator's sensitivity.



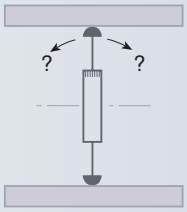
The three measuring bolts are spaced 120° apart, thus providing optimum self-centring.



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



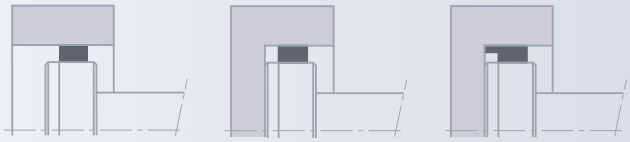
2-point contact measuring instruments are not self-centring. To make bore measurement easier, auxiliary means need additionally be used.



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

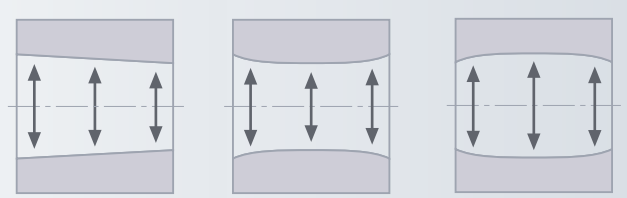
A single tool can replace hundreds of plug gauges

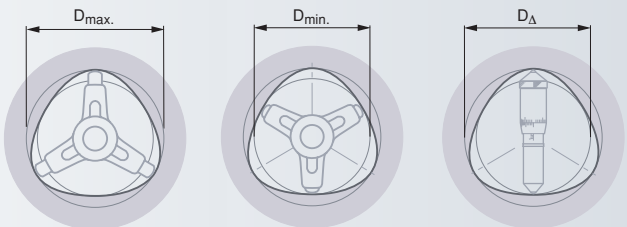
Unlike plug gauges that check only one toleranced size, a single tool can measure many diameters.
Depending on the model that is being used, through holes and blind bores along with short centring shoulders can be inspected, reliably.



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.



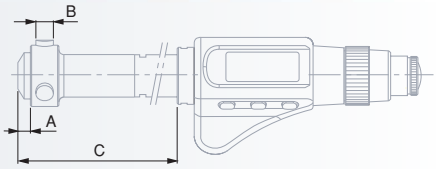


TESA IMICRO capa µ system with Digital Display

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







- ✓
- DIN 863 T4 (Style C1)
- 0,001 mm 0.0005 in
- Metric/inch Conversion
- LCD, 7 mm digit height
- Floating zero
- Display lock
- 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)
- RS 232 opto-coupled, bidirectional
- 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.
- 10 °C to 40 °C
- -10 °C to 60 °C
- 80%, non condensing
- ✓
- Measuring element IP54 (IEC 60529) or IP40 with active data output
- Plastic case
- Identification number
- TESA's calibration certificate
- Declaration of conformity

№	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 - 3 V, 190 mAh, type CR 203

For ordering information on cables etc., see section A. Suited carrying cases on page D-8.

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.



№	mm	№	№	mm	№	⌀ mm	№	mm
Partial sets including		*Elements*	*Measuring heads*		*Setting rings*		*Extensions*	
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	00840105	17		
			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 ÷ 200	06130012	06140040	100 ÷ 125	00840112	125	00842600	150
			06140041	125 ÷ 150	00840113	175		
			06140042	150 ÷ 175				
			06140043	175 ÷ 200				

Set composition for the application range from 200 to 300 mm available upon request

№	№	mm
Measuring Element	*Measuring heads*	
06130012	06140044	200 ÷ 225
	06140045	225 ÷ 250
	06140046	250 ÷ 275
	06140047	275 ÷ 300

- ✓
- DIN 863 T4 (Style C1)
- 0,001 mm 0.0005 in
- Metric/inch Conversion
- LCD, 7 mm digit height
- Floating zero
- Display lock
- 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)
- RS 232 opto-coupled, bidirectional
- 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.
- 10 °C to 40 °C
- -10 °C to 60 °C
- 80%, non condensing
- ✓
- Measuring element IP54 (IEC 60529) or IP40 with active data output
- Plastic case
- Identification number
- TESA's calibration certificate
- Declaration of conformity

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 0.0005 in

Metric/inch Conversion

LCD, 7 mm digit height

Floating zero

Display lock

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)

RS 232 opto-coupled, bidirectional

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.

10 °C to 40 °C

-10 °C to 60 °C

80%, non condensing

✓

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

Plastic case

Identification number

TESA's calibration certificate

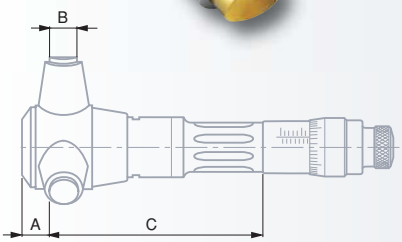
Declaration of conformity

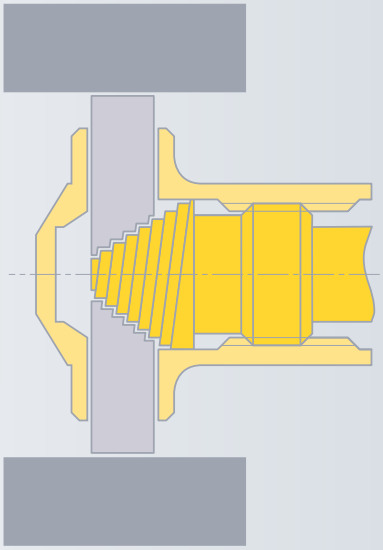
No	mm	No	mm	No	mm	No	mm
Full sets including		*Single micrometers*		*Setting rings*		*Extensions*	
06130220	3,5 ÷ 6,5	06130101	3,5 ÷ 4	00843200	4	–	
		06130102	4 ÷ 4,5	00843201	5,5		
		06130103	4,5 ÷ 5,5				
		06130104	5,5 ÷ 6,5				
06130221	6 ÷ 12	06130105	6 ÷ 8	00840101	8	00840001	100
		06130106	8 ÷ 10	00840102	10		
		06130107	10 ÷ 12				
06130222	11 ÷ 20	06130108	11 ÷ 14	00840103	11	00840301	150
		06130109	14 ÷ 17	00840105	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 ÷ 200	06130121	100 ÷ 125	00840112	125	00842600	150
		06130122	125 ÷ 150	00840113	175		
		06130123	150 ÷ 175				
		06130124	175 ÷ 200				

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.







✓

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)

Application ranges from 3,5 to 200 mm in a shipping box
200 to 300 mm in a wooden case with 1 extension of 150 mm (No. 00842600)

Identification number

Inspection report with a declaration of conformity

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

✓

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.

Additional technical data: see on the previous page.
Setting rings on page D-17.

Plastic case or suitcase

Identification number

Inspection report with a declaration of conformity

TESA IMICRO with Analogue Indication – Full Metric Sets



		mm		mm		mm		mm
Full sets including			*Single micrometers*		*Setting rings*		*Extensions*	
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				

Accessories for both TESA IMICRO and TESA IMICRO capa µ system



Extensions for Deep Hole Measurement



DIN 863 T4 (Style C1)

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

Centring Devices for TESA IMICRO



No	mm	mm
00860001	40 ÷ 100	150
00862601	100 ÷ 200	200

Moulded Cases for Single Micrometers, Full Sets and Partial Sets

No	No	mm
Single micrometers		
–	**06160002**	3,5 ÷ 12
00860007	**06160002**	11 ÷ 20
00860011	**06160002**	20 ÷ 40
00860015	**06160003**	40 ÷ 70
00860016	**06160003**	70 ÷ 100
00863016	**00863016**	100 ÷ 300

No	No	mm
Micrometer sets	*Full and partial micrometer sets*	
00863035	**06160006**	3,5 ÷ 6,5
00863005	**06160005**	6 ÷ 12
00860008	**06160005**	11 ÷ 20
00860012	**06160006**	20 ÷ 40
00860017	**06160007**	40 ÷ 100
00863017	**00863017**	100 ÷ 200

IMICRO Adapter

Every TESA IMICRO (SM versions or models with analogue indication) can easily be updated by means of the adapter used for coupling the measuring head with the new capa µ system element.



No	No	mm
Capa µ system element	*Adapter*	*Application range*
06130011		6 ÷ 100
	06140048	6 ÷ 12
	06140049	11 ÷ 20
	06140050	20 ÷ 40
	06140051	40 ÷ 100

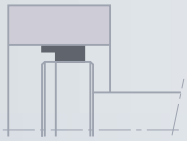
Note: To ensure accuracy, the micrometer needs to be recalibrated.

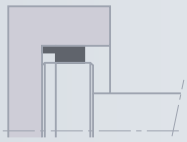
TESA ALESOMETER capa µ system with Digital Display

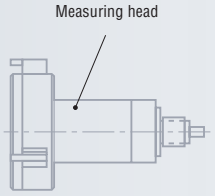
Fitted with a TESA patented capacitive measuring system

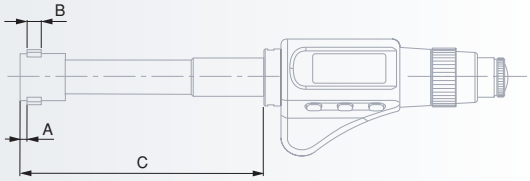
Bore gauges with 3-line contact. All TESA ALESOMETER are made to measure through and blind bores as well as short centring shoulders, except for the models covering the application range from 6 to 10 mm.











- ✓
- DIN 863 T4. Style C1 for models 6 to 10 mm or style C2 for all other models
- 0,001 mm 0.00005 in
- Metric/inch conversion
- LCD, digit height 7 mm
- Floating zero
- Display lock
- Measuring inserts for application range 6 to 10 mm: steel, hardened to HV30 550. 10 to 300: tungsten carbide tipped, HRC ≥ 70.
- RS 232 opto-coupled, bidirectional
- 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.
- 10 °C to 40 °C
- -10 °C to 60 °C
- 80%, non condensing
- ✓
- For the measuring element IP54 (IEC 60529) or IP40 with active data output
- ≤ 100 mm in a plastic case > 100 mm in a wooden case
- Identification number
- Inspection report with a declaration of conformity

Single Bore Gauges, Complete

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
06230040	200 ÷ 225	*7.8740 ÷ 8.8582*	8	8	0,3	30	175
06230041	225 ÷ 250	*8.8582 ÷ 9.8425*	8	8	0,3	30	175
06230042	250 ÷ 275	*9.8425 ÷ 10.8267*	8	8	0,3	30	175
06230043	275 ÷ 300	*10.8267 ÷ 11.8110*	8	8	0,3	30	175

Optional Accessory

01961000	1 Lithium battery 3 V, 190 mAh, type CR 2032

* Not applicable for models from 10 mm since the measuring inserts are close to the micrometer front face.
For ordering information on setting rings, see both pages D-12 and D-17, or report to page D-10 for storage cases or to section A for connecting cables and the like.

TESA ALESOMETER capa µ system with Digital Display

Partial Sets plus 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 HV30 550.
10 to 300: tungsten carbide tipped to HRC ≥ 70.

For additional technical data, see on page D-9 or D-12 for setting rings.

≤ 100 m in a plastic case, > 100 m in a wooden case

Identification number

Inspection report with a declaration of conformity

No	mm	No	mm	No	No	No	⌀ mm	No
Partial sets including		*Measuring heads*		*Connectors*	*Measuring elements*	*Setting rings*		*Storage cases*
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 composition for application range from 100 to 300 mm available upon request

	Measuring heads		*Connectors*	*Measuring element*	*Setting rings*		*Storage cases*
	0081720382	100 ÷ 125	0081620495	06230020	0211625111	125	00863016
	0081720384	125 ÷ 150			0211625112	150	
	0081720386	150 ÷ 175			0211625112	150	
	0081720388	175 ÷ 200			0211625113	175	
	0081720390	200 ÷ 225			0211625114	200	
	0081720392	225 ÷ 250			0211625115	225	
	0081720394	250 ÷ 275			0211625116	250	
	0081720396	275 ÷ 300			0211625117	275	

Each storage case can contain a single measuring head only.

✓

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 HV30 550. 10 to 300 mm: tungsten carbide tipped to HRC ≥ 70.

Wooden case

Identification number

Declaration of conformity

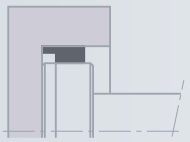
Calibration certificate upon request

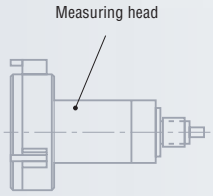
ROCH ALESOMETER with Analogue Indication, Metric

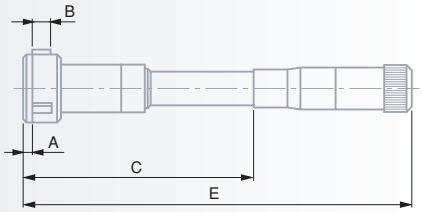
Bore gauges with 3-line contact. All ROCH ALESOMETER let you measure not only through bores, but also blind bores as well as centring shoulders, except for the models covering the application range 6 to 10 mm.











Single Bore Gauges, complete

№	mm	mm	µm	A mm*	B mm	C mm	E 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
0081725040	200 ÷ 225	0,01	9	0,3	30	153,7	233,5
0081725042	225 ÷ 250	0,01	9	0,3	30	153,7	233,5
0081725044	250 ÷ 275	0,01	9	0,3	30	153,7	233,5
0081725046	275 ÷ 300	0,01	9	0,3	30	153,7	233,5

* Not applicable for models from 10 mm since the measuring inserts are close to the micrometer front face.

ROCH ALESOMETER with Analogue Indication – Full Metric Sets



	mm		mm		mm		mm
Full sets including		*Single bore gauges*		*Setting rings*	*Extensions*		
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				
0081725072	100 ÷ 150	0081725032	100 ÷ 125	0211625111	125	0081625085	200
		0081725034	125 ÷ 150				

Extensions for Depth Increase

	mm	mm
0081625081	6 ÷ 10	100
0081625082	10 ÷ 20	100
0081625083	20 ÷ 40	150
0081625084	40 ÷ 100	150
0081625085	100 ÷ 300	200

ROCH Setting Rings

	mm		mm
0211625101	8	**0211625110**	90
0211625102	12,5	**0211625111**	125
0211625103	17,5	**0211625112**	150
0211625104	25	**0211625113**	175
0211625105	35	**0211625114**	200
0211625106	45	**0211625115**	225
0211625107	60	**0211625116**	250
0211625109	85	**0211625117**	275

✓
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 HV30 550. 10 to 300 mm: tungsten carbide tipped to HRC ≥ 70.
For any additional data, see on page D-11
Wooden case
Identification number
Declaration of conformity
Calibration certificate upon request

Extensions

✓
Hardened steel. Insulated body against hand warmth.
Identification number
Declaration of conformity

Setting rings

✓
NF E 11-011, type A2
Steel, hardened to 60 HRC
Bore related tolerance ± (3 µm + 10·10⁻⁶ D) µm
D = Nominal diameter in mm (1 µm + 5·10⁻⁶ D) µm
Shipping box
Identification number
Calibration certificate upon request

✓

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

0,002 mm

0,01 mm

Tungsten carbide tipped measuring bolts and cone

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

Shipping box

Identification number

Inspection report with a declaration of conformity

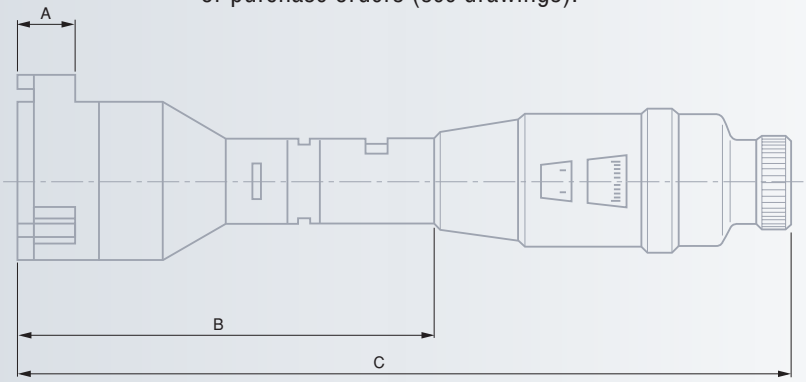
TESA TRI-O-BOR

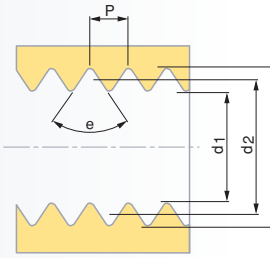
Self-centring and self-aligning internal micrometers with 3-line contact with the part being inspected. These micrometers measure trough holes, blind bores and short centring shoulders.

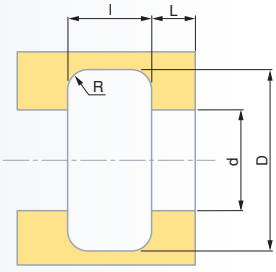


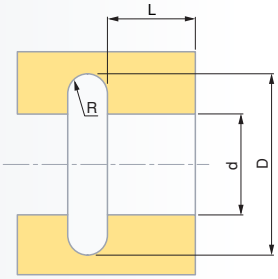
Measuring Bolts with Special Design

Used for ISO metric threads (M16 x 0,5 to M150 x 6), UN, UNC or UNF unified imperial threads (60°) and Whitworth threads (55°). Measuring bolts with special profiles can also be made available. Both the size and type of the thread or the workpiece to be measured must be specified in your inquiries or purchase orders (see drawings).









№	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

TESA TRI-O-BOR Full Sets



For technical data, see on page D-13.
For setting rings, report to page D-17.

Supplied with 1 extension for depth increase (150 mm) No. 00940000, 1 heat insulating sleeve No. 00940020, 2 keys No. 00940001, 1 screwdriver No. 00862801.

Protective case or carrying case

Inspection report with a declaration of conformity

Metric Executions

№		mm	№	mm	№	⌀ mm	№	IT mm
Full sets including			*Single micrometers*		*Setting rings*		*Extensions*	
00910004	BSC	15 ÷ 30	00910005	15 ÷ 20	00840104	15	00940000	150
			00910006	20 ÷ 25	00840105	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				

TESA TRI-O-BOR Accessories

Extension for Depth Increase

№	IT mm
00940000	150

Protective or Plastic Carrying Cases for TESA TRI-O-BOR

№	№	mm	in
Single micrometers	*Full micrometer sets*		
00960023	**00960024**	15 ÷ 30	*0.6 ÷ 1.2*
00960025	**00960026**	30 ÷ 60	*1.2 ÷ 2.4*
00960027	**00960028**	60 ÷ 90	*2.4 ÷ 3.6*
00960004	**00960008**	90 ÷ 120	*3.6 ÷ 4.8*

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.

✓

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

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

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

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

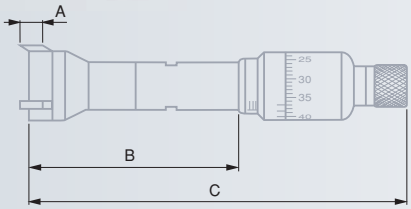
Repeatability limit for models covering the application ranges from
5 to 40 mm = 3 µm
40 to 100 mm = 4 µm
100 to 200 mm = 5 µm

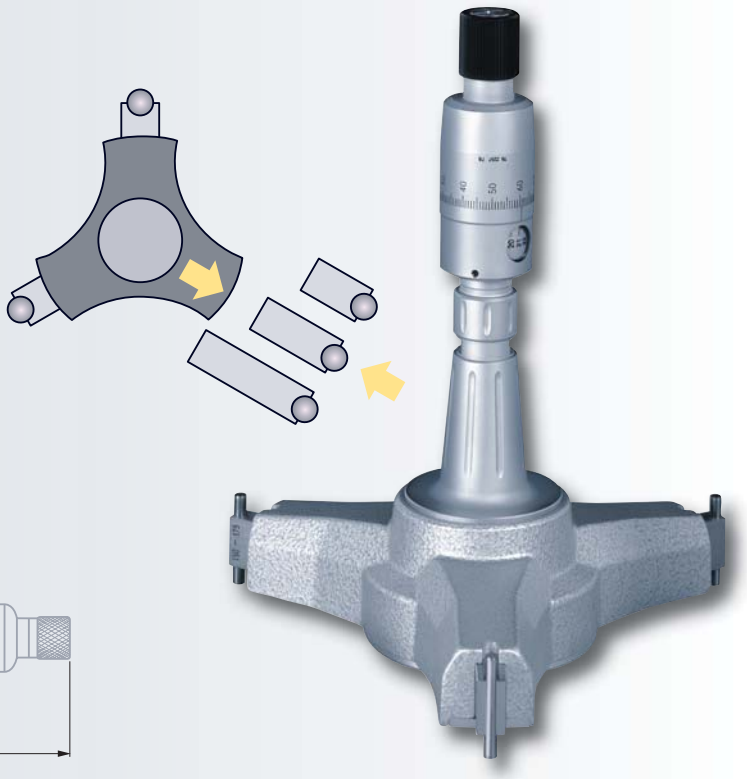
Protective case or carrying case

Identification number

Inspection report with a declaration of conformity







№	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	≥ 80	≤ 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 Tool Sets



✓

For technical data, see page D-15. For setting rings, report to page D-17.

Protective case or carrying case

Inspection report with a declaration of conformity

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

Partial sets including		*Single micrometers*	*Measuring bolts*		*Extensions*	
078110749	100 ÷ 150	078110733	078111003*	100 ÷ 125	078104940	150
			078111004	125 ÷ 150		

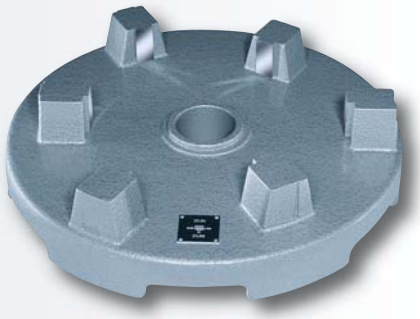
* Bolt set provided with the single micrometer No. 078110733.

Shipping box

Identification number

TESA Setting Rings and Setting Masters





№	⌀ mm	µm*	µm**
Setting rings			
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
Setting master			
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

Large sizes in mechanical engineering mean dimensions in excess of 500 mm.

Besides various measurement procedures like those that apply to large internal or external micrometers with two-point contact, tape rules (wrapping round the outside diameter), V-bases, rotating measuring disks (rolling-contact) and optical systems (triangulation with theodolite), resort is often to make use of simple testing means like fixed gauges (inside caliper gauges), gauge blocks combinations or adjustable telescopic gauges.

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.

Here's an example of a proportional relationship. With a bore of 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.

Whatever the sizes, from a simple distance between two surfaces parallel one another to large diameters, their 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.



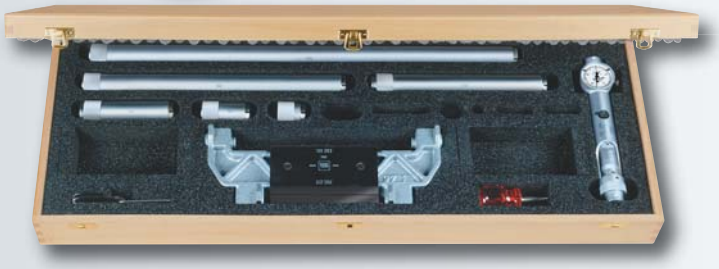
TESA UNITEST Internal Micrometer

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.

Precise, easy-to-handle micrometer – Horizontal or vertical position of use – Constant measuring force – Integrated dial gauge to show you the culmination point.







✓

DIN 863 T4 (Style B)

Measuring element

Micrometer and dial gauge to 0,01 mm

Micrometer: 0,1 mm

Micrometer: 25 mm

0,5 mm

Dial gauge: ± 0,22 mm

0,7 to 1 N

8 µm

Measuring bolts

Spherical end for measuring in the micrometer axis. All inserts are inter-changeable.

Tungsten carbide tipped

Extensions

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

Tungsten carbide tipped

One spherical and one flat measuring faces

Additional data

Wooden case

Setting standard with identification number

Declaration of conformity

mm

TESA UNITEST complete set

No		mm		
01110700		int. dimensions	200 ÷ 1400	

Consisting of:

No		mm	mm	µm
01110901	Meas. element for int. dimensions	200 ÷ 225		
01141001	Setting standard for 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	Special screwdriver			
01162302	Wooden case for complete set			

Optional Accessories

01141101	Extension		1000	10
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	

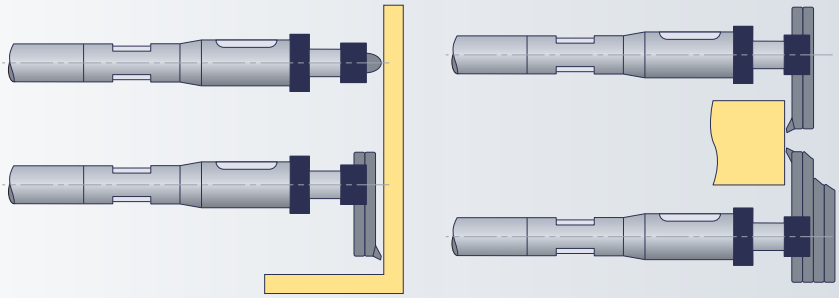
TESA UNIMASTER
Universal Measuring Instrument

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)

Measuring element

Micrometer and dial test indicator: 0,01 mm

Micrometer: 25 mm

1 mm

Dial test indicator: ± 0,4 mm

15 to 20 N. Mobile ball-bearing anvil under spring pressure.

Reversible probing direction to allow both internal and external measuring.

5 µm

Measuring bolts

Tungsten carbide tipped

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.

Extensions

38 mm dia. diameter steel tube with snap ring system. Built-in gauge rod.

Tungsten carbide tipped

One spherical and one flat measuring faces



mm

TESA UNIMASTER complete set

№		mm	
01110000		Internal dim. 250 ÷ 1475*	
		External dim. 225 ÷ 1450*	

Consisting of:

№	=	mm	mm	µm
01110300	Measuring element	internal dim. 250 ÷ 275		
		external dim. 225 ÷ 250		
01110203	Pair of measuring bolts for internal measuring			
01110205	Pair of measuring bolts for internal/external measuring, with length to		75	
01110208	Pair of measuring bolts for extern. measuring, length		100	
01110501	Setting standard	internal dimension	250	
		external dimension	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 for extensions			
01110401	Set of suspension accessories (4 brackets together with 4 clamps)			
01112401	Wooden case for complete set			

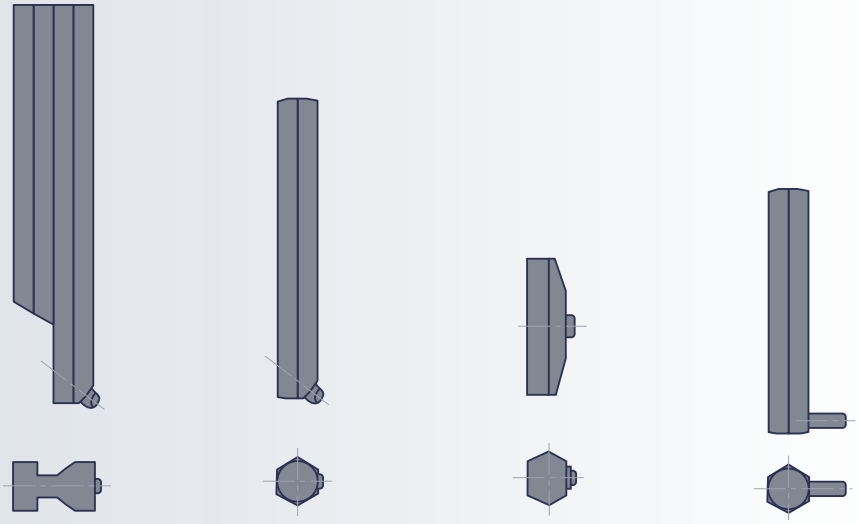
Optional Accessories

01110140	Extension		1000	10
01162001	Pair of measuring bolts for internal/external dimensions and grooves	Measuring depth	≤ 20	
		Tungsten carbide inserts	Ø 4 x 7	
01160001	Support roller supplied individually (2 items are needed)			

* Using 3 extensions at the very most.

Additional Data

- Wooden case
- Measuring element and setting standard with identification number
- Declaration of conformity



01110208 01110205 01110203 01162001

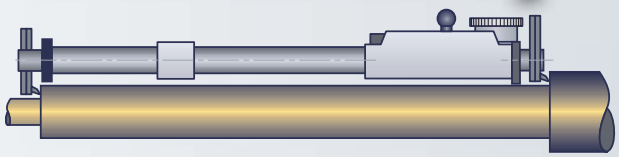
TESA INOTEST
Comparative Measuring Instrument

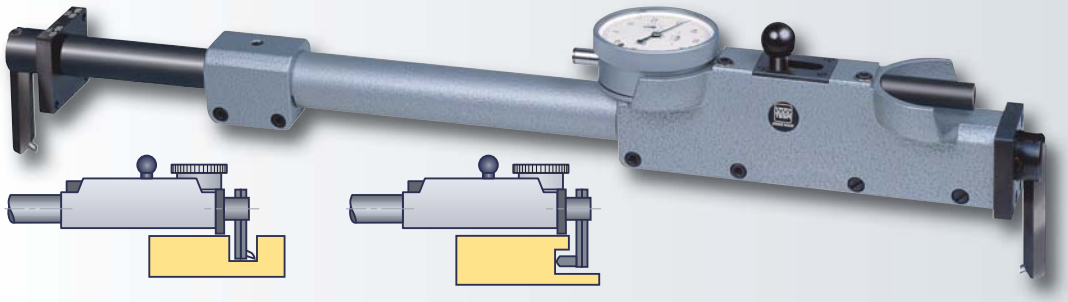
Allows for comparative measurement of large internal or external dimensions.

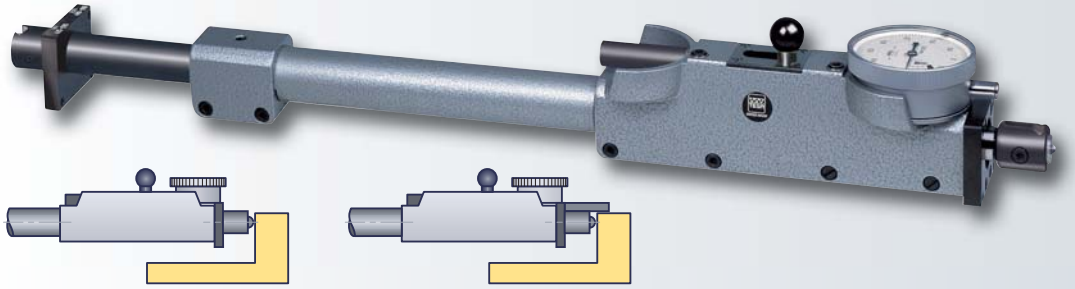
Consists of a measuring element with interchangeable inserts as well as a set of extensions. Since there is no material measure, the indication is set using a separate standard that can either be a gauge block, setting ring or horizontal measuring bench.

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.











✓

Measuring element

Mobile ball-bearing anvil, 10 mm measuring travel.

Watertight dial gauges 01470104 and 01480100

0,01 mm

10 mm

For additional technical data, see section F.

4 to 7 N. Reversible probing direction to allow both internal and external measuring.

Measuring bolts

Tungsten carbide tipped

Measuring bolts supplied in pairs:
- No. 01131901 for internal measuring in the instrument axis.
- No. 01131902 for internal/external measurement, measuring depth up to 30 mm from the lower edge of the tool.

Extensions

25 mm dia. steel tube. 19 mm dia. telescopic tube that can be clamped.

Additional data

Plastic case

Dial gauge with serial number

Dial gauge with inspection report

Declaration of conformity



mm

TESA INOTEST complete set

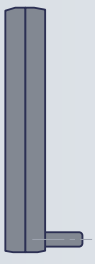
		mm
01111900		Internal dimensions 275 ÷ 1025 External dimensions 250 ÷ 1010

Consisting of:

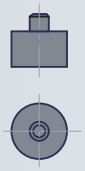
		mm	mm
01112301	Measuring element with dial gauge		
01131901	Pair of measuring bolts for internal measuring		
01131902	Pair of measuring bolts for internal/external measuring with length to		60
01132001	4 resting rods		Ø 7 x 40
00160101	3 insulating grips (order number for 1 item)		
01112001	Extension	internal dimensions 275 ÷ 335 external dimensions 250 ÷ 310	
01112002	Extension	internal dimensions 325 ÷ 435 external dimensions 300 ÷ 410	
01112003	Extension	internal dimensions 425 ÷ 635 external dimensions 400 ÷ 610	
01112004	Extension	internal dimensions 625 ÷ 1035 external dimensions 600 ÷ 1010	
01162303	Plastic case for complete set		

Optional Accessories

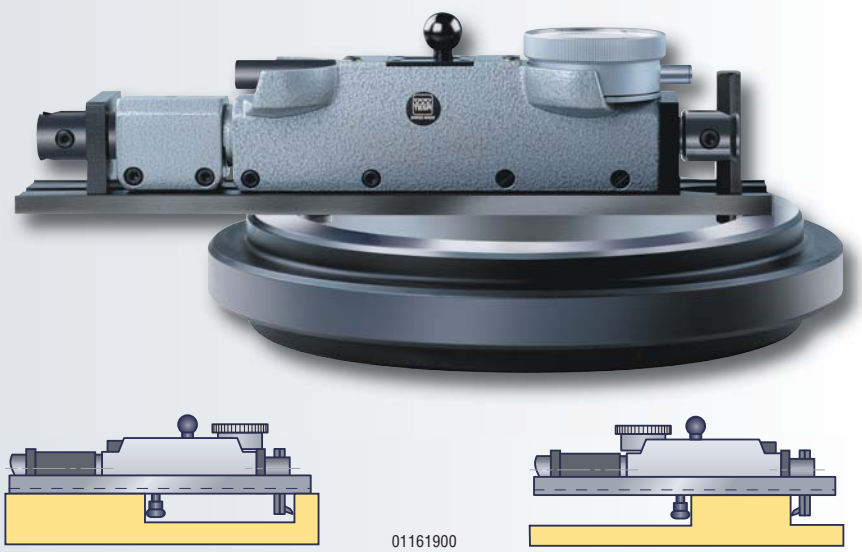
01141901	Extension for extending the application range by	500
01141902	Extension for extending the application range by	1000
01162001	Pair of tungsten carbide measuring bolts for internal/external dimensions	Ø 4 x 7
01162002	Pair of tungsten carbide measuring bolts for grooves	Ø 4 x 7
01161900	Measuring device for small - internal dimensions 35 ÷ 280 - external dimensions 15 ÷ 255	



01162001



01131901



01161900

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.





Complete sets					072109101	072109107	072109108	072109117	072109128
		mm			50 ÷ 170	50 ÷ 290	50 ÷ 530	50 ÷ 1010	50 ÷ 1510
Consisting of:									
		mm	mm	µm					
072103576	Micrometer element	50 ÷ 65		3	●	●	●	●	●
072103585	Extension		15	1,5	●	●	●	●	●
072105462	Extension		30	1,5	●	●	●	●	●
072109030	Extension		60	2	●	●	●	●	●
072103586	Extension		120	2		●	●	●	●
072109055	Extension		240	3			●	●	●
072109066	Extension		480	3,5				●	●
072109089	Extension		500	3,5					●

✓ Factory standard

Micrometer element

- 0,01 mm
- 15 mm
- 0,5 mm
- Spherical (R = 15 mm)
- Tungsten carbide tipped

Extensions

- Reference gauge rods
- 29 mm
- Tungsten carbide tipped

Additional data

- Wooden or plastic case
- Declaration of conformity

ROCH 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.



	Diameter mm	Circumference mm	mm
0951750222	20 ÷ 300	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
0951750226	1500 ÷ 1900	4710 ÷ 5980	0,30
0951750227	1900 ÷ 2300	5960 ÷ 7230	0,35

✓ Factory standard

- 0,1 mm
- See table
- 16 x 0,2 mm type section
- Steel band
- Shipping packaging
- Declaration of conformity

Electronic indicators, Dial Gauges, Precision Indicators









EASY-TO-USE AND VERSATILE

As manufacturer of a full range of precision dial gauges for more than 50 years, we are able to provide you with a wide variety of models.

- *Electronic indicators featuring a combined analogue/digital indication with the most up-to-date technology.*
- *Mechanical dial gauges with high-precision movement and smooth pointer revolution, doubIF-action shockproof mechanisms as well as measuring spans up to 100 mm.*

Which Style Do you Need?

- *Digital indication provides error-free readout of the measured values as the fractions of the scale divisions need not be estimated, visually.*
- *Analogue indication has the advantage to change smoothly according to the size of the workpiece feature to be measured. This type of indication is best suited for dynamic measurements, e.g. when determining axial and radial runout errors.*
- *Electronic indicators provide many additional functions compared to the mechanical models. For more information, also read the pages F-4 to F-11.*
- *Electronic indicators, precision dial gauges as well as dial test indicators have the capability to measure with the lowest possible hysteresis. Therefore, they are ideally suited for runout inspection where this capability is required.*
- *In order to significantly reduce the effects of the systematic errors, we recommend to carry out a number of comparative measurements because only the actual size of each related nominal length will be read out. This means that electronic indicators, dial gauges with limited range of indication and precision indicators are best suited for this purpose.*
- *These hand-held tools also permit to avoid rough reading errors of the metric range.*

Standards and Definitions

From now on, the international ISO 463:2006 standard replaces the national ones dealing with dial gauges. Newly applicable definitions and requirements also imply some changes of the so-called design and metrological characteristics, which could no be entirely reported in this issue.

This standard, which is part of the matrix «Product Specification (GPS) – Dimensional measuring equipment», states the requirements that affect the most significant characteristics mentioned above. Therefore, all values indicated in this catalogue as limit values for the metrological characteristics only are based on internal standards proper to our factory.

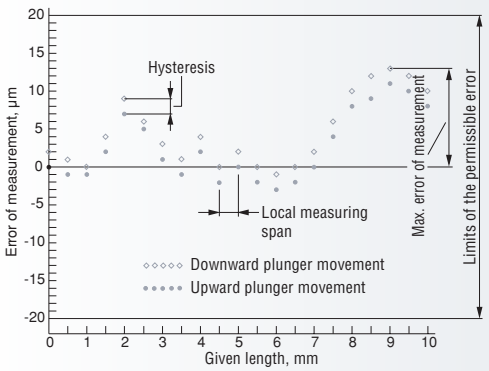
Electronic indicators
Precision indicators

Definitions used in this section:

Max. perm. errors in one measuring direction
over the whole measuring range
within the local measuring range
in both measuring directions

Repeatability limit

Max. hysteresis



Mechanical dial gauges

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

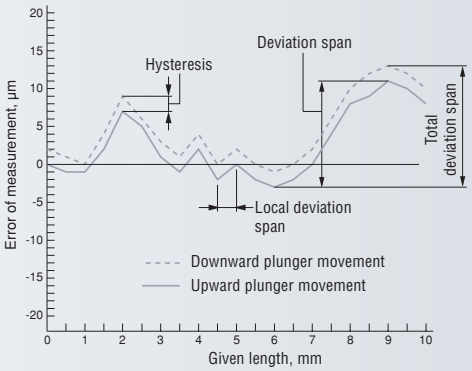
Deviation span
(Error of indication within the measuring range)

Deviation span (error of indication) within the local measuring span

Total deviation span
(Error of indication within the measuring range)

Repeatability limit of indication

Hysteresis of indication



INDICATORS		mm		mm / in	
NUMERICAL	Digico 200 - 300 - 400 - 500 - 600 - 700			12,5 ÷ 25	F-4 - F-7
	Digico 1			30 ÷ 60	F-8 - F-9
	Digico 12			5 ÷ 12,5	F-10 - F-11
ANALOGUE, TYPE HI-FI		0,001		0,1	F-12 - F-13

	mm / *in*		mm		mm / *in*	
ANALOGUE	mm	0,1	40 ÷ 58 ÷ 80		10 ÷ 20 ÷ 30	F-14
		0,01	40		0,4 ÷ 3 ÷ 5	F-15 - F-17
			58		0,8 ÷ 1 ÷ 10 ÷ 30 ÷ 50 ÷ 100	F-18 - F-23
			82		10 ÷ 30 ÷ 50 ÷ 100	F-24 - F-26
		0,002	40		0,16 ÷ 3	F-27
			58		0,16 ÷ 5	F-28
		0,001	40		0,08 ÷ 1	F-29 - F-30
			58		1 ÷ 5	F-31 - F-33
			82		1 ÷ 5	F-34
	in	*0.001*	40 ÷ 58		*0.2 ÷ 0.4 ÷ 1*	F-35
		0.0005	40 ÷ 58		*0.2 ÷ 0.4 ÷ 1*	F-36
		0.0001	40 ÷ 58		*0.12 ÷ 0.2*	F-37
ANALOGUE with small bezel (mm/*inch*)			29 mm – *1 1/8 in*		0,2 ÷ 1 mm - *0.01 ÷ 0.04 in*	F-38
ANALOGUE with back mounted plunger			38 ÷ 40 ÷ 58		0,16 ÷ 0,8 ÷ 1 ÷ 3 mm *0.05 in*	F-39 - F-41
ACCESSORIES				Measuring inserts Retraction devices Backs for precision dial gauges		F-42 - F-44 F-45 F-46

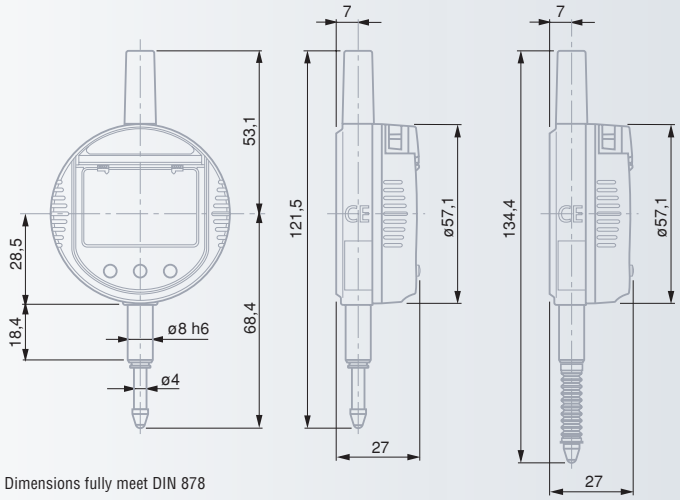
TESA DIGICO 205 and 305

- Dual LC Display.
- Mechanical tolerance marks.
- Dimensions according to DIN 878.

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



№		mm / *in*	mm / *in*	µm	µm
TESA DIGICO 205					
01910230	DIGICO 205 M	12,5 / –	0,01 / –	20	10
01930230	DIGICO 205 MI	12,5 / *0.5*	0,01 / *0.0005*	20	10
TESA DIGICO 305					
01910231	DIGICO 305 M	12,5 / –	0,001 / –	8	2
01930231	DIGICO 305 MI	12,5 / *0.5*	0,001 / *0.00005*	8	2
TESA DIGICO 305 IP54					
01930232	DIGICO 305 MIE	12,5 / *0.5*	0,001 / *0.00005*	8	2



Dimensions fully meet DIN 878

✓
Combined analogue and numerical display
6-decade LC display field plus minus sign
10 x 5 mm Digit size (H x L)
Resolution to 0,01 mm = ±0,25 mm
Resolution to 0,001 mm = ±0,025 mm
MI or MIE type: metric/inch conversion
Glass scale with incremental divisions, capacitive
≤ 2 m/s
Full-metal housing with front face in polyamide. Stainless steel plunger. M2,5 mounting thread for the measuring insert.
≤ 2N
RS232, opto-coupled
3V lithium battery, type CR2032
1 year to 2 years
10°C to 40°C
–10°C to 60°C
80%
EN 50081-1
EN 50082-1
150 g
Shipping case including a lithium battery 01961000
Identification number
Inspection report with a declaration of conformity

TESA DIGICO 400 and 500

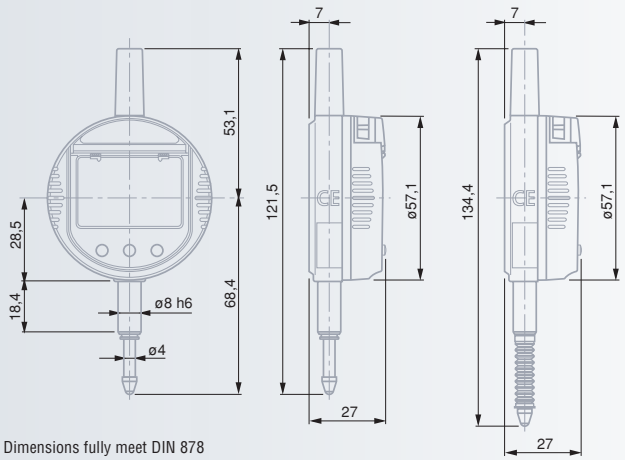
- Measuring modes **ABS/REL**.
- Dual LC Display.
- Display rotation through 270°. Same goes for the key functions.
- Mechanical tolerance marks.
- Symbols for both limit values.

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



- ✓
- Combined analogue and numerical display
- 6-decade LC display field plus minus sign
- 10 x 5 mm Digit size (H x L)
- Resolution to 0,01 mm = ±0,25 mm
  Resolution to 0,001 mm = ±0,025 mm
- MI or MIE type: metric/inch conversion
- Glass scale with incremental divisions, capacitive
- ≤ 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 year to 2 years
- 10 °C to 40 °C
- –10 °C to 60 °C
- 80%
- EN 50081-1
  EN 50082-1
- Shipping case including one lithium battery 01961000
- Identification number
- Inspection report with a declaration of conformity

№		mm / *in*	mm / *in*	µm	µm	N	g
TESA DIGICO 400							
01930240	Digico 405 MI	12,5 / *0.5*	0,01 / *0.0005*	20	10	< 2	150
01930241	Digico 410 MI	25 / *1*	0,01 / *0.0005*	20	10	< 2	162
TESA DIGICO 500							
01930250	Digico 505 MI	12,5 / *0.5*	0,001 / *0.00005*	4	2	< 2	150
01930251	Digico 510 MI	25 / *1*	0,001 / *0.00005*	5	2	< 2	162
TESA DIGICO 505 IP54							
01930255	Digico 505 MIE	12,5 / *0.5*	0,001 / *0.00005*	4	2	< 2	150

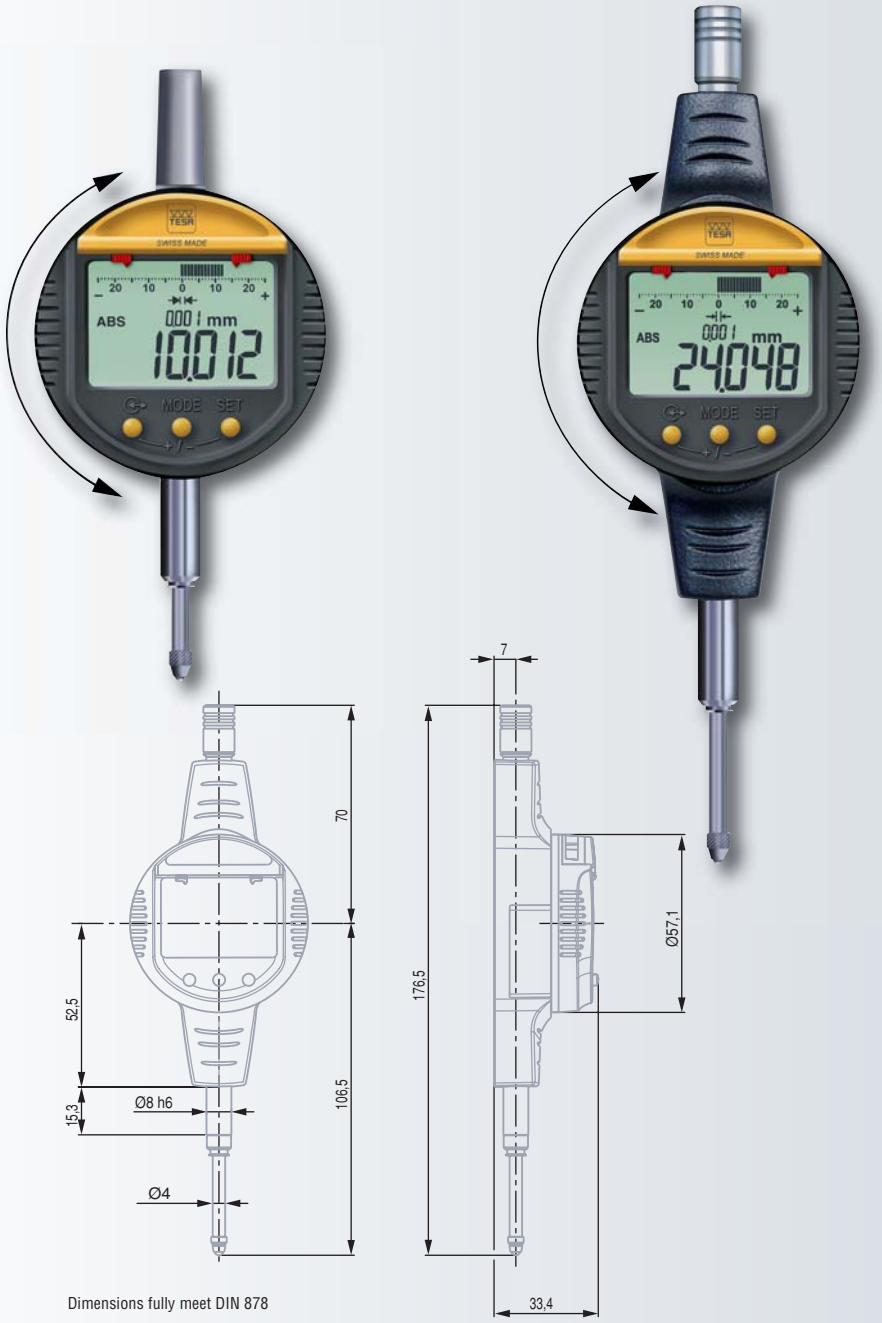


Dimensions fully meet DIN 878

TESA DIGICO 600

- Measuring modes **ABS/REL**.
- Dual LC Display.
- Display rotation through 270°. Same goes for the key functions.
- Mechanical tolerance marks.
- Symbols for both limit values.

Measuring functions and modes
ON – Auto OFF – PRESET mode – Tolerance mode – Value storage mode • Max • Min • Max-Min (TIR) – Data output – Counting sense reversal – Keypad lock – Metric/Inch units – Full RESET.



Dimensions fully meet DIN 878

NO		mm / *in*	mm / *in*	µm	µm	N	g
TESA DIGICO 600							
01930256	Digico 605 MI	12,5 / *0.5*	0,001 / *0.00005*	4	2	< 2	150
01930257	Digico 610 MI	25 / *1*	0,001 / *0.00005*	5	2	< 2	162

✓
Combined analogue and numerical display
6-decade LC display field plus minus sign
10 x 5 mm Digit size (H x L)
Resolution to 0,01 mm = ±0,25 mm
Resolution to 0,001 mm = ±0,025 mm
MI or MIE type with metric/inch conversion
Glass scale with incremental divisions, capacitive
≤ 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 year to 2 years
10°C to 40°C
–10°C to 60°C
80%
EN 50081-1
EN 50082-1
Shipping case including a lithium battery 01961000
Identification number
Inspection report with a declaration of conformity

✓

Combined analogue and numerical display

6-decade LC display field plus minus sign

10 x 5 mm Digit size (H x L)

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

MI or MIE type with metric/inch conversion

Glass scale with incremental divisions, capacitive

≤ 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 year to 2 years

10°C to 40°C

–10°C to 60°C

80%

EN 50081-1
EN 50082-1

Shipping case including a lithium battery 01961000

Identification number

Inspection report with a declaration of conformity

TESA DIGICO 705

Use in conjunction with bore gauges with 2-point contact. Allows setting of the dial gauge on the smallest setting ring value.

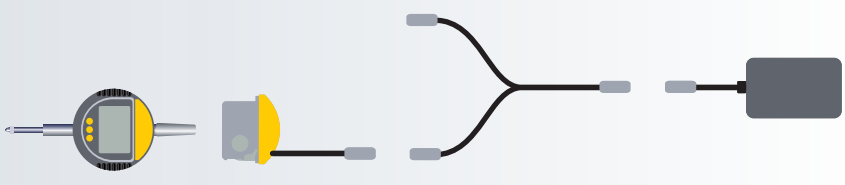
- Same functions as DIGICO 600.



№	=	mm / *in*	mm / *in*	µm	µm	N	g
TESA DIGICO 705							
01930258	Digico 705 MI	12,5 / *0.5*	0,001 / *0.00005*	4	2	< 2	150

Optional accessories available for all TESA DIGICO 200 to 700

№	=
01961000	Lithium battery, type CR2032, 3V, 190 mAh
01962002	External power supply
04761054	Mains adapter
04761055	Cable EU for mains adapter
04761056	Cable US for mains adapter
	Measuring inserts listed on page F-42
	Backs and retraction devices detailed on page F-45
	For information on connecting cables, refer to chapter A



Digico *01962002* *04761054*

TESA DIGICO 1 and 2

Both models are remarkable for their versatile functions, long measuring travel, high accuracy.

- Analogue and digital display; the latter can be displaced for easy reading in any position.
- Zero setting at any point within the measuring span.
- Data input through the keyboard.
- Counting sense reversal.
- Entry of limit values for classification through displayed symbols. Additional green, red or amber coloured background whenever the tool is connected to the mains.
- Value storage through the functions «Highest value», «Lowest value» or «Highest value minus lowest value».





№		mm	mm	in	in
TESA electronic indicators					
01930000	DIGICO 1	30	0,001 / 0,01	*1.18*	*0.00005 / 0.0005*
01930001	DIGICO 2	60	0,001 / 0,01	*3.36*	*0.00005 / 0.0005*

✓
LC display with coloured background
6 decades plus minus sign
9 x 4,5 mm digit size (H x W)
See table opposite
Metric/inch conversion
40 mm scale length
25 scale divisions
According to selected tolerances
30,4 mm (DIGICO 1) or 60,4 mm (DIGICO 2)
Incremental glass scale
Max. 1 m/s for (DIGICO 1) or max. 2 m/s for DIGICO 2
Plunger guided on a plain bearing
M2,5 mounting thread for the measuring insert.
2 µm for DIGICO 1
3 µm for DIGICO 2
1 µm
1 µm
See table on page F-9
RS232
3,6 V lithium battery or mains adapter

≈1000 h with lithium battery

0,002%/°C

10°C to 40°C

–10°C to 50°C

✓

Dial casing of regular models to 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 a suited shipping case including 1 lithium battery 01960007 plus 1 lift lever 01960005

Identification number

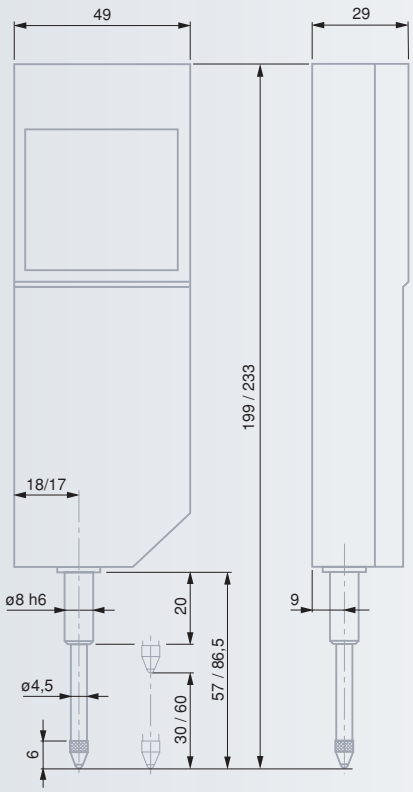
Inspection report with a declaration of conformity

✓

Measuring force

	DIGICO 1	DIGICO 2
Measuring force* close to 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

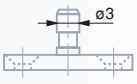
* Valid with the indicator used vertically, with downward oriented plunger, or in static measurement.



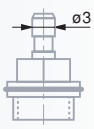
Accessories for TESA DIGICO 1 and 2

04761037	230 V mains adapter, 50 Hz, 9 V, 200 mA, 1,8 VA
04761057	110 V mains adapter
01960007	3,6 V lithium battery, LR6, AA
01960005	Lever for plunger retraction
01960009	Connector for vacuum plunger lift, suitable for DIGICO 1
01960008	Same as above, but for DIGICO 2
01960010	Connector for pneumatic plunger retraction, suitable for DIGICO 1 only
01960011	Adapter for use of the mains adapter together with the switch for triggering data transfer
04768000	Hand switch for triggering data transfer

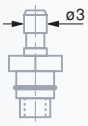
For information on connecting cables, refer to chapter A



01960008



01960009



01960010

TESA DIGICO 12

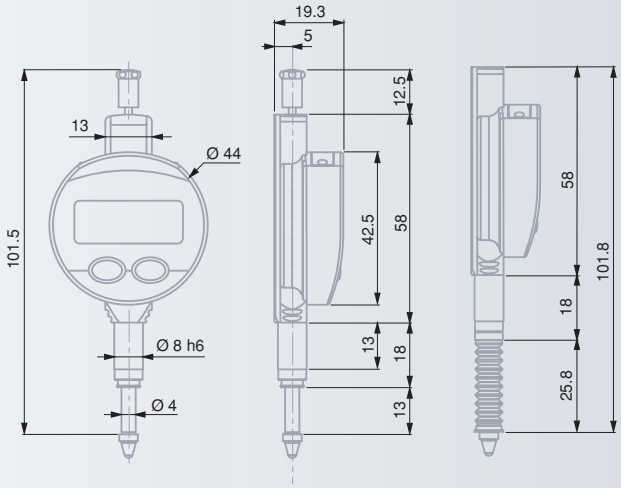
Made to measure in extreme workshop conditions – Water and coolant resistant (IP65) – 44 mm dial diameter – Lets you take advantage of the mechanics combined with digital reading.

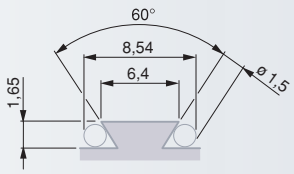




TESA DIGICO 12 – Standard

- 44 mm dial casing diameter.
- Water and coolant resistant (IP65).
- RS 232 SIMPLEX data output combined with external power supply.
- Inductive measuring system, patented.
- Choice between absolute («ABS») and relative («REL») measuring modes.
- Numerical display.
- Possible setting of PRESET value to ±130 mm.
- Inverse measuring direction.
- Direct conversion of the metric/inch units.
- Automatic shut down.





№	mm/*in*	mm	*in*	Module
IP65 indicators with electronic module protected against the penetration of liquids				
01930130	12,5/*0.5*	0,01	*0.0005*	IP65
01930132	12,5/*0.5*	0,001 / 0,01	*0.00005 / 0.0005*	IP65
IP65 indicators with mechanics and electronics protected against the penetration of liquids				
01930131	12,5/*0.5*	0,01	*0.0005*	IP65
01930133	12,5/*0.5*	0,001 / 0,01	*0.00005 / 0.0005*	IP65

- ✓
- 5-digit LC display + sign
- 6 mm digit height
- Zero-setting of display
- 20 µm
- 5 µm
- 0,5 to 0,9 N (± 0,15 N)
- Max. 2 m/s
- Number of measurements per second: 7
- Working temperature range: +5 °C to +40 °C
- 3V lithium battery, type CR 2032
- Battery life > 3500 hours
- RS232
- 70 g
- EN 61326-1
- IP65 (IEC 529)
- Shipping case including 1 lithium battery, type CR 2032 (order No. 01961000).
- Identification number
- Declaration of conformity
- Models 0,01 mm with report. Models 0,001 mm without report.

✓

LCD, 5 digits + sign

6 mm digit height

Zero-setting of display

4 µm

2 µm

0,4 to 0,75 N (±0,15 N)

Max. 2 m/s

Number of measurements per second: 9

Working temperature range: +5 °C to +40 °C

3V lithium battery, type CR 2032

Battery life > 4000 hours

RS232

70 g

EN 61326-1

IP65 (IEC 529)

1 lithium battery, type CR 2032. Order number: 01961000.

Identification number

Inspection report with a declaration of conformity

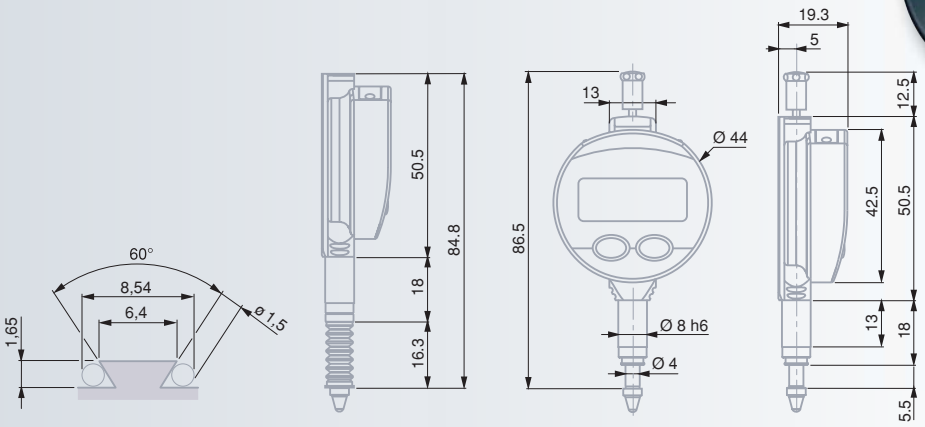
TESA DIGICO 12 – HP

- High-precision measuring system.
- Water and coolant resistant (IP65).
- Combined analogue/digital display.
- Analogue readout from ±0,025 to ±1,25 mm.
- NOR/MIN/MAX/MAX-MIN measuring modes.
- 44 mm dial casing diameter.
- RS232 data output, combined with external power supply.
- Inductive measuring system, patented.
- Zero-setting of display.
- Direct conversion of the metric/inch units.
- Automatic shut down. Can also be locked.



№	mm/*in*	mm	*in*	
IP65 indicator HP with electronic module protected against the penetration of liquids				
01930134	5/*0.210*	0,001 / 0,01	*0.00005 / 0.0005*	IP65
IP65 indicator HP with mechanics and electronics protected against the penetration of liquids				
01930135	5/*0.210*	0,001 / 0,01	*0.00005 / 0.0005*	IP65

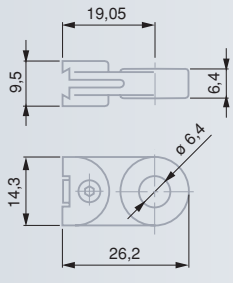




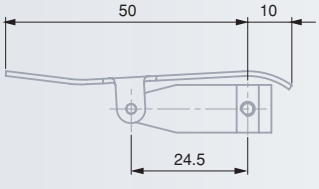
Accessories

№	
03238013	Clamping lug
01961012	Upper lift lever
01960005	Lower lift lever
04761060	RS232 connecting cable along with external power supply
01961000	3 V lithium battery, type CR 2032, 190 mAh

For information on connecting cables, refer to chapter A



03238013



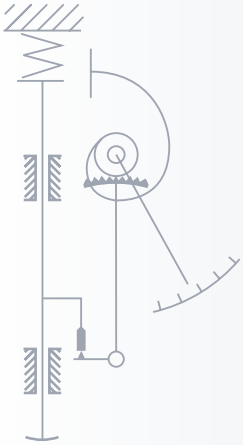
01961012

TESA CARY Microcomparators MCA-8

The absolute high precision

Specially designed for high precision measurement by comparison (0,8 µm) – Ideal for checking axial and radial runouts with a very low hysteresis (0,3 µm).

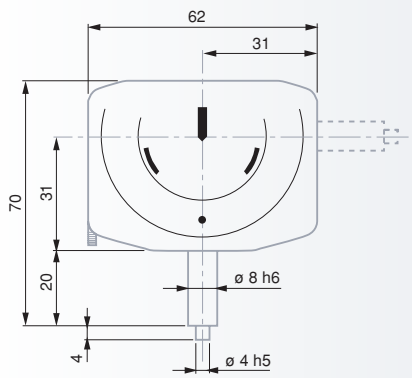
- TESA CARY precision mechanism mounted parallel to the measuring axis in compliance with the Abbe principle.
- Streamlined steel case for high rigidity.
- High precision throughout the measuring travel.
- Very low measuring force (from 150 mN).
- Non-rotating dial. Quickly set to zero by moving the pointer with just a thumb grip.
- Low sensitivity to temperature variations.





- ✓
- DIN 879
- Non-rotating dial
- Fine setting when moving the pointer
- Full-metal dial casing. Stainless steel plunger, hardened.
- Adjustable tolerance marks
- M2,5 mounting thread for the measuring insert
- Mounted insert with a 3 mm dia. steel ball tip
- 110 g
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

No			mm	mm	mN	mm	Range for zero-setting mm
Regular models							
01410423	MCA8-2-500	0,001	0,1	3	500	50 ÷ 0 ÷ 50	± 0,006
01410425	MCA8-2-150	0,001	0,1	3	150	50 ÷ 0 ÷ 50	± 0,006
01410426	MCA8-2-300	0,001	0,1	3	300	50 ÷ 0 ÷ 50	± 0,006
Lateral model							
01410424	MCA8-2-L	0,001	0,1	3	500	50 ÷ 0 ÷ 50	± 0,006
Accessory							
On request	Sealing bellow (to be specified when ordering)						



Precision

	0,001 mm
Max. perm. errors, G_{ges}	0,8 µm
Repeatability limit, r	0,3 µm
Max. hysteresis, f_u	0,3 µm

✓

DIN 879-1.
All sizes to
EN ISO 463

Ball-bearing
plunger

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

Adjustable
tolerance
marks.
Coupling thread for the
lifting cable.
M2,5 mounting thread for
the measuring insert.

≈ 1 N

Mounted insert
with a 3,175 mm
dia. steel ball tip.
Also with lifting
cable.

Suited
plastic case

Declaration
of conformity

ETALON Basic Precision Indicators

The absolute high precision

Remarkably reliable, even when constantly used for series inspection – Specially made for comparative measurements demanding a very low measurement uncertainty – Measure axial and radial runouts with the lowest hysteresis.

- Shockproof movement with gear-lever transmission and long dead travel.
- Large, non-dazzling dial for easy readout.
- No coarse reading errors as the measuring travel is limited to less than one revolution.
- Fine adjustment and protective knob to prevent unintentional pointer displacement.

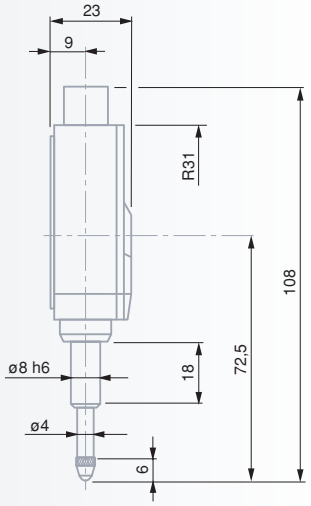




	mm	mm	mm	mm		
Regular model						
01419051	0,001	0,1	3,0	62	●	50 ÷ 0 ÷ 50
Model to IP54, protected against the penetration of liquids						
01419052	0,001	0,1	3,0	62	●	50 ÷ 0 ÷ 50

Precision

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

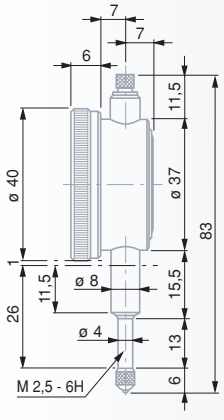


Precision Dial Gauges

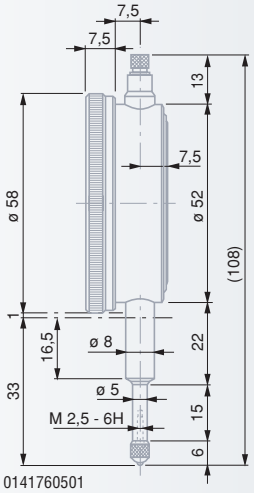
0,1 mm dial readout / 40, 58 or 80 mm dial diameter



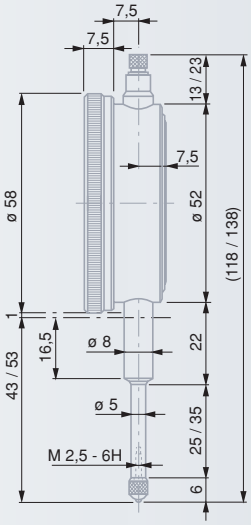
№	⌀							
	mm	mm	mm	mm		mm		N
ROCH dial gauges								
0141760500	40	0,1	10	10,5	–	10	0 ÷ 5 ÷ 10	≤1,0
0141760501	58	0,1	10	10,5	–	10	0 ÷ 5 ÷ 10	≤1,0
0141760502	58	0,1	20	20,5	–	10	0 ÷ 5 ÷ 10	≤1,0
0141760503	58	0,1	30	30,5	–	10	0 ÷ 5 ÷ 10	≤1,5
0141760513	80	0,1	30	30,5	–	10	0 ÷ 5 ÷ 10	≤2,0



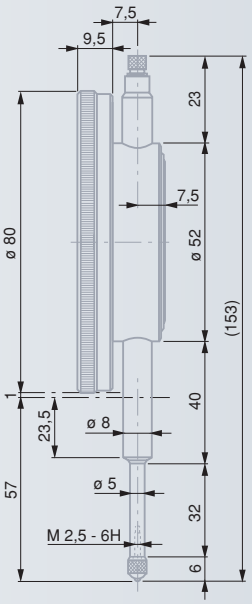
0141760500



0141760501



0141760503
Similar model:
0141760502



0141760513

Maximum permissible errors for a metrological characteristic (MPE)

	0,1 mm	10 mm
	Deviation span	40 µm
	Deviation span within the local measuring span of 1 mm	25 µm
	Total deviation span	55 µm
	Repeatability limit	15 µm
	Max. hysteresis	15 µm

✓
EN ISO 463
Factory standard
0,1 mm
1,1 mm (40 mm dia.)
1,5 mm (58 mm dia.)
2,2 mm (80 mm dia.)
Rotating dial
Full-metal dial casing. Stainless steel fixing shank and plunger, hardened .
Without shockproof mechanism
M2,5 mounting thread for the measuring insert
See table opposite
Mounted insert with a 3,175 mm dia. steel ball tip
Suited plastic case
Identification number
Declaration of conformity

✓

EN ISO 463
Factory standard

0,01 mm

2,2 mm

Rotating dial.
Regular models with or without dial lock.

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

With or without shockproof mechanism

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

3 mm dia. ball tip, already mounted.

Cardboard box

Identification number

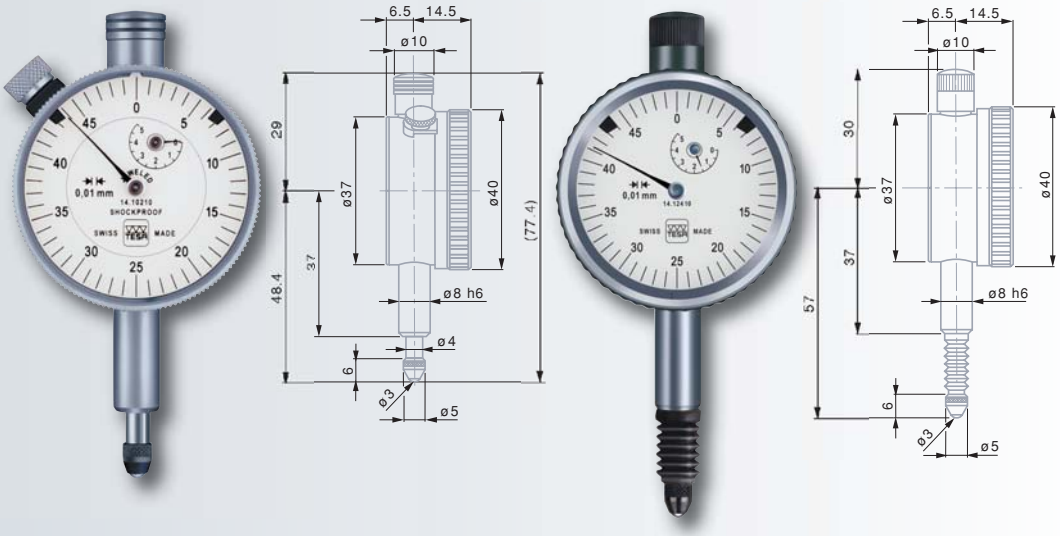
Inspection report with a declaration of conformity

Precision Dial Gauges

0,01 mm dial readout/ 40 mm dial diameter

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

- Smooth full-jewelled movement with rubies.
- Full-metal dial casing and bezel.
- Fully shockproof mechanism.
- Non-dazzling dial.
- Swiss Made.



		mm	mm	mm		mm		
TESA dial gauges								
01410210	**YR**	0,01	5	5,4	●	0,5	0 ÷ 25 ÷ 50	●
01410211	**YR**	0,01	5	5,4	●	0,5	0 ÷ 25 ÷ 0	●
01410212	**YR**	0,01	5	5,4	●	0,5	0 ÷ 25 ÷ 50	–
01412010	**YE**	0,01	5	5,4	–	0,5	0 ÷ 25 ÷ 50	–
MERCER dial gauges								
01416013	**X185-1**	0,01	5	5,4	–	0,5	0 ÷ 25 ÷ 0	●
01416014	**186-1**	0,01	5	5,4	–	0,5	0 ÷ 25 ÷ 50	●
TESA IP54 dial gauge, protected against the penetration of liquids								
01412410	**YE**	0,01	5	5,4	–	0,5	0 ÷ 25 ÷ 50	–

Permissible limits of a metrological characteristic (MPE/MPL)

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

Precision Dial Gauges

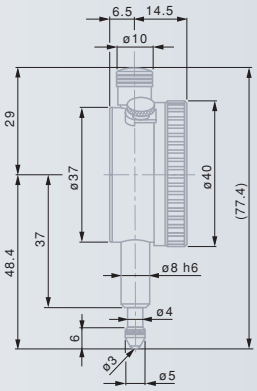
0,01 mm dial readout / 40 mm dial diameter

Remarkable for their robustness, these precision dial gauges are essential for the workshop.

- Smooth jewelled movement with rubies.
- Full-metal dial casing.
- Optimum protection against shocks.
- Swiss Made.







✓

EN ISO 463 Factory standard

0,01 mm

2,2 mm

Rotating dial

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

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

3 mm dia. ball tip, already mounted

Cardboard box

Identification number

Inspection report with a declaration of conformity

	mm	mm	mm			mm	
COMPAC dial gauge							
353	0,01	5	5,4	●	–	0,5	0 ÷ 25 ÷ 50
COMPAC IP54 dial gauge, protected against the penetration of liquids							
353E	0,01	5	5,4	●	–	0,5	0 ÷ 25 ÷ 50
COMPAC dial gauge with limited reading range							
353S	0,01	±0,2	3,3	●	–	0,5	20 ÷ 0 ÷ 20

Permissible limits of a metrological characteristic (MPE/MPL)

		± 0,2 mm	5 mm
	Deviation span	7 µm	12 µm
	Deviation span within the local measuring span 0,10 mm	5 µm	6 µm
	Total deviation span	9 µm	14 µm
	Repeatability limit	3 µm	3 µm
	Max. hysteresis	3 µm	3 µm
	Measuring force	≤ 1,4 N	≤ 1,4 N
	– Model IP54	–	≤ 2 N

Precision Dial Gauges

0,01 mm dial readout / 40 mm dial diameter

The model 0141760560 is specially advantageous whilst the other model 0141760561 is particularly robust.



✓ EN ISO 463 Factory standard

0,01 mm

2,2 mm

Rotating dial

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

With or without shockproof mechanism

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

See table opposite

Mounted insert with a 3,175 mm dia. steel ball tip

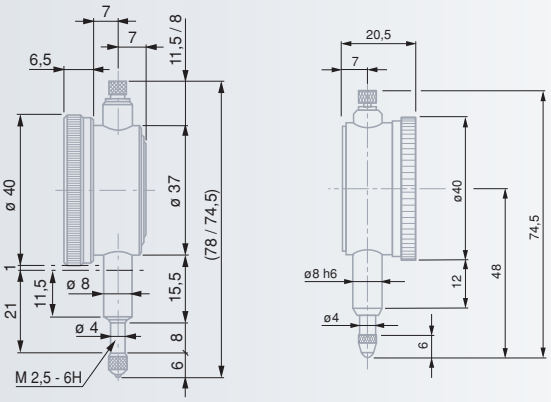
Plastic case or cardboard box

Identification number

Declaration of conformity

№	mm	mm	mm		mm		N
ROCH dial gauges							
0141760560	0,01	3	3,4	–	0,5	0 ÷ 25 ÷ 50*	≤1,4
0141760561	0,01	3	3,4	–	0,5	0 ÷ 25 ÷ 50*	≤1,4
ETALON dial gauge							
01419047	0,01	5		●	0,5	0 ÷ 25 ÷ 50	≈1

* With extra red tinted reverse numbering.



0141760561 01419047

Maximum permissible errors for a metrological characteristic (MPE)

	0,01 mm	3 mm	5 mm
	Deviation span	10 µm	12 µm
	Deviation span within the local 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	–

Precision Dial Gauges

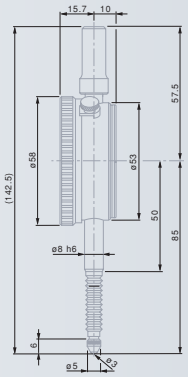
0,01 mm dial readout / 57 or 58 mm dial diameter



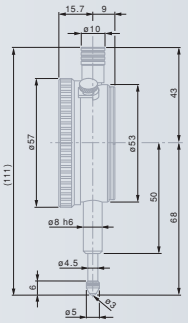
№								
		mm	mm	mm			mm	
TESA dial gauges								
01410610	**YR**	0,01	10	10,5	●	●	1	0 ÷ 50 ÷ 100
01410611	**YR**	0,01	10	10,5	●	●	1	0 ÷ 50 ÷ 0
01412310	**YE**	0,01	10	10,5	–	–	1	0 ÷ 50 ÷ 100
MERCER dial gauges								
01416020	**250-1**	0,01	10	10,5	–	●	1	0 ÷ 50 ÷ 0
01416021	**251-1**	0,01	10	10,5	–	●	1	0 ÷ 50 ÷ 100
TESA IP54 dial gauges, protected against the penetration of liquids								
01410721	**YR**	0,01	10	10,5	●	–	1	0 ÷ 50 ÷ 0
01412411	**YE**	0,01	10	10,5	–	–	1	0 ÷ 50 ÷ 100
TESA dial gauge with limited reading range								
01412211	**YE**	0,01	± 0,4	4	●	–	1,27	40 ÷ 0 ÷ 40

Permissible limits of a metrological characteristic (MPE/MPL)

		± 0,4	10 mm
	Deviation span	7 µm	15 µm
	Deviation span within the local measuring span 0,10 mm	5 µm	8 µm
	Total deviation span	9 µm	17 µm
	Repeatability limit	3 µm	3 µm
	Max. hysteresis	3 µm	3 µm
	Measuring force	≤ 1 N	≤ 1,5 N
	– Models IP54	–	≤ 2,2 N



01410721 – 01412411



01410610 – 01410611

✓ EN ISO 463 Factory standard

0,01 mm

1,5 mm

Rotating dial. Regular models with or without dial lock.

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

With or without shockproof mechanism

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

3 mm dia. ball tip, already mounted

Cardboard box

Identification number

Inspection report with a declaration of conformity

Precision Dial Gauges

0,01 mm dial readout / 58 mm dial diameter

✓

EN ISO 463
Factory standard

0,01 mm

1,5 mm

Rotating dial with or without dial lock

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

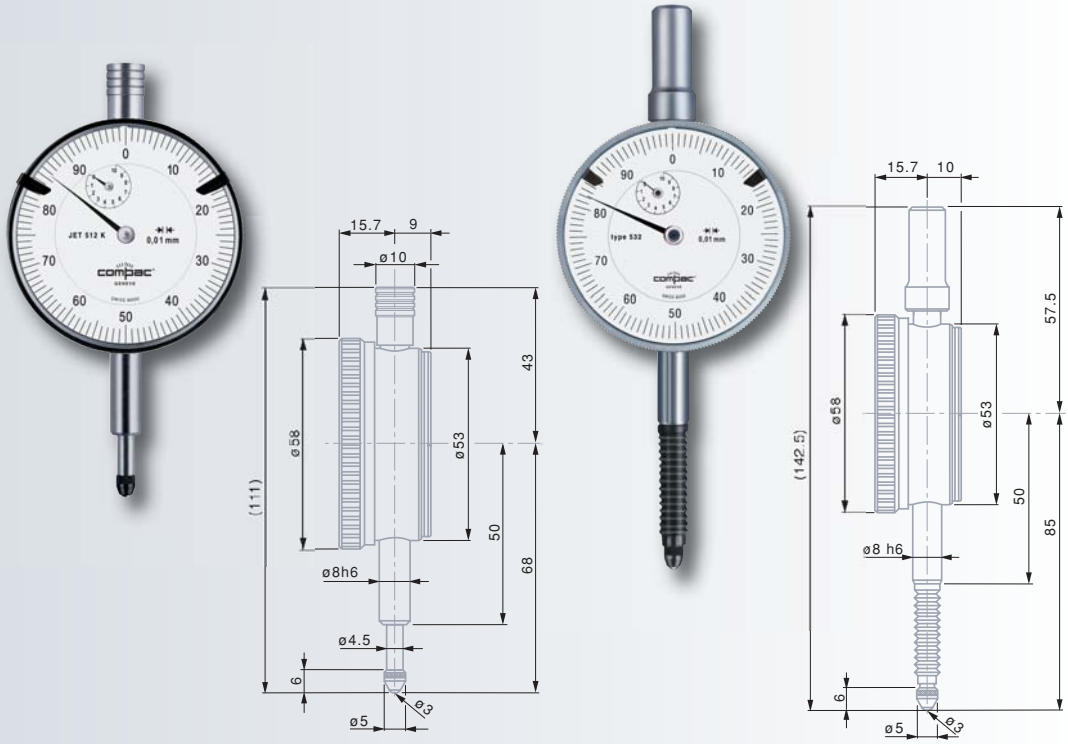
Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

3 mm dia. ball tip, already mounted.

Cardboard box

Identification number

Inspection report with a declaration of conformity



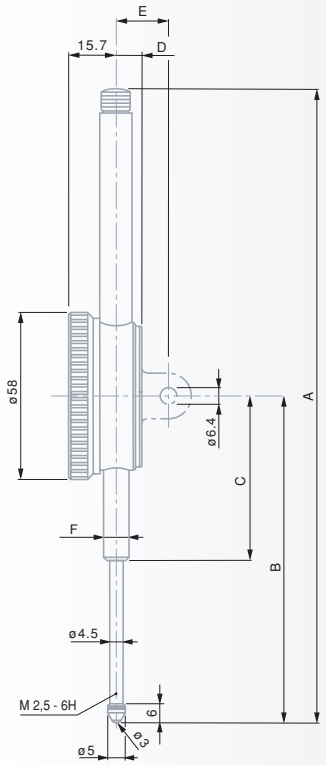
	mm	mm	mm			mm	
COMPAC dial gauges							
512K	0,01	10	10,5	–	–	1	0 ÷ 50 ÷ 100
532	0,01	10	10,5	●	–	1	0 ÷ 50 ÷ 100
COMPAC IP 54 dial gauge, protected against the penetration of liquids							
532E	0,01	10	10,5	●	–	1	0 ÷ 50 ÷ 100
COMPAC dial gauges with limited reading range							
532S	0,01	± 0,4	4	●	●	1,27	40 ÷ 0 ÷ 40
533S	0,01	± 0,5	4	●	–	1,27	50 ÷ 0 ÷ 50

Permissible limits of a metrological characteristic (MPE/MPL)

	±0,4 / ±0,5 mm	10 mm
Deviation span	7 µm	15 µm
Deviation span within the local measuring span 0,10 mm	5 µm	8 µm
Total deviation span	9 µm	17 µm
Repeatability limit	3 µm	3 µm
Max. hysteresis	3 µm	3 µm
Measuring force	≤1 N	≤1,5 N
– Model IP54	–	≤2,2 N

Long Range Precision Dial Gauges

0,01 mm dial readout / 58 mm dial diameter





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

		mm	mm	mm			mm	
COMPAC dial gauges								
712		0,01	30	30,5	●	–	1	0 ÷ 50 ÷ 100
722		0,01	50	50,5	●	–	1	0 ÷ 50 ÷ 100
732		0,01	100	100,5	●	–	1	0 ÷ 50 ÷ 100
MERCER dial gauge								
01416039	**252-1**	0,01	30	30,5	●	●	1	0 ÷ 50 ÷ 100

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

✓
EN ISO 463 Factory standard
0,01 mm
1,5 mm
Rotating dial with or without dial lock
Full-metal dial casing. Stainless steel fixing shank and plunger, hardened .
Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
3 mm dia. ball tip, already mounted.
Cardboard box
Identification number
Inspection report with a declaration of conformity

Long Range Precision Dial Gauges

0,01 mm dial readout / 58 mm dial diameter

Both models 0141760635 and 0141760636 are particularly profitable.



✓

EN ISO 463 Factory standard

0,01 mm

1,5 mm

Rotating dial

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

With or without shockproof mechanism

Adjustable tolerance marks.
Model No. 0141760640 with fine adjust mounted under the protective cap for dial reading.
M2,5 mounting thread for the measuring insert.

For accuracy, see table on page F-22

See table opposite

Mounted insert with a 3,175 mm dia. steel ball tip.
Exception:
Each model No. 0141760631 has a ruby ball tip.

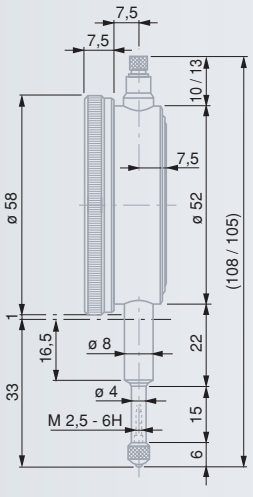
Plastic case or cardboard box

Identification number

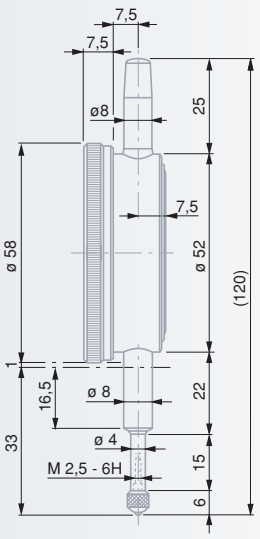
Declaration of conformity

Nº	mm	mm	mm		mm		N
ROCH dial gauges							
0141760631	0,01	10	10,5	–	1	0 ÷ 50 ÷ 100*	≤ 1,4
0141760635	0,01	10	10,5	–	1	0 ÷ 50 ÷ 100*	≤ 1,4
0141760636****	0,01	10	10,5	–	1	0 ÷ 50 ÷ 100*	≤ 1,4
0141760640	0,01	10	10,5	●	1	0 ÷ 50 ÷ 100*	≤ 1,4
0141761213***	0,01	15	15,5	●	1	0 ÷ 50 ÷ 100*	≤ 1,6
0141760651	0,01	30	30,5	–	1	0 ÷ 50 ÷ 100	≤ 1,6
0141760653	0,01	30	30,5	●	1	0 ÷ 50 ÷ 100	≤ 1,6
0141760661	0,01	50	51	–	1	0 ÷ 50 ÷ 100	≤ 2,2
0141760662**	0,01	50	51	–	1	0 ÷ 50 ÷ 100	≤ 2,2
0141760663	0,01	50	51	●	1	0 ÷ 50 ÷ 100	≤ 2,2
0141760671	0,01	80	81	–	1	0 ÷ 50 ÷ 100	≤ 3,0
ROCH IP54 dial gauge, protected against the penetration of liquids							
0141760624	0,01	10	10,5	●	1	0 ÷ 50 ÷ 100*	≤ 2

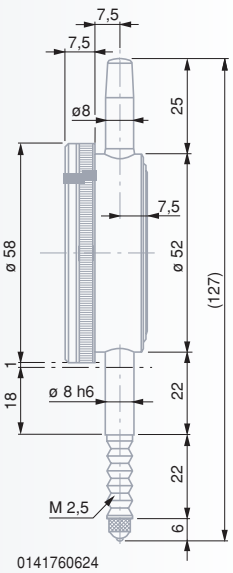
* With extra red tinted reverse numbering.
** Counterclockwise numbering.
*** 60,4 mm dial diameter.
**** With mounted central lug back.



0141760631
0141760635
0141760636

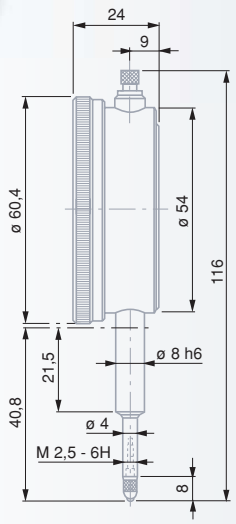


0141760640

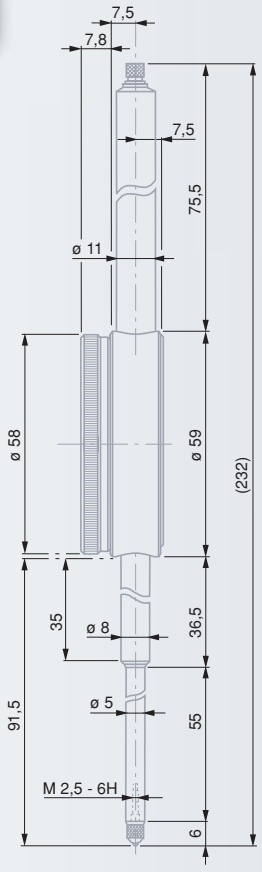


0141760624

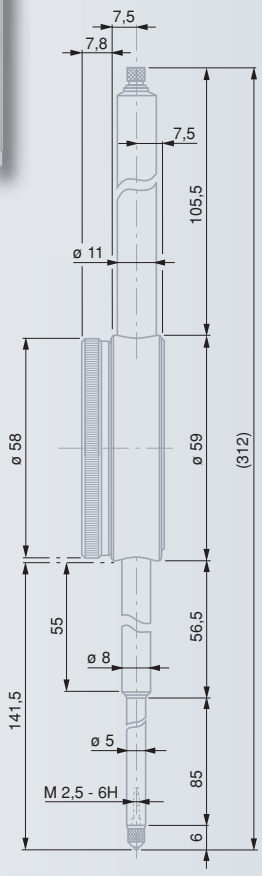




0141761213



0141760651
0141760653



0141760661 – 0141760663
0141760662 – 0141760671

✓

EN ISO 463
Factory standard

0,01 mm

1,5 mm

Rotating dial

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

With or without shockproof mechanism

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

In order to eliminate any hysteresis when measuring with the plunger moving downward, this feature has to be coupled on the measuring points, directly.

See table on the previous page F-21

Mounted insert with a 3,175 mm dia. steel ball tip.
Exception:
Each model No. 0141761213 has a ruby ball tip

Plastic case or cardboard box

Identification number

Declaration of conformity

Maximum permissible errors for a metrological characteristic (MPE)

0,01 mm	10 mm	15 mm	30 mm	50 mm	80 mm
Deviation span	15 µm	20 µm	20 µm	25 µm	30 µm
Deviation span within the local measuring span of 0,1 mm	5 µm	5 µm	5 µm	5 µm	5 µm
Repeatability limit	3 µm	3 µm	3 µm	3 µm	3 µm

Precision Dial Gauges

0,01 mm dial readout / 58 mm dial diameter

Regular and long range models

✓ EN ISO 463 Factory standard

0,01 mm

1,5 mm

Rotating dial

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

With or without shockproof mechanism

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

See table opposite

Mounted insert with a 3,175 mm dia. steel ball tip

Plastic case or cardboard box

Identification number

Declaration of conformity

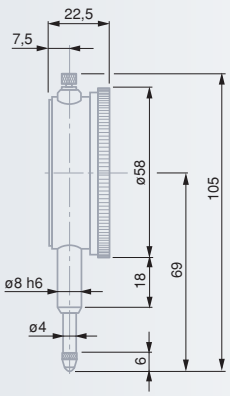


Nº		mm	mm	mm		mm		N
ETALON dial gauges								
01419048	0,01	10	58	–	1	0 ÷ 50 ÷ 100	≈1
01419049	0,01	30	58	●	1	0 ÷ 50 ÷ 100	1,5 ÷ 2
01419050	0,01	50	58	●	1	0 ÷ 50 ÷ 100	1,5 ÷ 2
Plunger retraction device								
01462003	Lift lever							

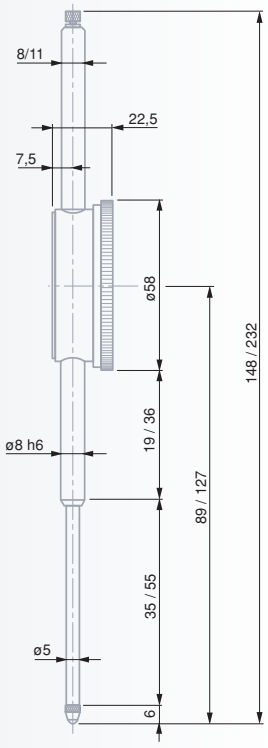
Backs with permanent magnet or central lug, see page F-45.

Maximum permissible errors for a metrological characteristic (MPE)

		mm	10	30	50
	Deviation span	µm	15	20	25
	Deviation span within the local measuring span of 0,1 mm	µm	8	9	12
	Repeatability limit	µm	3	3	3



01419048

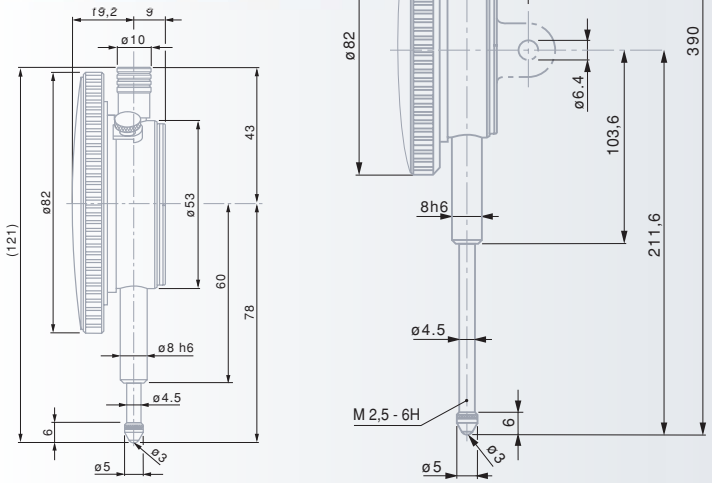


01419049 - 01419050

Precision Dial Gauges

0,01 mm dial readout / 82 mm dial diameter







№		mm	mm	mm		mm	
TESA dial gauge with dial lock							
01410910	**YR**	0,01	10	10,5	●	0,1	0 ÷ 50 ÷ 100
TESA dial gauge with a long range							
01412014	**YE**	0,01	100	100,5	●	1	0 ÷ 50 ÷ 100

Permissible limits of a metrological characteristic (MPE/MPL)

	10 mm	100 mm
Deviation span	15 µm	30 µm
Deviation span within the local measuring span 0,10 mm	8 µm	–
Total deviation span	17 µm	35 µm
Repeatability limit	3 µm	3 µm
Max. hysteresis	3 µm	8 µm
Measuring force	≤ 1,4 N	≤ 3,2 N

- ✓
- EN ISO 463 Factory standard
- 0,01 mm
- 2,3 mm
- Rotating dial with or without dial lock
- Full-metal dial casing. Stainless steel fixing shank and plunger, hardened.
- High performance shock proof system in both directions
- Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
- 3 mm dia. ball tip, already mounted
- Cardboard box
- Identification number
- Inspection report with a declaration of conformity

Precision Dial Gauges

0,01 mm dial readout / 82 mm dial diameter

✓

EN ISO 463
Factory standard

0,01 mm

2,2 mm

Rotating dial with or without dial lock

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

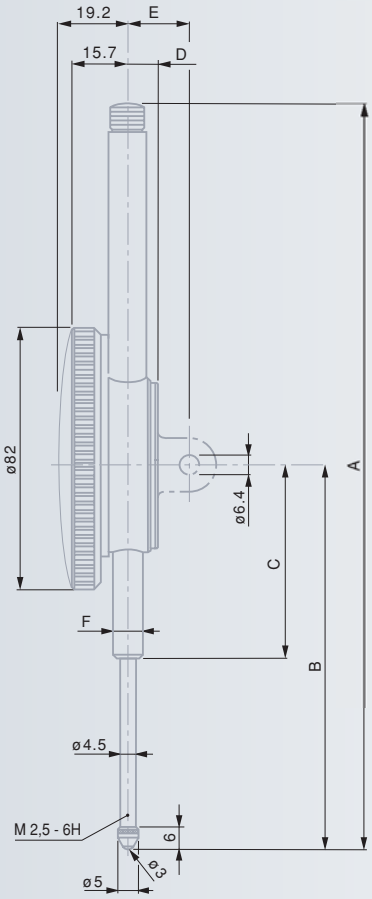
M2,5 thread for the measuring insert

3 mm dia. ball tip, already mounted.

Cardboard box

Identification number

Inspection report with a declaration of conformity





mm	30 mm	50 mm	100 mm
A	158	228	390
B	98	117,2	211,6
C	60	60	103,6
D	10	9	9
E	20	19	19
F	Ø 8h6	Ø 8h6	Ø 8h6

	mm	mm	mm			mm	
COMPAC dial gauges with a long range							
712G	0,01	30	30,5	●	–	1	0 ÷ 50 ÷ 100
722G	0,01	50	50,5	●	–	1	0 ÷ 50 ÷ 100
732G	0,01	100	100,5	●	–	1	0 ÷ 50 ÷ 100
732GB	0,01	100	100,5	●	●	1	0 ÷ 50 ÷ 100

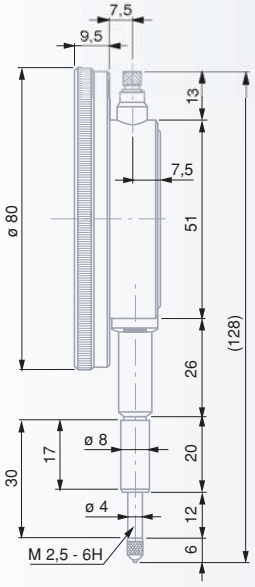
Permissible limits of a metrological characteristic (MPE/MPL)

	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

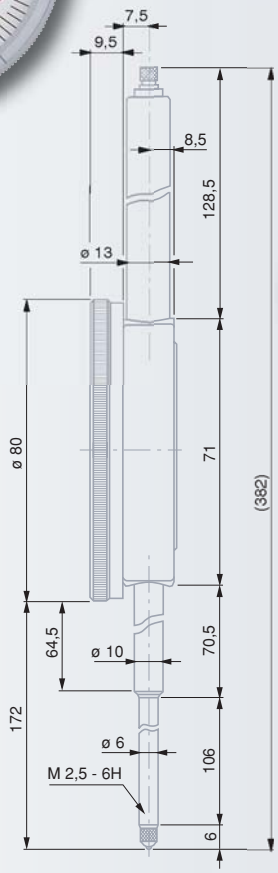
Precision Dial Gauges

0,01 mm dial readout / 80 mm dial diameter





0141761221



0141761224



	mm	mm	mm		mm		N
ROCH dial gauges							
0141761221	0,01	10	10,4	–	1	0 ÷ 50 ÷ 100*	≤1,4
0141761224	0,01	100	100,5	–	1	0 ÷ 50 ÷ 100	≤3,5

* With extra red tinted reverse numbering.

Maximum permissible errors for a metrological characteristic (MPE)

	10 mm	100 mm
Deviation span	15 µm	35 µm
Deviation span within the local measuring span of 0,1 mm	5 µm	8 µm
Total deviation span	19 µm	–
Repeatability limit	3 µm	8 µm
Max. hysteresis	3 µm	–

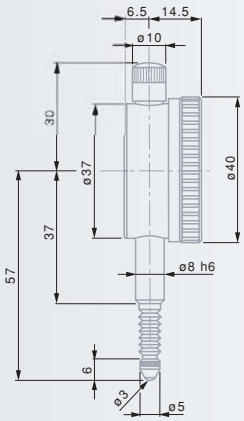
✓
EN ISO 463 Factory standard
0,01 mm
2,2 mm
Rotating dial
Full-metal dial casing. Stainless steel fixing shank and plunger, hardened .
With or without shockproof mechanism
Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
See in the table opposite
Mounted insert with a 3,175 mm dia. steel ball tip
Cardboard box
Identification number
Declaration of conformity

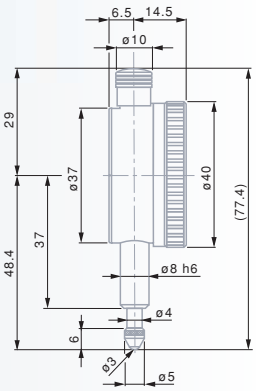
Precision Dial Gauges

0,002 mm dial readout / 40 mm dial diameter

- ✓
- EN ISO 463 Factory standard
- 0,002 mm
- 1,1 mm
- Rotating dial
- Full-metal dial casing. Stainless steel fixing shank and plunger, hardened .
- Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
- 3 mm dia. ball tip, already mounted
- Cardboard box
- Identification number
- Inspection report with a declaration of conformity







		mm	mm	mm			mm	
COMPAC dial gauge								
355		0,002	3	3,3	●	–	0,2	0 ÷ 10 ÷ 20
COMPAC dial gauge IP54, protected against the penetration of liquids								
355E		0,002	3	3,3	●	–	0,2	0 ÷ 10 ÷ 20
COMPAC dial gauge with limited reading range								
365S		0,002	±0,08	1,5	●	–	0,2	8 ÷ 0 ÷ 8

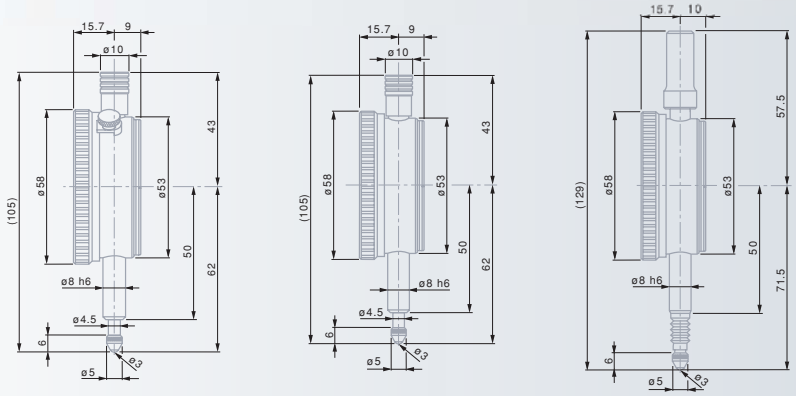
Permissible limits of a metrological characteristic (MPE/MPL)

		±0,08 mm	3 mm
	Deviation span	2 µm	10 µm
	Deviation span within the 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	≤ 1,4 N	≤ 1,4 N
	– Model IP54	–	≤ 1,7 N

Precision Dial Gauges

0,002 mm dial readout / 58 mm dial diameter





✓ EN ISO 463 Factory standard

0,002 mm

1,5 mm

Rotating dial with or without dial lock

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

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

3 mm dia. ball tip, already mounted.

Cardboard box

Identification number

Inspection report with a declaration of conformity

No		mm	mm	mm			mm	
MERCER dial gauges								
01416034	**253-1**	0,002	5	5,3	–	●	0,2	0 ÷ 10 ÷ 0
01416035	**254-1**	0,002	5	5,3	–	●	0,2	0 ÷ 10 ÷ 20
COMPAC dial gauge								
555		0,002	5	5,3	●	–	0,2	0 ÷ 10 ÷ 20
COMPAC dial gauge IP54, protected against the penetration of liquids								
555E		0,002	5	5,3	●	–	0,2	0 ÷ 10 ÷ 20
COMPAC dial gauge with limited reading range								
565S		0,002	±0,08	3,3	●	–	0,2	8 ÷ 0 ÷ 8

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

Precision Dial Gauges

0,001 mm dial readout / 40 mm dial diameter

✓ EN ISO 463 Factory standard

0,001 mm

1,1 mm

Rotating dial, With or without dial lock.

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

High performance shock proof system in both directions

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

3 mm dia. ball tip, already mounted.

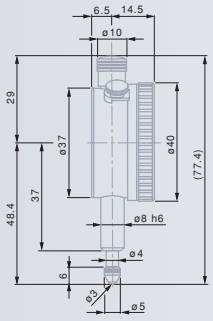
Cardboard box

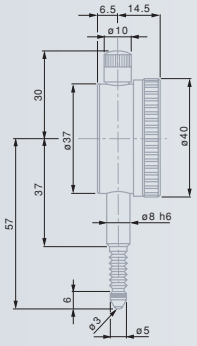
Identification number

Inspection report with a declaration of conformity



№								
		mm	mm	mm			mm	
TESA dial gauges								
01410010	**YR**	0,001	1	1,5	●	●	0,1	0 ÷ 50 ÷ 100
01410011	**YR**	0,001	1	1,5	●	●	0,1	0 ÷ 50 ÷ 0
01412510	**YE**	0,001	1	1,5	●	–	0,1	0 ÷ 50 ÷ 100
TESA dial gauges IP54, protected against the penetration of liquids								
01410120	**YR**	0,001	1	1,5	●	–	0,1	0 ÷ 50 ÷ 100
01410121	**YR**	0,001	1	1,5	●	–	0,1	0 ÷ 50 ÷ 0
01412710	**YE**	0,001	1	1,5	●	–	0,1	0 ÷ 50 ÷ 100
COMPAC dial gauge								
367		0,001	1	1,5	●	–	0,1	0 ÷ 5 ÷ 10
COMPAC dial gauge IP54, protected against the penetration of liquids								
367E		0,001	1	1,5	●	–	0,1	0 ÷ 5 ÷ 10
COMPAC dial gauge with limited reading range								
367S		0,001	±0,04	1,5	●	–	0,1	4 ÷ 0 ÷ 4



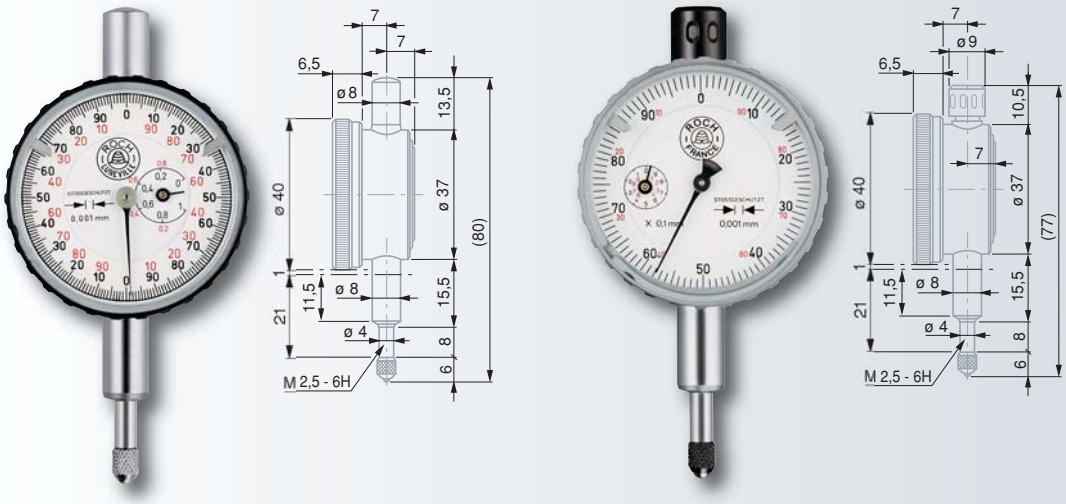


Permissible limits of a metrological characteristic (MPE/MPL)

		±0,04 mm	1 mm
	Deviation span	2 µm	4 µm
	Deviation span within the local measuring span 0,10 mm	2 µm	4 µm
	Total deviation span	4 µm	5 µm
	Repeatability limit	1 µm	1 µm
	Max. hysteresis	1 µm	1 µm
	Measuring force	≤ 1,4 N	≤ 1,7 N
	– Models IP54	–	≤ 2 N

Precision Dial Gauges

0,001 mm dial reading / 40 mm dial diameter



	mm	mm	mm		mm		N
ROCH dial gauges							
0141761261	0,001	1	1,1	●	0,2	0 ÷ 100/0 ÷ 100*	≤ 1,5
0141761262	0,001	1	1,1	●	0,1	0 ÷ 50 ÷ 100*	≤ 1,2

* With extra red tinted reverse numbering.

Maximum permissible errors for a metrological characteristic (MPE)

	1 mm
0,001 mm	
Deviation span	5 µm
Deviation span within the local measuring span of 0,01 mm	3 µm
Total deviation span	7 µm
Repeatability limit	3 µm
Max. hysteresis max.	3 µm

- ✓
- EN ISO 463 Factory standard
- 0,001 mm
- 1,1 mm (0141761261) 2,2 mm (0141761262)
- Rotating dial
- Full-metal dial casing. Stainless steel fixing shank and plunger, hardened .
- With shockproof mechanism
- Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
- See table opposite
- Mounted insert with a 3,175 mm dia. steel ball tip
- Suited plastic case
- Identification number
- Declaration of conformity

Precision Dial Gauges

0,001 mm dial readout / 58 mm dial diameter

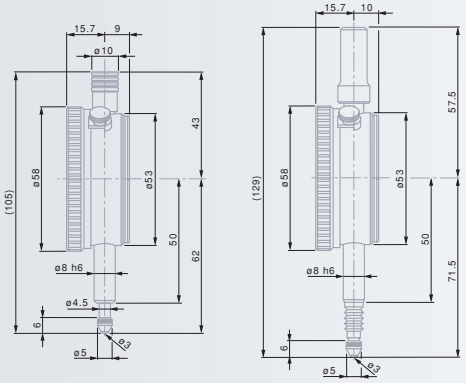


- ✓
- EN ISO 463 Factory standard
- 0,001 mm
- 1,5 mm
- Full-metal dial casing. Stainless steel fixing shank and plunger, hardened .
- High performance shockproof system in both directions
- Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
- 3 mm dia. ball tip, already mounted
- Cardboard box
- Identification number
- Inspection report with a declaration of conformity

№		mm	mm	mm			mm	
TESA dial gauges								
01412511	**YE**	0,001	1	1,5	●	–	0,1	0 ÷ 50 ÷ 100
01410410	**YR**	0,001	1	3,3	●	–	0,1	0 ÷ 50 ÷ 100
01410411	**YR**	0,001	1	3,3	●	–	0,1	0 ÷ 50 ÷ 0
01412611	**YE**	0,001	5	5,3	●	–	0,2	0 ÷ 100 ÷ 200
COMPAC dial gauges IP54, protected against the penetration of liquids								
01412711	**YE**	0,001	1	1,5	●	–	0,1	0 ÷ 50 ÷ 100
01410520	**YR**	0,001	1	3,3	●	–	0,1	0 ÷ 50 ÷ 100

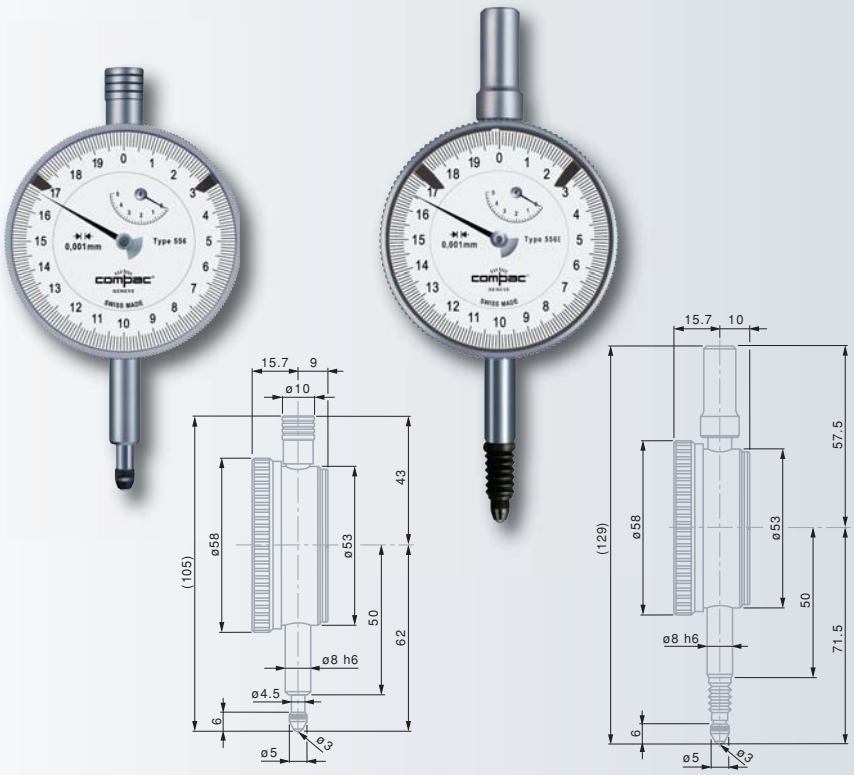
Permissible limits of a metrological characteristic (MPE/MPL)

	1 mm	5 mm
Deviation span	4 µm	12 µm
Deviation span within the 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	≤ 1,7 N	≤ 1,5 N
– Models IP54	–	≤ 1,7 N



Precision Dial Gauges

0,001 mm dial readout / 58 mm dial diameter



- ✓
- EN ISO 463 Factory standard
- 0,001 mm
- 1,5 mm
- Rotating dial
- Full-metal dial casing. Stainless steel fixing shank and plunger, hardened.
- Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
- 3 mm dia. ball tip, already mounted.
- Cardboard box
- Identification number
- Inspection report with a declaration of conformity

	mm	mm	mm			mm	
COMPAC dial gauges							
556	0,001	5	5,3	●	–	0,2	0 ÷ 10 ÷ 20
567	0,001	1	3,3	●	–	0,1	0 ÷ 5 ÷ 10
COMPAC dial gauges IP54, protected against the penetration of liquids							
556E	0,001	5	5,3	●	–	0,2	0 ÷ 10 ÷ 20
567E	0,001	1	3,3	●	–	0,1	0 ÷ 5 ÷ 10

Permissible limits of a metrological characteristic (MPE/MPL)

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

Precision Dial Gauges

0,001 mm dial readout / 58 mm dial diameter



EN ISO 463
Factory standard

0,001 mm

0,8 mm (No. 0141761281, 0141761282 and 0141761283)
1,5 mm (No. 0141761284)

Rotating dial

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

With or without shockproof mechanism

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

For accuracy, see the table on page F-30

See table opposite

Mounted insert with a 3,175 mm dia. steel ball tip

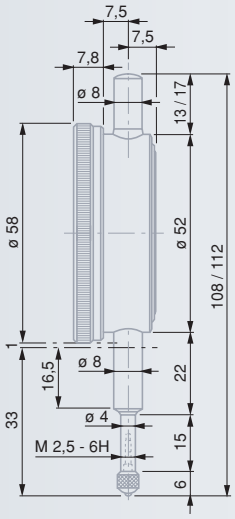
Suited plastic case

Identification number

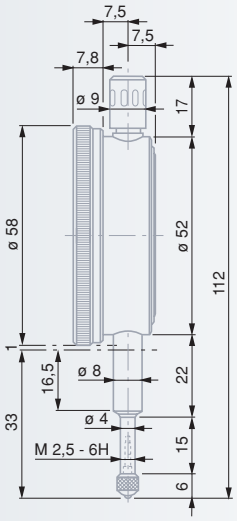
Declaration of conformity

No	⌀							
	mm	mm	mm	mm		mm		N
ROCH dial gauges								
0141761282	58	0,001	1	1,1	–	0,2	0 ÷ 100/0 ÷ 100*	≤ 1,5
0141761283	58	0,001	1	1,1	●	0,2	0 ÷ 100/0 ÷ 100*	≤ 1,5
0141761284	58	0,001	1	1,1	●	0,1	0 ÷ 50 ÷ 100*	≤ 1,5
ROCH dial gauge IP54, protected against the penetration of liquids								
0141761281	58	0,001	1	1,1	●	0,2	0 ÷ 100/0 ÷ 100*	≤ 2,0

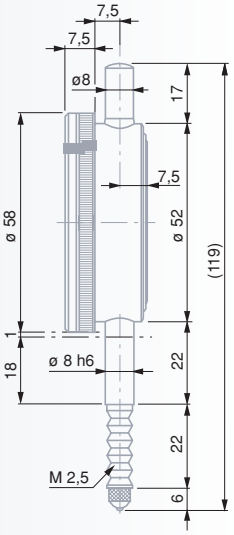
* With extra red tinted reverse numbering.



0141761282
0141761283



0141761284



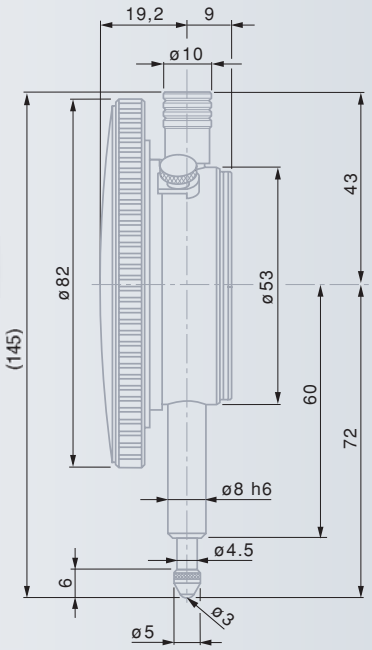
0141761281

Precision Dial Gauges

0,001 mm dial readout / 82 mm dial diameter







✓ EN ISO 463 Factory standard

0,001 mm

2,3 mm

Rotating dial. With or without dial lock.

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

High performance shockproof system in both directions

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

3 mm dia. ball tip, already mounted

Cardboard box

Identification number

Inspection report with a declaration of conformity

NO		mm	mm	mm			mm	
TESA dial gauges								
01410810	**YR**	0,001	1	3,3	●	●	0,1	0 ÷ 50 ÷ 100
01410811	**YR**	0,001	1	3,3	●	●	0,1	0 ÷ 50 ÷ 0
COMPAC dial gauge								
556G		0,001	5	5,3	●	–	0,2	0 ÷ 10 ÷ 20

Permissible limits of a metrological characteristic (MPE/MPL)

	1 mm	5 mm
Deviation span	4 µm	12 µm
Deviation span within the 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	≤ 1,7 N	≤ 1,5 N

Precision Dial Gauges

0.001 in dial readout / 40 or 58 mm dial diameter

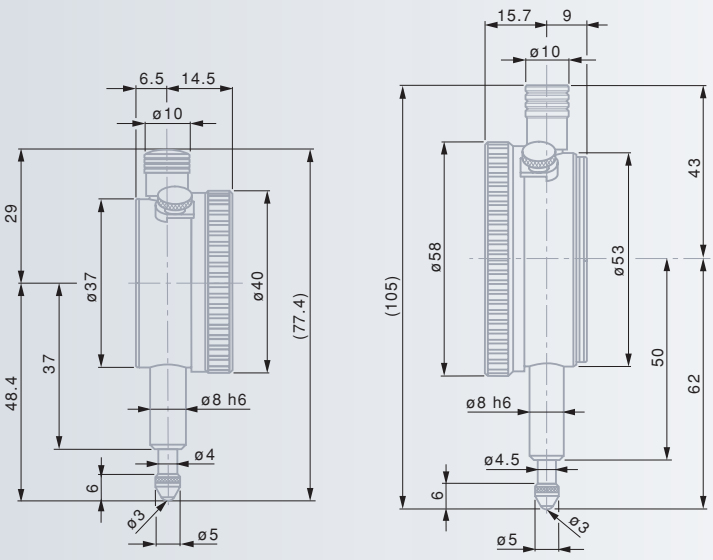


- ✓
- Factory standard
- 0.001 in
- 2,2 mm
- Rotating dial with dial lock
- Full-metal dial casing. Stainless steel fixing shank and plunger, hardened.
- Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
- Mounted insert with a 3 mm dia. steel ball tip
- Cardboard box
- Identification number
- Inspection report with a declaration of conformity

Nº	=	⌀ mm	in	in	in		●	in	
MERCER dial gauges									
01426010	***181-1***	*40*	*0.001*	*0.200*	*0.212*	–	●	*0.1*	*0 ÷ 50 ÷ 0*
01426011	***182-1***	*40*	*0.001*	*0.200*	*0.212*	–	●	*0.1*	*0 ÷ 50 ÷ 100*
01426026	***210-1***	*58*	*0.001*	*0.400*	*0.420*	–	●	*0.1*	*0 ÷ 50 ÷ 0*
01426027	***211-1***	*58*	*0.001*	*0.400*	*0.420*	–	●	*0.1*	*0 ÷ 50 ÷ 100*
01426031	***216-1***	*58*	*0.001*	*1*	*1.2*	●	●	*0.1*	*0 ÷ 50 ÷ 100*

Permissible limits of a metrological characteristic (MPE/MPL)

	0.2 in	0.4 in	1 in
Deviation span	*0.0005 in*	*0.0006 in*	*0.0008 in*
Total deviation span	*0.0006 in*	*0.0007 in*	*0.001 in*
Repeatability limit	*0.00015*	*0.0002*	*0.00015*
Max. hysteresis	*0.00015 in*	*0.0002 in*	*0.0002 in*
Measuring force	*≤ 1,4 N*	*≤ 1,4 N*	*≤ 2,2 N*



Precision Dial Gauges

0.0005 in dial readout / 40 or 58 mm dial diameter



✓ Factory standard

0.0005 in

3,1 mm

Rotating dial with or without dial lock

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

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.

Mounted insert with a 3 mm dia. steel ball tip

Cardboard box

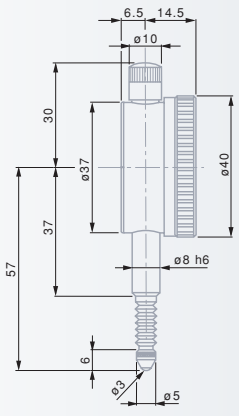
Identification number

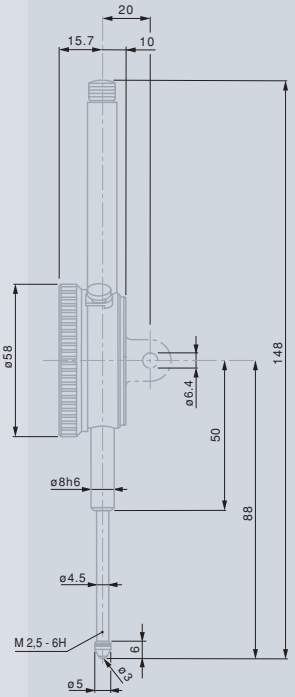
Inspection report with a declaration of conformity

№	=	Ø							
		mm	in	in	in			in	
MERCER dial gauges									
01426012	***183-1***	40	*0.0005*	*0.200*	*0.212*	●	●	*0.05*	*0 ÷ 25 ÷ 0*
01426013	***184-1***	40	*0.0005*	*0.200*	*0.212*	●	●	*0.05*	*0 ÷ 25 ÷ 50*
01426020	***212-1***	58	*0.0005*	*0.400*	*0.420*	–	●	*0.05*	*0 ÷ 25 ÷ 0*
01426021	***213-1***	58	*0.0005*	*0.400*	*0.420*	–	●	*0.05*	*0 ÷ 25 ÷ 50*
01426032	***217-1***	58	*0.0005*	*1*	*1.2*	●	●	*0.05*	*0 ÷ 25 ÷ 50*
COMPAC dial gauge									
354A		40	*0.0005*	*0.200*	*0.212*	●	–	*0.02*	*0 ÷ 10 ÷ 20*
COMPAC dial gauge IP54, protected against the penetration of liquids									
354AE		40	*0.0005*	*0.200*	*0.212*	●	–	*0.02*	*0 ÷ 10 ÷ 20*

Permissible limits of a metrological characteristic (MPE/MPL)

		0.2 in	0.4 in	1 in
	Deviation span	*0.0005 in*	*0.0006 in*	*0.0008 in*
	Total deviation span	*0.0006 in*	*0.0007 in*	*0.001 in*
	Repeatability limit	*0.00015 in*	*0.0002 in*	*0.0015 in*
	Max. hysteresis	*0.00015 in*	*0.0002 in*	*0.0002 in*
	Measuring force – Model IP54	≤ 1,4 N ≤ 1,7 N	≤ 1,4 N –	≤ 2,2 N –





Precision Dial Gauges

0.0001 in dial readout / 40 or 58 mm dial diameter

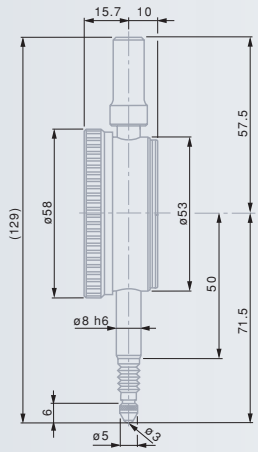
- ✓
- Factory standard
- 0.0001 in
- 1,1 mm
- Rotating dial with or without dial lock
- Full-metal dial casing. Stainless steel fixing shank and plunger, hardened.
- Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
- Mounted insert with a 3 mm dia. steel ball tip
- Cardboard box
- Identification number
- Inspection report with a declaration of conformity



№		mm	in	in	in			in	
COMPAC dial gauge IP54, protected against the penetration of liquids									
355AE		*40*	*0.0001*	*0.120*	*0.130*	●	–	*0.01*	*0 ÷ 5 ÷ 10*
MERCER dial gauges									
01426028	***240-1***	*58*	*0.0001*	*0.200*	*0.210*	–	●	*0.01*	*0 ÷ 50 ÷ 0*
01426029	***241-1***	*58*	*0.0001*	*0.200*	*0.210*	–	●	*0.01*	*0 ÷ 50 ÷ 100*

Maximum permissible errors for a metrological characteristic (MPE)

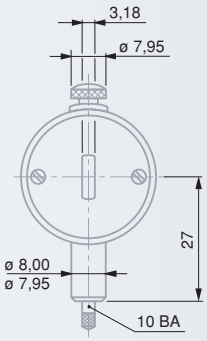
		0.12 in	0.2 in
	Deviation span	*0.0004*	*0.0005*
	Total deviation span	*0.0005*	*0.00055*
	Repeatability limit	*0.00006*	*0.00006*
	Max. hysteresis	*0.00008*	*0.00008*
	Measuring force	*≤ 2 N*	*≤ 2.2 N*

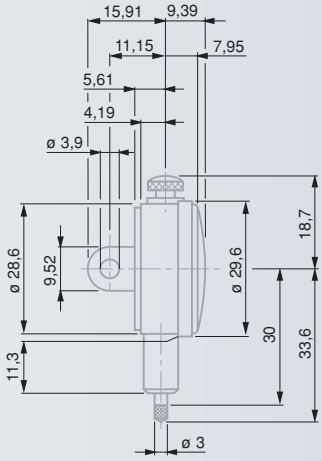


Small Dial Gauges

MERCER Series 70, 1⅛ in or 29 mm dial diameter







Models to 0.001 or 0.0001 in

№		in	in	in		in		N
Standard models								
01426050	*71*	*0.001*	*0.04*	*0.05*	*–*	*0.04*	*0 ÷ 20 ÷ 0*	*≤ 1,5*
01426051	*73*	*0.0001*	*0.01*	*0.05*	*–*	*0.01*	*0 ÷ 5 ÷ 0*	*≤ 1,5*

Models to 0,01 or 0,002 mm

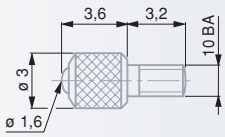
№		mm	mm	mm		mm		N
Standard models								
01416050	72	0,01	1	1,2	–	1	0 ÷ 50 ÷ 0	≤ 1,5
01416051	74	0,002	0,2	1,2	–	0,2	0 ÷ 10 ÷ 0	≤ 1,5

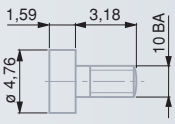
Permissible limits of a metrological characteristic (MPE/MPL)

	0.001 in	*0.0001 in*	0,01 mm	0,002 mm
Deviation span	*0.0005 in*	*0.0005 in*	10 µm	6 µm
Total deviation span	*0.0008 in*	*0.0007 in*	13 µm	9 µm
Repeatability limit	*0.0003 in*	*0.0002 in*	3 µm	2 µm
Max. hysteresis	*0.0003 in*	*0.0002 in*	3 µm	3 µm

Accessories for MERCER dial gauges, series 70

10BA coupling thread





Standard insert with spherical measuring faces.

№		mm
03560072	Steel	1,6
03560073	Carbide	1,6

Measuring insert with a flat measuring face.

№		mm
03560074	Steel	4,76

✓ Factory standard or EN ISO 463 for metric models

See table opposite

2,25 mm or 0,9 mm

Rotating dial

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

Without shockproof mechanism

Back with central lug. Measuring insert with a 10BA coupling thread.

See in the table opposite

Mounted insert with a 3 mm dia. steel ball tip

Cardboard box

Identification number

Inspection report with a declaration of conformity

Dial Gauges with Back Mounted Plunger

0,01 or 0,002 mm dial readout / 40 mm dial diameter

✓

EN ISO 463. Factory standard.

Rotating dial

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

Shockproof system protecting the movement

Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
Fastening sleeve with a 8h6 or 25h6 stem diameter.

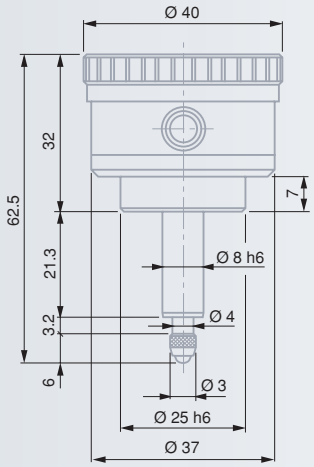
Mounted insert with a 3 mm ball tip dia.

Cardboard box

Serial number

Inspection report with a declaration of conformity





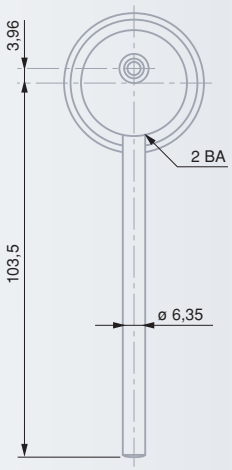
	mm	mm	mm	mm		µm	µm	µm	N
COMPAC dial gauges									
CP 352	0,01	3	3,2	1	0 ÷ 50 ÷ 100	14	3	3	0,9
CP 353	0,01	3	3,2	0,5	0 ÷ 25 ÷ 50	14	3	3	0,9
CP 355	0,002	3	3,2	0,2	0 ÷ 10 ÷ 20	14	2	2,5	0,9
COMPAC dial gauges with a limited reading range									
CP 352S	0,01	±0,4	3,2	(1)	40 ÷ 0 ÷ 40	9	3	3	0,9
CP 355S	0,002	±0,08	3,2	(0,2)	8 ÷ 0 ÷ 8	9	2	2,5	0,9

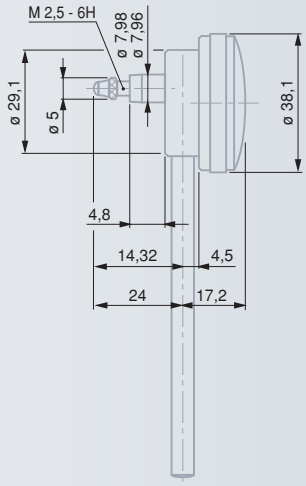
S: Models with a restricted reading range.
Since the pointer travels less than one revolution, all reading errors due to the revolution counter are eliminated.

Dial Gauges with Back Mounted Plunger

MERCER Serie 90, 38 mm dial diameter







- Factory standard or EN ISO 463 for metric models
- 0.001 in and 0,01 mm
- 2,4 mm or 1,2 mm
- Rotating dial
- Full-metal dial casing. Stainless steel fixing shank and plunger, hardened.
- Without shockproof mechanism
- Measuring insert with a M2,5 thread. Also with a 6,35 mm dia. holding rod that can be unscrewed.
- See table opposite
- Mounted insert with a 3 mm dia. steel ball tip
- Cardboard box
- Identification number
- Inspection report with a declaration of conformity

Models to 0,01 mm

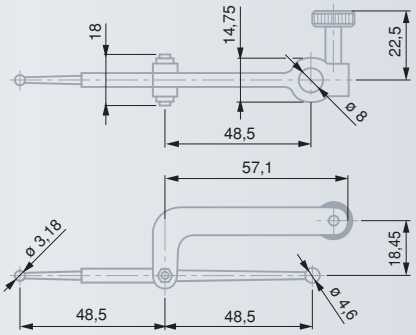
N°		mm	mm	mm		mm		N
01416060	**93**	0,01	1	3,5	–	1	0 ÷ 50 ÷ 0	≤1,5
01416061	**94**	0,01	1	3,5	–	1	0 ÷ 50 ÷ 100	≤1,5

Models to 0.001 in

N°		*in*	*in*	*in*		*in*		*N*
01426060	***91***	*0.001*	*0.05*	*0.14*	–	*0.05*	*0 ÷ 25 ÷ 0*	*≤1,5*
01426061	***92***	*0.001*	*0.05*	*0.14*	–	*0.05*	*0 ÷ 25 ÷ 50*	*≤1,5*

Maximum permissible errors for a metrological characteristic (MPE)

	0,01 mm	*0.001 in*
Deviation span	25 µm	*0.0010 in*
Total deviation span	40 µm	*0.0015 in*
Repeatability limit	12 µm	*0.0005 in*
Max. hysteresis	12 µm	*0.0005 in*



Accessories for MERCER dial gauges, series 90

Swivelling arm

N°	Amplification
03560078	1:1

Dial Gauges with Back Mounted Plunger

0,01 mm dial readout / 40 or 58 mm dial diameter

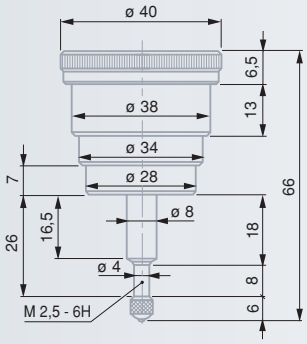
✓
EN ISO 463
Factory standard
0,01 mm
2,2 mm (Ø 40)
1,5 mm (Ø 58)
Rotating dial
Full-metal dial casing. Stainless steel fixing shank and plunger, hardened.
Without shock-proof mechanism
Adjustable tolerance marks. M2,5 mounting thread for the measuring insert.
See table opposite
Mounted insert with a 3,175 mm dia. steel ball tip
Cardboard box
Identification number
Declaration of conformity

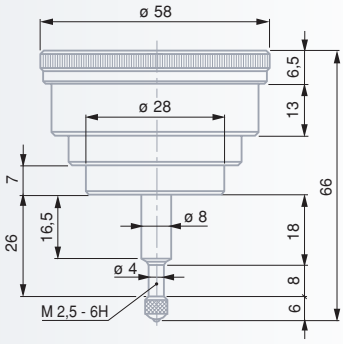




№	⌀ mm	mm	mm	mm		mm		N
ROCH dial gauges								
0141760566	40	0,01	3	3,5	–	0,5	0 ÷ 25 ÷ 50*	≤1,2
0141760611	58	0,01	3	3,5	–	1	0 ÷ 50 ÷ 100*	≤1,5

* With extra red tinted reverse numbering.



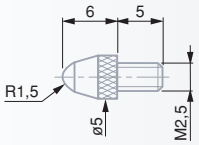


Maximum permissible errors for a metrological characteristic (MPE)

	3 mm
Deviation span	12 µm
Deviation span with the local measuring span of 0,1 mm	5 µm
Total deviation span	15 µm
Repeatability limit	5 µm
Max. hysteresis	15 µm

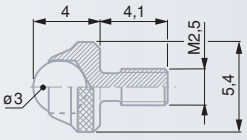
Measuring Inserts for Dial Gauges, Axial Probes and other Handtools

Executions with a M2,5 coupling thread



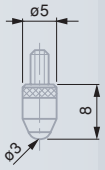
Standard spherical measuring inserts.

No		L mm
03510001	Steel	6
03510002	Carbide	6
03560001	Sapphire	6



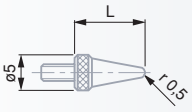
Short spherical measuring insert.

No		L mm
03560007	Carbide	4



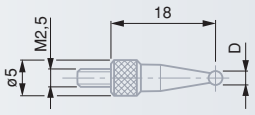
Long spherical measuring inserts.

No		L mm
03560019	Steel	8
03560020	Carbide	8
03560021	Sapphire	8



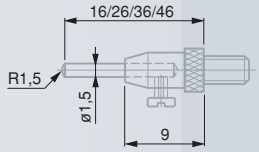
Spherical measuring inserts, R = 0,5 mm.

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



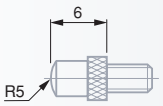
Spherical measuring inserts.

No		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
03560059	Carbide	9
03560060	Steel	10
03560061	Steel	11
03560062	Steel	12



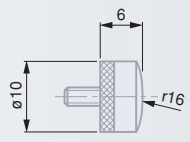
Spherical measuring insert with 4 interchangeable pins, R = 1,5 mm.

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



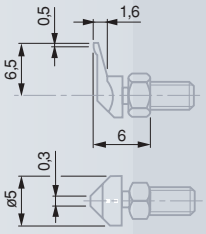
Spherical measuring inserts.

No		R mm
03510101	Steel	5
03510102	Carbide	5



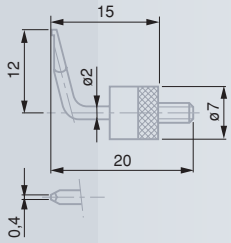
Spherical measuring inserts

No		R mm
03560017	Steel	16
03560018	Carbide	16



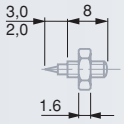
Measuring insert with offset (A) contact point and lock nut for radial alignment.

No		A mm
03510401	Steel	6,5



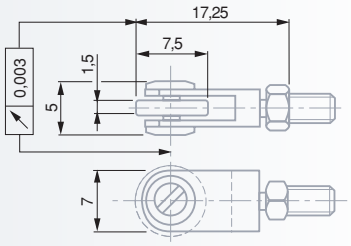
Measuring insert with offset (A) contact point and lock nut for radial alignment.

		A mm
03560063	Steel	12



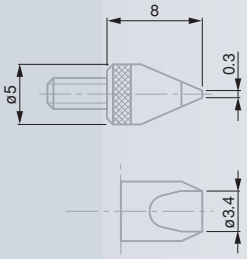
Measuring insert with needle contact point.

03560030	Steel



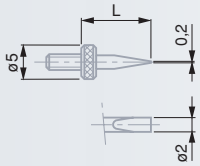
Measuring inserts with ball-bearing rollers. Lock nut for radial alignment.

		Shape
03560010	Steel	cylindrical
03560011	Steel	ball-shaped



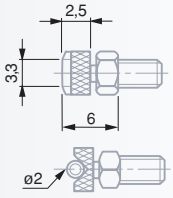
Inserts with a blade-shaped measuring face. Lock nut for radial alignment.

		B mm
03560024	Steel	0,3
03560025	Carbide	0,3



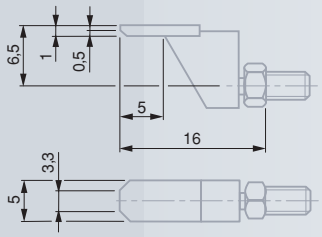
Inserts with a blade-shaped steel face. Lock nut for radial alignment.

	L mm	**B** mm
03560031	5	0,2
03560032	10	0,2
03560033	15	0,2
03560034	20	0,2



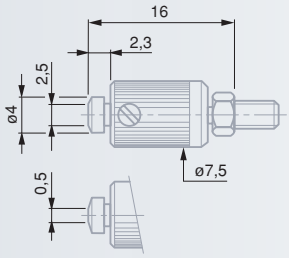
Insert with a cylindrical measuring face. Lock nut for radial alignment.

03510502	Carbide



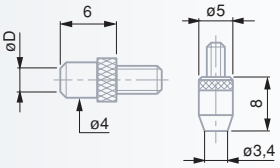
Insert with a narrow, off-centre measuring face. Lock nut for radial alignment.

		B mm
03510602	Carbide	0,5



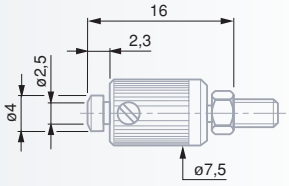
Insert with a narrow, parallel measuring face, adjustable. Lock nut for radial alignment.

		B mm
03510702	Carbide	0,5



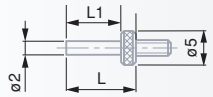
Inserts with a flat measuring face.

		mm
03510801	Steel	2,5
03510802	Carbide	2,5
03560022	Steel	3,4
03560023	Carbide	3,4



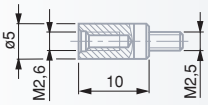
Insert with a flat, parallel measuring face., adjustable. Lock nut for radial alignment.

		mm
03510902	Carbide	2,5



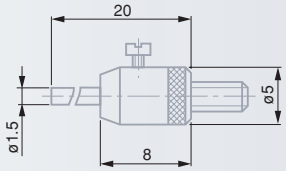
Steel inserts with a flat measuring face.

	L mm	L1	ø mm
03560026	5	2,8	2
03560027	10	7,8	2
03560028	15	12,8	2
03560029	20	17,8	2



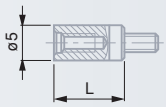
Connectors for measuring inserts.

	Outside	Inside
03560092	M2,5	M2
03560066	M2,5	M2,6
03560067	M2,5	M3
03560064	M2,6	M2,5
03560065	M3	M2,5



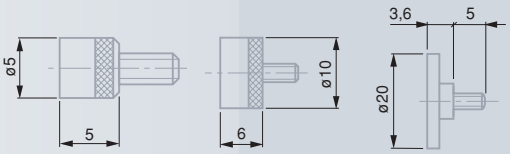
Inserts with a flat measuring face as well as interchangeable pin.

		ø
03560008	Steel	1,5
03560009	Carbide	1,5



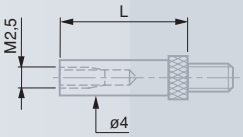
Extensions for measuring inserts.

	L mm
03560042	10
03560043	15
03560044	20
03560045	25
03560046	30
03560047	35
03560048	40
03560049	45
03560050	50



Inserts with a flat measuring face.

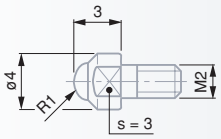
		ø
03560012	Steel	5
03560013	Carbide	5
03560014	Steel	10
03560015	Carbide	10
03560016	Steel	20

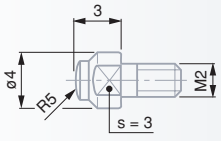


Extensions for measuring inserts.

	L mm
03540501	10
03540502	15
03540503	20
03540504	40

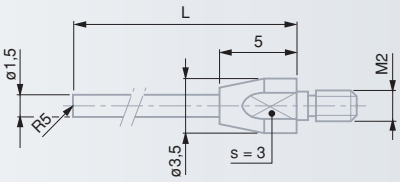
Executions with a M2 Coupling Thread





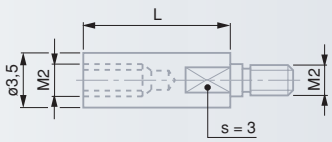
Spherical measuring inserts. M2 thread.

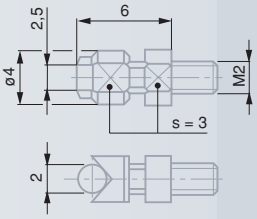
		ø mm
03510204	Carbide	R 1
03510103	Carbide	R 5



Spherical measuring inserts, R = 5 mm. M2 thread.

		L mm
03510202	Carbide	16
03510203	Carbide	26





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

03510503 Carbide

Extensions for measuring inserts, M2.

	L mm
03540505	10
03540506	15

Devices for Plunger Retraction

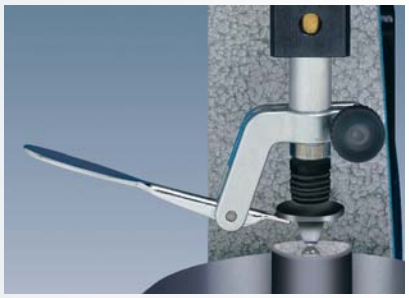
Top mounted retraction devices.

№	=	mm
03560004	Retraction device	Ø 40
03560005	Retraction device	Ø 58
Each consisting of:		
	Lift lever	
	Head screw	



Bottom mounted retraction device.

№	=
03540104	Retraction device
Consisting of:	
03540101	Lift lever
03540102	Washer



Bottom mounted lift lever.

№
01960005



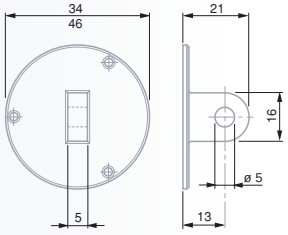
90° Angle Probe

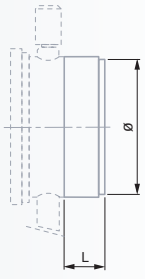
№	=
03560006	90° angle probe used for the transmission of the plunger movement up to 10 mm. Suited for dial gauges with a 0,01 mm scale division.
Furnished with:	
03560012	Measuring insert with a 5 mm diameter flat face



Backs for ROCH or ETALON Dial Gauges

№	Ø Bezel diameter	Ø Back diameter	Magnetic face	L mm
Central lug backs				
01462004	40 mm	34 mm		
01462005	58, 60, 80 mm	46 mm		
Magnetic back with permanent magnets				
01462001	58, 60, 80 mm	46 mm	46 mm	17 mm





Backs for dial gauges

TESA YR, TESA YE, MERCER, COMPAC, 40, 58 or 82 mm dial diameter

DIGICO 205-705, 58 mm dial diameter

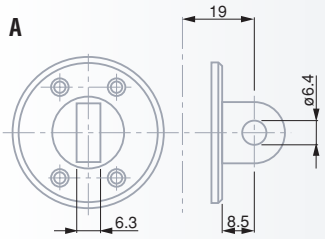
✓ Dull-chrome plated, except for models No. 01460010, 01460011, 01460016 and 01460017

Holding force = 150 N

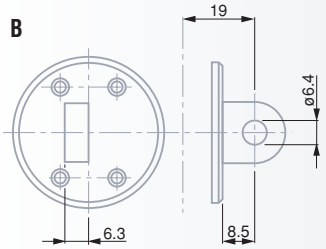
Executions for dial gauges with a 40 mm dial diameter

01460008	A	Back with central lug
01460009	B	Back with offset lug
01460010	C	Back with a 8 mm dia. fixing shank
01460011	D	Back with M6 inner thread
01460012	E	Back with permanent magnet

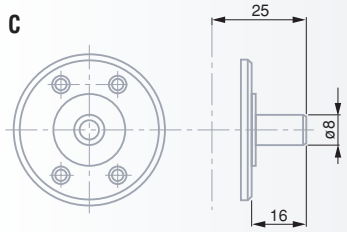
A



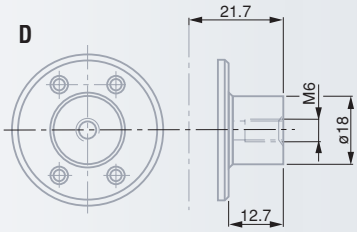
B



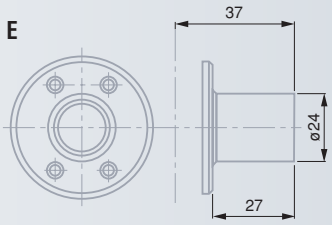
C



D



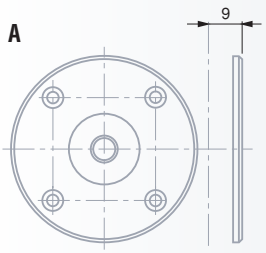
E



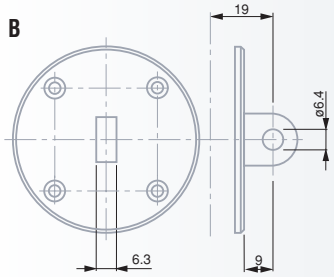
Executions for dial gauges with a 58 or 82 mm dial diameter

01460013	A	Flat back
01460014	B	Flat back with central lug
01460015	C	Flat back with offset lug
01460016	D	Back with a 8 mm dia. fixing shank
01460017	E	Back with a M6 inner thread
01460018	F	Back with 4 clamping bores as per CNOMO French standard
01460019	G	Back with permanent magnet

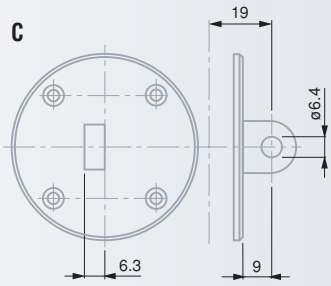
A



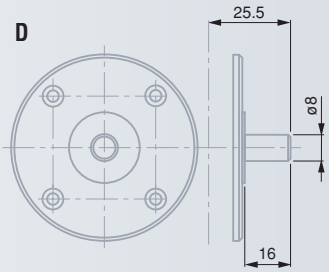
B



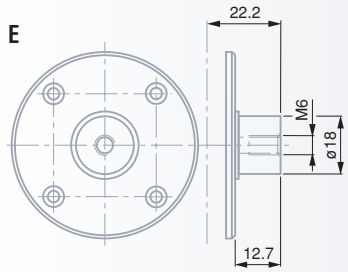
C



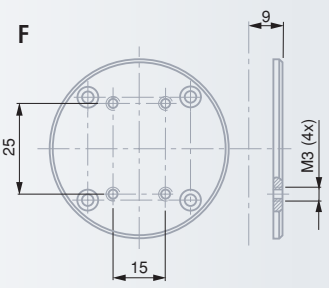
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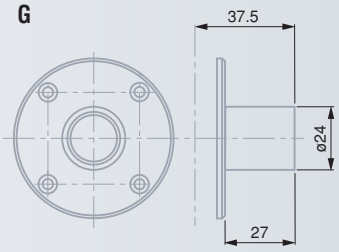
E



F



G



Dial Test Indicators (Lever-type)



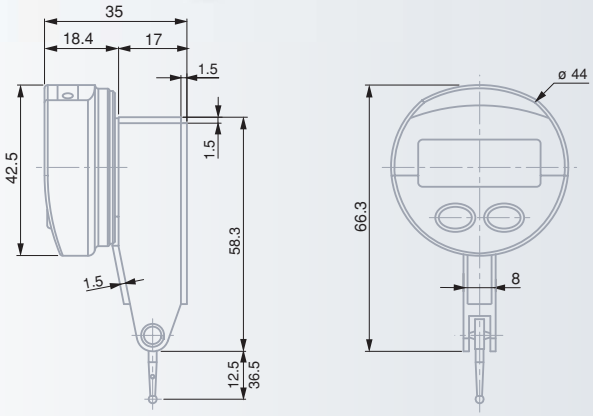


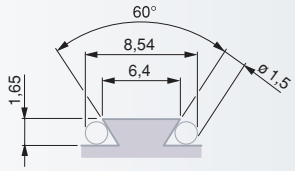
TESA IP65
Electronic Dial Test Indicators

Provide the advantages of mechanics combined with electronics – All in one.



- Inductive measuring system, patented.
- Analogue and numerical indication.
- Numerical interval to 0,01/0,001 mm.
- Selectable scale division: 10, 20, 50 µm/1, 2, 5 µm.
- Water and coolant resistant (IP65).
- Metric/inch conversion.
- RS 232 data output combined with external power supply.
- Displayed measuring modes (NOR/MIN/MAX/MAX-MIN).
- Automatic shut-down.
- Compatible with all TESATAST accessories.





№	mm	*in*	mm	Insert mm	N (± 15%)
01830001	0,01/0,001	*0.0005/0.00005*	0,8	12,5	0,13
01830002	0,01/0,001	*0.0005/0.00005*	0,5	36,5	0,07

Accessories

№	
01961000	3V lithium battery, 190 mAh, type CR 2032
04761060	RS 232 connecting cable with external power supply

Compatible with all TESATAST measuring inserts and accessories

- ✓
- LCD, 5 digits + sign
- Digit height 6 mm
- Resolution to 0,01/0,001mm; .0005/.00005 in
- Zero-setting
- Max. perm. errors: f_e = 10 µm f_{gas} = 13 µm Pre-span = 0,05 mm
- Repeatability: f_w = 1 µm
- Hysteresis: f_h = 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
- Operating temperature range: +5°C to + 40°C
- 3 V lithium battery, type CR 2032
- > 4000 hours
- RS 232
- 73 g (L = 12,5 mm) 75 g (L = 36,5 mm)
- EN 61326-1
- Degree of protection IP65 (IEC 529)
- Supplied in a plastic case along with:
  1 Insert with a 2 mm dia. (No. 01860202)
  1 Wrench (No. 01860307)
  1 Mounting rod with a 8 mm dia. (No. 01840105)
- Identification number
- Declaration of conformity

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 with measuring insert swivelling through to 240°.
- Very low measuring force.
- Full-metal construction giving exceptional robustness.
- Monobloc housing with 3 countersunk dovetail attachments.

Standard Models

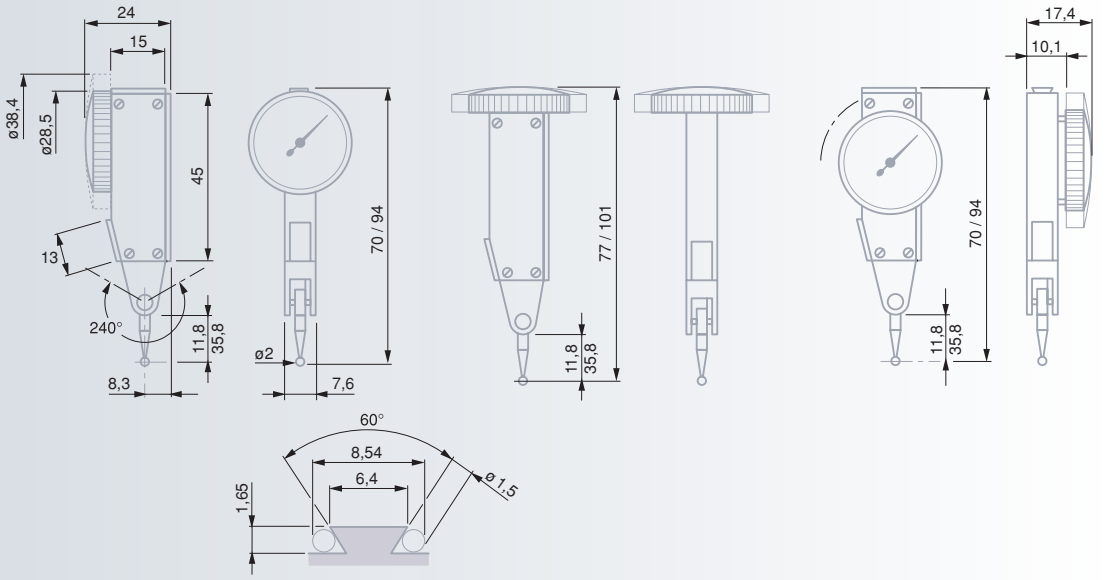
Well-proven dial test indicators with dial face mounted parallel to the insert's axis.

Perpendicular Models

Dial test indicators with dial face mounted at right angle to the insert's axis.

Lateral Models

Dial test indicators with dial face mounted parallel to the insert's axis, but on the flat side of the dial housing.



Permissible limits of a metrological characteristic (MPE/MPL)

			0,02 mm	0,01 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 lengths				
		12,53 mm		0,15 N	0,15 N
		36,53 mm	0,06 N	0,06 N	

TESATAST Standard Models



			Ø		Insert
mm					
01810005	0,01	0,8	28	0 ÷ 0,4 ÷ 0	12,53
01810006	0,01	0,8	38	0 ÷ 0,4 ÷ 0	12,53
01810007	0,01	0,5	28	0 ÷ 0,25 ÷ 0	36,53
01810008	0,01	0,5	38	0 ÷ 0,25 ÷ 0	36,53
01810009	0,002	0,2	28	0 ÷ 100 ÷ 0	12,53
01810010	0,002	0,2	38	0 ÷ 100 ÷ 0	12,53
S18001695	0,001	0,2	38	0 ÷ 100 ÷ 0	12,53
in					
01820006	*0.0005*	*0.030*	*1.1*	*0 ÷ 15 ÷ 0*	*1/2*
01820007	*0.0005*	*0.030*	*1.5*	*0 ÷ 15 ÷ 0*	*1/2*
01820008	*0.0005*	*0.020*	*1.1*	*0 ÷ 10 ÷ 0*	*1 7/16*
01820009	*0.0005*	*0.020*	*1.5*	*0 ÷ 10 ÷ 0*	*1 7/16*
01820010	*0.001*	*0.030*	*1.1*	*0 ÷ 15 ÷ 0*	*1/2*
01820011	*0.0001*	*0.008*	*1.1*	*0 ÷ 4 ÷ 0*	*1/2*
01820012	*0.0001*	*0.008*	*1.5*	*0 ÷ 4 ÷ 0*	*1/2*
01820013	*0.00005*	*0.008*	*1.5*	*0 ÷ 4 ÷ 0*	*1/2*

SWISSTAST Standard Models



			Ø		Insert
mm					
01811000	0,01	0,8	28	0 ÷ 0,4 ÷ 0	12,53
01811001	0,002	0,2	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



			Ø		Insert
mm					
01810204	0,01	0,8	28	0 ÷ 0,4 ÷ 0	12,53
01810205	0,01	0,5	28	0 ÷ 0,25 ÷ 0	36,53
01810304	0,002	0,2	38	0 ÷ 100 ÷ 0	12,53
in					
01820204	*0.0005*	*0.030*	*1.1*	*0 ÷ 15 ÷ 0*	*1/2*
01820304	*0.0001*	*0.008*	*1.5*	*0 ÷ 4 ÷ 0*	*1/2*

✓

DIN 2270
NF E 11-053

Rotating dial

Very low measuring force see table on page G-3

Movement with patented shock proof system

Lever system with friction drive to prevent overload

Accuracy: see table on page G-3

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

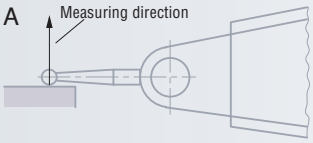
Identification number

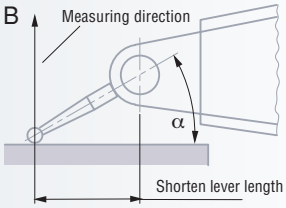
Declaration of conformity



TESATAST Lateral Models

No			Ø		Insert
	mm				
01810011	0,01	0,8	28	0 ÷ 0,4 ÷ 0	12,53
01810012	0,02	2	38	0 ÷ 1,0 ÷ 0	36,53
01810013	0,002	0,2	28	0 ÷ 100 ÷ 0	12,53
	in				
01820014	*0.0005*	*0.030*	*1.1*	*0 ÷ 15 ÷ 0*	*½*





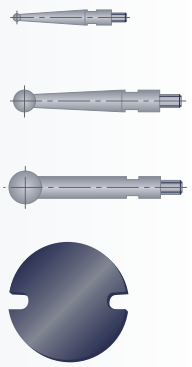
Note on the use of TESATAST dial test indicators

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.

Measuring inserts

No	No	Ø		
Carbide ball tips	Ruby ball tips			mm
01860201	**01860301**	1		12,53
01860202	**01860302**	2		12,53
01860203	**01860303**	3		12,53
01860211	**01860304**	1		36,53
01860212	**01860305**	2		36,53
01860213	**01860309**	3		36,53
01860307	Wrench for measuring inserts			



Note

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

✓ Tungsten carbide or ruby ball tip

M1.4 coupling thread

Indicator Sets with Small Support

No	=
01630003	Indicator sets with small support
consisting of:	
01810005	Dial test indicator (lever-type)
01810010	Dial test indicator (lever-type)
01860203	Measuring insert
01840104	Mounting rod
01840105	Mounting rod
01860307	Wrench for measuring inserts
01639007	INTERAPID small support UJ 15



✓ DIN 2270 NF E 11-053

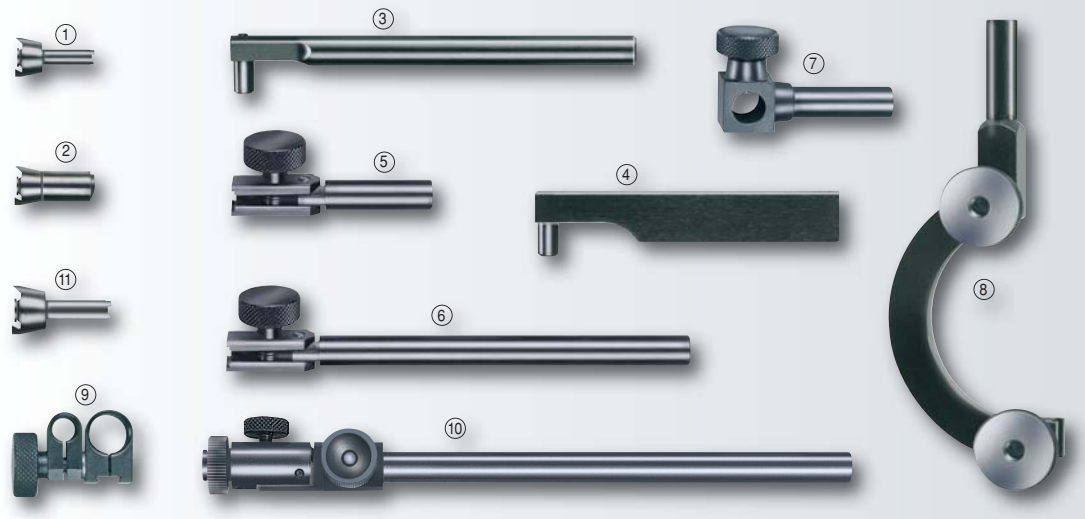
Technical data are listed under each single product

Plastic case

Identification number

Declaration of conformity

TESATAST Accessories



			mm
01840104	①	Mounting rod with dovetail clamp	Ø 4
01840105	②	Mounting rod with dovetail clamp	Ø 8
01840202	③	Mounting rod with cylindrical body and clamping tenon	Ø 8 x 80 Ø 5,6
01840203	④	Mounting rod with right-angle body and clamping tenon	13 x 6 x 50 Ø 5,6
01840404	⑤	Short swivel holder with mounting rod and dovetail clamp	Ø 8 x 25
01840405	⑥	Long swivel holder with mounting rod and dovetail clamp	Ø 8 x 90
01840406	⑦	Angle holder with mounting rod Clamping bore	Ø 8 x 25 Ø 8
01840501	⑧	Centring shoulder for TESATAST Perpendicular with cylindrical rod Clamping point for mounting rod and dovetail clamp	 Ø 8 x 25 Ø 4
01860401	⑨	Dovetail clamp with tightening point	Ø 5,6 Ø 9,5
01840407	⑩	Long swivel holder with cylindrical rod and dovetail clamp as well as fine setting device	Ø 8 x 125
01860008	⑪	Mounting rod with dovetail clamp	Ø 6

Sets of Accessories

Consisting of the following components:

№ mm		01840104	01840105	01840202	01840203	01840404	01840405	01840406	01840501	01860401
01840001*	№ 1	●	●							
01840100**	№ 2			●	●	●	●	●		●
01840703***	№ 3			●	●	●	●	●	●	●

* Supplied with one single insert No. 01860201, 01860202 and 01860203, one wrench No. 01860307 as well as a suited case No. 01860308.
** Supplied in a suited case No. 01860608.
*** Supplied in a suited case No. 01860702.

INTERAPID 312 Dial Test Indicators

Very large measuring span – Ideal for inspecting all significant size variations, e.g. on the surface plate – Measure position, form and shape errors.

- Additional revolution counter for safe reading.
- Bidirectional measuring with automatic reversal inside the movement.
- Thereby pointer rotation is constant.
- Jewelled movement with rubies.
- Ball-bearing lever system with measuring insert swivelling through 210°.
- Full-metal construction giving outstanding robustness.
- Monobloc housing with mounted dovetail attachments as well as a 4 mm swivelling shank.

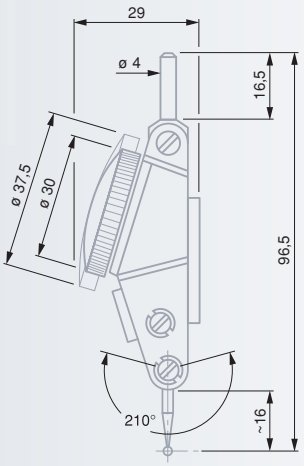


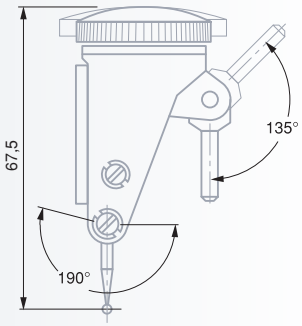
Regular Model

Time-tested dial test indicator with dial face mounted parallel to the insert's axis.

Perpendicular Model

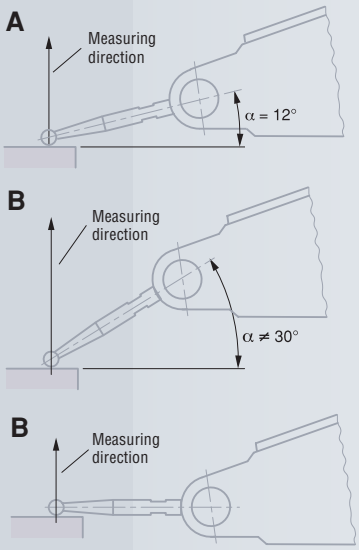
Dial test indicator with dial face mounted at right angle to insert's axis.





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, read values have to be corrected accordingly (Fig. B). With regard to this, also read in the instruction manual.



Permissible limits of a metrological characteristic (MPE/MPL)

	0,01 mm		0,002 mm	
	Pointer Rev 1	Pointer Rev 2	Pointer Rev 1	Pointer Rev 2
Deviation 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 Regular Models

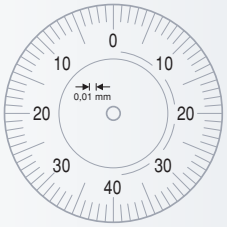
No			Ø		Insert
mm					
074111366	0,01	1,6	37,5	0 ÷ 40 ÷ 0	16,5
074111367	0,01	1,6	30	0 ÷ 40 ÷ 0	16,5
074111368	0,002	0,4	37,5	0 ÷ 10 ÷ 0	15,2
074111369	0,002	0,4	30	0 ÷ 10 ÷ 0	15,2
in					
074111370	*0.0005*	*0.060*	*1.5*	*0 ÷ 15 ÷ 0*	*0.65*
074111371	*0.0005*	*0.060*	*1.2*	*0 ÷ 15 ÷ 0*	*0.65*
074111965	*0.0005*	*0.060*	*1.5*	*0 ÷ 15 ÷ 0*	*2.675*
074111374	*0.001*	*0.060*	*1.2*	*0 ÷ 15 ÷ 0*	*0.65*
074111372	*0.0001*	*0.016*	*1.5*	*0 ÷ 4 ÷ 0*	*0.65*
074111373	*0.0001*	*0.016*	*1.2*	*0 ÷ 4 ÷ 0*	*0.65*





INTERAPID 312 Perpendicular Models

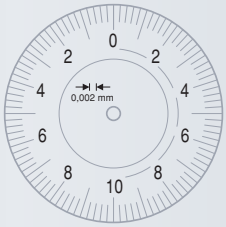
No			Ø		Insert
mm					
074111375	0,01	1,6	37,5	0 ÷ 40 ÷ 0	16,5
074111376	0,01	1,6	30	0 ÷ 40 ÷ 0	16,5
in					
074111377	*0.0005*	*0.060*	*1.5*	*0 ÷ 15 ÷ 0*	*0.65*
074111378	*0.0005*	*0.060*	*1.2*	*0 ÷ 15 ÷ 0*	*0.65*
074111958	*0.0005*	*0.060*	*1.5*	*0 ÷ 15 ÷ 0*	*2.675*
074111379	*0.001*	*0.060*	*1.2*	*0 ÷ 15 ÷ 0*	*0.65*
074111957	*0.0001*	*0.016*	*1.5*	*0 ÷ 4 ÷ 0*	*0.65*



074111366



074111367



074111368



074111369

✓ Rotating dial

Very low measuring force (see table on page G-7)

Lever system with friction drive to prevent overload

Accuracy: see table on page G-7

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

Declaration of conformity

✓ Technical data as listed under: each single product

Plastic case

Declaration of conformity

Dial Test Indicator Sets, Complete with Accessories

Each full set consists of:

No	=
	INTERAPID 312 as listed in the tables below
074106331	Rectangular attachment
074108942	Reducing sleeve, metric
	or
074108943	Reducing sleeve, inch
074106026	Swivel holder, metric
	or
074106931	Swivel holder, inch
074111474	Storage case for measuring inserts
01860307	Wrench for measuring inserts



INTERAPID 312 Regular Models

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

No *in*	*074111370*	*074111371*	*074111372*	*074111373*	*074106331*	*074108943*	*074106931*	*074111474*	*01860307*
074111508	●				●	●	●	●	●
074111509		●			●	●	●	●	●
074111510			●		●	●	●	●	●
074111511				●	●	●	●	●	●

INTERAPID 312 Perpendicular Models

No mm	074111375	074111376	074106331	074108942	074106026	074111474	01860307
074111506	●		●	●	●	●	●
074111507		●	●	●	●	●	●

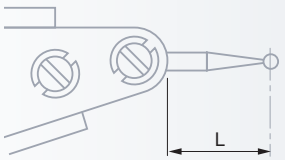
No *in*	*074111377*	*074111378*	*074106331*	*074108943*	*074106931*	*074111474*	*01860307*
074111513	●		●	●	●	●	●
074111514		●	●	●	●	●	●

Measuring Inserts for INTERAPID 312

Ball tips in hardened steel or tungsten carbide

M1,7 coupling thread

Length L of measuring inserts



Steel ball tips	Carbide ball tips			L
		mm		
074107893	**074105993**	0,01	2	16,5
074107895	**074105994**	0,01	1,5	16,5
074107897	**074105995**	0,01	0,8	16,5
	074106358	0,01	2	36,6*
	074106360	0,01	0,8	36,6*
074110481	**074110482**	0,002	2	15,2
074110492	**074110491**	0,002	1,5	15,2
074110493	**074110507**	0,002	0,8	15,2
	074110494	0,002	2	34*
	074110508	0,002	0,8	34*
		in		
074107899	***074105996***	*all***	*0.080*	*0.650*
074107901	***074105997***	*all***	*0.060*	*0.650*
074107903	***074105998***	*all***	*0.031*	*0.650*
	074106361	*all***	*0.080*	*1.375**
	074106363	*all***	*0.031*	*1.375**
	074111913***		*0.080*	*2.675*
	074111912****		*0.100*	*2.675*

mm/*in*	
01860307	Wrench for measuring inserts
074111474	*Storage case for measuring inserts*

* The length of the used insert changes the amplification factor of the lever system. Therefore, each read value must be doubled.

** Except for both models No. 074111965 and 074111958.

*** Model No. 074111965 only.

**** Model No. 074111958 only.

Note

The original measuring insert mounted on every INTERAPID 312 as well as any other insert with same nominal length but having different ball tip diameters are fully interchangeable.

Accessories for INTERAPID 312



		mm
074106331	Rectangular clamping attachment, complete	
01840203	Rectangular attachment with clamp	13 x 6 x 50 Ø 5,6
074108603	Double attachment with clamping point and dovetail	Ø 4
074106026	Swivel holder with clamping points and dovetail	Ø 8 x 133 Ø 4
074108942	Reducing sleeve	Ø 8 / Ø 4

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.

✓ DIN 2270 and factory standard

Rotating dial

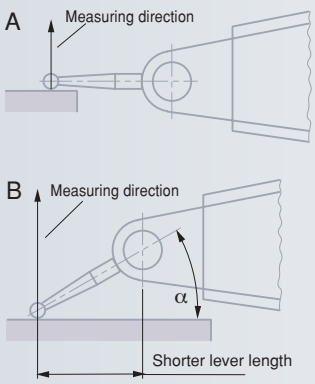
Friction lever system to preventing overload

Contact points with tungsten carbide ball tips

Delivery in a suited plastic case including:
1 contact point, 2 mm dia.
1 rigid stem with 8 mm dia., L = 15 mm, No. 01840107
1 rigid stem with 4 mm dia., L = 15 mm, No. 01840109
(except for series 220).

Serial number

Inspection report with a declaration of conformity



Technical features

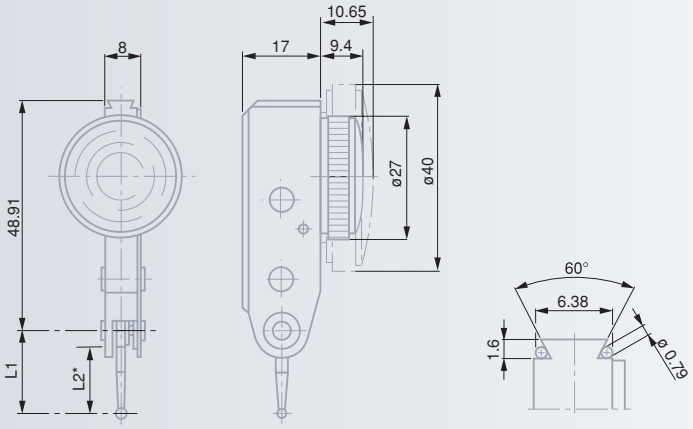
- Long range up to 3 mm.
- Bidirectional measuring, without reversing lever.
- Continuous two-way clockwise rotation of the pointer.
- Swivelling probe through 180°.
- Main pivot on oversized, self-aligning angular bearings.
- Dovetail mounting machined in the indicator body.
- Dull-chrome plated bezel and housing.
- Rotating dial.
- Insensitive to magnetic fields generated in common precision mechanics.

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 to 1:1.

In any other measuring position (angle α in Fig. B), the effective lever length changes so that the read value need be corrected. With respect to this, also read in the instruction manual.

COMPAC Series 210 – Type Standard



*L2 see table page G-15



Metric Reading

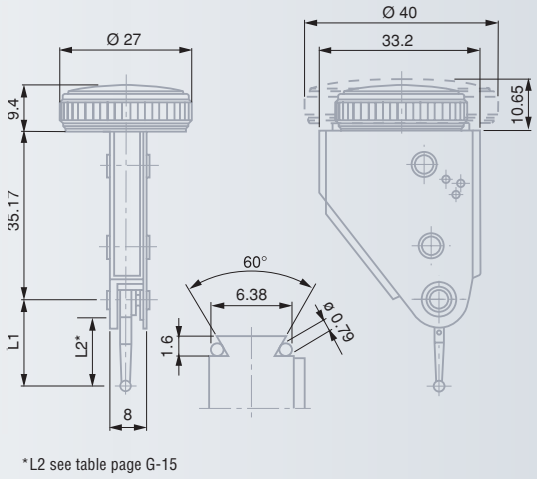
	mm	Whole travel mm	Travel/ revolution mm	Ø mm		Contact point L1 mm	µm	µm	µm	N
213	0,01	1,5	0,5	27	0÷25÷ 50	18	13	3	3	≤ 0,35
213G	0,01	1,5	0,5	40	0÷25÷ 50	18	13	3	3	≤ 0,35
212L	0,01	3	1	27	0÷50÷100	36	26	3	6	≤ 0,20
212GL	0,01	3	1	40	0÷50÷100	36	26	3	6	≤ 0,20
215	0,002	0,6	0,1	27	0÷ 5÷ 10	18	13	1,5	2,5	≤ 0,30
215G	0,002	0,6	0,1	40	0÷ 5÷ 10	18	13	1,5	2,5	≤ 0,30
215GL	0,002	1,2	0,2	40	0÷10÷ 20	36	26	1,5	5	≤ 0,20
216G	0,001	0,6	0,1	40	0÷ 5÷ 10	18	13	1,5	2,5	≤ 0,30

Inch Reading

		Whole travel	Travel/ revolution			Contact point				
	in	in	in	Ø in		L 1 in	in	in	in	N
214A	0.0005	0.06	0.02	1.063	0÷10÷20	0.72	0.0005	0.00015	0.00015	≤ 0,35
214GA	0.0005	0.06	0.02	1.575	0÷10÷20	0.72	0.0005	0.00015	0.00015	≤ 0,35
213LA	0.0005	0.12	0.04	1.063	0÷20÷40	1.44	0.001	0.00015	0.00025	≤ 0,20
213GLA	0.0005	0.12	0.04	1.575	0÷20÷40	1.44	0.001	0.00015	0.00025	≤ 0,20
215A	0.0001	0.024	0.004	1.063	0÷20÷40	0.72	0.00005	0.00005	0.0001	≤ 0,30
215GA	0.0001	0.024	0.004	1.575	0÷20÷40	0.72	0.00005	0.00005	0.0001	≤ 0,30

COMPAC Series 220 – Type Perpendicular





*L2 see table page G-15

Metric Reading

		Whole travel	Travel/ revolution			Contact point				
	mm	mm	mm	Ø mm		L1 mm	µm	µm	µm	N
223	0,01	1,5	0,5	27	0÷25÷ 50	18	13	3	3	≤ 0,35
223G	0,01	1,5	0,5	40	0÷25÷ 50	18	13	3	3	≤ 0,35
222L	0,01	3	1	27	0÷50÷100	36	26	3	6	≤ 0,20
222GL	0,01	3	1	40	0÷50÷100	36	26	3	6	≤ 0,20
225	0,002	0,6	0,1	27	0÷ 5÷ 10	18	13	1,5	2,5	≤ 0,30
225G	0,002	0,6	0,1	40	0÷ 5÷ 10	18	13	1,5	2,5	≤ 0,30

Inch Reading

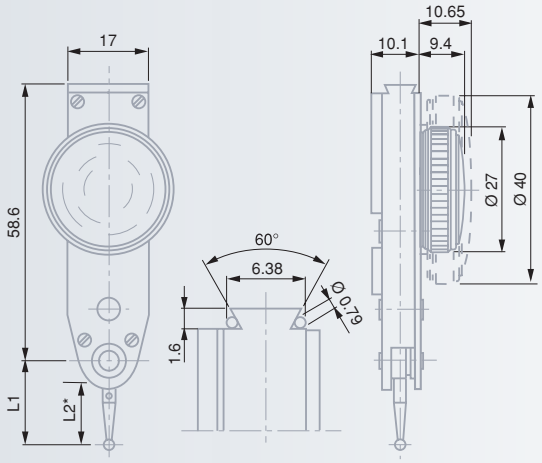
		Wole travel	Travel/ revolution			Contact point				
	in	in	in	Ø in		L1 in	in	in	in	N
224A	0.0005	0.06	0.02	1.063	0÷10÷20	0.72	0.0005	0.00015	0.00015	≤ 0,35
224GA	0.0005	0.06	0.02	1.575	0÷10÷20	0.72	0.0005	0.00015	0.00015	≤ 0,35
223GLA	0.0005	0.12	0.04	1.575	0÷20÷40	1.44	0.001	0.00015	0.00025	≤ 0,20
225GA	0.0001	0.024	0.004	1.575	0÷20÷40	0.72	0.0005	0.00005	0.0001	≤ 0,30

COMPAC Series 230 – Type Parallel

- DIN 2270 and factory standard
- Rotating dial
- Friction lever system to preventing overload
- Contact points with tungsten carbide ball tips
- Delivery in a suited plastic case

including:
1 contact point, 2 mm dia.
1 rigid stem with 8 mm dia. , L = 15 mm, No. 01840107
1 rigid stem with 4 mm dia., L = 15 mm, No. 01840109
(except for series 220).

- Serial number
- Inspection report with a declaration of conformity



*L2 see table page G-15



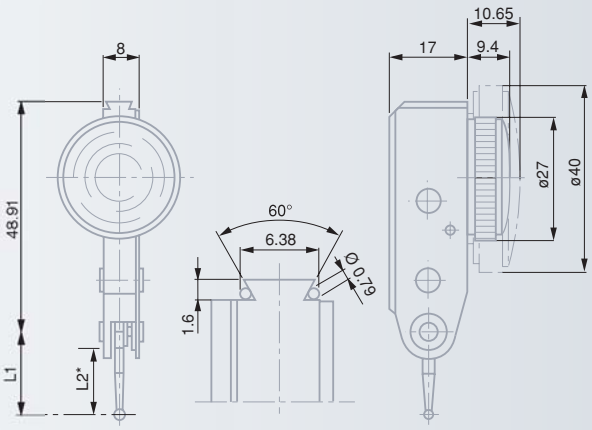
Metric Reading

	mm	Whole travel mm	Travel/ revolution mm	Ø mm		Contact point L1 mm	µm	µm	µm	N
233	0,01	1,5	0,5	27	0÷25÷ 50	18	13	3	3	≤ 0,35
233G	0,01	1,5	0,5	40	0÷25÷ 50	18	13	3	3	≤ 0,35
232L	0,01	3	1	27	0÷50÷100	36	26	3	6	≤ 0,20
232GL	0,01	3	1	40	0÷50÷100	36	26	3	6	≤ 0,20
235G	0,002	0,6	0,1	40	0÷ 5÷ 10	18	13	1,5	2,5	≤ 0,30

COMPAC Series 240 – Reduced Range

One-revolution models





*L2 see table page G-15

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

Metric Reading

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

Inch Reading

No		*Whole travel*	Ø		*Contact point*				
	in	*in*	*in*		*L1 in*	*in*	*in*	*in*	*N*
244A	*0.0005*	*0.030*	*1.063*	*0÷15÷0*	*0.6754*	*0.0005*	*0.0001*	*0.00015*	*≤ 0,25*
245A	*0.0001*	*0.008*	*1.063*	*0÷ 4÷0*	*0.7200*	*0.00015*	*0.00006*	*0.00008*	*≤ 0,25*
245GA	*0.0001*	*0.008*	*1.575*	*0÷ 4÷0*	*0.7200*	*0.00015*	*0.00006*	*0.00008*	*≤ 0,25*

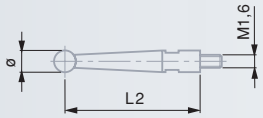
✓

Stainless steel with carbide or ruby contact points

M1.6 coupling thread

Original inserts mounted on every indicators as well as any other inserts with same nominal length but having different tip diameters are fully interchangeable.

Contact Points for COMPAC Dial Test Indicators



Metric Models

Carbide ball tips — Ruby ball tips

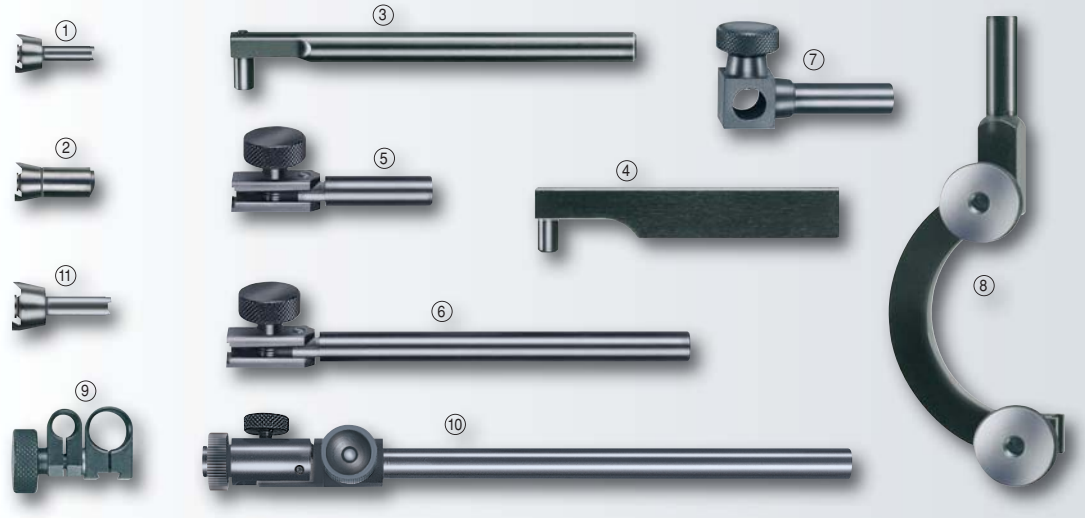
		mm	L1 mm	L2 mm
01866014		0,8	18	14,26
01866003	**01866026**	2	18	14,26
01866021		3	18	14,26
01866016		0,8	36	32,26
01866004	**01866027**	2	36	32,26
01866023		3	36	32,26
01866015		0,8	45	41,26
01866006	**01866028**	2	45	41,26
01866022		3	45	41,26

Inch Models

Ruby ball tips

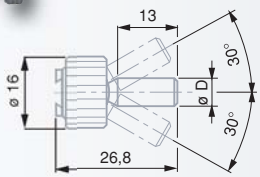
	mm	*L1 in*	*L2 in*
01866010	0,8	*0.6754*	*0.5278*
01866007	2	*0.6754*	*0.5278*
01866011	0,8	*0.72*	*0.5724*
01866005	2	*0.72*	*0.5724*
01866024	0,8	*1.44*	*1.2924*
01866009	2	*1.44*	*1.2924*
01866025	3	*1.44*	*1.2924*
01866008	2	*1.8*	*1.6527*

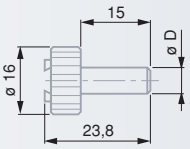
Accessories for COMPAC Dial Test Indicators



№			mm
01840104	①	Fixing shank with dovetail clamp	Ø 4
01840105	②	Fixing shank with dovetail clamp	Ø 8
01840202	③	Cylindrical fixing shank with tightening tenon	Ø 8 x 80 Ø 5,6
01840203	④	Rectangular fixing shank with tightening tenon	13 x Ø 5,6
01840404	⑤	Short swivel holder with cylindrical shank and dovetail grip	Ø 8 x
01840405	⑥	Long swivel holder with cylindrical shank and dovetail grip	Ø 8 x 90
01840406	⑦	Angle holder with cylindrical shank Clamping bore	Ø 8 x 25 Ø 8
01840501	⑧	Centring holder for perpendicular model with cylindrical shank Clamping point for fixing shank and dovetail clamp	Ø 8 x 25 Ø 4
01860401	⑨	Double fixing clamp with clamping point and dovetail clamp	Ø 5,6
01840407	⑩	Long swivel holder, cylindrical shank with dovetail grip. Also with fine setting.	Ø 8 x 125
01860008	⑪	Fixing shank with dovetail clamp	Ø 6







		Stem	Clamping length
SPT	Rotating holder	8 mm	25 mm
SPTA	*Rotating holder*	*1/4 in*	*1 in*
SPTA-3/16	*Rotating holder*	*3/16 in*	*1 in*
SPTA-3/8	*Rotating holder*	*3/8 in*	*1 in*
SPTA-5/16	*Rotating holder*	*5/16 in*	*1 in*

№		D
Mounting rods with dovetail grip		
01850106	*Fixing shank swivelling through ± 30°*	*Ø 1/4 in*
01850107	*Rigid fixing shank*	*Ø 1/4 in*
01840106	Fixing shank swivelling through ± 30°	Ø 8 mm
01840107	Rigid fixing shank	Ø 8 mm
01840108	Fixing shank swivelling through ± 30°	Ø 4 mm
01840109	Rigid fixing shank	Ø 4 mm



Comparative Measurement

TESA TPS 300 / 500 / 1000 Motorised Setting Benches

These motorised benches are specially made for display setting as well as for calibrating 2-point shop tools used to measure both internal and external dimensions up to 1000 mm.



Benefit
A single bench can replace a wide number of setting standards such as gauge blocks or setting rings.

- ✓
- 0,001 mm
- Linear 1,5 + L (mm)/ 300 µm
- 1 µm
- Holding force 240 N
- 100/240 AC – 1,5 A 50/60 Hz
- RS 232
- +10 to +40°C
- –10 to +40°C
- ✓
- Shipping packaging
- Identification number
- Inspection report
- Declaration of conformity

Technical Data

		Internal mm/*in*	External mm/*in*	mm	kg
02130001	TPS 300	0,1 ÷ 305 *(0.04 ÷ 12)*	40 ÷ 345 *(1.6 ÷ 13.5)*	610 x 300 x 270	75
02130002	TPS 500	0,1 ÷ 508 *(0.04 ÷ 20)*	40 ÷ 548 *(1.6 ÷ 21.5)*	820 x 300 x 300	90
02130003	TPS 1000	0,1 ÷ 1016 *(0.04 ÷ 40)*	40 ÷ 1056 *(1.6 ÷ 41.5)*	1330 x 340 x 340	240
On request	TPS 1500 mm, 2000 mm, 3000 mm				
Provided with the following accessories:					
02160038	Power supply 80 – 240 V, 50 – 60 Hz				
	Rubber feet (3) acting as vibration inhibitors				
02160027	AL300003 adapter mounted on the mobile stop				

All given maximum permissible errors for a metrological characteristic (MPE) are valid for a temperature of 20° ± 0,5° C and relative humidity of 50 ±5%.

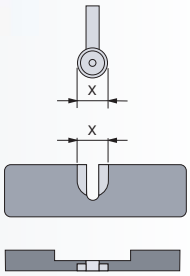
Optional Accessories For Bore Gauges

– TESA Veribor

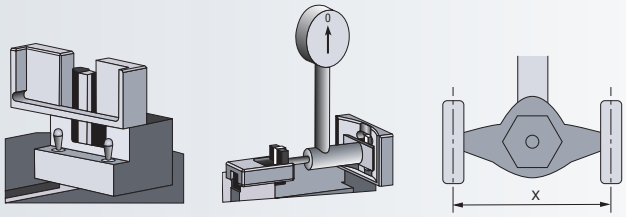


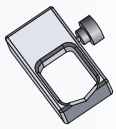
Application range 4,5 ÷ 50 mm

№	=	mm	x
02160020	A7547	4,5 ÷ 6	Ø 4,5
02160021	A7548	6 ÷ 12,5	Ø 5,8
S21050003	A7527	12 ÷ 25	Ø 9,5
02160023	A7559	25 ÷ 50	Ø 17,5

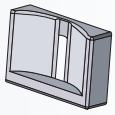


Application range 50 ÷ 550 mm

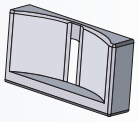




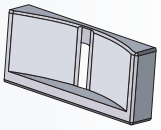
AL300003



AL30055



AL5590



AL90125

№	=	mm	x
02160024	AL30055	50 ÷ 150	30 ÷ 55
02160025	AL5590	150 ÷ 300	55 ÷ 90
02160026	AL90125	240 ÷ 550	90 ÷ 125
02160043	AL120-170		120 ÷ 170
02160044	AL170-220		170 ÷ 220

Each bench is supplied with AL300003 adapter.

– TESA YA

№	=	mm
02160028	A7750-A7751-A7752	6 ÷ 12,5







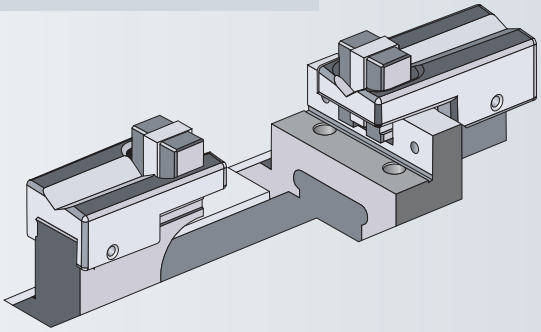
For IRA 2 and ETALON Caliper Gauges

Internal measuring

Nº	=	mm
02160030	A300005	10 ÷ 150

Requires 2 items.





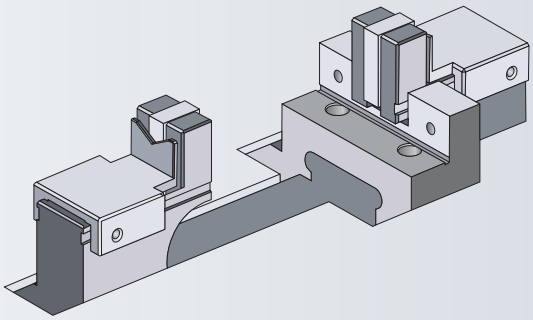
For ETALON Caliper Gauges

External measuring

Nº	=	mm
02160029	A300000	40 ÷ 60

Requires 2 items.



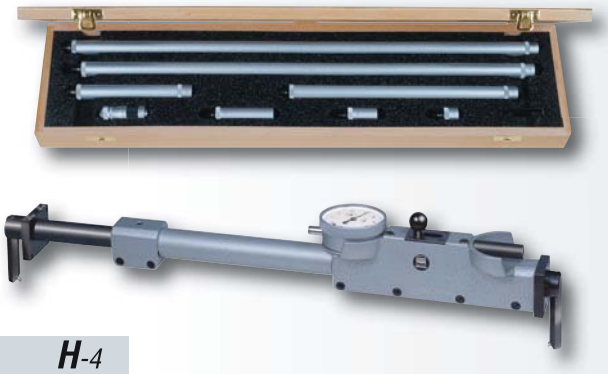


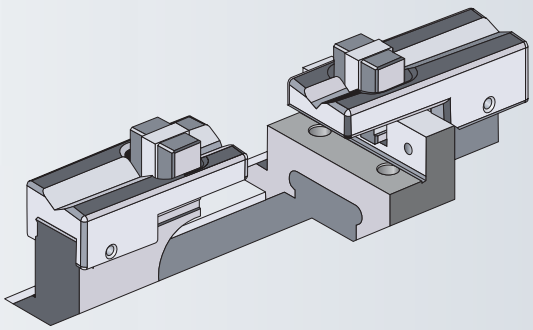
For TESA INOTEST

Comparator gauges with 2-point contact for internal and external measuring

Nº	=	mm
02160031	A300004	50 ÷ 1500

Requires 2 items

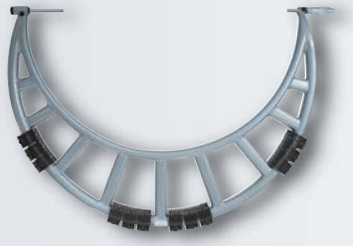


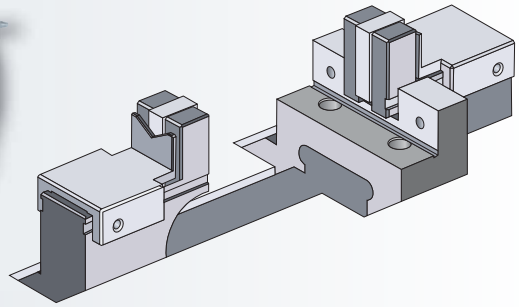


For External Micrometers

№	=	mm
02160029	A300000	40 ÷ 1500

TPS 300 requires 1 item, TPS 500 and 1000 need 2 items.

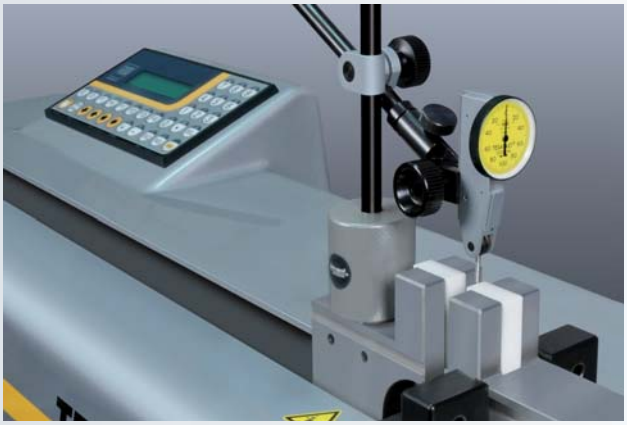




For Lever-Type Dial Test Indicators

№	=
01639007	Measuring support with articulated arm

For any other shop tool, please ask your local TESA sales representative.

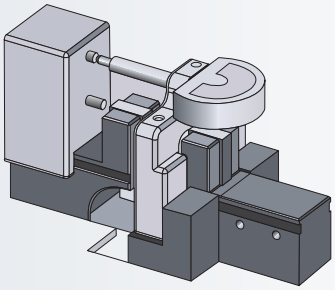






For Dial Gauges

№	=	mm
02160035	A300001-A300002	10 ÷ 150



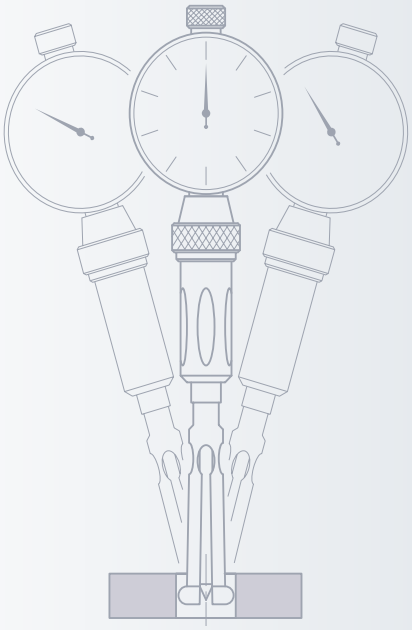


TESA YA Bore Gauges

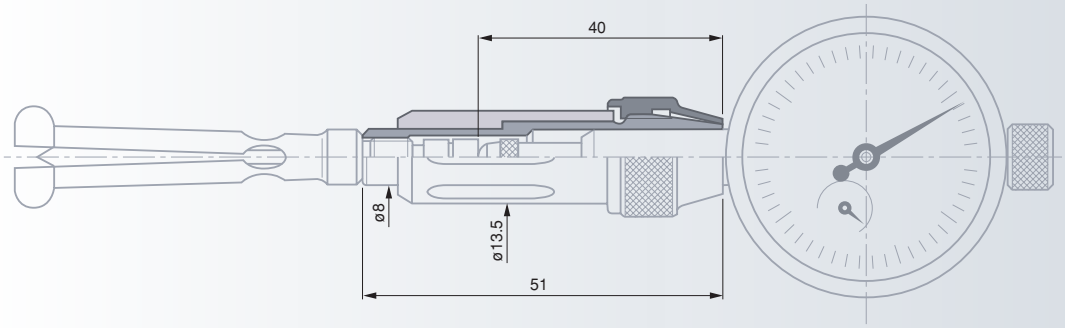
Specially designed for small bores from 0,47 up to 12,20 mm – Check bore sizes as well as form and shape errors through 2-point measurements – Excellent repeatability.

These bore gauges have an interchangeable measuring head housing a needle as well as a clamping shank with a 8 mm diameter fixing bore for a dial gauge or any other sensor.

- Probing heads with spherical faces for through bores.
- Probing heads with faces forming a rounded edge on their front face. Used to check blind bores or short centring shoulder.
- Probing heads for deeper bores.







✓

Handgrip
With mount for shop tools with a 8 h6 dia. clamping shank

Measuring heads
See tables

See tables

Dull-chrome plated steel, hardened to ≈1000 HV 25

Measuring needles
See tables

Steel hardened to ≈ 800 HV 25

Setting rings
Nominal diameter ≤ 1,5 mm: with inserted ring in synthetic sapphire, >1,5 mm: steel, hardened to ≈780 HV 25

Reliability of the engraved size: ± 2s = 1 µm

1 µm

Complete Sets for Through Holes Measurement



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

Technical data: see page H-6

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

Suited plastic case

Declaration of conformity

	№	mm	Measuring depth max. mm	Measuring depth min. mm	№	№	⌀ mm
	Measuring heads				*Needles*	*Setting rings*	
Set compositions:							
Set 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
Set 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
						01540612	1,50
	01540412	1,50 ÷ 1,90	17	0,9	01540004	01540613	1,7
	01540413	1,70 ÷ 2,15	17	0,9	01540004	01540614	2,00
	01540414	2,05 ÷ 2,45	17	0,9	01540004	01540615	2,25
Set 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
Set 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

Complete Sets for Measuring Blind Bores and Short Centring Shoulders



No	mm
01510400	1,50 ÷ 2,45
01510500	2,30 ÷ 6,20
01510600	6,00 ÷ 12,20

✓

Technical data: see page H-6

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

Suited plastic case

Declaration of conformity

	Measuring heads	mm	Measuring depth max. mm	Measuring depth min. mm	Needles	Setting rings	⌀ mm
Set compositions:							
Set 01510400	01540501	1,50 ÷ 1,90	17	0,3	01540009	01540613	1,75
	01540502	1,70 ÷ 2,15	17	0,3	01540009	01540614	2,00
	01540503	2,05 ÷ 2,45	17	0,3	01540009	01540615	2,25
Set 01510500	01540504	2,30 ÷ 2,75	22	0,3	01540010	01540616	2,50
	01540505	2,65 ÷ 3,20	22	0,3	01540010	01540617	3,00
	01540506	3,05 ÷ 3,50	22	0,3	01540010	01540618	3,25
	01540507	3,35 ÷ 3,85	22	0,2	01540010	01540619	3,50
	01540508	3,80 ÷ 4,30	22	0,2	01540010	01540620	4,00
	01540509	4,20 ÷ 5,00	40	0,5	01540011	01540621	4,50
	01540510	4,70 ÷ 5,50	40	0,5	01540011	01540622	5,00
	01540511	5,30 ÷ 6,20	40	0,5	01540011	01540623	5,7
Set 01510600	01540512	6,00 ÷ 6,80	40	0,5	01540011	01540624	6,50
	01540513	6,60 ÷ 7,50	40	0,5	01540011	01540625	7,00
	01540514	7,30 ÷ 8,15	40	0,5	01540011	01540626	7,75
	01540515	8,00 ÷ 8,80	40	0,5	01540011	01540627	8,50
	01540516	8,50 ÷ 9,40	50	0,5	01540011	01540628	9,00
	01540517	9,15 ÷ 10,00	50	0,5	01540011	01540629	9,50
	01540518	9,60 ÷ 10,80	50	1,0	01540012	01540630	10,00
	01540519	10,65 ÷ 12,20	50	1,0	01540012	01540631	11,50

Special Executions

Available upon request:

- Measuring heads with tungsten carbide tipped measuring faces.
- Measuring heads for uncommon inspection job.
- Measuring heads for through holes and deeper bores covering other application ranges.
- Tungsten carbide measuring needles.
- 125, 250, 500, 750 and 1000 mm depth extensions.

Technical data: see page I-8

Declaration of conformity

Optional Accessories for TESA YA Bore Gauges

Measuring stand for stationary use.

01639009	INTERAPID UA 30 measuring stand
Must be equipped with:	
01610201	UK 25 sliding arm
01640000	UAZ 10 depth stop



TESA VERIBOR Light Bore Gauge

Two-point contact gauge made to measure bores and form errors – Self-centring – Can equally be used with a dial gauge, precision indicator or any other sensor type having a 8 h6 dia. clamping shaft.

✓

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

Mount for a sensor having a 8h6 dia. clamping shaft

2 µm

4 µm

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

Wooden case

Declaration of conformity



No		mm	Bolt travel, mm	Measuring depth, mm
05710090	TESA Veribor Light	18 ÷ 35	1,30	176
05710091	TESA Veribor Light	35 ÷ 60	1,40	178
05710092	TESA Veribor Light	50 ÷ 150	1,40	178
05710093	TESA Veribor Light	18 ÷ 150	1,30 / 1,40	176 / 178

Dial gauge not included.

✓

See tables

Measuring bolts and anvils fitted with tungsten carbide ball tips

Mount for a sensor having a 8 h6 dia. clamping shaft

2 µm (VERIBOR alone)

± 2s = 0,5 µm (VERIBOR alone)

TESA VERIBOR Bore Gauges

Proven construction and high reliability over decades – Able to take 2-point measurements on bores from 4,5 up to 550 mm – Detect form and shape errors – Gauge body with a 8 mm diameter clampingn bore for a dial gauge, precision indicator or any other sensor.

- High repeatability through the circular reversing element inside the gauge, virtually free from clearance.
- Gauge body made of invar steel to prevent the measurement results from being affected by hand warmth transfer.
- Centring shoe ensuring a correct alignment of the gauge into the bore to be checked.
- Tungsten carbide ball tips for high resistance to wear.



TESA VERIBOR without dial gauge

✓

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

Wooden case

Declaration of conformity

NP	mm
05710012	4,5 ÷ 6
05710013	6 ÷ 12,5
05710014	12 ÷ 25
05710015	25 ÷ 50
05710016	50 ÷ 150
05710018	50 ÷ 300
05710017	240 ÷ 550

TESA VERIBOR with dial gauge

					mm
	05710054	05710061			4,5 ÷ 6
	05710055	05710062			6 ÷ 12,5
	05710056	05710063			12 ÷ 25
			05710057	05710064	25 ÷ 50
			05710058	05710065	50 ÷ 150
			05710059	05710066	50 ÷ 300
			05710060	05710067	240 ÷ 550

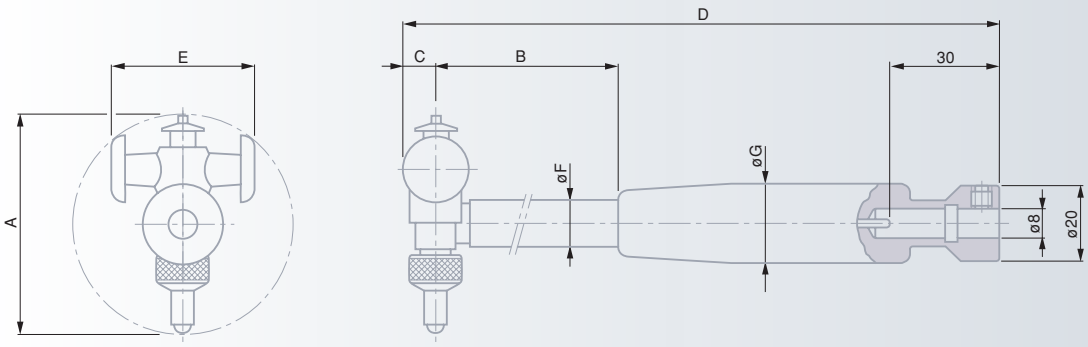
Provided with a TESA dial gauge

	01412010	01412510	01412310	01412511
mm	40	40	58	58
mm	0,01	0,001	0,01	0,001

Full set including 1 single TESA VERIBOR Light plus 1 set of interchangeable fixed inserts covering the whole application range, 1 dial gauge as shown in the table opposite, 1 dial gauge guard.

Wooden case

Declaration of conformity



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.

Optional Accessories for TESA VERIBOR Bore Gauges

Set of extensions

For extending the application range of VERIBOR No. 05710016, 05710058 and 05710065 up to 300 mm dia.

No		mm
05740001		
Consisting of:		
1 Centring shoe		
3 Extensions		50 mm



Depth extensions (not pictured)

To be mounted on each tool shaft from diameters ≥ 25 to ≤ 550 mm for depth increase (Size B – Drawing on page H-12).

No	mm
05760026	250
05760027	500
05760028	750
05760029	1000

Dial gauge guard

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

No	mm
05760012	Ø 40
05760013	Ø 58



Cable holder

Used for the probe cable. To be mounted at the end of the gauge shaft.

No
05760014



INTERAPID IRA 2

The finest precision gauge for measuring by comparison – Performs two- or three-point measurement depending on the used accessory – Suitable for verifying through holes, blind bores, grooves, undercuts or slots with plan-parallel faces, among others.

- Wide application range from 10 up to 150 mm.
- Ideal in design, light in weight, easy to handle.
- Built-in indicator to 0,01 mm with fine setting.
- Centring arm for 2-point measurement.

✓

0,01 mm or 0.0005 in

10 ÷ 150 mm 0.375 ÷ 6 in

± 0,20 mm or ± 0.008 in

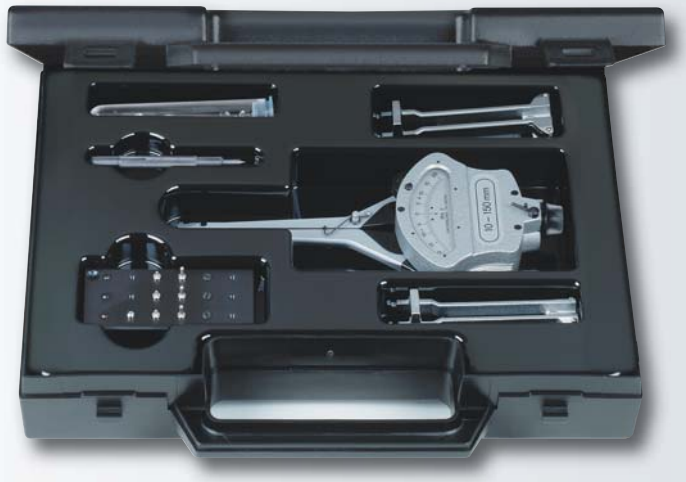
10 mm arm clearance

Hardened seel or tungsten carbide tipped measuring faces as listed in the table

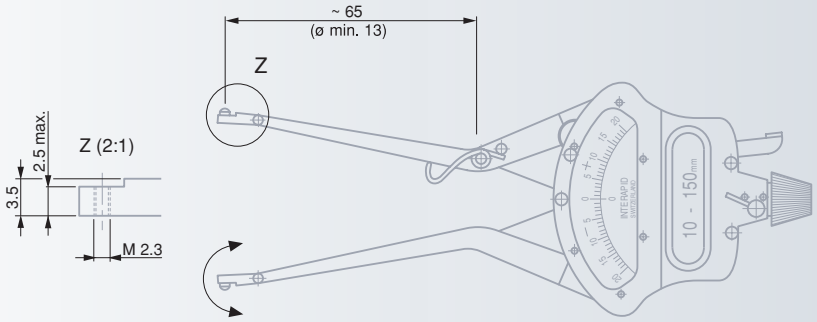
3,5 N

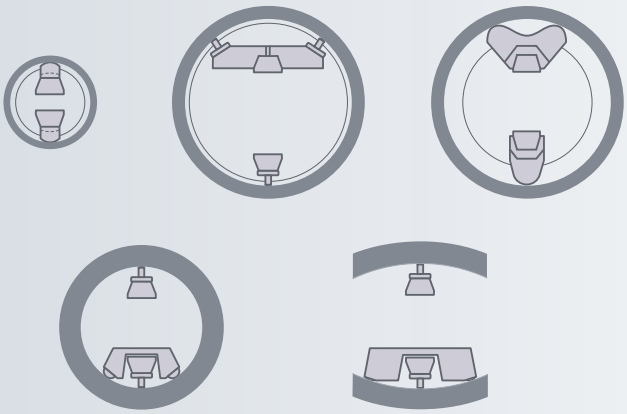
Suited plastic case

Declaration of conformity



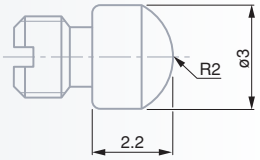
Nº mm	=	Nº in
079105704	**INTERAPID IRA 2**	***079108640***
Supplied with the following standard accessories:		
079105667	3 Steel inserts, hardened (order number for 1 item)	***079105697***
079105668	3 Short steel inserts, hardened (order number for 1 item)	***079105698***
079105669	3 Long steel inserts, hardened (order number for 1 item)	***079105699***
079112126	2 Adjustable contact arms for bores ≥ 6 mm	***079112126***
079110111	1 Small insert holder for 3-point measurement	***079110113***
079110110	1 Large insert holder for 3-point measurement	***079110112***
079108502	1 Centring arm for bores 15 ÷ 30 mm	***079108504***
079108503	1 Centring arm for bores 30 ÷ 150 mm	***079108505***
079105694	1 Screwdriver with special design	***079105694***
079111401	**INTERAPID IRA 2 md** Same as INTERAPID IRA 2, but furnished with the measuring inserts listed below instead of those in steel with order No. 079105667 or 079105697.	***079111402***
079105756	3 Tungsten carbide inserts (order number for 1 item)	***079105759***



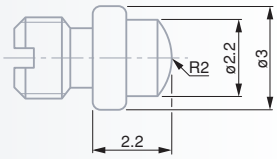




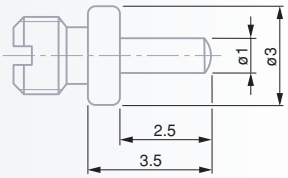
079105667



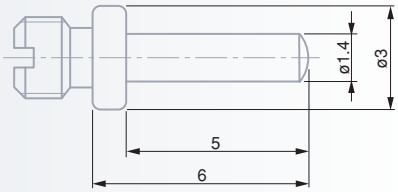
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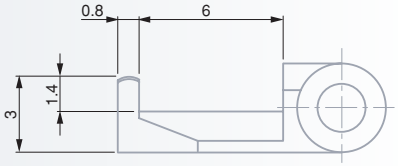
079105668



079105669



079112126

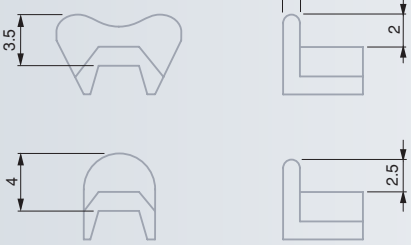


Optional Accessories

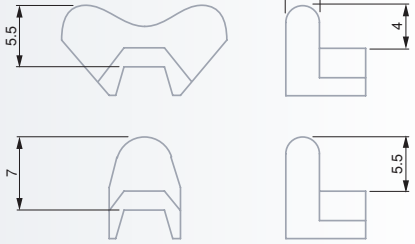
№	=
079112051	Set = 2 small inserts (1-point contact) 1 small insert (2-point contact)
079112052	Set = 2 large inserts (1-point contact) 1 large insert (2-point contact)
079108830	Handle

✓ Chrome plated, hardened steel

079112051



079112052

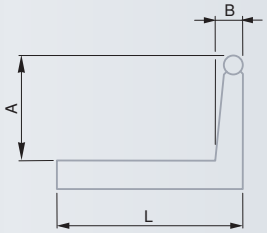


ETALON Caliper Gauges

for Internal or External Dimensions – Reading to 0,01 or 0,02 mm

Long-lasting precision movement – No gear transmission – Tungsten carbide measuring faces for high wear-resistance – Concentric pointer for sure reading of the millimetres – Lifting lever for the gauge legs.

- 0,01 mm or 0,02 mm
- Tungsten carbide measuring faces
- Models with reading to 0,01 mm = 30 µm 0,02 mm = 60 µm
- Models with reading to 0,01 mm = 20 µm 0,02 mm = 40 µm
- Suited plastic case
- Identification number
- Inspection report with a declaration of conformity



External Short Leg Caliper Gauges

	mm	mm	**A** mm	**B** mm	**L** mm
07919000	0 ÷ 10	0,01	9,3	3,0	39,7



External Long Leg Caliper Gauges

	mm	mm	**A** mm	**B** mm	**L** mm
07919009	0 ÷ 20	0,02	9,3	3,0	87



Internal Short Leg Caliper Gauges

	mm	mm	**A** mm	**B** mm	**L** mm
07919015	5 ÷ 15	0,01	1,1	1,5	39,7
07919016	10 ÷ 20	0,01	3,3	1,5	39,7
07919017	15 ÷ 25	0,01	4,0	1,8	39,7



Internal Long Leg Caliper Gauges

	mm	mm	**A** mm	**B** mm	**L** mm
07919023	10 ÷ 30	0,02	3,3	1,8	87
07919024	20 ÷ 40	0,02	7,0	2,5	87
07919025	30 ÷ 50	0,02	9,75	2,8	87
07919026	40 ÷ 60	0,02	9,75	2,8	87



INTERAPID Thickness Gauges

These gauges with a frame are specially made to measure the thickness of plastic parts as well as hard and soft materials such as glass, wood, paper, rubber, metal sheets etc. – All models have a dial that can be rotated for zero setting.



✓
15 mm throat depth
37 mm dial diameter
10 mm
Non-interchangeable inserts
40 µm (dial gauge)
Suited plastic case
Declaration of conformity

Small-size models, reading to 0,1 m

With open inserts when not in use

№		mm	mm		mm
074115586		0 ÷ 10	0,1	flat	Ø 6,35
074115587		0 ÷ 10	0,1	flat	Ø 10



✓
40 mm dial diameter
1 mm
Non-interchangeable, retractable measuring inserts.
0,7 N
15 µm (dial gauge)
Suited plastic case
Declaration of conformity

Small-size models, reading to 0,01 mm

№	mm	№	mm	mm	mm		mm
074115629	18	**074115633**	45	0 ÷ 10	0,01	flat	Ø 6,35
074115630	18	**074115634**	45	0 ÷ 10	0,01	flat	Ø 10



✓
50 mm throat depth
57 mm dial diameter
1 mm
Non-interchangeable, retractable measuring inserts.
≈ 1,2 N
15 µm (dial gauge)
Cardboard box
Declaration of conformity

Models with roller-type measuring inserts, reading to 0,01 mm

№	mm	mm	Ø mm	Length mm	Side discs
			Roller-type inserts		
074115647	0 ÷ 5	0,01	8,4	8,7	●
074115648	0 ÷ 5	0,01	8,4	8,7	—

Regular Models, reading to 0,01 mm



- ✓
- 57 mm dial diameter
- 1 mm
- Interchangeable, retractable measuring inserts
- ≈ 1 N
- 40 µm (dial gauge)
- Cardboard box
- Declaration of conformity

mm 50	mm 100				
N°	N°	mm	mm		mm
074115642	**074115649**	0 ÷ 10	0,01	flat	Ø 30
074115643	**074115650**	0 ÷ 10	0,01	flat	Ø 20
074115644	**074115651**	0 ÷ 10	0,01	flat	Ø 10

Measuring insert available upon request.

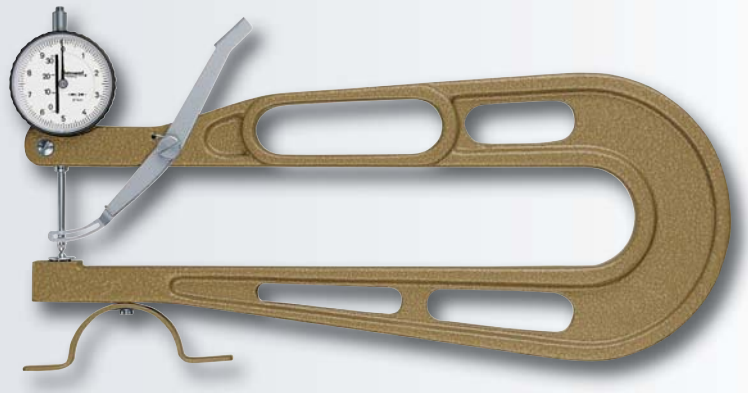
Models with deep throat, reading to 0,01 mm



- ✓
- 57 mm dial diameter
- 1 mm
- Interchangeable, retractable measuring inserts
- ≈ 2 N
- 15 µm (dial gauge)
- Cardboard box
- Declaration of conformity

mm 0 ÷ 10	mm 0 ÷ 30					
		mm	mm		mm	Paired inserts
074115654	**074115659**	0,01	200	flat	Ø 30	**074115734**
074115655	**074115660**	0,01	200	flat	Ø 20	**074115735**

Models with deeper throat, reading to 0,1 mm



- ✓
- 57 mm dial diameter
- 10 mm
- With foot for stationary use
- Interchangeable, retractable measuring inserts
- ≈ 2 N
- 40 µm (dial gauge)
- Cardboard box
- Declaration of conformity

mm 400					
	mm	mm		mm	Paired inserts
074115624	0 ÷ 30	0,1	flat	Ø 30	**074115734**
074115625	0 ÷ 30	0,1	flat	Ø 20	**074115735**
074115626	0 ÷ 30	0,1	flat	Ø 10	**074115731**
074115628	0 ÷ 30	0,1	spherical	Ø 5	**074115733**

Model for laminated plies, reading to 0,001 mm



№		mm	mm		mm
074115664	0 ÷ 1	0,001	flat	Ø 6,35

✓
30 mm throat depth. Highly stable frame with heat insulating handle.
57 mm dial diameter
0,2 mm
Non-interchangeable, retractable measuring inserts.
≈ 2 N
5 µm (dial gauge)
Cardboard box
Declaration of conformity

Models with reading to 0,1 mm

With open inserts when not in use



mm 0 ÷ 20	mm 0 ÷ 30					
№	№	mm	mm		mm	Paired inserts
074115599	**074115604**	0,1	50	flat	Ø 30	074115686
074115600	**074115605**	0,1	50	flat	Ø 20	074115687
074115601	**074115606**	0,1	50	flat	Ø 10	074115726
074115602	**074115607**	0,1	50	convex	Ø 10	074115727
074115603	**074115608**	0,1	50	spherical	Ø 5	074115728

✓
57 mm dial diameter
10 mm
Interchangeable measuring inserts
40 µm (dial gauge)
Cardboard box
Declaration of conformity

Hardened steel

Finely lapped measuring faces.
Mount with clamp for a dial gauge or a probe.

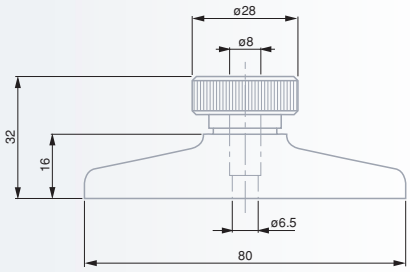
Provided without dial gauge

Cardboard box

Declaration of conformity

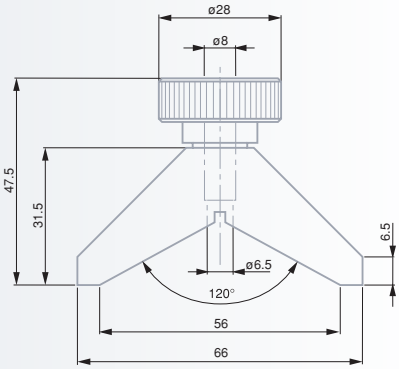
Dial Depth Gauges, Type PF1





№		mm	Mount mm
01639046	Flat base	80 x 16	Ø 8





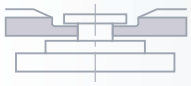
№		mm	Width mm	Mount mm
01639047	V-base	10 ÷ 100	120° 16	Ø 8

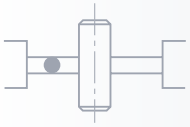
INTERAPID Small Bench SHE.30 or SHE.35

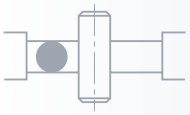
The ideal solution for precise inspection of small part series dedicated to watchmaking and precision mechanics – Fast in measuring and easily adaptable to changes from a workpiece-type to another – Wide choice of measuring inserts specially designed for the broadest variety of metrology applications.



INTERAPID SHE.30 for External Dimensions


03360300


03360301

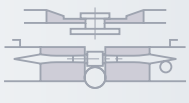

03360302

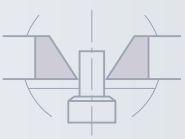

03360307

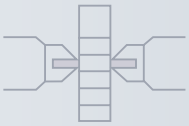
№	=	
03330004		**INTERAPID small measuring bench SHE.30 for external dimensions**, without measuring inserts
Tungsten carbide tipped measuring inserts available in pairs		
03360300		Flat measuring face, 3,5 mm long, 0,4 mm thick
03360301		Cylindrical insert with a flat measuring face, 1,2 mm diameter
03360302		Cylindrical insert with a flat measuring face, 2 mm diameter
03360307		Knife-edged measuring face, 3,5 mm long, 0,05 mm thick, 40°

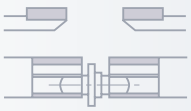
Inserts with special design available upon request.

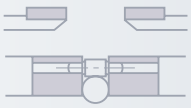

B 124


B 132


B 125

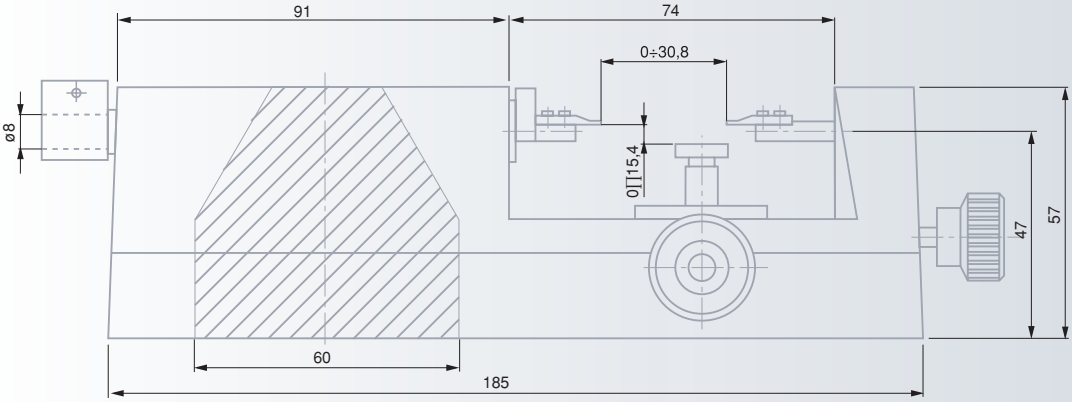

B 121


B 134


B 133


B 152


B 151



✓

0 to 30 mm

Mobile measuring bolt mounted on a plain bearing, also fitted with a semi-circular releasing disc plate.

Measuring inserts supplied in pairs. One is tighten on the measuring bolt, the other on the fixed anvil using one indexing pin with 1 mm dia. and two M1,4 clamping screws.

Resting table with vertical and lengthwise adjustment facility
Table surface area:
24 x 9,5 mm.
Setting range:
15 mm upright,
14 mm lengthwise.
With tightening screws.

Sensor
(must be ordered separately), e.g. dial gauge, electronic or precision indicator, analogue or digital probe with a 8 mm dia. shaft.

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

Produced by used sensor. The SH.30 model has no spring-loaded measuring force.

Accuracy is usually influenced by the measuring instrument as well as both flatness and parallelism of the measuring faces of used inserts.

Clamping precision
Tolerance in flatness of both clamping faces: 0,05 mm.
Tolerance for the axial position of both indexing pins against bolt axis: 0,05 mm.
Tolerance for the parallel position of the table surface against bolt axis: 0,05 mm.

Also see drawing

2,1 kg

Shipping packaging

Declaration of conformity

INTERAPID SHE.35 for Internal Dimensions

✓

30 mm

8 up to 38 mm (standard accessory)

Mobile measuring bolt mounted on a plain bearing, also fitted with a retracting ball-shaped handle.

Measuring inserts supplied in pairs. Can be exchanged. Provided with a 4 mm dia. fixing shaft.

Height adjustable resting table
Table surface area: 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 with a 8 mm dia. clamping shaft.

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

Produced by used sensor. The bench has no spring-loaded measuring force.

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

2,3 kg

Shipping packaging

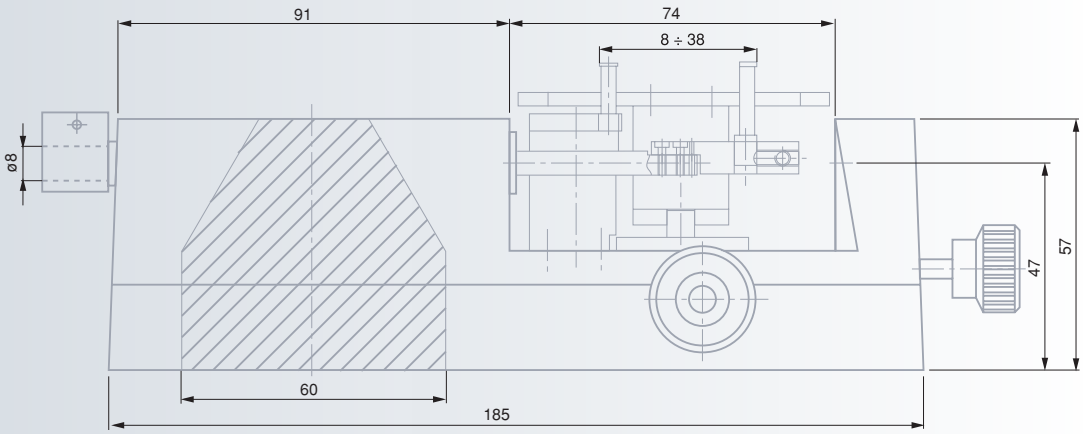
Declaration of conformity



03330006	**INTERAPID small bench SHE.35 for internal dimensions**, with measuring inserts included.	8 ÷ 38 mm

Inserts with special design also available on request





TESA QUICK-CONTROL C2 for Stationary Use

This versatile shop tool allows 2-point measurement of part series using one mobile insert coupled with the sensor plus another fixed one fitted with a clamp for mounting any dial gauge, precision indicator or axial probe having a 8 mm dia. clamping shaft.

- Quick, easy, dependable and precise measurement (repeatability to 2 µm without the use of the sensor).
- Robust construction, easy to mount and to use.
- Adjustable measuring force.
- Measures workpieces with plan-parallel, cone-shaped or cylindrical surfaces, grooves, through holes and blind bores, short centring shoulders and wall thickness. Also serves to check diameters on gear teeth.
- Detects form and positional errors, i.e. roundness, concentricity and coaxiality.

✓
Hardened steel inserts
Lapped measuring faces
2 µm (QUICK-CONTROL alone)
Adjustable from 0 up to10 N. Can be reversed from «neutral» to internal or external measuring
Suited plastic case
Identification number
Declaration of conformity

TESA QUICK-CONTROL 160 C2

Main tool version within the C2 range. Measures mean to small or even very small dimensions (see below for details).



No		mm	*in*	mm	*in*
		Internal dimensions		*External dimensions*	
03330024	**QUICK-CONTROL 160 C2**	30 ÷ 120	*1.19 ÷ 4.72*	0 ÷ 90	*0 ÷ 3.54*
Provided with the following accessories:					
03360022	1 Steady insert holder, short.				
03360027	1 Pair of long inserts for internal/external diameters, through holes, blind bores, grooves and slots with max. depth to 3,7 mm, max. height to 25 mm.				
03360026	1 additional insert, as above but short. For use instead of the long one when measuring at low height.				
Option 1– For small dimensions					
03360065	1 Pair of long inserts with a 8 mm dia.clamping shaft, 6 mm dia. probing head.	22 ÷ 120	*0.87 ÷ 4.72*	0 ÷ 90	*0 ÷ 3.54*
Option 2 – For smaller dimensions					
03360031	1 Pair of inserts for checking very small bores.	11.5 ÷ 60	*0.46 ÷ 2.36*	0 ÷ 90	*0 ÷ 3.54*
03360024	1 Pair of adapters for 5 mm dia. inserts. For use at probing points with a 8 mm dia.				
03360032	1 Pair of raising blocks used to scale down the width of the slot lying in the middle of the upper tool table.				

✓

Hardened steel inserts

Lapped measuring faces

2 µm (QUICK-CONTROL alone)

Adjustable from from 0 up to10 N. Can be reversed from «neutral» to internal or external measuring

Suited plastic case

Identification number

Declaration of conformity

TESA QUICK-CONTROL C3 for Stationary Use

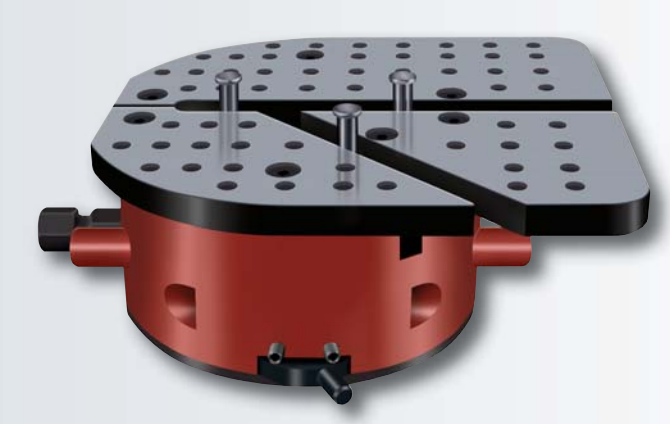
Having the same features and capabilities as TESA QUICK-CONTROL C2, this model also provides an extra transverse insert.

Both mobile and fitted inserts are used for 2-point measurements. The third one moves transversally, thus enabling a correct positioning of the workpiece, without the need for locating the culmination point. This insert also allows workpiece diameter and form errors to be measured at the same time.

TESA QUICK-CONTROL 160 C3 AL

Main version within the C3 tool range for mean to small dimensions.

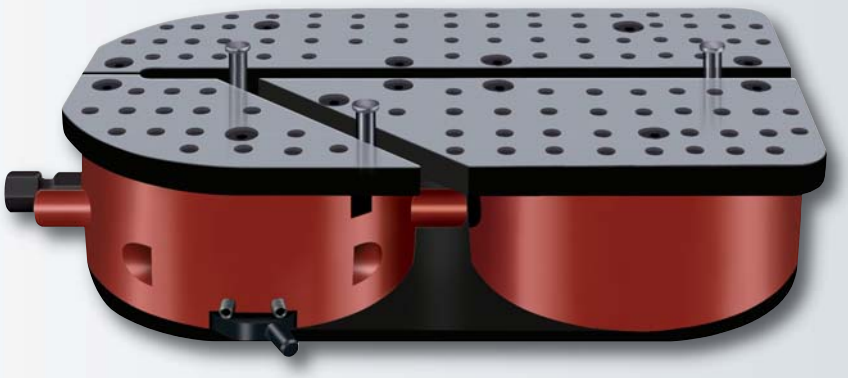
With a mounted stop-like insert that can be moved in the 45° V-slot.



Nº		mm	in	mm	in
		Internal dimensions		*External dimensions*	
03330026	**QUICK-CONTROL C3 AL**	32 ÷ 120	*1.26 ÷ 4.72*	0 ÷ 90	*0 ÷ 3.54*
Provided with the following accessories:					
03360067	1 Mobile standard insert, 10 mm dia. spherical probing head				
03360068	Pair of standard inserts for fixed holder, 10 mm dia. spherical probing head, L = 36 mm				
03360069	1 Fixed insert holder				
03360070	1 Fixed stop holder				
Option 1 – For small dimensions					
03360066	3 long inserts with a 8 mm clamping shaft, 6 mm dia. probing head.	25 ÷ 120	*0.99 ÷ 4.72*	0 ÷ 90	*0 ÷ 3.54*

TESA QUICK-CONTROL 160 C3 JS

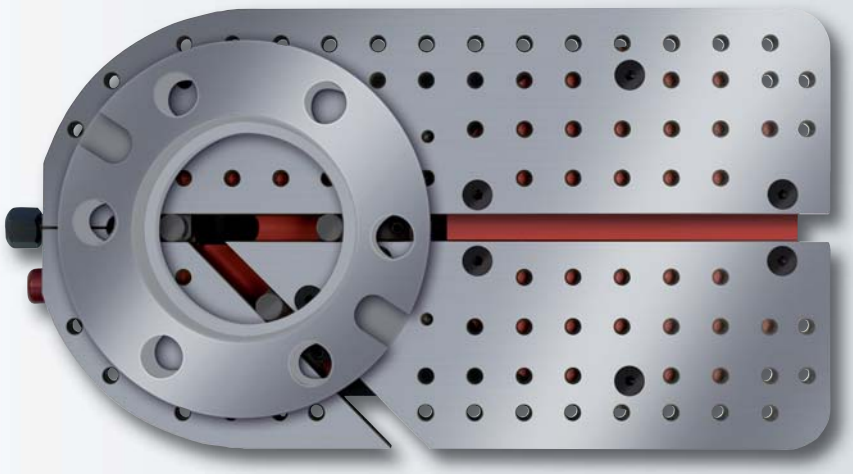
Identical to TESA QUICK-CONTROL 160 C3 AI, but with extended application range.



- ✓
- Hardened steel inserts
- Lapped measuring faces
- 2 µm (QUICK-CONTROL alone)
- Adjustable from 0 up to10 N. Can be reversed from «neutral» to internal or external measuring
- Suited plastic case
- Identification number
- Declaration of conformity

No		mm	in	mm	in
		Internal dimensions		*External dimensions*	
03330027	**QUICK-CONTROL 160 C3 JS**				
Provided with the following standard accessories:					
03360067	1 Mobile standard insert, long, 10 mm dia. spherical probing head	32 ÷ 190 (3 points) 32 ÷ 275 (2 points)	*1.26 ÷ 7.48 (3 points)* *1.26 ÷ 10.8 (2 points)*	0 ÷ 170 (3 points) 0 ÷ 245 (2 points)	*0 ÷ 6.69 (3 points)* *0 ÷ 9.65 (2 points)*
03360068	Pair of standard inserts for fixed stop and support, 10 mm dia. spherical probing head, L = 36 mm				
03360069	1 Fixed insert holder				
03360070	1 Fixed stop holder				

The option 1 for small dimensions can also be used on the model 160 C3 JS.



✓
Hardened steel inserts
Lapped measuring faces
2 µm (QUICK-CONTROL alone)
Adjustable from 0 up to10 N. Can be reversed from «neutral» to internal or external measuring
Suited plastic case
Identification number
Declaration of conformity



TESA QUICK-CONTROL 160 C3 90 ST2

Special model for small and very small dimensions. Features a mounted stop-like insert fitted in the 90° V-slot. Also adjustable.

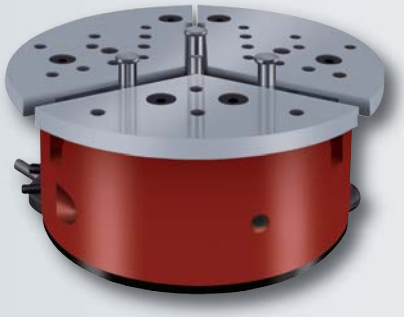


№		mm	in	mm	in
		Internal dimensions		*External dimensions*	
03330028	**QUICK-CONTROL 160 C3 90 ST2**	10 ÷ 80	*0.4 ÷ 3.14*	0 ÷ 55	*0 ÷ 2.16*

Provided with the following standard accessories:

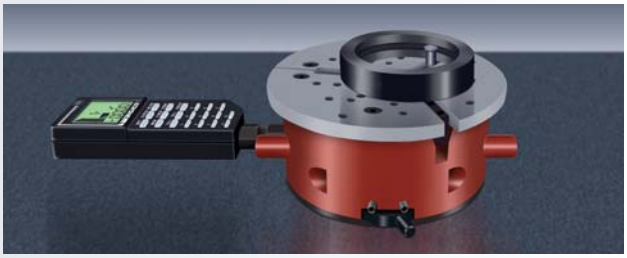
03360072	1 Fixed insert holder for adapter
03360073	1 Fixed insert holder for the third point and adapter
03360074	3 Adapters
03360075	3 Long inserts with as 5 mm dia. shaft
03360067	1 Mobile standard insert, 10 mm dia. probing head
03360068	1 Pair of standard inserts for fixed holder, 10 mm dia. spherical probing head, L = 36 mm

✓
Hardened steel inserts
Lapped measuring faces
2 µm (QUICK-CONTROL alone)
Adjustable from 0 up to10 N. Can be reversed from «neutral» to internal or external measuring
Suited plastic case
Identification number
Declaration of conformity



TESA QUICK-CONTROL 160 C3 120

Measures internal and external dimensions with 2-point contact. Features one mobile and two fixed inserts lying 120° apart. Specially designed for bore measurement. Uses 2 setting rings matching both upper and lower limit values of the toleranced size for display setting and calibration. Recommended sensor: DIGICO 1 precision indicator with order No. 01930000.



Various pairs of inserts and accessories available upon request.

№		mm	in	mm	in
		Internal dimensions		*External dimensions*	
03330029	**QUICK-CONTROL 160 C3 120**	≥ 25	*≥ 0.99*	≤ 80	*≤ 3.15*

Provided with the following standard accessories:

03360067	1 Mobile standard insert, Ø 10 mm dia. spherical probing head
03360068	1 Pair of standard inserts for fixed holder, 10 mm dia. spherical probing head, L = 36 mm
03360022	2 Fixed insert holders, short

TESADIA Plug Gauge

Easy-to-handle plug gauge for 2-point or 3-point measurement on cylindrical bores – Ideal for blind bores and short centring shoulders with diameters ranging from 2,98 up to 250 mm.

- Features a built-in probe that can be connected to a TESA's electronic unit, e.g. TESATRONIC or TESA Interface Box BP 880.
- Specially suited for recurrent dimensional inspection of medium and large-sized batches of parts in the shop floor as well as for receiving and final inspection.
- Equipped with a guiding cylinder that renders unnecessary swinging the plug gauge to find the culmination point. Self-centring and self-aligning.



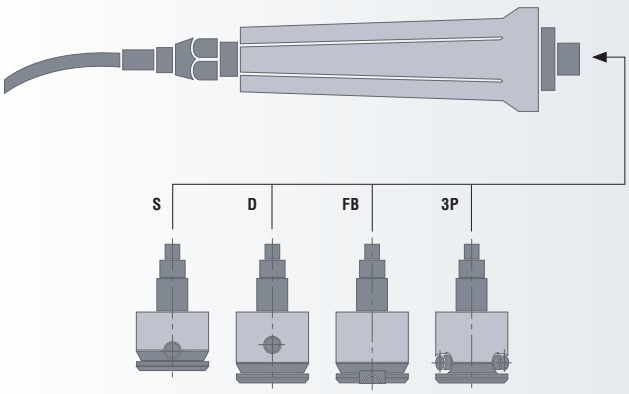
05560221	Handle with built-in GT21 axial probe
05560228	Handle alone

You may ask for a quotation for plug gauges with their own setting rings as well as for the electronic unit.

Specify nominal dimension along with both upper and lower limits of size as well as workpiece material.

Handle

- With built-in TESA GT 21 axial probe.
- Mechanical device for fine adjustment, stress-relieved probe cable.
- Possible connection of a TESA GT 21 compatible probe from another source.



S 2-point plug gauge in standard execution for through holes
D 2-point plug gauge with longer guiding cylinder for through holes
FB Plug gauge for blind bores
3P 3-point plug gauge for through holes

Plug Gauge

- Equipped with both a measuring head and guiding cylinder.
- Uses the measuring needle with reversal wedge at one end to transfer the sweeping movement of the measuring insert to the axial probe.
- Houses a guiding cylinder having a special profile for unrestrainedly introduction of the plug gauge into the bore to be measured. No locking, no tilting.
- Choice of gauging contacts offering optimum adaptation to the parts to be checked, i.e.:

– tungsten carbide tipped (not suited for non-ferrous metal alloy);
– hard-chrome plated (partially suited for non-ferrous metal alloy);
– ruby contacts (suited for non-ferrous metal alloy);
– diamond contacts (suited for soft light alloy);
– synthetic contacts (suited for polished surfaces).

✓

Measuring faces: see opposite

Plug gauges with built-in probe.
- 2-point model: 1%
- 3-point model: 3%

These percentages refer to the measuring span of each plug gauge

Plug gauges with built-in probe.
- 2-point model: ≤ 1 µm
- 3-point model: ≤ 2 µm

Plug gauges with built-in probe: ≤ 0,4 µm

0,3 to 1,2 N according to relevant model

10° C to 35° C

-25° C to 55° C

Declaration of conformity

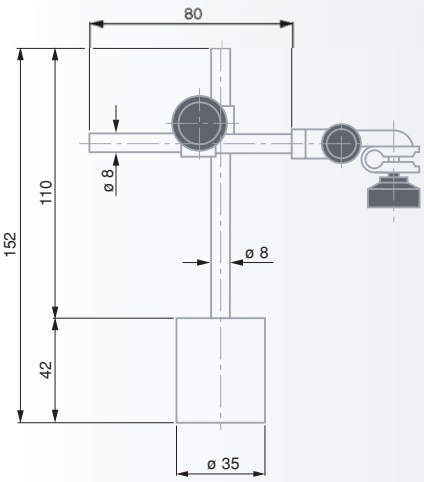
Measuring Stands and Auxiliary Fixtures

INTERAPID
Small Magnetic Supports

Ideal for dial test indicators (lever-type) or dial gauges having a 40 mm dial diameter – Versatile due to 2 rigid joints and fine adjust option.

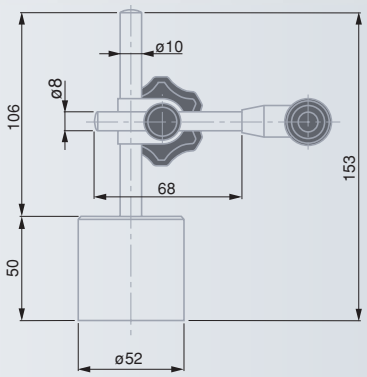
UJ 15 Model





UJ 15G Model





✓

Rounded base with permanent magnet

Holding force on a flat surface:
≈ 220 N for UJ 15
≥ 350 N for UJ 15G

0,47 kg for UJ 15
0,93 kg for UJ 15G

Supplied without indicator

Suited carrying case

Declaration of conformity

Steel Base Plate

50 x 80 x 20 mm

0,60 kg

№	
01639007	INTERAPID small magnetic support UJ15 with a 8 mm diameter clamping bore and dovetail clamp
01639016	INTERAPID small magnetic support UJ15G with both a 8 mm and 4 mm diameter clamping bore and dovetail clamp
Accessory	
01640501	Steel base plate for use of UJ 15 as mobile support

Model with Articulated Arm

✓

Base has a vee recess and one magnetic flat face with disengageable magnet. Articulations made from duralumin.

Holding force on a flat surface ≈ 170 N

Dovetail clamp with a 8 mm diameter clamping bore

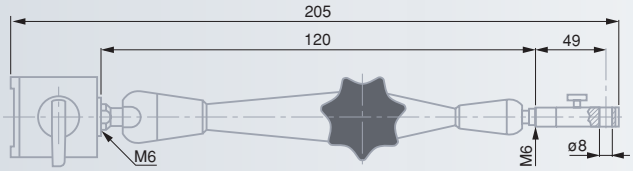
0,4 kg

Supplied without indicator

Suited carrying case

Declaration of conformity

			mm
01639025	INTERAPID small magnetic support with articulated arm	Full length	205
Consisting of:			
	1 Articulated arm	Length	120
	1 Dovetail clamp with fine adjustment		
	1 Magnetic base	L x W x H	30 x 30 x 30





Magnetic Supports with Flat or V-Base

✓

Model with a flat base has 2 rounded permanent magnets

72 x 38 x 11 mm for model with a flat base or 72 x 38 x 26 mm for model with a V-base

Holding force: ≈ 180 N for the flat base or ≈ 260 N for the V-base

Clamp with a 8 mm diameter clamping bore

Supplied without indicator

Suited carrying case

Declaration of conformity





01639011	INTERAPID magnetic support with a flat base
01639012	INTERAPID magnetic support with a V-base

INTERAPID Magnetic Supports

Standard Model and Models with Powerful Holding Force

№		N	Fine adjust	V-Base for
01639017	Standard model	≈ 600	●	70 ÷ 220
01639018	Powerful holding force	≈1000	–	70 ÷ 220
01639019	Powerful holding force	≈1000	●	70 ÷ 220

✓

Disengageable magnet. Clamp with a 8 mm dia. clamping bore.

Supplied without indicator

Suited carrying case

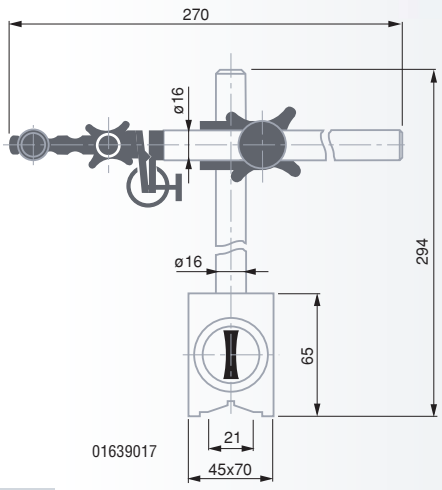
Declaration of conformity



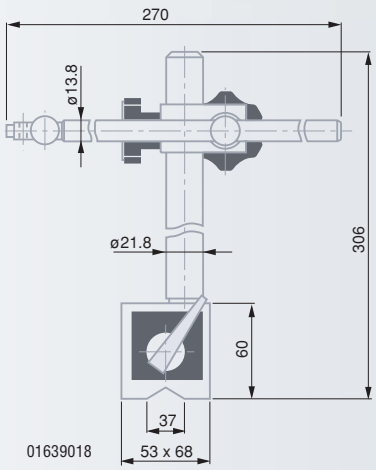
01639017



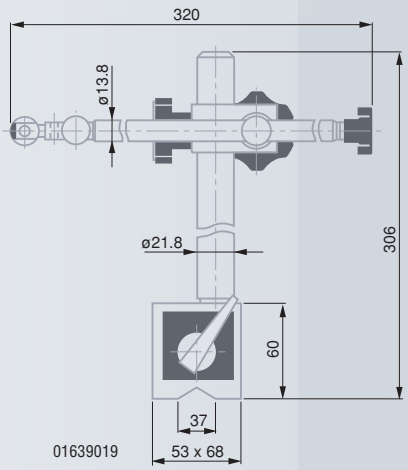
01639019



01639017



01639018



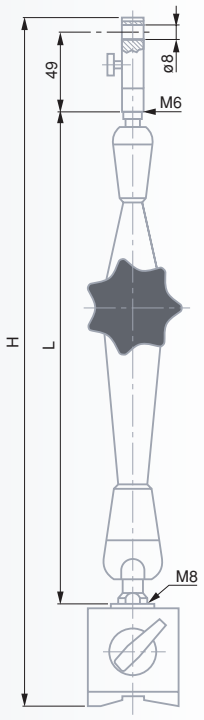
01639019

Models with Articulated Arm

Attach simply and securely using a single lobe knob – Solid arm with highly rigid articulations.

- ✓
- Magnetic base has 2 flat faces plus 1 prismatic one. Articulations made from duralumin. Disengageable permanent magnet. Dovetail clamp with a 8 mm diameter clamping bore.
- Magnetic base (L x W x H) 60 x 50 x 55 mm
- 1,45 kg or 1,85 kg
- Supplied without indicator
- Suited carrying case
- Declaration of conformity





№		H mm	L mm	N	Fine adjust	V-Base for
01639022	Magnetic support	310		≈700	●	30 ÷ 150
01639023	Magnetic support	390		≈700	●	30 ÷ 150
Consisting of:						
	Articulated arm		200			
	Articulated arm		280			
	Clamp					
	Magnetic base			≈700	●	30 ÷ 150



Model with Flexible Arm

For hard-to-reach locations – Lever controlled arm that holds securely on any surface.

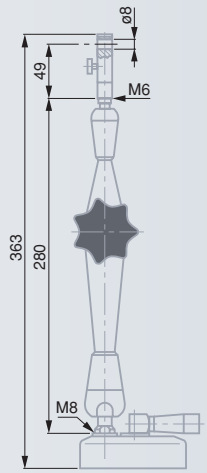
- ✓
- Magnetic base has 2 flat faces plus 1 prismatic one. Disengageable permanent magnet. Full length 350 mm. Dovetail clamp with a 8 mm diameter clamping bore.
- Holding force on a flat surface ≈ 1000 N
- Supplied without indicator
- Suited carrying case
- Declaration of conformity

№	
01639020	INTERAPID magnetic support with flexible arm

INTERAPID Measuring Support with Suction Base

Holds firmly on any plain, flat surface – Clamps easily and reliably over the lobe knob – Provides high rigidity – Free from magnetic fields.





✓

Round suction base in duralumin.(88 mm in diameter and 28 mm in height) with a flat face.
Articulations in duralumin.
Disengageable suction effect using the lever.
Dovetail clamp with a 8 mm diameter clamping bore.

1,1 kg

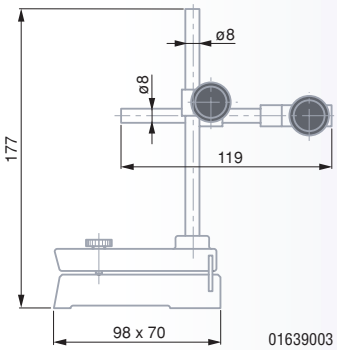
Supplied without indicator

Suited carrying case

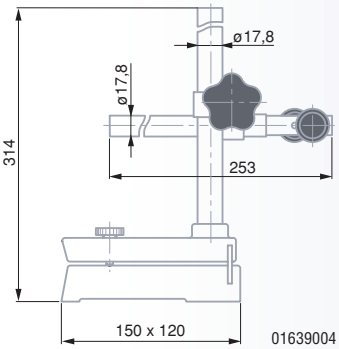
Declaration of conformity

№		H mm	L mm	N	Fine adjust
01639024	Support with suction base	363	280	≈400	●
consisting of:					
	Articulated arm		280		
	Clamp				●
	Round suction base			≈400	

INTERAPID Measuring Supports



01639003



01639004





✓

Base with resting front face.
Clamp for a 8 mm diameter mounting rod or a dial gauge with lug.
Model No. 01639003 with added dovetail clamp

Cast iron base

1,3 kg or 4,35 kg

Supplied without indicator

Suited carrying case

Declaration of conformity

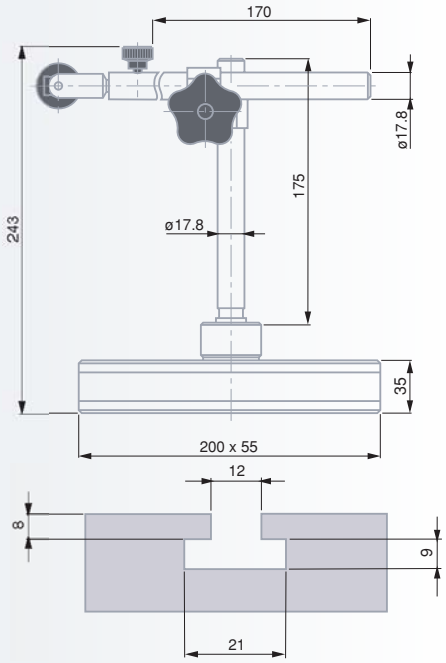
№		*Used in conjunction with*
01639003	INTERAPID small support	Dial test indicators, small dial gauges
01639004	INTERAPID small support	Dial test indicators, dial gauges, precision indicators, electronic probes etc.

INTERAPID UD 12 Universal Stand

Medium-sized sliding support for dial test indicators (lever-type), dial gauges, electronic probes etc. – With fine adjust option.

- ✓
- Stand with lateral guiding faces. Vertical column that can be moved along the T-slot. Provided with 2 rigid articulations.
- Cast iron base
- 3,3 kg
- Supplied without indicator
- Suited carrying case
- Declaration of conformity





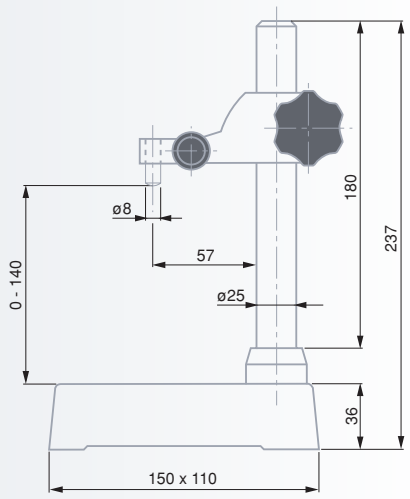
№		
01639000	INTERAPID UD 12 universal stand	
Furnished with:		
01640100	Clamp with a 8 mm dia. tightening	
01840105	Clamping rod, 8 mm dia., with dovetail recess	

INTERAPID UA 1

Measuring stand without fine adjustment

- ✓
- Measuring table with ground measuring face. Dismountable column. Measuring arm with a 8 mm dia. tightening.
- Cast iron table. Chrome-plated steel column. Spherical graphite cast iron arm.
- 3 kg
- Supplied without indicator
- Suited carrying case
- Declaration of conformity

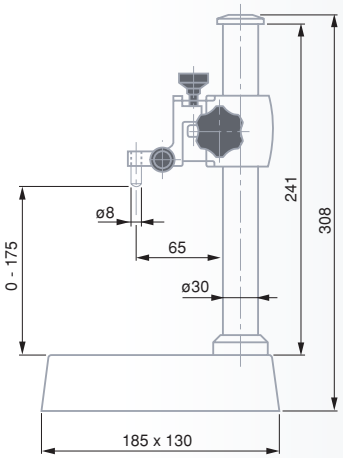




№		mm	mm
01639008	INTERAPID UA 1 measuring stand	0 ÷ 140	100 x 100

INTERAPID UA 30

Basic component for mounting specific workpiece attachments for series inspection.











№		mm	mm
01639009	INTERAPID UA 30 basic stand (without measuring arm)	0 ÷ 175	125 x 115
Accessories			
01610200	UK 20 measuring arm with fine adjustment		
01610201	UK 25 sliding arm used in conjunction with TESA YA for stationary bore measurement (also see page H-6)		
01640000	UAZ 10 depth stop plate		

✓

Basic stand

Ground measuring face. 2 T-slots. Dismountable column

Cast iron table. Chrome-plated steel column

Measuring arm

Fine adjustment within a range of 1 mm. 8 mm dia. clamping bore.

Sliding arm

Floating holder for TESA YA. Adjustable swinging movement. 13 mm dia. clamping bore. 35, 57 or 80 mm travel length.

Measuring span 60 mm.

Depth stop plate

Dimensions: 115 x 35 x 3,5 mm. 120° vee recess for diameters ≤ 120 mm. Two tightening screws.

Additional data

4,85 kg (basic stand). 0,85 kg (measuring arm). 1,75 kg (sliding arm).

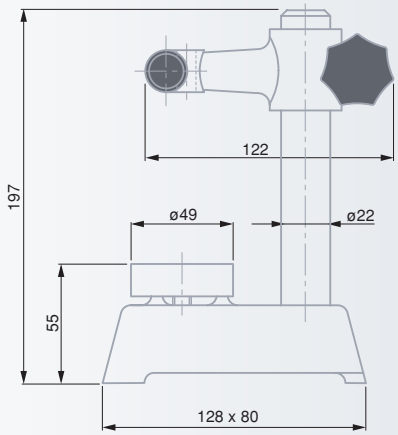
Supplied without indicator

Suited carrying case

Declaration of conformity

INTERAPID Small Measuring Stand

With round steel measuring table.





№		mm	mm
01639006	INTERAPID small measuring stand	0 ÷ 100	Ø 49

✓

Measuring arm with a 8 mm dia. clamping bore, without fine adjustment. Measuring span 48 mm

Measuring table and column in hardened steel

2,7 kg

Supplied without indicator

Suited carrying case

Declaration of conformity

INTERAPID Measuring Stands

Supports

N° 01639035
black burnished steel column with a 8 mm dia. clamping bore.

N° 01639029
Chrome-plated column with thread and setting ring for height adjustable measuring arm. 8 mm dia. clamping bore. Measuring face with dust grooves.

N° 01639030
Chrome-plated steel column. Tilting measuring arm with articulation.
4 or 8 mm dia. bore for a dovetail clamp or lug.

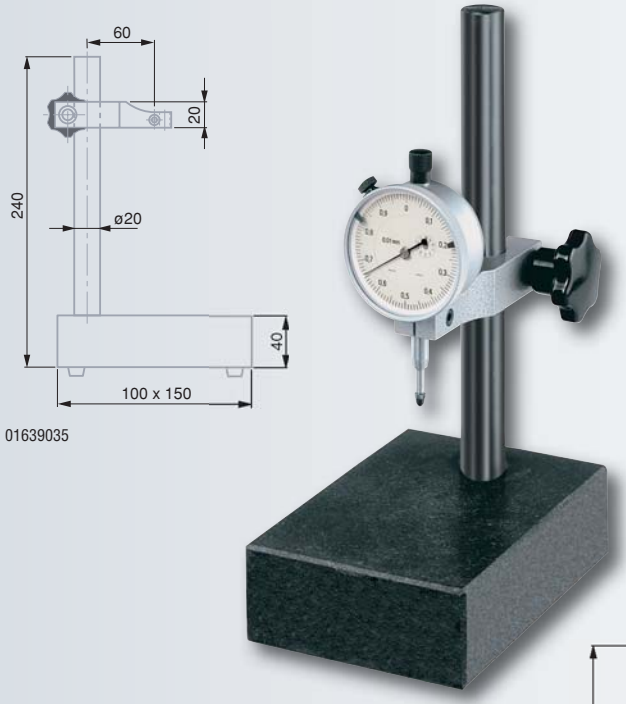
N° 01639033
Chrome-plated steel column. Sliding measuring arm, horizontally.
4 or 8 mm dia. bore for a dovetail clamp or lug.

3 µm as per DIN 876 T1, grade 00.

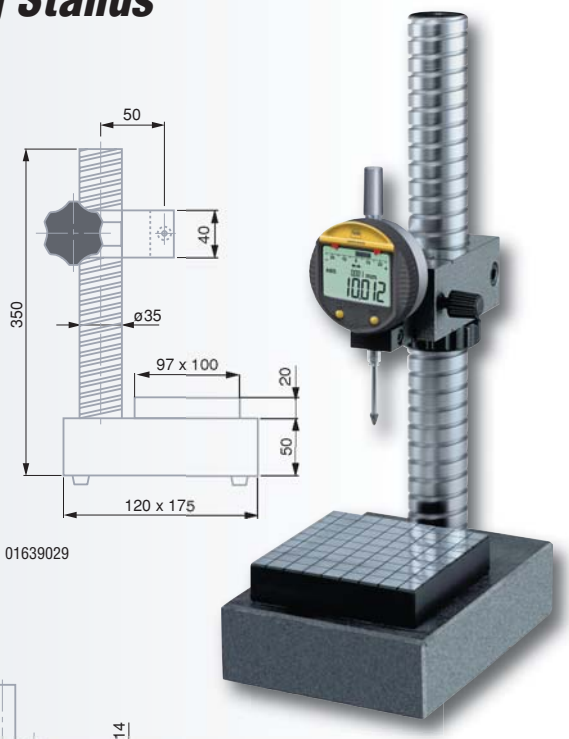
Supplied without indicator

Suited carrying case

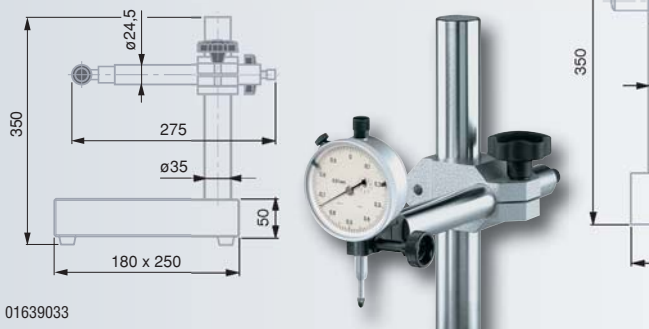
Declaration of conformity



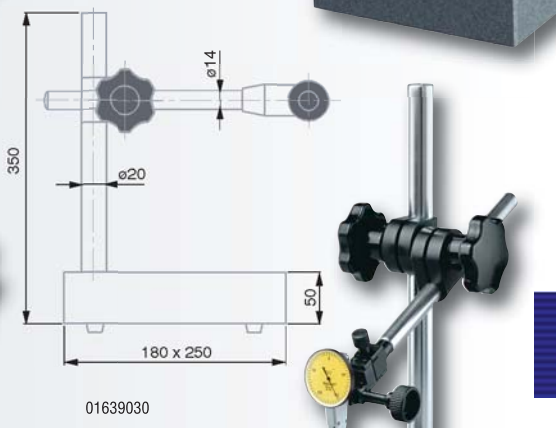
01639035



01639029



01639033



01639030

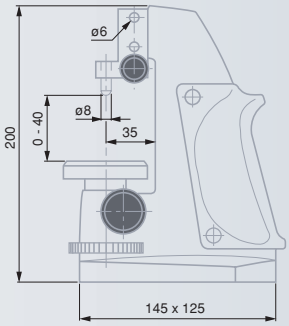
NP	Measuring face	Measuring face mm	mm	Fine adjustment	Span mm
01639035	Granite	100 x 115	0 ÷ 170	–	50
01639029	Steel, hardened	100 x 100	0 ÷ 225	●	68,5
01639030	Granite	180 x 205	0 ÷ 240	●	adjustable
01639033	Granite	180 x 200	0 ÷ 260	●	adjustable

	Measuring table	Measuring table mm	Column mm	Column mm	kg
01639035	Granite	100 x 150 x 40	20	200	2,6
01639029	Granite	120 x 175 x 50	35	300	8,1
01639030	Granite	180 x 250 x 50	20	300	8,4
01639033	Granite	180 x 250 x 50	35	300	10,5

INTERAPID UM 20

Stable stand for measuring small parts accurately.





With a 8 mm dia. tightening plus two 6 mm dia. clamping bores for the UPZ 6 probe-holder. Measuring span 35 mm.

3 kg (measuring stand alone)

Supplied without indicatorr

Suited carrying case

Declaration of conformity

INTERAPID UM 20 measuring stand (without measuring table)
Height adjustable table mount with thread and fine adjustment.
Clamping groove for UMZ 12 depth stop (No. 01640300)

Nº	mm	Fine adjustment mm
01639002	0 ÷ 40	15

UMZ 40 meas. table with dust grooves
Hardened steel, lapped measuring face.

No	mm
01640302	Ø 66 x 12



UMZ 41 plain measuring table
Hardened steel, finish ground measuring face.

No	mm
01640303	Ø 66 x 12



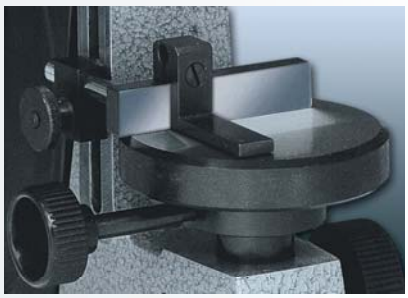
UPZ 6 double probe-holder
8 mm dia. mounting bore for 2 probes. Clamped on the measuring stand with 2 shafts having a 6 mm dia.

No	Sideways mm
01640401	13 ÷ 80



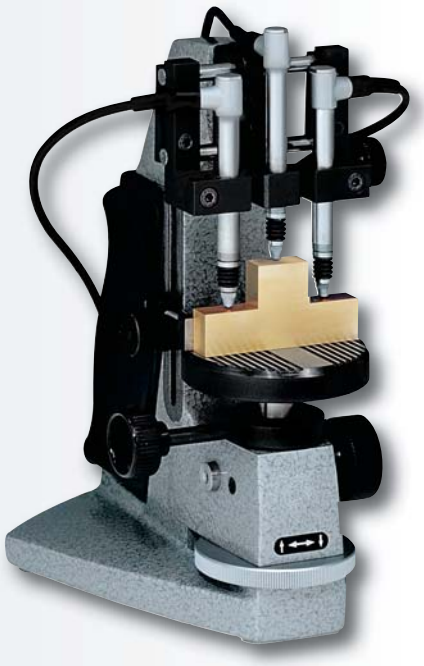
UMZ 12 depth stop
Clamp to be mounted in the T-slot of the basic stand. Hardened and ground stop plate.

No	Resting face mm
01640300	55 x 11



UMZ 13 side stop
Hardened and ground. For use along with UMZ 12.

No	Resting shoulder mm
01640301	31,5 x 10 x 3



INTERAPID Universal Stands UP

These two universal stands provide different height levels along with a wide range of accessories that serve for setting up a variety of measuring configurations – High-precision components, also highly stable and extremely wear-resistant – Guaranteed lowest measurement uncertainty for the skilled manufacuring shop floor.

Besides dial gauges, precision indicators and dial test indicators (lever-type), both stands enable electronic probes to be mounted, especially to carry out direct, sum or comparative measurement (see section O).

✓

Heavy cast iron base with mounted ground steel column (50 mm dia.). Measuring arm with a 8 mm dia. tightening and 2 mounting bores having a 6 mm dia. for UPZ 6.
Fine adjust control using the protected knob.
1 mm travel length.

Base and measuring arm in cast iron. Dull-chrome plated steel column.

Supplied without indicator

Suited carrying case

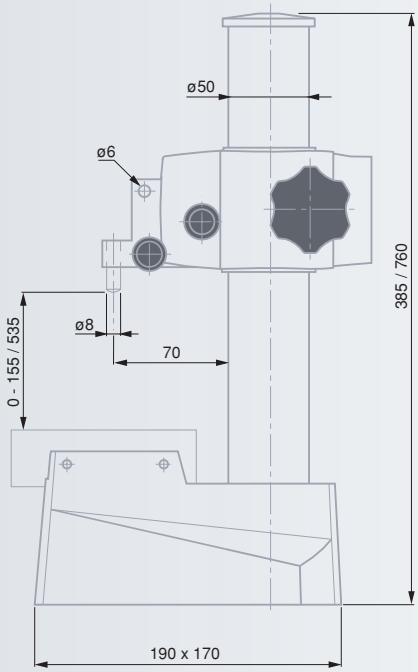
Declaration of conformity

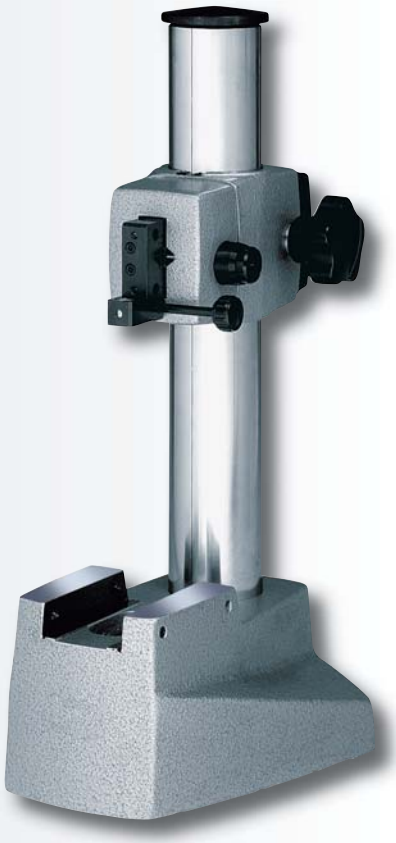


INTERAPID universal stands UP (without measuring table)

Heavy cast iron models. Measuring arm with locking device and brake stop.
For additional technical data, see opposite.

		mm	kg
01639041	UP 160 measuring stand	0 ÷ 155	13,5
01639042	UP 200 measuring stand	0 ÷ 535	19





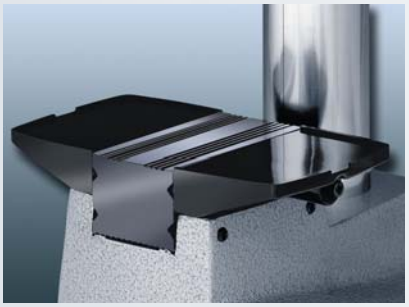


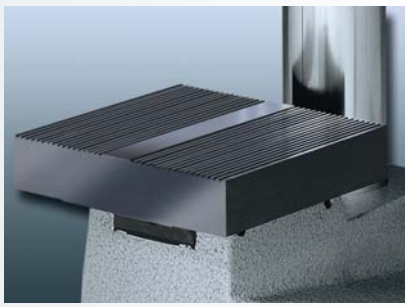
UPZ 40 standard measuring table

Hardened steel. Two measuring faces with dust grooves, lapped. One face has a 13 mm wide strip along the centre.

	mm	µm
01640405	45 x 95	1







UPZ 46 A measuring table along with probe-holder

Feature a 8 mm dia. clamping bore for axial probes. Hardened and lapped measuring face with dust grooves as well as a 13 mm wide strip along the centre.

	mm	µm
01640410	45 x 95	1

UPZ 20 side plates

To be mounted sideways on both UPZ 40 and UPZ 46 A measuring tables. Made of black plastic. Supplied in pairs.

	Resting face mm
01640404	55 x 95

UPZ 47 large measuring table along with probe-holder

8 mm dia. clamping bore for axial probes. Hardened and lapped measuring face with dust grooves as well as a 18 mm wide strip along the centre.

	mm	µm
01640411	120 x 120	1,5



UPZ 53 cross beam

For centre and vee supports. Made from cast iron and ground.

No	Length mm
01640416	300



UPZ 51 centre supports

For axial and radial run-out inspection. Max. distance between points: 155 mm. Feature solid and spring-loaded hollow points, movable lengthwise but also lockable. Used with cross beam UPZ 53. Supplied in pairs.

No	Height of points mm
01640414	50



UPZ 54 length stop

For use on the cross beam UPZ 53 with UPZ 52 resting blocks. A probe can be mounted instead of the stop rod.

No
01640417



UPZ 52 resting blocks

For cylindrical or conical components. Resting plates with tungsten carbide pins, adjustable to the part diameter. Distance between plates matches ≤ 300 mm. Used with cross beam UPZ 53. Supplied in pairs.

No	⌀ mm
01640415	≤ 30





UPZ 15 limit stop

Mounted with clamp on the column. Hardened, dull-chrome plated.

	Stop face mm
01640403	68 x 20

UPZ 60 rack and pinion slide

For vertical adjustment of the measuring arm.

	Travel length mm
01640419	185

UPZ 14 stop plate

For use with limit stop UPZ 15. Hardened, dull-chrome plated.

	Vee angle
01640402	120°





UPZ 6 double probe-holder

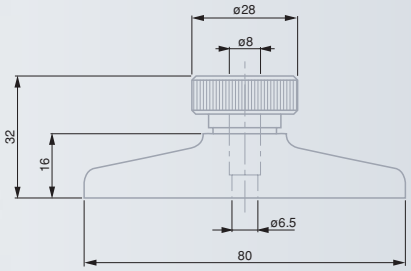
Tightening collar, 8 mm dia., for 2 electronic probes. Mounted on the stand by means of 2 shafts having a 6 mm dia.

	Lateral mm
01640401	13 ÷ 80

INTERAPID Depth Feet

Model with a flat measuring face





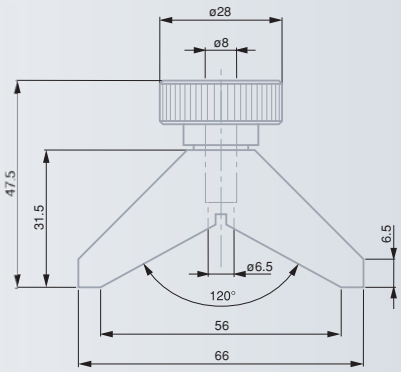
Nº	mm	Clamp mm
01639046	80 x 16	Ø 8

- Hardened steel
- Finish lapped measuring faces. Clamp with lock for mounting a dial gauge or an electronic probe
- Supplied without indicator
- Suited carrying case
- Declaration of conformity

Model with a prismatic measuring face

For measuring groove depth on cylindrical shafts. Also for establishing circularity errors etc.





Nº	mm	Width mm	Clamp mm
01639047	10 ÷ 100	120° 16	Ø 8

Brown & Sharpe CENTER FINDER

Practical auxiliary support that helps Users to quickly align the centre of the bores against the spindle axis on a machine tool – Used without clamping shaft can also serve as small magnetic support – Designed for clamping a dial test indicator whether standard or perpendicular.





Nº	=
06769006	Brown & Sharpe CENTER FINDER

- Center Finder includes the following components:
  - cylindrical shank that can be clamped on the chuck of a machine tool.
  - powerful permanent magnets.
  - swivel joint along with a dovetail collar for clamping a lever-type dial test indicator.
- Wooden case

Brown & Sharpe V-Blocks and Clamps

V-blocks have a frame for clamping cylindrical parts with diameters ranging from 0,7 to 40 mm – To be used for workpiece inspection or machining.

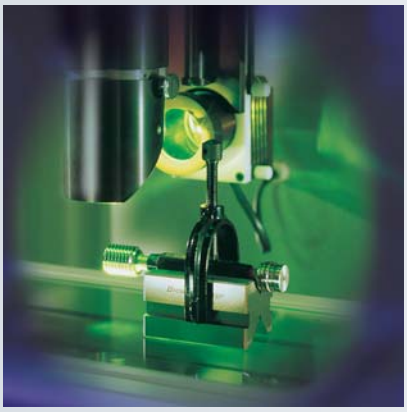
✓

Hardened steel

Ground for both resting and vee faces

Not available as single components

Suited plastic case





№		Clamping range mm
06769007	Brown & Sharpe V-blocks and clamps	0,7 ÷ 40
Consisting of:		
	1 Pair of V-blocks	5 ÷ 40
	1 Extra V-block	3 ÷ 8
	1 Extra V-block	1,5 ÷ 5
	5 Extra V-blocks	0,7 ÷ 3,5
	2 In-between bridges	
	2 Large frames	
	1 Small frame	

Brown & Sharpe Positioning Block Set

Pair of matched blocks convenient for positioning and holding workpieces or for use as stops on surface plates, metrology set-ups, machine-tools and the like – Blocks are precision ground.

✓

Each block has 18 through bores with a 9,53 mm dia. as well as 5 M10 threaded bores

Hardened steel, 55 to 60 HRC

7 µm for each pair

2,5 µm for all faces

Supplied with five M10 socket head screws as well as one 8 mm socket wrench

Suited plastic case





№		mm
06769004	Brown & Sharpe positioning block set	75 x 50 x 25

Brown & Sharpe Adjustable Parallels

Available in a set including 6 adjustable parallels – Frequently used as parallel pads, setting standards for handheld tools or plug gauges for checking internal dimensions on parallel surfaces.

Each parallel consists of two tapered parts dovetailed together – Two tightening screws lock parallels to size.



№		Heigth mm	Lengthr mm	Width mm
06769010	Set of Brown & Sharpe Engineer's parallels, adjustable			
Consisting of:				
	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

✓ Hardened steel

Supplied along with a PH 1 screwdriver

Plastic bag

ROCH Flexible Steel Rules

Made from stainless steel – Scale divisions to 1 and 0,5 mm.



№	mm	Width mm	Thickness mm
0951750181	200	13	0,5
0951750182	300	13	0,5
0951750184	500	18	0,5
0951750187	1000	18	0,5
0951750188	1500	18	0,5
0951750189	2000	18	0,5

✓ EG class II

Stainless spring-loaded steel

Suited carrying case

Declaration of conformity

ROCH Thickness Gauges

✓
Alloyed steel
100 mm long blades with max. width of 13 mm
Blades are not supplied individually
Plastic bag
Declaration of conformity

№	Number of blades	Thickness mm	Stepping mm
0951753013	6 7	0,05 ÷ 0,3 0,4 ÷ 1,0	0,05 0,1
0951753014	20	0,05 ÷ 1,0	0,05
0951753015	21	0,1 ÷ 2,0	0,1+1 x 0,05



ROCH Radius Gauges

Radius gauges with both concave and convex blades – Designed for visual assessment of radii.

✓
Stainless steel
Blades are not upplied individually
Plastic bag
Declaration of conformity

№	Number of blades	Radii mm	Stepping mm	Radii mm
0951753001	2 x 17	1,0 ÷ 2,75 3,0 ÷ 7,0	0,25 0,5	0,1 0,1
0951753002	2 x 16	7,5 ÷ 15,0	0,5	0,15
0951753003	2 x 15	15,5 ÷ 19,5 20,0 ÷ 25,0	0,5 1,0	0,2 0,2



ROCH Screw Pitch Gauges

60° or 55° flank angles for ISO metric threads or Whitworth threads.

✓
Alloyed steel
Blades are not supplied individually
Plastic bag
Declaration of conformity

№		mm					
0951753045	ISO 60°	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

№		*Threads per inch*						
0951753046	Whitworth 55°	*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*	



ROCH Hand-Held Magnifier

Folding handle with added small magnifier – Retractable support.

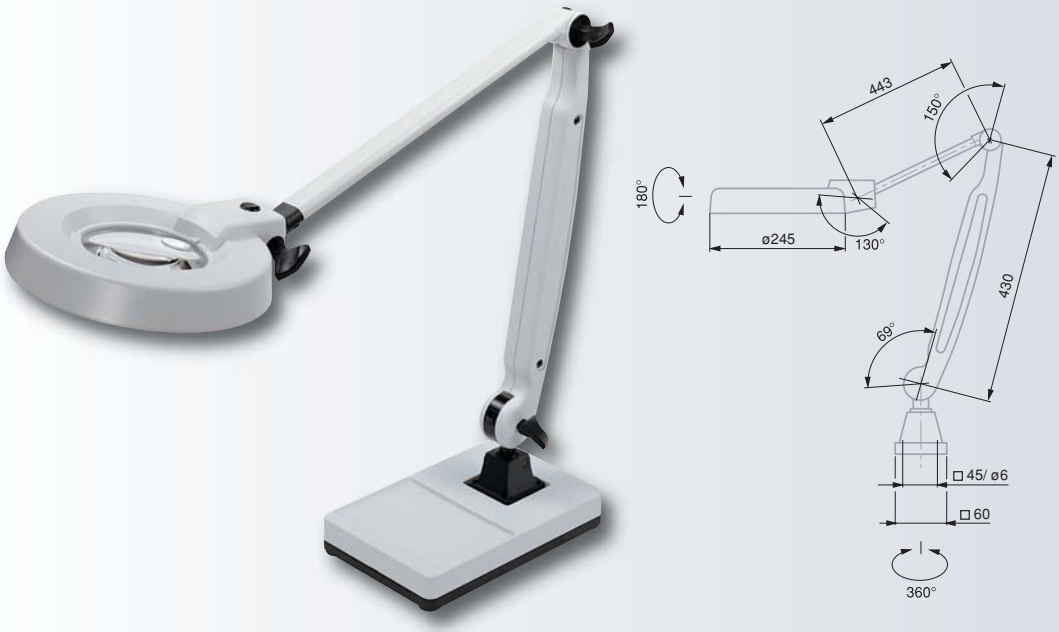


✓
Solid plastic
Cardboard box
Declaration of conformity

		Large model	Small mode	
	mm		mm	
0951754511	80 x 45	3x	13	10x

ROCH Magnifier with Ring Light

Table model ideal for sampling inspection, small part assembly etc. – Main plus extra magnifier with no distortion – Perfect illumination – Tilting magnifier head to any position – Easy and safe positioning through spring-loaded articulations.



✓
120 mm dia. magnifying glass
Materials: glass with solid plastic for the magnifier head. Sturdy cast iron base.
230 Vac, 50 Hz
Supplied with ring light (22 W)
Suited carrying case
Declaration of conformity

		Large model	Small model
0951754531	Magnifier with ring light	2x	4x
Accessory			
0951654531	Spare lamp, 22 W		



Straightness, Angle and Inclination Measurement

LEVELS BASED ON A NATURAL REFERENCE

Irrespective of their type, all precision levels are based on long-time stabilisation and reliability, but also on a free measuring base – the centre of the earth. Due to the gravitation, the liquid with embedded bubble of gas or the gravity pendulum indicates the horizontal or vertical level based on this natural reference. Electronic inclinometers or spirit levels measure the position of the pendulum compared to the measuring faces fitted on the tool body.

From these perfect conditions, each level offers a wide number of possibilities for accurately measuring to the nearest degree.

The measuring faces lying horizontally and vertically enable any deviation of the geometrical elements being measured on the workpiece to be detected.

These deviations often result from straightness or flatness errors, but also from position errors like those from parallelism or squareness.

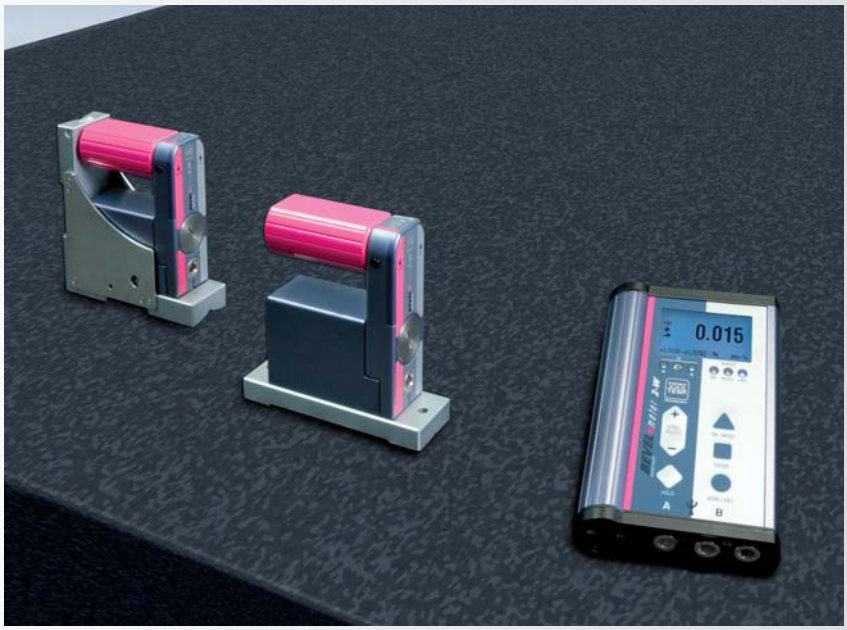
Value reading may vary, depending on the used level-type. Typical value outputs are:

- *inclination in 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"*



Calibration of a try square using ETALON RA.

Electronic dual-function clinometer that uses the difference mode for establishing flatness errors of a granite plate (example).



ROCH Bevelled Straight Edges

Provided with 1 bevelled edge – Also with Heat insulating handle.

- ✓
- DIN 874 T2
  NF E 11-104
- Hardened steel to ≥ 650 HV 10
- Models with length up to 200 mm in a plastic bag.
  Models from 300 mm in a wooden case.
- Declaration of conformity

№	mm	µm
0951750002	75	2
0951750003	100	2
0951750004	125	3
0951750005	150	3
0951750006	200	3
0951750007	300	3
0951750008	400	4
0951750009	500	4
0951750010	600	5
0951750011	750	5



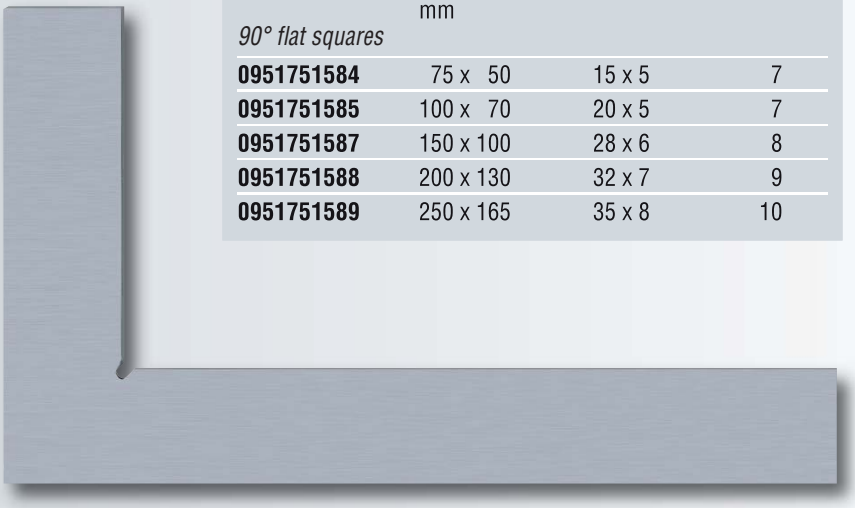
ROCH Flat and Try Squares

Made from stainless steel

- ✓
- Factory standard
- Stainless steel to 200 HRB (not tempered)
  or ≥ 550 HV 30 (tempered)
- Accuracy class 0 or 1
- Suited carrying case
- Declaration of conformity

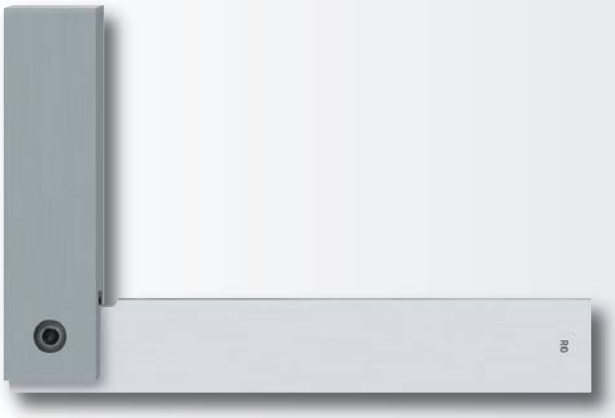
Accuracy class 0, not tempered

№	Length of beams mm	Section mm	µm
90° flat squares			
0951751584	75 x 50	15 x 5	7
0951751585	100 x 70	20 x 5	7
0951751587	150 x 100	28 x 6	8
0951751588	200 x 130	32 x 7	9
0951751589	250 x 165	35 x 8	10



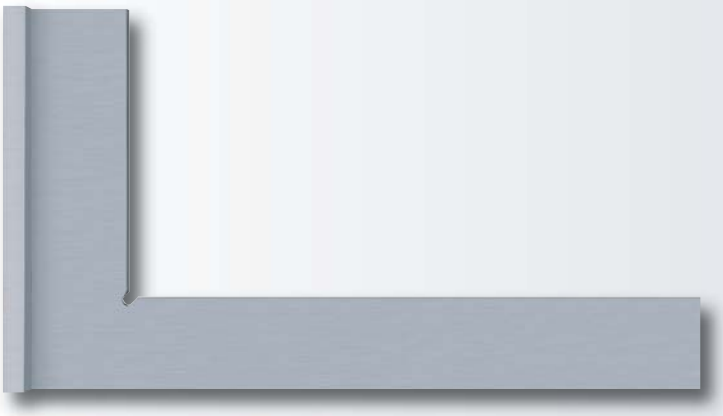
Accuracy class 0, tempered

90° flat squares	*90° try squares*	Length of beams mm	Flat squares section of beams mm	Try squares section long beam mm	Try squares section short beam mm	µm
0951751523	**0951751543**	50 x 40	15 x 4	16 x 2	14 x 10	7
0951751524	**0951751544**	75 x 50	15 x 4	18 x 2	14 x 10	7
0951751525	**0951751545**	100 x 70	20 x 5	18 x 2	16 x 10	7
0951751527	**0951751547**	150 x 100	30 x 6	22 x 2	20 x 12	8
0951751528	**0951751548**	200 x 130	30 x 7	26 x 3	24 x 14	9
0951751530	**0951751550**	300 x 200	40 x 8	32 x 3	30 x 18	11



Accuracy class 1, not tempered

90° flat squares	*90° try squares*	Length of beams mm	Section mm	µm
0951751564	**0951751604**	75 x 50	15 x 5	14
0951751565	**0951751605**	100 x 70	20 x 5	15
0951751567	**0951751607**	150 x 100	28 x 6	18
0951751568	**0951751608**	200 x 130	32 x 7	20
0951751569	**0951751609**	250 x 165	35 x 8	23
0951751570	**0951751610**	300 x 200	40 x 8	25
0951751572	**0951751612**	500 x 330	50 x 10	35
0951751574	**0951751614**	750 x 500	60 x 12	43
0951751575	**0951751615**	1000 x 660	70 x 14	60



✓
Factory standard
Hardened steel
Suited plastic case

Brown & Sharpe Try Square Set

06739001	**Brown & Sharpe Try Square Set**		
		mm	µm
Consisting of:			
	1 Try square	68 x 45	16
	1 Try square	120 x 70	16
	1 Try square	175 x 95	16





ROCH Bevelled Edge Squares

Made from stainless steel, hardened

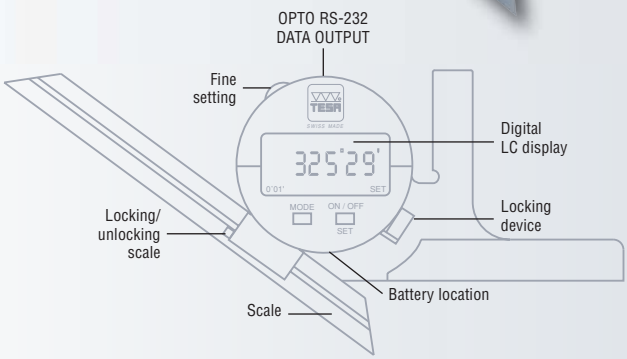
✓
DIN 875
NF E 11-103
Stainless steel hardened to ≥ 550 HV 30
Accuracy class 00
Suited carrying case
Declaration of conformity

	Length of beams mm	Section of beams mm	µm
90° flat squares			
0951751533	50 x 40	14 x 4,5	3
0951751534	75 x 50	16 x 4	3
0951751535	100 x 70	20 x 5	3
0951751537	150 x 100	28 x 6	4
0951751538	200 x 130	30 x 7	4

TESA Angle Protractor with Numerical Indication

- Decimal or sexagesimal large LC display
- 2 measuring directions
- Fine setting
- Locking device
- Scales - 200 300 or 500 mm





№		
00630010	TESA angle protractor with numerical indication. Provided with a regular scale, 200 mm long.
Accessories	
00660004	Scale, 200 mm
00660005	Scale, 300 mm
00660006	Scale, 500 mm
00660007	Extra base with one flat plus one prismatic measuring faces for small angles
00660008	Edge square for sharp angles
01961000	3V lithium battery, type CR 2032, 190 mAh
	For information on connecting cables etc., see section A.



00660007



00660008

- ✓
- LCD, 5 digits + sign
- Measuring ranges: 1 x 360°, 2 x 180°, 4 x 90°
- Digit height: 8,5 mm
- Resolution: 0,01° or 1 minute of arc (0°01')
- Preset to 0° or 180°
- Max. perm. error: 4 minutes of arc
- Max. perm. rotation speed: 1080°/s
- IP51 (IEC 529)
- +5 °C to + 40 °C
- 3V lithium battery, type CR 2032
- Battery life > 3000 hours
- RS 232, opto-coupled
- Stainless steel body, hardened
- 410 g
- ✓
- Wooden case
- Serial number
- Declaration of conformity

TESA EAC Angle Protractors with Dial

Circular scale with pointer – Easy, reliable readout of both the main and auxiliary scales – Very low hysteresis – Precision movement mechanism with compensation of play.

- ✓
- 2 circular scales
- 5' on main scale. Clockwise or counter clockwise reading.
- 10° on the auxiliary scale
- Stainless steel, hardened
- Max. perm. error: 5' (without accessory)
- Plastic case
- Declaration of conformity



No		Scale length mm
00630001	4 x 90°	200
00630002	4 x 90°	300

Optional accessories

No		mm
00660002	Scale	200
00660003	Scale	300
00610101	Auxiliary scale for acute angles up to 15°	
00610102	Cast iron base with steel bottom surface, hardened	



00610102



00610101

ETALON 436
Angle Protractor with Vernier

- ✓
- 5'
- Stainless steel, hardened
- Max. perm. error: 5' (without accessory)
- Plastic case
- Declaration of conformity



No		Scale mm	Auxiliary scale
076115566	4 x 90°	200	–
076115567	4 x 90°	300	–
076116009	4 x 90°	200	●
076116010	4 x 90°	300	●

Optional Accessories (as shown above)

No		mm
00660002	Scale	200
00660003	Scale	300
00610101	Auxiliary scale for acute angles up to 15°	
00610102	Cast iron base with steel bottom surface, hardened	
00610103	Magnifying glass	

Brown & Sharpe Angle Protractor Combination

Commonly used as bevelled protractor, ruler, scale, try square, depth and centre gauge as well as spirit level.

✓
Hardened steel, wear protected measuring faces
Suited plastic case





№	
06719000	**Brown & Sharpe Angle Protractor Combination**
Consisting of:	
	1 Ruler graduated in millimetres, 300 mm long
	1 Protractor head with 2 x 90° graduations
	1 Centre head
	1 Square head with hardened steel 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 steel
Removable front stop
Cardboard box
Declaration of conformity



№	Centre distance mm	mm
06769005	127 ± 0,004	123 x 25



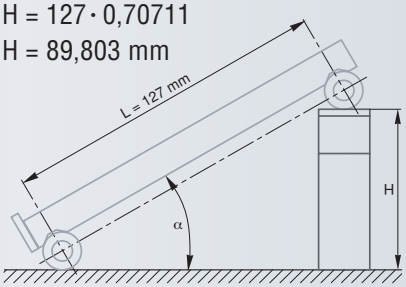
Calculating a 45° setting angle (example)

Gauge block combination H

$H = l \cdot \sin \propto$

$H = 127 \cdot 0{,}70711$

$H = 89{,}803$ mm



✓

Angle standard made of fine-grained granite

Max. perm. error for squareness and straightness applies to the whole measuring range (carriage travel).

Valid for a theoretical line drawn symmetrically to the lateral guiding faces, at a distance of about 60 mm from the one in front of the angle standard.

ETALON RA only (without value sensor): 0,2 µm

Temperature stabilisation at < 0,1°C

Needed pressure: > 5 bar
Air consumption: < 20 l / min

Dimensions (L x W x H):
ETALON RA 500
250 x 80 x 634 mm
ETALON RA 700
250 x 80 x 884 mm

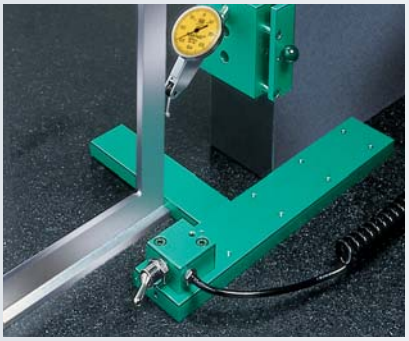
Suited carrying case

SCS calibration certificate

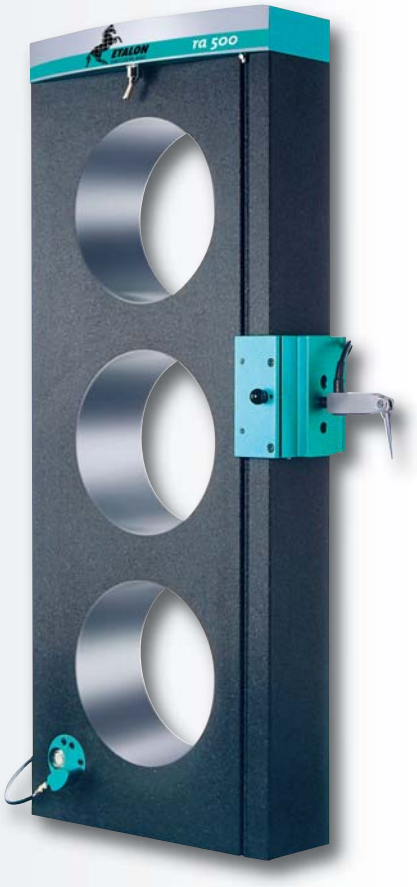
ETALON RA for Squareness Measurement

High-precision measuring instruments for determining squareness, straightness and parallelism errors – Perfect for use in the inspection laboratory as on the shop floor.

- Angle and straightness standards are made of natural granite with finely lapped measuring faces.
- Patented, hand moved carriage that attaches by vacuum on the guiding face of the angular standard. The grid potential thus obtained enables the carriage to be guided free of play.
- Base face on air bearing for easy displacement of the reference angle on the surface plate, practically without wear and tear.
- Helpful optional accessories to make measuring easy.







№		mm	Frontal µm	Lateral µm	µm	kg
05319201	**ETALON RA 500**	500	1,2	5	1,2	26
05319202	**ETALON RA 700**	700	1,5	7	1,5	37

Optional Accessories

05360007	Auxiliary vacuum square for mounting either a flat or a try square at right angle on the ETALON RA front face.
05360008	Probe holder with a 8 mm dia. clamp for inspecting the angle lying inside a flat or a try square and the like.
05360009	Air filter unit (oil and water collector)
05360011	Wooden case for safe storage of ETALON RA 500
05360012	Wooden case for safe storage of ETALON RA 700

TESA ClinoBEVEL 1
Electronic Inclinometer

User-friendly, versatile inclinometer made to measure the amount of tilt using either of both direct and differential modes – Measuring range ±45° with clear display of any measured angles or slopes – Reinforced aluminium housing and latest electronics – Large LC display for error free read-out.



№			mm/m	mm
05330203	TESA ClinoBEVEL 1 USB	±45°	≥ 0,02	100 x 75 x 35
Supplied with :				
	ClinoSOFT Software plus USB cable to host computer			
Optional Accessories				
04768002	4 Batteries, type LRC 6, AA, 1,5 V)			
05360006	Cable with switch for value acquisition (2 m long			
05360014	Remote switch for value acquisition (range 10 to 15 m)			

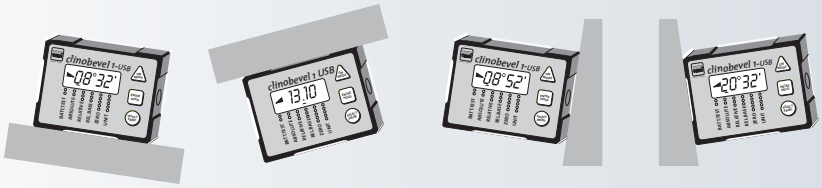
Numerous measuring applications, including comparative measurement of two parallel surfaces by means of two inclinometers. Inspection reports are also automatically generated under Microsoft EXCEL.



Measuring functions available: A ; B ; A+B ; A-B



ClinoBEVEL 1 USB can be used on any of its four faces.



- ✓
- DIN 2276 Part 2 (Form D)
- LC display

Angle
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
- Anodised light alloy
- Flat face 4 x 90°
- 2' + 1 numerical interval
- 21 storable correction values (high accuracy)
- Response time ≈1 s
- Display lock
- RS 485, asynchronous, 7 bits, 2 stop bits, no parity, 9600 bauds
- 1,5 V battery, type LRC 6, AA
- ≈ 150 hours
- Automatic shut down after 8 min
- 0 to 40 °C
- -20 to 70 °C
- IP65 (IEC 60529)
- EN 50081-1 / -2 EN 50082-1 / -2
- 100 x 75 x 35 mm
- 0,52 kg
- Plastic case
- Identification number
- Inspection report with a declaration of conformity

✓

DIN 2276 Part 2 (Form D)

LC display

Angle
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

Rust inhibiting housing

2 flat measuring faces with V-slot for diameters from 17 to 94 mm

5" +0,07% based on measured value

Response time: < 5 s

RS 232

2 batteries 1,5 V, type LRC 6, AA

40 to 60 hours

150x150x35 mm

3 kg

Automatic shut down after 8 min

0 to 40 °C

-20 to 70 °C

IP65 (IEC 60529)

EN 50081-1 / -2
EN 50082-1 / -2

Plastic case

Identification number

Declaration of conformity

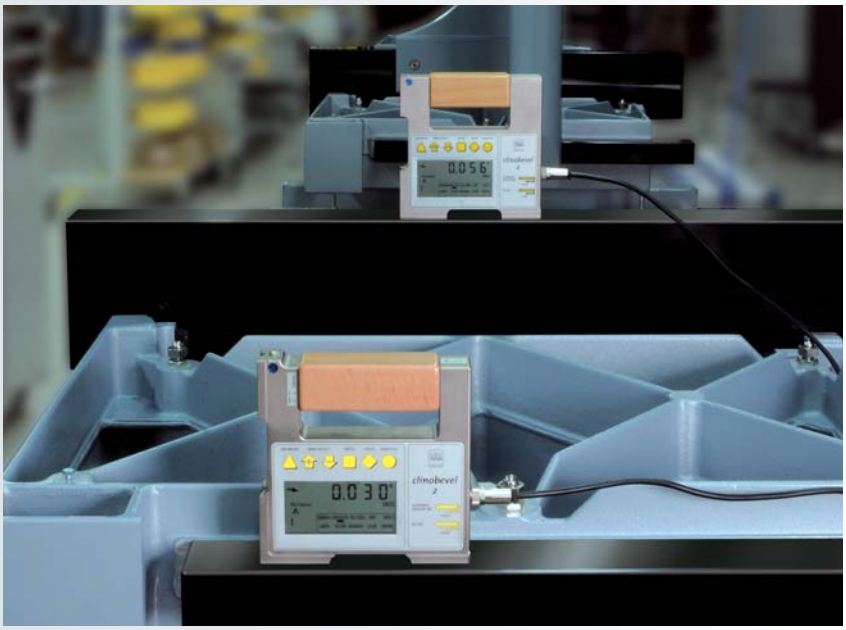
TESA ClinoBEVEL 2
Electronic Inclinometer

World-class model – Tilting range ±45° with inclination or angle units clearly displayed – Integrated temperature compensation – Microprocessor-based auxiliaries allowing both display and tool setting – Dual data output for comparative measurements etc.



				mm
05330202	TESA ClinoBEVEL 2	±45°	≥ 5"	100 x 150 x 35
Optional Accessories				
04768002	4 Batteries, type LRC 6, AA, 1,5 V			
05360004	Cable for connecting two Clinobevel 2, length 2,50 m			
S53070174	RS885 connecting cable Sub-D 9p/f to PC			

ClinoBEVEL 2 can be used on either of its both reference faces, but also linked to a second inclinometer. Use of a PC is unnecessary.



TESA MICROBEVEL 1

These electronic inclinometers measure slightly inclined surfaces, precisely – e.g when inspecting flatness of a surface plate or the geometry of a machine – Specially suited for use in rough surrounding conditions.

		Basis length mm	Width mm	mm/m	kg
05330003	Horizontal model	110	45	0,01 or 0,001	1,8
05330004	Horizontal model	150	45	0,01 or 0,001	2,1
05330005	Square model	150	45	0,01 or 0,001	3,1

Models with numerical interval to 0,05 or 0,005 mm/m available on request

Optional Accessories

04768002 4 Batteries, type LRC 6, AA, 1,5 V



Range	mm/m	mm/m	mm	G = mm/m ≤ 5 mm/m	G = mm/m >5 mm/m
1	± 20	± 5	0,01	G = 1% of measured value plus at least 0,01 mm/m	G = 0,01 mm/m
Range	mm/m	mm/m	mm	≤1 mm/m	>1 mm/m
2	± 2	± 2	0,001	G = 1% of measured value plus at least 0,001 mm/m	G = 1% of (2x measured value -1)

- ✓
- DIN 2276 Part 2 (Style D)
- LCD (see table)
- See table
- Fully encapsulated measuring system with gravity pendulum
- Cast iron base, chromium plated side faces, varnished light alloy housing
- 2 flat measuring faces with V-slot for diameters from 20 to 120 mm
- See table below
- Response time < 3 s
- 1 mV per unit (100 kΩ)
- 1,5 V battery, type LRC 6, AA
- 100 to 140 hours
- Automatic shut down after 55 min
- 0 to 40°C
- -20 to 70°C
- ≤ 0,1%/ °C based on the measuring range at 20 ±5°C
- As in above table, incl. suited case
- EN 50081-1 / -2 EN 50082-1 / -2
- Plastic case
- Identification number
- Declaration of conformity

Inclinometer Sets for TESA SERVICE SET 2

Two distinct sets are available : TESA SERVICE SET 2-C operating with cables only, and TESA SERVICE SET 2-W allowing for data transfer either through cables or using the wireless operating mode.

Possible connection of a separate BEVELmeter 2 display unit to each BEVELtronic 2 for comparative measurement.

BEVELtronic 2

1 flat measuring face and 1 perpendicular face with a V-slot for diameters from 20 to 120 mm

BEVELmeter 2

- LCD
- Response time ≤ 3 s
- RS232
- 33 à 40h
- Automatic shut down after 8 min

SERVICE SET 2

- 0°C to 40°C
- -20°C to 70°C
- < 95%
- EN 50081-1 / EN 50082-1
- Plastic case
- Identification number
- Declaration of conformity



TESA SERVICE SET 2-W



TESA SERVICE SET 2-C

N°		mm/m	µm/m	Arcsec	< 0,5 full scale	> 0,5 full scale
05330304	TESA SERVICE SET 2-C	± 10	1	0,2	*	**
05330305	TESA SERVICE SET 2-C	± 50	5	1	*	**
05330310	TESA SERVICE SET 2-W	± 10	1	0,2	*	**
05330311	TESA SERVICE SET 2-W	± 50	5	1	*	**

Each kit consists of the following:

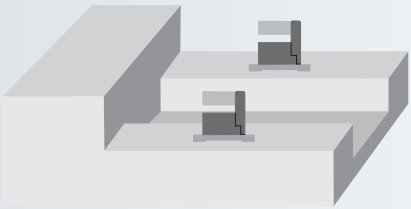
- 1 BEVELtronic 2 – Horizontal model
- 1 BEVELtronic 2 – Square model
- 1 BEVELmeter 2, numerical interval to 0,001 or 0,005 mm/m
- 2 Single cables BEVELtronic 2 to BEVELmeter (2,5 m in length for each)
- 1 Infrared remote control
- 7 Alcaline batteries, type LR14 1,5V, C
- 2 Alcaline batteries, type LR03 1,5V, AA

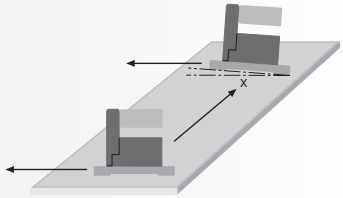
* Maximum 1% of measured value + minimum 1 digit
** Maximum 1% of (2x measured value less 0,5x full scale value)

Additional Data

	Basis length mm	Width mm	kg
BEVELtronic 2 – Horizontal model	150	45	1,6
BEVELtronic 2 – Square model	150	45	1,7

Made for highly accurate difference measurements taken, for example, on granite plates or guiding rails or for checking the straightness.





TESA BEVELSOFT for SERVICE SET 2

The software that allows for geometry and flatness measurements.

TESA BEVELSOFT is specially designed for checking surfaces, but also for viewing any changes that need be made. Icon-driven menus besides a wide choice of languages available make it simple for the operator to quickly create full inspection reports.

Standards: DIN 876, JIS, GGG-P-463c, BS 817, ISO 8512

Minimum requirements for the computer:
- Microsoft Windows 98 / NT / 2000 / XP / 7
- Pentium III
- 128 MB RAM
- Graphics card, 800 x 600 pixels
- CD-Rom
- 50 MB free space on hard disk



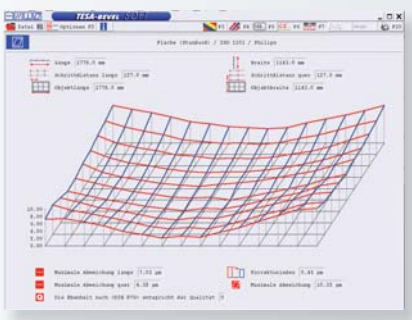
05360015 TESA BEVELSOFT

Consisting of:

	CD containing instructions for installation and TESA BEVELsoft programme
	USB dongle
	Connecting cable BEVELmeter 2/PC along with 2 extra outlets and connector RS485 Sub-D 9-pin/f connector, length 2,5 m
	Power supply, 24 V
	Hand switch with cable for value acquisition, length 2,5 m

Measuring functions

	Straight line	
	Twisted line	
//	Parallelism	2 or 3 lines
//	Twisted parallelism	2 ou 3 lines
⊥	Perpendicularity	Various references
▱	Flatness	Standard and U-Jack
▱	Partial flatness	



Measurement of a large granite plate



Measurement of a granite plate according to U-Jack

✓

DIN 2276 Part 2 (Style D)

See table

See table

Inductive measuring system with gravity pendulum

Cast iron body. Horizontal model with granite base.

Horizontal model with a flat measuring face. Square model with 2 flat faces having a V-slot for diameters from 20 to 120 mm

0,005 mm / m + 1% of the measured value

0,001 mm / m

≈ ± 0,2 V Impedance 4,5 kΩ

10 to 30°C

-20 to 60°C

EN 50081-1 / -2 EN 50082-1 / -2

Wooden case

Identification number

Declaration of conformity

TESA NIVELTRONIC
Electronic Levels

Most popular electronic levels with a solid cast iron body used for checking and levelling horizontal and vertical surfaces – Also suitable for accurate measurement of small angles, especially while inspecting surface flatness of granite plates.



Nº		Basis length mm	Width mm	mm/m	kg
03130063	Horizontal model	150	45	0,05 / 0,01	6,0**
03130060	Square model	200	45	0,05 / 0,01	6,5**
Optional Accessories					
03160007	Granite base*	200	50		1,0
03160008	Granite base*	250	50		1,5
03160009	Granite base*	500	50		6,0
03160048	Holder with built-in voltage regulator (4,65 V) plus 1 battery-set as below				
04761059	1 Set = 4 spare batteries, type LR 03, AAA, 1,5 V				

* For horizontal model ** Along with a wooden case



Range	mm/m	”	mm/m	”
1	± 0,75	± 150”	0,05	10”
2	± 0,15	± 30”	0,01	2”

TESA Spirit Levels

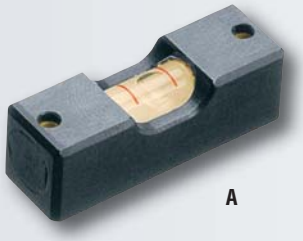


✓
DIN 877
See table
DIN 2276 Part 1
No. 05331350 to No. 05331352 in a wooden case, others models in cardboard boxes
Declaration of conformity

	No	mm/m	mm	For shafts mm
Model A	*Spirit levels with a prismatic measuring face, Ω-shaped*			
	05331650	1,0	100 x 30 x 35	17 ÷ 80
	05331651	0,3	100 x 30 x 35	17 ÷ 80
Model B	*Tubular spirit levels with a flat measuring face*			
	05331250	0,1	80 x 9, Ø 16	
	05331251	0,3	80 x 9, Ø 16	
	05331252	0,1	100 x 10, Ø 20	
	05331254	0,05	150 x 11, Ø 22	
	05331255	0,1	150 x 11, Ø 22	
	05331256	0,3	150 x 11, Ø 22	
	05331257	0,05	200 x 12, Ø 22	
	05331258	0,1	200 x 12, Ø 22	
Model C	*Spirit levels for transmission shafts with side viewing slots*			
	05331350	0,05	100 x 30 x 35	17 ÷ 80
	05331351	0,3	100 x 30 x 35	17 ÷ 80
	05331352	0,1	200 x 30 x 35	17 ÷ 80

✓
DIN 877
See table
DIN 2276 Part 1
2 or 3 mounting screws
Cardboard box
Declaration of conformity

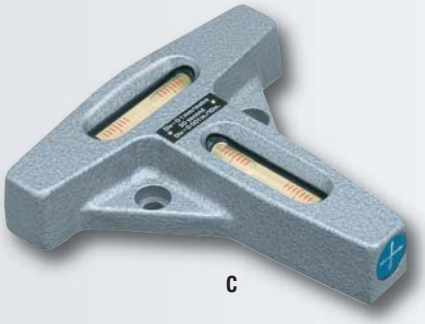
TESA Screw-On Spirit Levels



A



B



C

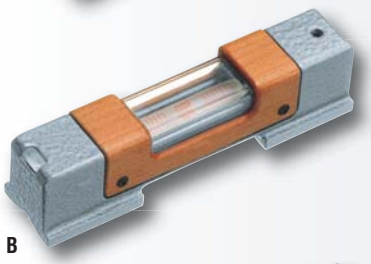
	No	mm/m	l x L mm	mm	H mm
Model A	*Screw-on spirit levels with a longitudinal vial*				
	05331400	2 ÷ 5	30 x 10		10
	05331401	2 ÷ 5	40 x 10		11
	05331402	1,0	50 x 10		12
	05331404	1,0	60 x 12		14
	05331406	0,3	60 x 12		14
	05331407	2 ÷ 5	80 x 15		18
	05331408	0,1	80 x 15		18
	05331410	1,0	100 x 18		22
	05331411	0,1	100 x 18		22
Model B	*Circular screw-on spirit levels with both a longitudinal and cross vials*				
	05331500	2 ÷ 5		40	11
	05331502	0,3		60	13
Model C	*T-shaped screw-on spirit levels with both a longitudinal and cross vials*				
	05331550	0,1	80 x 65		17
	05331551	0,3	80 x 65		17
	05331552	0,02	150 x 147		30

TESA Precision Spirit Levels

Used for checking and aligning flat or cylindrical surfaces in the horizontal position.



A



B



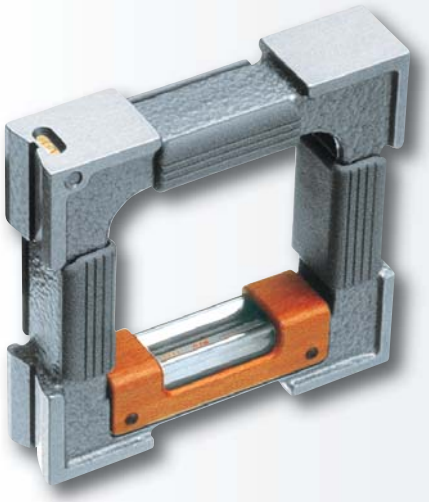
C

	mm/m	mm	For shafts mm	
Precision spirit level with insulating pad				
05331600	0,05	100 x 45 x 35	19 ÷ 120	A
Precision spirit levels with insulating grip and vial protection, side viewing slots				
05331050	0,02	100 x 32 x 35	17 ÷ 84	B
05331051	0,1	100 x 32 x 35	17 ÷ 84	B
05331052	0,3	100 x 32 x 35	17 ÷ 84	B
05331054	0,02	150 x 35 x 38	17 ÷ 94	C
05331056	0,05	150 x 35 x 38	17 ÷ 94	C
05331057	0,1	150 x 35 x 38	17 ÷ 94	C
05331058	0,02	200 x 40 x 42	19 ÷ 108	C
05331059	0,04	200 x 40 x 42	19 ÷ 108	C
05331061	0,1	200 x 40 x 42	19 ÷ 108	C
05331063	0,02	250 x 45 x 42	19 ÷ 120	C
05331065	0,05	300 x 50 x 42	22 ÷ 135	C

✓
DIN 877
Longitudinal and cross level vials
Flat and prismatic measuring faces
See table
DIN 2276 Part 1
Wooden case
Declaration of conformity

TESA Precision Spirit Levels with a Frame

For checking and levelling flat or cylindrical surfaces in both horizontal and vertical positions – Insulating grips and vial protection – Side viewing slots.



	mm/m	mm	For shafts mm
05331201	0,05	100 x 100 x 32	17 ÷ 84
05331202	0,1	100 x 100 x 32	17 ÷ 84
05331204	0,05	150 x 150 x 35	17 ÷ 94
05331206	0,02	200 x 200 x 40	19 ÷ 108
05331208	0,05	200 x 200 x 40	19 ÷ 108
05331210	0,05	250 x 250 x 45	19 ÷ 120

✓
DIN 877
Longitudinal and cross level vials
4 x 90° flat measuring faces, machined to one another. Two of them have a V-shape
See table
DIN 2276 Part 1
Wooden case
Declaration of conformity

TESA Precision Spirit Levels

Magnetic Square Models

For inspecting and levelling flat or cylindrical surfaces in both horizontal and vertical positions – Attach magnetically on such surfaces – Fitted with insulating handle.

- ✓
- DIN 877
- Longitudinal and cross level vials
- Two flat measuring faces machined to one another (90°), with a vee slot
- See table
- DIN 2276 Part 1
- Wooden case
- Declaration of conformity

№	mm/m	mm	For shafts mm
05331000	0,02	150 x 150 x 40	19 ÷ 108
05331001	0,04	150 x 150 x 40	19 ÷ 108
05331002	0,05	150 x 150 x 40	19 ÷ 108



TESA Precision Spirit Level with Micrometer Element

For checking surface flatness and slopes – With insulating pads.

- ✓
- DIN 877
- Longitudinal and cross level vials
- Hardened and ground base
- Flat, prismatic measuring faces
- DIN 2276 Part 1
- Wooden case
- Declaration of conformity

№	mm/m	mm	For shafts mm
05331450	0,02	150 x 45 x 45	19 ÷ 120



TESA Protractor Spirit Inclinometer

- ✓
- Factory standard
- Lengthwise plus transverse vials
- Flat and prismatic measuring faces
- Wooden case
- Declaration of conformity

№			Vial	mm	For shafts mm
05331300	4 x 90°	1°	7 ÷ 17'	180 x 75 x 22	15 ÷ 55



TESA Protractor Spirit Inclinometers



✓
Factory standard
Longitudinal and cross level vials

Square model
90° flat measuring faces with added V-slot, machined to one another.

Model with a frame
Four 90° measuring faces, machined to one another. Two of them have a V-slot.

Wooden case
Declaration of conformity

		Vernier	Vial	mm	For shafts mm
Square model with fine setting for the pivoting vial					
05331150	90°	10’	1’	150 x 150 x 40	19 ÷ 108
Model with frame and fine setting for the rotating vial					
05331700	2 x 180°	3’	1’	150 x 150 x 40	19 ÷ 108

TESA Spirit Clinometer with Micrometer Element



✓
DIN 877
Longitudinal and cross level vials
Hardened and ground base
Flat and prismatic measuring faces
DIN 2276 part 1
Wooden case
Declaration of conformity

		Micrometer element	Vial	mm	For shafts mm
05331750	2 x 180°	1’	1’	150 x 35 x 116	17 ÷ 80



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 conformance 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 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 much resistant 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 sweaty hands, among others.
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 the production 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 the production.*

Grade 0
*These gauge blocks are designated for use as «**Company Standards**» in calibration laboratories or environmentally controlled inspection room 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 measuring instruments as well.*

Grade 00
The new standard ISO 3650 does no longer take 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 conformance or non conformance 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 Comité Français d'Accréditation (COFRAC) depending on the manufacturer.

Accreditation is the authentic 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). And this 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*

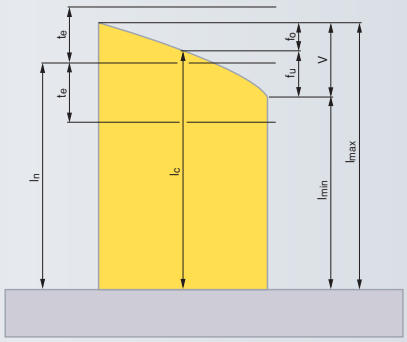
Limit Deviations and Tolerances

Limit deviations t_e

Tolerances t_v

Flatness tolerance t_f

Nominal length	Calibration grade and other grades			
	K	0	1	2
	Flatness tolerance t_f			
mm	µm	µm	µm	µm
0,5 ≤ ln ≤ 150	0,05	0,1	0,15	0,25
150 < ln ≤ 500	0,1	0,15	0,18	0,25
500 < ln ≤ 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.

Nominal length	Calibration grade K		Grade 0		Grade 1		Grade 2	
	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 ≥ ln ≤ 10	0,2	0,05	0,12	0,1	0,2	0,16	0,45	0,3
10 < ln ≤ 25	0,3	0,05	0,14	0,1	0,3	0,16	0,6	0,3
25 < ln ≤ 50	0,4	0,06	0,2	0,1	0,4	0,18	0,8	0,3
50 < ln ≤ 75	0,5	0,06	0,25	0,12	0,5	0,18	1	0,35
75 < ln ≤ 100	0,6	0,07	0,3	0,12	0,6	0,2	1,2	0,35
100 < ln ≤ 150	0,8	0,08	0,4	0,14	0,8	0,2	1,6	0,4
150 < ln ≤ 200	1	0,09	0,5	0,16	1	0,25	2	0,4
200 < ln ≤ 250	1,2	0,1	0,6	0,16	1,2	0,25	2,4	0,45
250 < ln ≤ 300	1,4	0,1	0,7	0,18	1,4	0,25	2,8	0,5
300 < ln ≤ 400	1,8	0,12	0,9	0,2	1,8	0,3	3,6	0,5
400 < ln ≤ 500	2,2	0,14	1,1	0,25	2,2	0,35	4,4	0,6
500 < ln ≤ 600	2,6	0,16	1,3	0,25	2,6	0,4	5,0	0,7
600 < ln ≤ 700	3	0,18	1,5	0,3	3	0,45	6,0	0,7
700 < ln ≤ 800	3,4	0,2	1,7	0,3	3,4	0,5	6,5	0,8
800 < ln ≤ 900	3,8	0,2	1,9	0,35	3,8	0,5	7,5	0,9
900 < ln ≤ 1000	4,2	0,25	2,0	0,4	4,2	0,6	8	1
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*
ln ≤ 0,4	*5*	*2*	*5*	*4*	*10*	*6*	*20*	*12*
0,4 < ln ≤ 1	*6*	*2*	*6*	*4*	*12*	*6*	*25*	*12*
1 < ln ≤ 2	*8*	*3*	*8*	*4*	*15*	*7*	*30*	*12*
2 < ln ≤ 3	*10*	*3*	*10*	*5*	*20*	*7*	*40*	*14*
3 < ln ≤ 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< ln ≤ 6	*31*	*3*	*15*	*5*	*31*	*8*	*63*	*16*
6< ln ≤ 8	*40*	*3*	*20*	*6*	*40*	*10*	*79*	*16*
8< ln ≤ 10	*47*	*4*	*23*	*6*	*47*	*10*	*95*	*18*
10< ln ≤ 12	*55*	*4*	*28*	*7*	*55*	*10*	*110*	*20*
12< ln ≤ 16	*70*	*5*	*35*	*8*	*70*	*12*	*140*	*20*
16< ln ≤ 20	*87*	*5*	*43*	*10*	*87*	*14*	*174*	*24*

TESA Gauge Block Set, metric

Nominal lengths 1 to 100 mm



✓

ISO 3650

Steel: highly alloyed, wear resistant.
Tungsten carbide: wear resistant and stable.
Ceramic: stabilised zirconia, extremely resistant to wear and scratches

Steel: (11,5 ± 1,0) x 10^{-6} K^{-1}
Tungsten carbide: (4,23 ± 0,1) x 10^{-6} K^{-1}
Ceramic: (9,7 ± 0,8) x 10^{-6} K^{-1}

Limit deviations t_e on page K-4

Tolerances t_v on page K-4

See page K-4

Supplied individually or in sets

Wooden case

Identification number

Steel gauges to all grades with DKD certificate.
Carbide or ceramic gauges to all grades with UKAS certificate

Steel	Carbide	Ceramic		Set compositions		
				mm	Steps mm	Pieces
32-Piece Set – M32						
0651516027	**0651526027**	**0651536027**	K	1,005		1
0651515027	**0651525027**	**0651535027**	0	1,01 ÷ 1,09	0,01	9
0651511027	**0651521027**	**0651531027**	1	1,1 ÷ 1,9	0,1	9
0651512028	**0651522027**	**0651532027**	2	1,0 ÷ 9,0	1,0	9
				10, 20, 30, 60		4
47-Piece Set – M47						
0651516021	**0651526021**	**0651536021**	K	1,005		1
0651515021	**0651525021**	**0651535021**	0	1,01 ÷ 1,09	0,01	9
0651511021	**0651521021**	**0651531021**	1	1,1 ÷ 1,9	0,1	9
0651512021	**0651522021**	**0651532021**	2	1,0 ÷ 24,0	1,0	24
				25 ÷ 100	25	4
88-Piece Set – M88						
0651516014	**0651526014**	**0651536014**	K	1,0005		1
0651515014	**0651525014**	**0651535014**	0	1,001 ÷ 1,009	0,001	9
0651511014	**0651521014**	**0651531014**	1	1,01 ÷ 1,49	0,01	49
0651512014	**0651522014**	**0651532014**	2	0,5 ÷ 9,5	0,5	19
				10 ÷ 100	10	10
112-Piece Set – M112						
0651516012	**0651526012**	**0651536012**	K	1,0005		1
0651515012	**0651525012**	**0651535012**	0	1,001 ÷ 1,009	0,001	9
0651511012	**0651521012**	**0651531012**	1	1,01 ÷ 1,49	0,01	49
0651512012	**0651522012**	**0651532012**	2	0,5 ÷ 24,5	0,5	49
				25 ÷ 100	25	4
122-Piece Set – M122						
0651516011	**0651526011**	**0651536011**	K	1,0005		1
0651515011	**0651525011**	**0651535011**	0	1,001 ÷ 1,009	0,001	9
0651511011	**0651521011**	**0651531011**	1	1,01 ÷ 1,49	0,01	49
0651512011	**0651522011**	**0651532011**	2	1,6 ÷ 1,9	0,1	4
				0,5 ÷ 24,5	0,5	49
				30 ÷ 100	10	8
				25, 75		2

TESA Maintenance Kit

Full set in a wooden case



Nº	
0652500450	TESA maintenance kit for gauge blocks

Supplied with the following items:

Nº		
0652500452	1	Arkansas stone
0652500453	1	Soft tipped tweezers
0652500454	1	Pneumatic vacuum pen
0652500455	1	Nanofibre cleaning cloth
0652500456	1	Pair of cotton gloves
0652500457	1	Acid-free solvent
0652500458	1	Box with protective grease
02530050	1	Optical flat, 50 mm dia.
0652500460	1	Solvent container
0652500461	1	Dust remover
0652500462	1	Dust-brush
0652500463	1	Bottle of super-fine, acid-free oil
0652500451	1	Wooden case

TESA Optical flats

Used for examining flatness and wringability of gauge blocks or any other test pieces having flat faces with same high grade of accuracy.

✓

✓

Diameter and thickness as shown in table

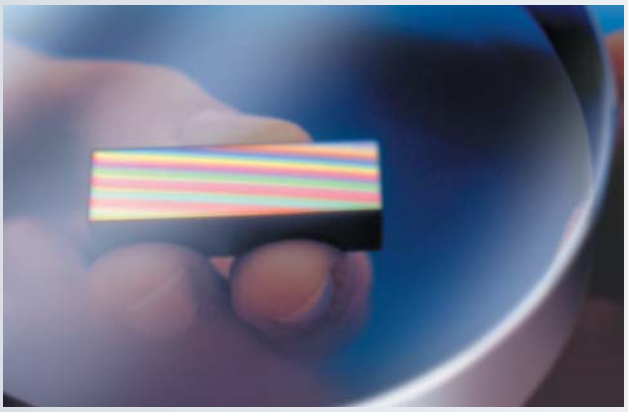
Optical flats with 2 flat measuring faces. No guaranty can be given for parallelism.

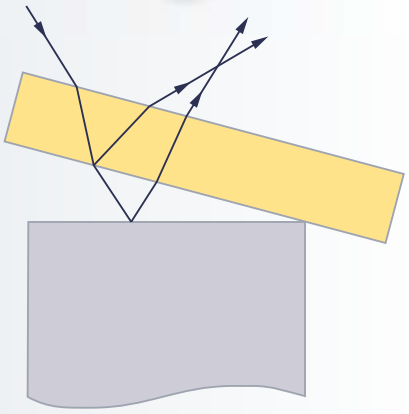
Wooden case

Declaration of conformity

№	⌀ mm	mm	□ µm
02530050	50	15	0,125
02530075	75	20	0,125







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. .

✓

Case in lacquered wood

406 x 406 x 355 mm (W x D x H)

Light source: 35 W sodium lamp, 89% monochromatic, colour yellow, wavelength 0,575 µm

See table

Surface plate in hardened steel

Surface plate: 0,5 µm

Surface plate: 2,5 µm

Suited carrying case

№		
0652500422	210 ÷ 230	
Accessories		
0651570269	200 mm dia. surface plate. Lapped and polished measuring face	
0652500424	Spare lamp (sodium)	



Brown & Sharpe Angle Gauges

For setting and calibration purposes – Smallest step to 15’ (1/4°).



✓

Hardened steel

30”

Width: 6,35 mm (1/4 in)
Length: ≥ 76,2 mm (3 in)

Suited plastic case

		Set composition					
06769002	1 Set = 12 precision squares	15’	30’	1°	2°	3°	4°
		5°	10°	15°	20°	25°	30°

Steel Balls

Steel balls are used to measure internal tapers and the like.

TESA Steel Balls

✓

Special steel, hardened

(11,5 ± 1,0) x 10^{-6} K^{-1}

Max. perm. deviation from the nominal size: 20 µm or 0.0008 in.
Uniformity of size within a set of three balls having the same nominal size: 1 µm or 0.00004 in

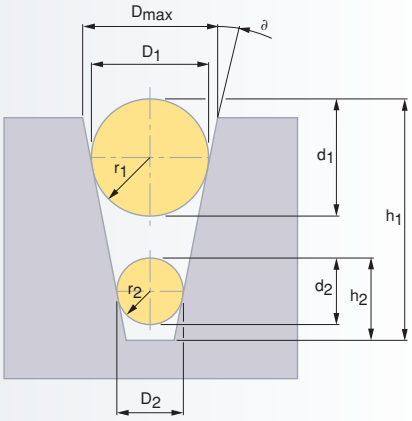
± 0,5 µm or ± 0.00002 in

Full set or set including three balls of same nominal size

Wooden case

UKAS calibration certificate





№ mm		mm	Step mm	Pieces/ Nominal size	Total pieces
0651500950	Steel ball set	1 ÷ 25	1	3	75
0651500951	Steel ball set	1,5 ÷ 12,5	1	3	36

Brown & Sharpe Steel Balls

✓

Special steel, hardened

3 µm

Not available individually

Plastic case



№ mm		mm	Step mm	Pieces/ Nominal size	Total pieces
06769009	Steel ball set	1 ÷ 25	1	2	50

Plug Gauges

The best and quickest method for inspecting bores with small diameters.

✓ EN ISO 1938 Factory standard

Steel

Light alloy, coloured handle with engraved nominal diameter

Accuracy: STANDARD (blue handle) ± 0,4 µm. ETALON (yellow handle) ± 0,15 µm

Inspection report available on request

TESA CARY plug gauges with diameters from 0,050 up to 0,300 mm

Type TDH

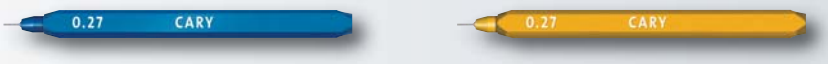
Due to their small size, these plug gauges are best handled using tweezers.



	STANDARD ±0,4 µm		ETALON ±0,15 µm	
mm	Step 2 µm	1 µm	Step 2 µm	1 µm
0,050 ÷ 0,080	**CJ1D1S2**	**CJ1D1S0**	**CJ1D1E2**	**CJ1D1E0**
0,081 ÷ 0,309	**CJ1D2S2**	**CJ1D2S0**	**CJ1D2E2**	**CJ1D2E0**

Type TLH

This type is identical to the TDH one, but with a 30 mm long handle.



	STANDARD ± 0,4 µm		ETALON ± 0,15 µm	
mm	Step 2 µm	1 µm	Step 2 µm	1 µm
0,050 ÷ 0,080	**CJ1L1S2**	**CJ1L1S0**	**CJ1L1E2**	**CJ1L1E0**
0,081 ÷ 0,309	**CJ1L2S2**	**CJ1L2S0**	**CJ1L2E2**	**CJ1L2E0**

Type TLH-5 or TLH-10 with a length of 5 or 10 mm

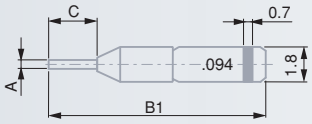
TLH-5		STANDARD ± 0,5 µm		ETALON ± 0,2 µm	
TLH-10		STANDARD ± 0,8 µm		ETALON ± 0,3 µm	
	mm	Step 2 µm	1 µm	Step 2 µm	1 µm
TLH-5	0,101 ÷ 0,309	**CJ1L5S2**	**CJ1L5S0**	**CJ1L5E2**	**CJ1L5E0**
TLH-10	0,101 ÷ 0,309	**CJ1L10S2**	**CJ1L10S0**	**CJ1L10E2**	**CJ1L10E0**

Type TTLH

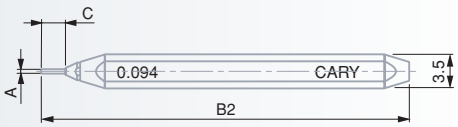
Double-ended plug gauges consisting of two TDH-type plug gauges.



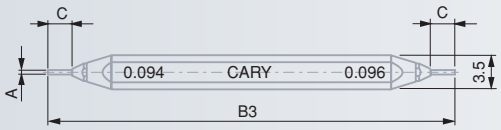
	STANDARD ± 0,4 µm		ETALON ± 0,15 µm	
mm	Step 2 µm	1 µm	Step 2 µm	1 µm
0,050 ÷ 0,080	–	**CJ1LL1S0**	–	**CJ1LL1E0**
0,081 ÷ 0,309	–	**CJ2LL2S0**	–	**CJ1LL2E0**



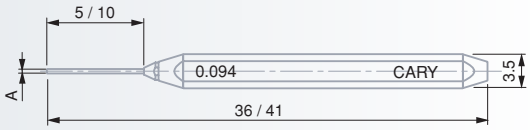
TDH



TLH



TTLH



TLH-5/TLH-10

TDH/TLH/TTLH gauge sizes

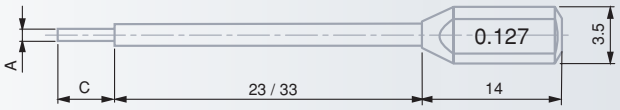
A mm	**B1** mm	**B2** mm	**B3** mm	**C** mm
0,050 ÷ 0,100	10,3	31,8	33,6	0,8
0,100 ÷ 0,150	10,5	32	34	1,0
0,150 ÷ 0,200	10,7	32,2	34,2	1,2
0,200 ÷ 0,250	10,9	32,4	34,4	1,4
0,250 ÷ 0,300	11,1	32,6	34,6	1,6

Standard accessories

CJ1ED25N	ED25N	Wooden case for 25 TDH plug gauges
CJ1EL25N	EL25N	Wooden case for 25 TLH plug gauges
CJ1XDL	XDL	Plastic case for TDH/TLH/TXH plug gauges



Type TZH for deep bores with diameters from 0,050 up to 0,300 mm



These plug gauges are mounted on holders for checking hard-to-reach bores.

When ordering, please specify:

- plug gauge diameter (0,050 to 0,300 mm)
- desired quality (STANDARD or ETALON)
- holder length (23 or 33 mm)

TESA CARY steel plug gauges with diameters from 0,3 up to 10 mm

Type TXH

Single-ended steel plug gauges (1 item).



mm	STANDARD Step 10 µm	STANDARD 2 µm	STANDARD 1 µm	ETALON Step 10 µm	ETALON 2 µm	ETALON 1 µm
0,300 ÷ 1,509	**CJ1X1S10**	**CJ1X1S2**	**CJ1X1S0**	**CJ1X1E10**	**CJ1X1E2**	**CJ1X1E0**
1,510 ÷ 3,509	**CJ1X2S10**	**CJ1X2S2**	**CJ1X2S0**	**CJ1X2E10**	**CJ1X2E2**	**CJ1X2E0**
3,510 ÷ 10,000	**CJ1X3S10**	–	**CJ1X3S0**	**CJ1X3E10**	–	**CJ1X3E0**

Type TTXH

Steel plug gauges, type GO/NOT GO (2 items)



mm	STANDARD Step 1 µm	ETALON Step 1 µm
0,300 ÷ 1,509	**CJ1XX1S0**	**CJ1XX1E0**
1,510 ÷ 3,509	**CJ1XX2S0**	**CJ1XX2E0**
3,510 ÷ 6,509	**CJ1XX3S0**	**CJ1XX3E0**
6,510 ÷ 10,000	**CJ1XX4S0**	**CJ1XX4E0**

✓

EN ISO 1938
Factory standard

Steel

Light alloy, coloured handle with engraved nominal diameter

Accuracy: STANDARD (blue handle) ± 0,4 µm for diameters 0,3 ÷ 3 mm or ± 0,5 µm for diameters 3 ÷ 10 mm. ETALON (yellow handle) ± 0,25 µm for diameters 0,3 ÷ 3 mm or ± 0,3 µm for diameters 3 ÷ 10 mm.

Inspection report available on request

✓

EN ISO 1938

Tungsten carbide

Light alloy, coloured handle with engraved nominal value

Accuracy: STANDARD (black handle) ± 0,4 µm for diameters 0,3 ÷ 3 mm or ± 0,5 µm for diameters 3 ÷ 6 mm. ETALON (red handle) ± 0,25 µm for diameters 0,3 ÷ 3 mm or ± 0,3 µm for diameters 3 ÷ 6 mm.

Inspection report available on request

TESA CARY tungsten carbide plug gauges with diameters from 0,3 up to 6 mm

Type TCH

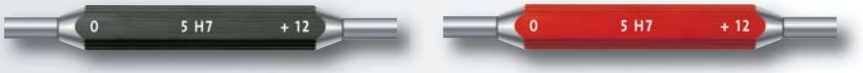
Single-ended tungsten carbide plug gauges (1 item)



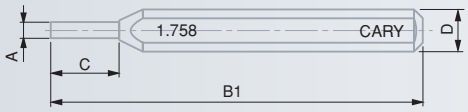
	STANDARD		ETALON	
mm	Step 10 µm	1 µm	Step 10 µm	1 µm
0,300 ÷ 1,509	**CJ1C1S10**	**CJ1C1S0**	**CJ1C1E10**	**CJ1C1E0**
1,510 ÷ 3,509	**CJ1C2S10**	**CJ1C2S0**	**CJ1C2E10**	**CJ1C2E0**
3,510 ÷ 6,000	**CJ1C3S10**	**CJ1C3S0**	**CJ1C3E10**	**CJ1C3E0**

Type TTCH

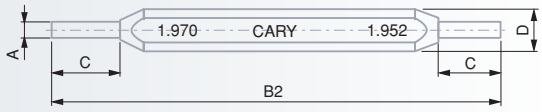
Tungsten carbide plug gauges, type GO/NO GO (2 items)



	STANDARD	ETALON
mm	Step 1 µm	Step 1 µm
0,300 ÷ 1,509	**CJ1CC1S0**	**CJ1CC1E0**
1,510 ÷ 3,509	**CJ1CC2S0**	**CJ1CC2E0**
3,510 ÷ 6,000	**CJ1CC3S0**	**CJ1CC3E0**



TXH/TCH



TTXH/TTCH

Plug gauge sizes

A mm	B1 mm	B2 mm	C mm	D mm
0,30 ÷ 0,50	38	41	3	3,5
0,50 ÷ 1,00	39	43	4	3,5
1,00 ÷ 1,50	40	45	5	3,5
1,50 ÷ 2,00	46	52	6	5
2,00 ÷ 2,50	47	54	7	5
2,50 ÷ 3,00	48	56	8	5
3,00 ÷ 3,50	49	58	9	5
3,50 ÷ 4,00	60	70	10	8
4,00 ÷ 5,00	61	72	11	8
5,00 ÷ 10,0	62	74	12	8

Standard accessories

CJ1PTXK	PTXK	Suited case for 50 plug gauges Ø 0,300 ÷ 1,509 mm
CJ1MTXK	MTXK	Suited case for 50 plug gauges Ø 1,510 ÷ 3,509 mm
CJ1GTXK	GTXK	Suited case for 50 plug gauges Ø 3,510 ÷ 10,00 mm

LTXH-type precision steel pins with diameters from 0,30 up to 10 mm

These steel pins can be made available without handle upon request.

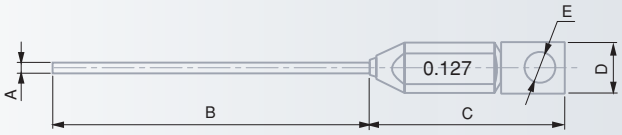
When ordering, please specify:

- pin diameter (0,30 to 10 mm)
- desired quality (STANDARD or ETALON)

PNH-type wires with handle for checking threads. wire diameters from 0,10 up to 10 mm



mm	STANDARD Step 10 µm	ETALON Step 10 µm
0,10 ÷ 0,15	**CJ1N1S**	**CJ1N1E**
0,16 ÷ 0,50	**CJ1N2S**	**CJ1N2E**
0,51 ÷ 4,00	**CJ1N3S**	**CJ1N3E**
4,01 ÷ 10,00	**CJ1N4S**	**CJ1N4E**



PNH

✓

EN ISO 1938

Hardened steel, ground and lapped

Aluminium, coloured handle with engraved nominal diameter

Accuracy: STANDARD (blue handle) ± 0,8 µm for diameters 0,1 ÷ 10 mm. ETALON (yellow handle) ± 0,3 µm for diameters 0,1 ÷ 6 mm or ± 0,5 µm for diameters 6 ÷ 10 mm.

Inspection report available on request

Plug gauge sizes

A mm	B mm	C mm	D mm	E mm
0,10 ÷ 0,15	20	9,5	1,8	0,9
0,16 ÷ 0,30	32	9,5	1,8	0,9
0,31 ÷ 1,10	32	14	3,5	1,5
1,11 ÷ 10,00	32	14	5	2

Standard accessories

CJ1N50	Suited clear box for 50 PNH thread wires
CJ1N3	Carrying tube for 3 PNH thread wires
CJ1NGC	Box engraving for each diameter
CJ1NLSM	Thread wire alone, without handle

Ring Gauges

Designed for inspecting cylindrical components such as pivots or axles – Used to determine external diameters.

TESA CARY steel ring gauges with diameters from 0,151 up to 5 mm

✓

EN ISO 1938
Factory standard

Steel

Inserted into a light alloy, blue coloured ring for easier handling.
Also with engraved nominal diameter.

Ø 0,15 ÷ 3 mm: ± 0,6 µm
Ø 3 ÷ 4,999 mm: ± 0,75 µm

Inspection report from 2 mm available on request





Type BAH	1 Steel ring gauge	
Type BIMHa	2 BAH steel ring gauges mounted in pairs on plates for use as GO/NOT GO type gauges	
	BAH	BIMHa
mm	Step 1 µm	Step 1 µm
0,151 ÷ 1,500	**CJ1B2A**	**CJ1B2IA**
1,501 ÷ 2,500	**CJ1B3A**	**CJ1B3IA**
2,501 ÷ 4,000	**CJ1B4A**	**CJ1B4IA**
4,001 ÷ 4,999	**CJ1B5A**	**CJ1B5IA**

TESA CARY carbide ring gauges with diameters from 0,060 up to 5 mm

✓

EN ISO 1938
Factory standard

Tungsten carbide

Inserted into a black coloured, light alloy ring for easier handling.
Also with engraved nominal diameter of the ring

Ø 0,060 ÷ 3 mm: ± 0,6 µm
Ø 3 ÷ 4,999 mm: ± 0,75 µm

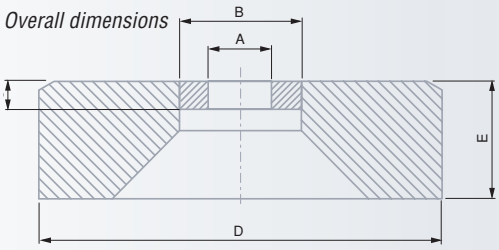
Inspection report from 2 mm available on request





Type BCH	1 Carbide ring gauge	
Type BIMHm	2 BCH carbide ring gauges mounted in pairs on plates for use as GO/NOT GO type gauges	
	BCH	BIMHm
mm	Step 1 µm	✓ Step 1 µm
0,060 ÷ 0,150	**CJ1B1C**	**CJ1B1IM**
0,151 ÷ 1,500	**CJ1B2C**	**CJ1B2IM**
1,501 ÷ 2,500	**CJ1B3C**	**CJ1B3IM**
2,501 ÷ 4,000	**CJ1B4C**	**CJ1B4IM**
4,001 ÷ 4,999	**CJ1B5C**	**CJ1B5IM**

Overall dimensions



A mm	Ring gauges B mm		C mm		Outer rings D mm	E mm
	BAH	BCH	BAH	BCH		
0,060 ÷ 0,50	1,4	1,8	0,35	0,5	8	2,5
0,50 ÷ 0,75	1,8	1,8	0,5	0,5	8	2,5
0,75 ÷ 1,25	2,4	2,4	0,75	0,75	8	2,5
1,25 ÷ 1,50	3	3	0,9	0,9	8	2,5
1,50 ÷ 2,50	5	5	1,5	1,5	12	4
2,50 ÷ 4,00	8	8	2,4	2,4	16	5,5
4,00 ÷ 5,00	10	10	3	3	20	7

Standard accessories

		A mm
CJ1CEB3	Suited case for 3 rings	0,06 ÷ 1,50
CJ1CEB4	Suited case for 4 rings	0,06 ÷ 1,50
CJ1EB12	Suited case for 12 rings	0,06 ÷ 1,50
CJ1CB40	Suited case for 12 rings	1,50 ÷ 2,50
CJ1CB24	Suited case for 24 rings	2,50 ÷ 4,00
CJ1CB18	Suited case for 12 rings	4,00 ÷ 5,00
CJ1280,21.010A	Aluminium resting plate for 2 rings	0,06 ÷ 1,50
CJ1280,21.011A	Aluminium resting plate for 2 rings	1,51 ÷ 2,50
CJ1280,21.012A	Aluminium resting plate for 2 rings	2,51 ÷ 4,00
CJ1280,21.013A	Aluminium resting plate for 2 rings	4,01 ÷ 5,00
CJ1BAA	Bearing ring (one item for each ring gauge)	

TESA CARY steel ring gauges with diameters from 5 up to 30 mm



Type BOMa 1 Steel ring gauge

Type BBOMa 2 BOMa steel ring gauges mounted in pairs on plates for use as GO/NOT GO type gauges

mm	BOMa Step 1 µm	BBOMa Step 1 µm
5,00 ÷ 9,99	**CJ1BOA1**	**CJ1BBA1**
10,00 ÷ 11,99	**CJ1BOA2**	**CJ1BBA2**
12,00 ÷ 13,99	**CJ1BOA3**	**CJ1BBA3**
14,00 ÷ 15,99	**CJ1BOA4**	**CJ1BBA4**
16,00 ÷ 17,99	**CJ1BOA5**	**CJ1BBA5**
18,00 ÷ 19,99	**CJ1BOA6**	**CJ1BBA6**
20,00 ÷ 22,99	**CJ1BOA7**	**CJ1BBA7**
23,00 ÷ 25,99	**CJ1BOA8**	**CJ1BBA8**
26,00 ÷ 29,99	**CJ1BOA9**	**CJ1BBA9**

✓

Steel

Inserted into a light alloy, grey coloured ring for easier handling.
Also with engraved nominal diameter.

5 ÷ 10 mm dia.: ± 1,25 µm
10 ÷ 18 mm dia.: ± 1,5 µm
18 ÷ 29,99 mm dia.: ± 2 µm

Inspection report available on request

✓

EN ISO 1938
Factory standard

Tungsten carbide

Inserted into a light alloy, black coloured ring for easier handling.
Also with engraved nominal diameter.

Ø 5 ÷ 10 mm: ± 1,25 µm
Ø 10 ÷ 18 mm: ± 1,5 µm
Ø 18 ÷ 29,99 mm: ± 2 µm

Better quality upon request (Q5)
5 ÷ 10 mm dia.: ±1 µm
10 ÷ 18 mm dia.: ±1,2 µm
18 ÷ 29,99 mm dia.: ±1,5 µm

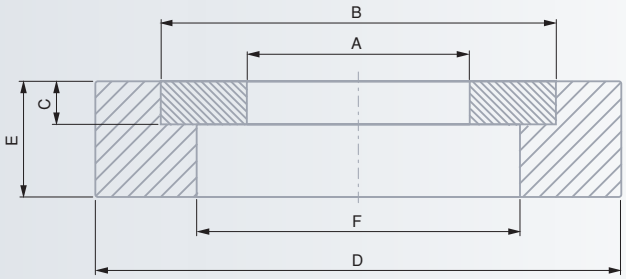
Inspection report available on request

TESA CARY tungsten carbide ring gauges with diameters from 5 up to 30 mm

Type BOMm	1 Tungsten carbide ring gauge
Type BBOMm	2 BOMm carbide ring gauges mounted in pairs on plates for use as GO/NOT GO plug gauges

Ø mm	BOMm Step 1 µm	BBOMm Step 1 µm
5,00 ÷ 9,99	**CJ1BOM1**	**CJ1BBM1**
10,00 ÷ 11,99	**CJ1BOM2**	**CJ1BBM2**
12,00 ÷ 13,99	**CJ1BOM3**	**CJ1BBM3**
14,00 ÷ 15,99	**CJ1BOM4**	**CJ1BBM4**
16,00 ÷ 17,99	**CJ1BOM5**	**CJ1BBM5**
18,00 ÷ 19,99	**CJ1BOM6**	**CJ1BBM6**
20,00 ÷ 22,99	**CJ1BOM7**	**CJ1BBM7**
23,00 ÷ 25,99	**CJ1BOM8**	**CJ1BBM8**
26,00 ÷ 29,99	**CJ1BOM9**	**CJ1BBM9**

Overall dimensions



Ø	*Ring gauges*		*Outer rings*		
A mm	**B** mm	**C** mm	**D** mm	**E** mm	**F** mm
5 ÷ 10	18	2	30	4	10,5
10 ÷ 14	24	2,5	38	5	15
14 ÷ 18	30	3	46	6	19
18 ÷ 24	38	3,5	56	8	25
24 ÷ 30	46	4	68	8	31

Standard Accessory

CJ1BBA	Bearing ring (one item for each ring gauge)

Calibration Equipment





CONFIDENCE IS NOT ENOUGH...

Control of inspection and measuring equipment is an element of the quality management that is more important than ever before. The introduction of the ISO 9000 family of international standards has led to major changes in this field as well. Among 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 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 Big Choice

TESA can provide you with the most varied means specifically suited for inspection and calibration of standards, handtools and plug gauges. Some of them are described in the various sections of this catalogue, especially:



- *Gauge blocks*
- *Setting rings*
- *Steel balls*
- *Cylindrical setting standards with outside diameters*
- *Optical flats*
- *Plan 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 the measuring equipment that serve to calibrate other such inspection means. But, they can also be used for high-accuracy measurement of precision parts.

The precision tool that was first developed for calibrating gauge blocks is an improved external micrometer manufactured early in the 20th century by Brown& Sharpe for the inventor of the gauge set compositions, C.E. Johansson.

Gauge Block Calibration

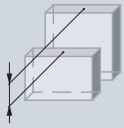
In the hierarchical chain of dimensional transfers that can be traced to the metre length unit, the gauge blocks hold a key position. And this makes them the most important material measures used in metrology.

The transference of the length unit, based on specific wavelengths of light, to gauge blocks is achieved in the first instance by a fundamental interferential measurement. From the gauge blocks measured in this way, the lengths are transferred to other gauge blocks by hierarchical measurements.

TESA Gauge Block Comparators – General Overview

TESA offer two models operating based on to two different measurement procedures.

- TESA UPD measures gauges blocks directly over 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			
Direct measurement			
• Length comparison with a variation in nominal length up to 25 mm		●	
• Number of reference gauge blocks required for calibrating a 122-piece set: 9 blocks		●	
• Number of gauges blocks required for calibrating the comparator: 9 blocks + 6 pairs of blocks		●	
Comparative measurement			
• Comparison of gauge blocks of same nominal length		●	●
• Number of reference gauge blocks required for calibrating a 122-piece set: 122 blocks		●	●
• Number of gauge blocks required for calibrating the comparator: 6 pairs		●	●
Errors of measurement			
For details about the information below, refer to both pages L-8 and L-10			
Repeatability limit	0,015 µm	●	●
	0,025 µm		●
Uncertainty of measurement	U = ± (0,05 + 0,5 · L) µm L in m	●	●
	U = ± (0,10 + 1,0 · L) µm		●
Application ranges			
Nominal lengths	0,5 to 100 mm/*0.02 to 4.0 in*	●	●
	0,5 to 500 mm/*0.02 to 20 in*	▲	▲
Measuring span			
25 mm/1 in			●
Sensors for capturing length dimensions			
• Two axial probes in sum measurement		●	●
• Digital system, opto-electronic with incremental divisions		●	
• Analogue measuring system, both electric and inductive			●
• Inductive analogue system, electric			
– electro-motorised		●	
– under the spring force			●
• Measuring bolt retraction			
– electro-motorised		●	
– by vacuum			●
Template systems (see page L-5)			
• Single template system		●	●
• Dual template system		●	❍
Handling of gauge blocks with nominal lengths up to 10 mm approx.			
Suction loader used in conjunction with the electric vacuum pump		❍	❍
TESA UPT temperature device			
Includes 4 thermal sensors (4-wire type) which measure the electric resistance		●	❍
TESA software programme for value processing			
• **TESA UP**, WINDOWS 98, 2000, NT, XP		●	●

▲ Available upon request ❍ Recommended option

TESA UPD Gauge Block Comparator with a 25 mm Measuring Span

- Direct measurement of gauge blocks with a variation in nominal length of up to 25 mm or 1 in.
  – Allows the number of required reference gauge blocks to be reduced by nearly 80%.
- Typical 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 needed corrections included.



New Technical Concept through Direct Measurement

Two mutually opposed aligned probes connected in sum measurement (+A+B) also check thin gauge blocks reliably as the upper sensor A is able to capture lengths up to 25 mm. Displacement of the measuring bolt and activation of the measuring force are both electromotorised.

PT 100 platinum resistances let you capture the temperature of the two gauge blocks as well as the measuring table and support.

The TESA UP software programme processes length and temperature values as measured while executing and controlling your measurement cycles simultaneously.



General

✓

✓

EN ISO 3650

For gauge blocks with nominal lengths from 0,5 mm to 100 mm / 0.02 in to 4 in

Measuring procedures: direct and comparative measurements through the transference of the length of a reference gauge block to the gauge block to be measured.

In **direct measurement**, the nominal length of the two gauge blocks to be compared may vary up to the size of the measuring span, i.e. 25 mm.

In **comparative measurement**, comparison is always based on two gauge blocks of same nominal length.

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.

Shipping packaging

Identification number

Calibration certificate from the supplier for the comparator or the Swiss Calibration Service for the temperature device.

TESA UPD – The flexible concept that provides distinctive metrological features with substantial savings



Direct Measurement

- Permits over 90% of a 122-piece set to be checked using the same reference gauge block. All nominal lengths of the full gauge set being contained within 0,5 and 25 mm, the measuring span is therefore not exceeded.
- Allows the reference gauge set to be reduced by nearly 80% against the ones needed until now.
- Provides substantial savings in the gauge block supply and recalibration through reduced set compositions.
- Enables direct measurement of gauge blocks that cannot be compared with other existing gauge blocks due to their unusual nominal lengths.

Comparative Measurement

- Allows the gauge blocks of same nominal lengths to be measured by comparison as usual.
- Enhances the measuring conditions, thus permitting all measurements to be taken with a lower uncertainty.
- Reduces the number of systematic errors through limited length related influences of both the upper probe A and the gauge block to be compared.





TESA dual template system that protects expensive reference gauge blocks (patented)

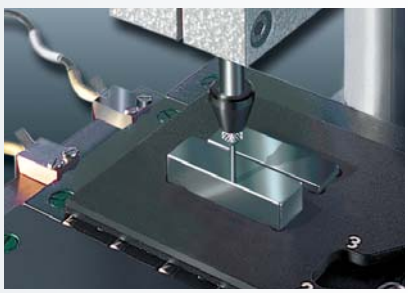
- Simultaneous use of two templates allows you to release your reference gauges until their handling becomes necessary.
- This system makes it possible for you to save time and money.
- During the measurement cycles on a routine basis, the travel length of the reference gauges over the measuring table is reduced by nearly 70%. This contributes to significantly lower the risks of damaging and wearing the measuring faces.
- The double protection of your reference gauges leads to significant cost savings by reducing the need for:
  - recalibration
  - restoring the measuring faces
  - replacing worn or damaged reference gauge blocks
  - long downtime while extending the life of your full reference gauge sets.





Single Template System

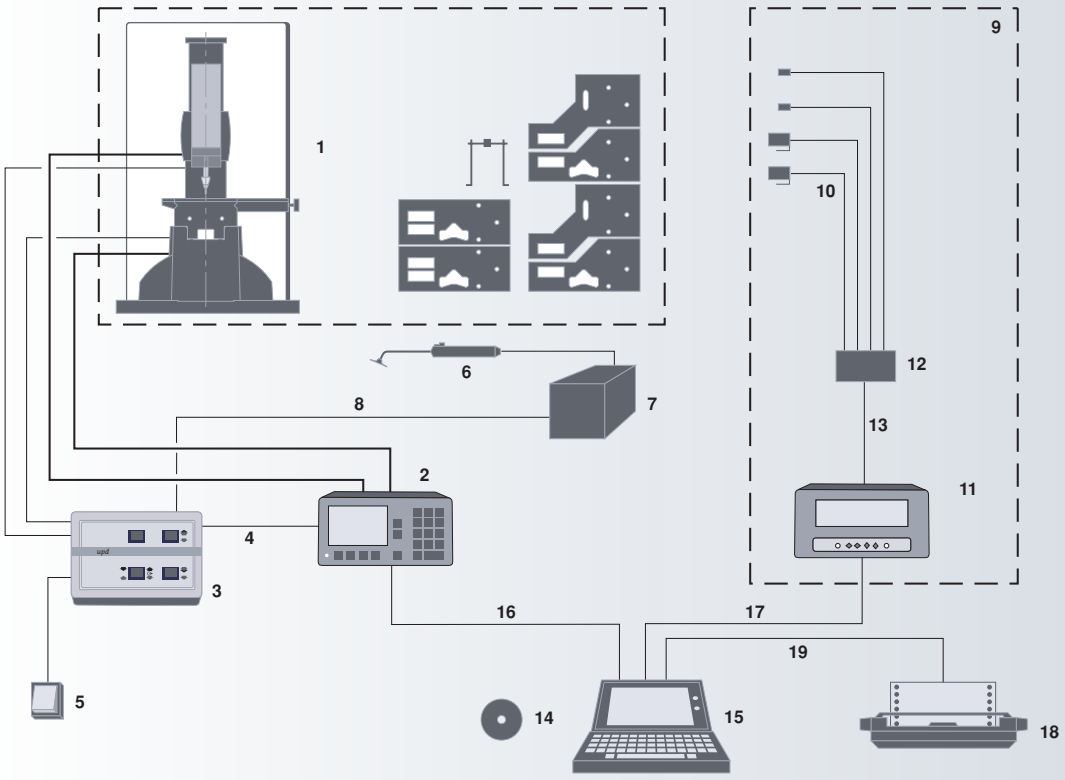
- With this system, your reference gauge blocks along with those to be calibrated are moved together during the measurement cycles.



TESA UPD Delivery Programme – Three Ordering Variations

	05930005	**TESA UPD gauge block comparator with temperature device***			●
	05930004	**TESA UPD gauge block comparator without temperature device***		●	
	S59300102	**TESA UPD gauge block comparator, complete* with temperature device, TESA UP software programme for value processing, PC (standard), printer**	●		
		Key components			
1	05930008	1 TESA UPD mechanical part	●	●	●
2	05960016	1 HEIDENHAIN computing counter ND 287 featuring 2 probe inputs	●	●	●
3	05960013	1 Control panel	●	●	●
4	05960014	1 Connecting cable for control panel to ND 287 computing counter	●	●	●
5	04768001	1 Foot switch	●	●	●
6	01660011	1 Suction loader	●		●
7	03260433	1 Electrical vacuum pump with external control, 230 Vac, 50 Hz	●		●
8	05960028	1 Connecting cable for electric vacuum pump to control panel	●		●
9	05930011	1 TESA UPT temperature device, complete	●		●
14	05960025	1 TESA UP software programme for value processing	●		
15	S59070014	1 Computer. For minimum requirements, refer to page L-14	●		
16	03969007	1 Connecting cable for ND 287 counter to host computer	●		
17	05960026	1 Connecting cable for temperature device to host computer	●		
18	S59070012	1 Laser printer, colour	●		
19	S59070013	1 Connecting cable for host computer to printer	●		

* Special execution for 110 Vac, 60 Hz also available on request.



Measuring stand

Heavy construction with toothed rack guide plus hand wheel for setting the measuring arm.
Fixing bores (16 and 3 mm dia, resp.) for upper probe A plus one temperature sensor No. 05960010

Main body in cast iron. Hardened steel column, dull-chrome plated and ground.

Special table

Solid measuring table fitted with 6 cylindrical pins so as to ensure and protect each handled gauge block.

3 mm diameter clamping bore for one temperature sensor No. 05960010 as well as retaining plate mounted laterally on the table for both sensors 05960008 and 05960009 fitted with clip.

Steel, hardened. Tungsten carbide pins, cylindrical.

Positioning device for gauge blocks

Single and dual template systems to shift the gauge blocks to selected measuring points.
For more details on both systems, report to the previous page.

Sensors for length measurements

Two HEIDENHAIN axial probes, opto-electronic with electro-motorised bolt activation.

ZERODUR® glass ceramic with incremental divisions

Dividing periods 4 µm

25 mm / 1 in for upper probe A.
1 mm for lower probe B.

Measuring bolt on a plain bearing

1,0 N for upper probe A.
0,63 N for lower probe B.

Measuring bolt in invar steel

Tungsten carbide tip with a spherical measuring face, R = 20 mm

Computing counter

HEIDENHAIN up and down computing counter ND 287 provided with two probe inputs

TFT type, 9-decade display plus sign. Also with auxiliary display for activated functions.

Signal division ≤ 400x

0,5 to 0,002 µm 0,02 to 0.0000001 in

14 mm

21 keys available for digit input as well as operating functions

Sum measurement with both probes set to +A+B. Linear correction of systematic errors. PRESET function for digit entry. 2 programmable datum points.

RS 232 and V.24

100 to 240 Vac (-15% to 10%), 50 to 60 Hz

0°C to 45°C

-30°C to 70°C

75%, non-condensing

Die-cast aluminium housing

IP40 (IEC 60529)

EN 55022, Class B

211x112x209 mm (W x H x D)

TESA UPD System Components

	No	
1	**05930008**	**TESA UPD Mechanical Part** *Consisting of:*
	05930009	1 Measuring stand with toothed rack guide. Manually operated for setting the measuring arm. Attachment has a 16 mm dia. fixing bore for the upper probe.
	05960015	1 Solid measuring table in special version Made from hardened steel and fitted with 6 tungsten carbide cylindrical pins for safe positioning of the gauges blocks. Provide high protection and wear resistance to the gauge blocks over many years. Threaded bores for clamping the lower probe. Prepared for the integration of the temperature sensor (see below).
	05960029	1 Positioning device provided with a single or dual template system Interchangeable templates to shift the gauge blocks from a given measuring point to another delivered as follows: 1 Pair for gauge blocks having a 9 x 30 mm cross-section. Consists of 1 template No. 05960019 for the reference gauge blocks plus 1 template No. 05960020 for the gauge blocks to be calibrated. 1 Pair for gauge blocks having a 9 x 35 mm cross-section. Consists of 1 template No. 05960021 for the reference blocks plus 1 template No. 05960022 for the blocks to be calibrated. Also with added support to prevent the blocks from tilting. 1 Template No. 05960023 for reference blocks and those to be calibrated (9x30 mm) Template No. 05960024 for the reference blocks and those to be calibrated having a 9 x 35 mm cross-section. Also with added support to prevent the gauge blocks from tilting.
	05930010	1 System for value acquisition with electro-motorised bolt activation. *Consisting of:* 1 Upper probe A, type HEIDENHAIN CT 25 (No. 05930006). Measuring span 25 mm/1 in. Measuring force 1,0 N. Fitted with probe insert No. 03510003. 1 Lower probe B, type HEIDENHAIN special (No. 05930007). Measuring span 1 mm. Measuring force 0,63 N. Fitted with probe insert No. 03510003.
	01660031	1 Setting piece for probe alignment
	01640420	1 Heat protection shield, 250 x 380 mm
	01660001	1 Pair of grip pliers for safe handling of gauge blocks
	01660030	1 Dust cover
2	**05960016**	**HEIDENHAIN Computing Counter ND 287** Up and down computing counter with LCD color monitor consisting of: 1 counter 05969029 + 1 card 05960040, each with a single entry - i.e. 2 probe entries along with 1 RS 232 data output, 100 to 240 Vac, 50 to 60 Hz.
3	**05960013**	**Control Panel** With touch keys for electro-motorised activation of the measuring bolt as well as for triggering data transfer.
4	**05960014**	**Connecting Cable** For control panel No. 05960013 to HEIDENHAIN computing counter ND 287 No. 05960016.
5	**04768001**	**Foot Switch** For fine displacement of the measuring bolt as well as data transfer.
6	**01660011**	**Pneumatic Suction Loader** For safe and easy handling of the gauge blocks with nominal length up to 10 mm. To be connected to the vacuum pump.
7		**Electrical Vacuum Pump with External Control** For the connection of the suction loader No. 01660011.
	03260433	Execution 230 Vac, 50 Hz
	S32070030	Execution 110 Vac, 60 Hz
8	**05960028**	**Connecting Cable** For vacuum pump to control panel No. 05960013.

continued next page

	Nº	
9	**05930011**	**TESA UPT temperature device for TESA Gauge Block Comparators** 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. *Consisting of:*
10	05960018	1 Set of 4 temperature sensors PT 100 platinum resistances giving exceptional long-term stability while drifts are kept to a minimum over years of use. This set includes the following single sensors: 1 Temperature sensor with clamp R for reference gauge blocks having nominal lengths from about 14 mm, No. 05960009 1 Temperature sensor with clamp P for gauge blocks to be calibrated having nominal lengths from about 14 mm, No. 05960008. 2 Temperature sensors to be mounted on the measuring stand or the table. PT 100 diameter: 3 g8 mm, 10 mm long. Order number 05960010 for 1 item.
11	05960038	1 FLUKE 1529 temperature measuring unit Precision thermometer including a switch for the measuring points. With use of the PT 100 platinum resistances, provides 4 measuring channels with a 0,001°C numerical interval. RS 232 or IEEE 488 data output, 115 or 230 Vac for 50 or 60 Hz.
12	05960012	1 Adapter For connecting up to 4 temperature sensors
13	05960011	1 Connecting cable For adapter Nº 05960012 to temperature unit Nº 05960038.
14	**05960025**	**TESA UP Software Programme for Value Processing** Running under WINDOWS 98, 2000, NT or XP. Software package including 1 CD-ROM along with 1 Hardkey. 10 languages available for function menus. For more details, see page L-14.
15	**S59070014**	**Computer** Available upon request.
16	**03969007**	**Connecting cable** For serial data transmission from HEIDENHAIN ND 287 to host computer (2 connectors 9-pin/female).
17	**05960026**	**Connecting cable** For serial data transmission from temperature device to host computer (9-pin/male and 9-pin/female).
18	**S59070012**	**Laser printer, colour** Upright A4 format. USB interface.
19	**S59070013**	**Connecting cable** For USB data transmission from host computer to printer

Temperature Sensors

4 PT 100 platinum resistances, 4-wire type

Temperature Device

Multiple-channel precision thermometer. Also equipped with a switch for the measuring points.

Procedure: 4-wire resistance measurement with continuous value acquisition through connected sensors. PT 100 linearisation according to EN 60751.

Alphanumeric LC display with background lighting

0,001°C

°C, °F or K

8 mm

6 keys available for the functions

RS 232 and IEEE 488

115 ±10% Vac or 230 ±10% Vac, for 50 and 60 pHz

5°C to 40°C

-25°C to 60°C

75%, non-condensing

EN 61010, EN 50081, EN 50082 and EN 55011

191 x 102 x 208 mm (W x H x D)

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 en 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

General

✓

EN ISO 3650

For gauge blocks ranging from 0,5 mm to 100 mm or 0.02 in to 4 in

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.

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 needed 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).



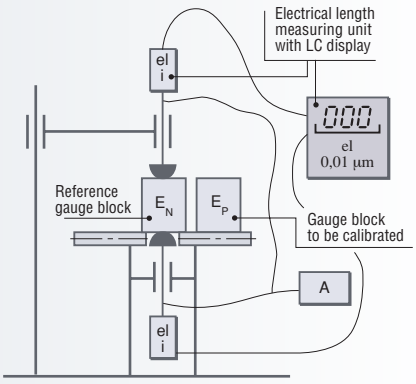


TESA UPC is specially designed for the calibration – or dimensional inspection – of gauge blocks with nominal lengths ranging from 0,5 to 100 mm. The configuration, which consists of two probes aligned opposite one another, associated with both the concept and quality of the measuring system provides 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.



Single Template System

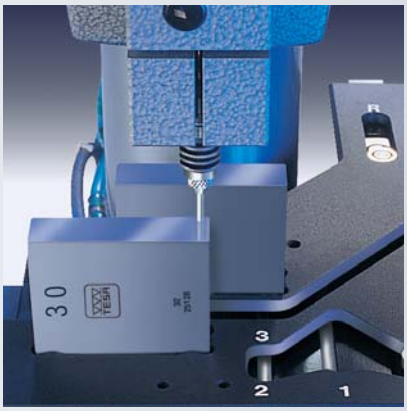
- With this system, your reference gauge blocks along with those to be calibrated are moved all together throughout the measurement cycle.

Dual Template System

(TESA Patent)

- The use of two templates instead of a single one allows you to leave your reference gauge blocks aside until their handling becomes necessary.





Errors of Measurement

Provided all the metrological conditions are met, the reliability of the two standard executions No. 05930000 and 05930002 is expressed as follows:

Repeatability limit (with no effect due to external temperature): 0,025 µm

Measurement uncertainty* U=±(0,10+1,0·L) µm (L in m)

Condition involves the use of reference standards (see pages 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

** Applicable to steel gauge blocks*

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): 0,015 µm

Measurement uncertainty* U=±(0,05+0,5·L) µm (L en m)

Condition involves the use of reference standards (see pages 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*

Measuring stand

Heavy construction with toothed rack guide plus handwheel for coarse setting of the measuring arm.
Encapsulated attachment plus device for extra-fine setting of upper probe A.
3 mm dia. fixing bore for one temperature sensor No. 05960010.

Main body in cast iron. Column in hardened steel, dull-chrome plated and ground.

Special table

Solid measuring table fitted with 6 cylindrical pins to ensure and protect the gauge blocks as they are being handled.
3 mm dia.clamping bore for one temperature sensor No. 05960010 as well as retaining plate mounted laterally on the table for both sensors No. 05960008 and 05960009 with clip.

Hardened steel. Tungsten carbide cylindrical pins.

Positioning device

Single and dual template systems to shift the blocks to predefined measuring point.

For further details on both template systems, report to page L-5 as well as to System components on page L-12.

Sensors for length values

2 TESA GT 22-spec. inductive probes with pneumatic retraction of the measuring bolt.
Electrical adjustment through resistances fitted on each probe

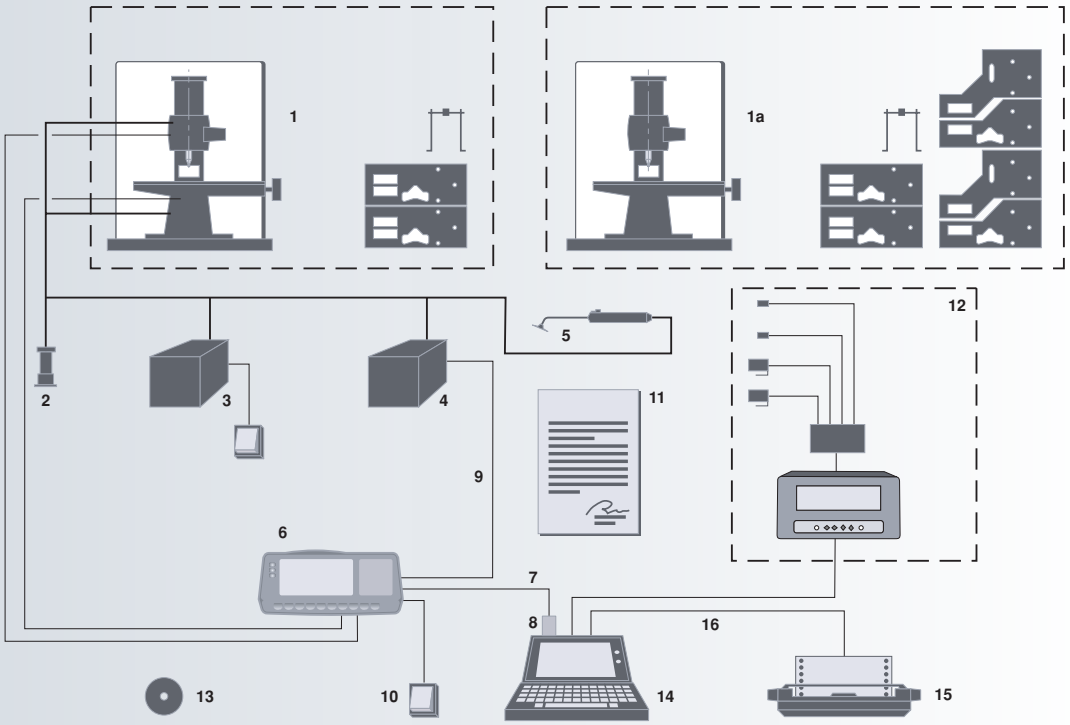
± 150 µm measuring travel

Upper probe A ≈ 1N, lower probe B ≈ 0,63 N

Tungsten carbide insert with spherical measuring face, R = 20 mm

TESA UPC Delivery Programme – Eight Ordering Variations

TESA UPC gauge block comparator equipped with single template system										
	05930000	**Standard execution, without computer application**								●
	05930001	**Execution for greater accuracy, without computer application**							●	
	05930002	**Standard execution, with computer application**						●		
	05930003	**Execution for greater accuracy, with computer application**					●			
TESA UPC gauge block comparator equipped with single and dual template system										
	05930012	**Standard execution, without computer application**				●				
	05930013	**Execution for greater accuracy, without computer application**			●					
	05930014	**Standard execution, with computer application**		●						
	05930015	**Execution for greater accuracy, with computer application**	●							
Each version consists of:										
1	**01610401**	**1 TESA UPC mechanical part** Equipped with the single template system					●	●	●	●
1a	**05960030**	**1 TESA UPC mechanical part** Equipped with the single and dual template system	●	●	●	●				
2	**03260401**	1 Pneumatic retraction of the measuring bolt, manually operated				●				●
3	**03260432**	1 Electric vacuum pump with foot switch			●				●	
4	**03260433**	1 Electric vacuum pump with external control	●	●			●	●		
5	**01660011**	1 Pneumatic suction loader	●	●	●		●	●	●	
6	**04430012**	1 TESATRONIC electronic unit TT90	●	●	●	●	●	●	●	●
	05960039	1 Set of TESA UPC accessories, including the components listed under 7,8,9								
7	**04761049**	1 Opto-RS cable, bidirectional	●	●			●	●		
8	**04760087**	1 Opto-RS interface	●	●			●	●		
9	**04761070**	1 Connecting cable TESATRONIC TT90 to vacuum pump	●	●			●	●		
10	**04768000**	1 Hand switch	●	●			●	●		
11	**01690021**	1 Option for greater accuracy with calibration certificate	●		●		●		●	



TESATRONIC TT90

- 6-decade display plus negative sign
- Used range: ±20 µm
- 0,001 µm or 0.05 µin
- 6,6 mm
- RS 232 data output, opto-coupled

TESA UPC System Components

	№	=
1	**01610401**	**TESA UPC mechanical part provided with single template system** Prepared for mounting the TESA UPT temperature device *Consisting of:*
	01630004	1 Measuring stand with toothed rack guide Manually operated for coarse setting of the measuring arm. Encapsulated attachment and device allowing extra-fine setting of the upper probe.
	05960031	1 Special solid measuring table Made from hardened steel and fitted with 6 carbide cylindrical pins for a safe positioning. Provides high protection and wear resistance to the gauge blocks over years. Adjustable attachment for lower probe B. Prepared for the integration of the temperature sensors.
	05960032	1 Single template system Used to shift the gauge blocks from a given point to another. Interchangeable templates No. 01660045 (for gauge blocks 9 x 30 mm) and No. 01660046 (for gauge blocks 9 x 35 mm). Also with added support to prevent them from tilting.
	03230045	1 Sensor system for value acquisition consisting of: – Upper probe A, GT 22-spec. No. 03290075. Measuring force to 1 N. Fitted with the measuring insert No. 03510003. – Lower probe B, GT 22-spec. No. 03290076. Measuring force to 0,63 N. Fitted with the measuring insert No. 03510003. – Air pipe system
	01660031	1 Setting piece for probe alignment
	01640420	1 Heat protection shield, 250 x 380 mm in size.
	01660001	1 Pair of grip pliers for safe handling of gauge blocks
	01660030	1 Dust cover
1a	**05960030**	**TESA UPC mechanical part provided with the single and dual template system** Prepared for mounting the TESA UPT temperature device *Includes the same components as described under the first item above, except for:*
	05960029	1 Single and dual template system for positioning the gauge blocks including: 1 Pair of templates for gauge blocks 9 x 30 mm with 1 item No. 05960019 for the reference blocks and 1 item No. 05960020 for the gauge blocks to be calibrated. 1 Pair of templates for gauge blocks 9 x 35 mm with 1 item No. 05960021 for the reference blocks and 1 item No. 05960022 for the gauge blocks to be calibrated. Also with added support to prevent tilting. 1 Template No. 05960023 for the reference blocks and those to be calibrated, 9x30 mm. 1 Template No. 05960024 for the reference blocks and those to be calibrated, 9x35 mm Also with added support to prevent the gauges tilting.
2	**03260401**	**Pneumatic retraction of the measuring bolt** Manually operated
3	**03260432**	**Electric vacuum pump with foot switch** For retracting the measuring bolt of each probe. Also used to plug the hand-operated pneumatic suction loader No. 01660011, 230 V.
4	**03260433**	**Electrical vacuum pump with external control** Connected to the measuring unit TT90 No. 044430012. Used for the retraction of the measuring bolt of each probe. Also used to plug the suction loader No. 01660011, 230 V.
5	**01660011**	**Pneumatic suction loader** For safe, easy handling of gauge blocks with nominal lengths up to 10 mm. Connected to the electric vacuum pump No. 03260432 or No. 03260433.
6	**04430012**	**TESATRONIC length measuring instrument TT90** For a detailed description, see chapter O.

0°C to 60°C

-10°C to 70°C

80%, non-condensing

Battery charger 100 to 240 V, 50 to 60 Hz. Nominal output voltage: 7,3 V

Electric vacuum pump

No. 03260432 or 03260433 = 230 Vac, 50 Hz

Temperature device

See page L-8

Additional data

≈ 23 kg (comparator complete, but without computer). ≈ 4 kg (temperature device)

Shipping packaging

Each execution with the option for greater accuracy is provided with serial number

In-house calibration certificate for the version with greater accuracy or declaration of conformity for the standard version.

Temperature device with SCS certificate.

Electric vacuum pump in special version

With external control as for No. 03260433, except:

110 Vac, 60 Hz

№ **S32070030**

	05960039	**Set of TESA UPC accessories** *consisting of:* Components as listed under items 7, 8 and 9 below.
7	**04761049**	**Opto-RS cable, bidirectional** For serial data transfer.
8	**04760087**	**Opto-RS interface** For Opto-RS cable to RS 232 PC port.
9	**04761070**	**Connecting cable** For electronic unit TT90 (No. 04430012) to vacuum pump (No. 03260433)
10	**04768000**	**Hand switch** Used for triggering any movement of the measuring bolt along with data transfer from TESATRONIC TT90 (No. 04430012) to host computer. Direct connection to the electronic unit.
11	**01690021**	**Option for greater accuracy and calibration certificate** Consists of TESA UPC (mechanical part No. 01610401 together with TESATRONIC TT90 specially adjusted and calibrated. All key components are marked with serial number.
12	**05930011**	**TESA UPT temperature device for TESA gauge block comparators** 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. Used in association with TESA UP software programme for value processing. *Consisting of:*
	05960018	1 Set of 4 temperature sensors
	05960038	1 FLUKE 1529 temperature device
	05960012	1 Adapter
	05960011	1 Connecting cable For a detailed description, refer page L-15.
13	**05960025**	**TESA UP software programme for value processing** Running under **WINDOWS 98, 2000, NT or XP** • For details on the programme related features, report to page L-14.
14	**S59070014**	**Computer** Available upon request. For minimum requirements, see page L-14.
15	**S59070012**	**Laser Printer, colour** Upright A4 format. USB interface.
16	**S59070013**	**Connecting cable** For USB data transmission between host computer to printer.

Hardware

All hardware components listed opposite (items 14 to 16) can be purchased locally. Should you wish to, we may also provide you with a quotation on request.
TESA cannot assure the UP system will operate properly when run on a network. Therefore, we recommend to inquire about a technical information before purchasing your own equipment.

TESA UP Software Programme for Value Processing

Suitable for both TESA gauge block comparators UPD and UPC as well as for comparators from other manufacturers.

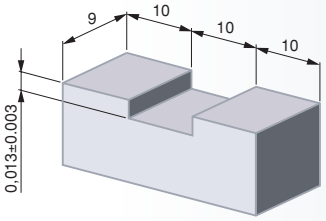
- Choice of 10 languages.
- On-line processing of length and temperature values as transferred.
- Measurement cycles and result outputs according to EN ISO 3650.
- Flexible architecture for optimum adaptation to specific User's needs.
- Possible entry of limit values and accuracy grades peculiar to Users.
- 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 various versions.

05960025	**TESA UP software programme for gauge block calibration** Running under WINDOWS 98, 2000, NT, XP *Software package including:* 1 CD-ROM plus 1 USB protective Hard-key

✓
EN ISO 3650
Metric/Inch units

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 98, 2000, NT or XP
- Processor: 650 MHz
- 1 Hard disc (6 GB)
- RAM capacity: 64 MB
- CD-ROM drive (24x)
- RS 232 serial port
  1 for length values
  1 for temperature values
- USB port



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 listed on page L-15 is additionally required for calibrating TESA UPD.

Set Composition Including 11 Gauge Blocks

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.

		µm
	Set of 11 gauge blocks for calibrating each comparator	
	Set composition as listed in the chart opposite. Supplied with:	
S59110152	Calibration certificate issued by the Physikalisch Technische Bundesanstalt (PTB)	**± 0,015**
S59110489	Calibration certificate issued by a laboratory accredited by the German calibration service (DKD)	± 0,030

Full tungsten carbide set also available on request

Pairs N°	Nominal length A mm	B mm
1	0,5	0,5
2	1,0	1,005
3	1,0	1,01
4	4,0	4,0
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. Exception: 6 mm special carbide gauge blocks.
Class K
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.
Wooden case
Identification number
PTB or DKD calibration certificate

✓

✓

EN ISO 3650

Special high-alloy steel, wear resistant and stable

Grade K

Expanded uncertainty k = 2 is valid for the given one

Wooden case

Identification number

For calibration certificates, see opposite

Additional Gauge Block Set for the Calibration of TESA UPD

To achieve the lowest uncertainty of measurement, we recommend the use of reference standards of grade K, which are measured directly by interferometry and come along with a calibration certificate. And this, irrespective of any other requirement such as the ambient conditions.

№		µm
	9-piece gauge set for the calibration of TESA UPD *Set composition as listed in table opposite. Supplied with:*	
S59300103 **S59300107**	Calibration certificate issued by the laboratory of a national institute of metrology Metas (Switzerland) PTB (Germany)	±(0,02+0,2·L) µm L in m Measuring method: direct inteferometry
S59300104	Calibration certificate issued by a laboratory officially accredited SCS	±(0,05+0,5·L) µm L in m Measuring method: by comparison

Set Composition (mm)
1 5 10 15 20 25 50 75 100

Steel

Accuracy grade K

Other set compositions or carbide gauge blocks also available on request.

✓

Temperature Sensors

PT 100 platinum resistances, 4-wire type

Temperature Device

Multi-channel precision thermometer equipped with a switch for the measuring points

4-wire measuring method with continuous value acquisition over connected sensors.
PT100 linearisation according to EN 60751.

0,001 °C

RS 232 or IEEE 488

115 ±10% Vac or 230 ±10% Vac. For 50 and 60 Hz

EN 61010, EN 50081, EN 50082 EN 55011

Additional technical data listed on page L-8

TESA UPT Temperature Devices

№	
05930011	**TESA UPT temperature device for TESA Gauge Block Comparators** 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. *Consisting of:*
05960018	1 Set of 4 temperature sensors PT100 platinum resistances giving exceptional long-term stability while drifts are kept to a minimum over years of use. This set includes the following sensors: 1 Temperature sensor with clamp R for reference gauge blocks having nominal lengths from about 14 mm, No. 05960009. 1 Temperature sensor with clamp P for gauge blocks to be calibrated having nominal lengths from about 14 mm, No. 05960008 2 Temperature sensors mounted on the measuring stand or the table. PT 100 sensors. 3 g8 in diameter, 10 mm long. Order number for a single item: 05960010.
05960038	1 FLUKE 1529 measuring unit for temperature Precision thermometer including a switch for the measuring points. With use of the PT 100 platinum resistances, provides 4 measuring channels with a 0,001 °C numerical interval.RS 232 or IEEE 488 data output. 115 or 230 Vac for 50 or 60 Hz.
05960012	1 Adapter. Allows up to 4 temperature sensors to be connected.
05960011	1 Connecting cable For adapter No 05960012 to measuring unit No 05960038.
05960026	**Connecting cable** For serial data transfer from temperature device 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 or 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.

✓
✓
Shipping packaging
Identification number
In-house calibration certificate



Calibration of Standards

- Cylindrical 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 Plug Gauges

- Limit plug gauges
- Plug gauges «GO»
- Plug gauges «NOT GO»
- Plain plug gauges
- Ring gauges «GO»
- Ring gauges «NOT GO»
- Threaded plug gauges







ETALON POLO
Measuring Bench

✓

0 to 100 mm for external dimensions
• 10 to 110 mm with standard accessories

• 2,5 to 110 mm with optional accessories

50 mm measuring span

Max. perm. error within the measuring span: 0,5 µm with standard accessories

0,1 µm

0 to 4 N

Opto-electronic measuring system with incremental glass scale, type LIF – HEIDENHAIN

8,0 • 10^{-6}/°C

Tilting range of the floating table ± 0,5°

See on drawing
• shortest distance A = 0 mm
• longest distance A = 11,5 mm

19,0 kg net net
(main part alone, without table)
2,8 kg net (floating table)
2,1 kg net (fixed table)

10°C to 40°C

--10°C to 40°C

EN 50081-1
EN 50082-2
EN 61000-4-2
EN 61000-4-4



Calibration of Hand-Held Tools

- Dial gauges
- Precision indicators
- Dial test indicators (lever-type)
- Electronic probes



ETALON POLO with Floating Resting Table

05939001	**ETALON POLO measuring bench with floating resting table and HEIDENHAIN computing counter ND 287 included.**

Consists of the following main components:

05919002	**1 Main part** Application range 0 to 100 mm for external dimensions or 10 to 110 mm for internal dimensions (with standard accessories). 50 mm measuring span. Base plate with measuring unit and mounting block for the fixed meas uring stops fitted with a stop pin; measuring unit equipped with a spindle as well as opto-electronic system featuring an incremental glass scale. Stop pin and spindle have both a mounting bore for a 6,5 mm dia. meas uring insert; attachment for the stops and measuring device allowing the table to be moved vertically, and then tilted for inside measurements. Also with adjust system for the measuring force.
05969024	**1 Pair of standard measuring inserts for external dimensions** With a 6,5 mm dia. tungsten carbide flat face, already mounted.
05969015	**1 Floating resting table** Already mounted, also interchangeable. Used for positioning parts in the measuring direction when inspecting internal dimensions. Includes a stainless steel plate, hardened and ground, mounted on ball bearings. 200 x 100 mm table surface area, also with mount for the limit stops.
05969029	**1 HEIDENHAIN computing counter ND 287** Up/down counter with LCD color display. Switchable from metric to inch. Captures both extreme values with output of the difference between these values. Value classification capability. RS 232 data output.

Supplied with the following standard accessories:

05969020	**1 Pair of standard inserts for internal dimensions from 10 mm** Stainless steel measuring face, hardened and ground. Ball tip section R = 2,5 mm. M4 locking screw.
05969030	**1 Dust cover**

ETALON POLO with Fixed Resting Table

05939000	**ETALON POLO measuring bench with fixed resting table and HEIDENHAIN computing counter ND 287 included**

Consists of the following components:

05919002	**1 Main part** As described on the previous page.
05969024	**1 Pair of standard measuring inserts for external dimensions** With a 6,5 mm dia. carbide flat measuring face, already mounted.
05969014	**1 Fixed resting table** Already mounted, also interchangeable. Used for internal measurements. Includes a stainless steel base plate, hardened and ground. Table surface 200 x 100 mm. Also with stop clamp for positioning the workpiece.
05969029	**1 HEIDENHAIN computing counter ND 287** Up/down counter with LCD color display. Switchable from metric to inch. Captures extreme values with output of the difference between both. Value classification capability. RS 232 data output.

Supplied with the following standard accessories:

05969016	**1 Single pair of standard inserts for internal dimensions from 10 mm**
05969030	**1 Dust cover**

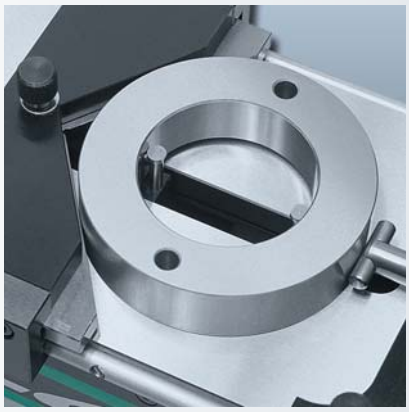
Workpiece Inspection

External dimensions

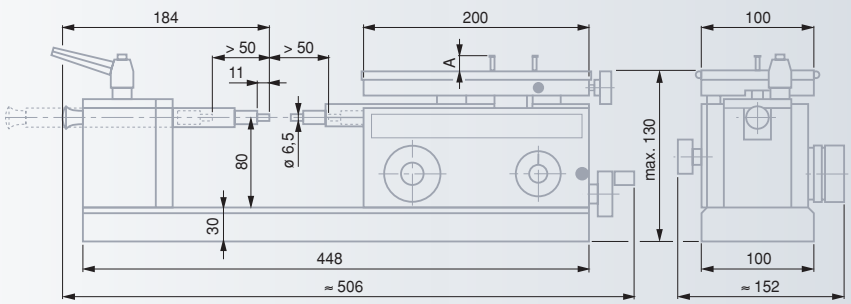
- Stepped shafts
- Cutting tools
- Cylindrical pins
- Ball tips
- Grooves
- Short centring shoulders
- Threads (measured according to the 3-wire method)

Internal dimensions

- Through bores
- Blind bores
- Centring grooves
- Slots
- Sliding guides







HEIDENHAIN ND 287 Computing Counter

- ✓
- Up/down counter for inner data processing and output
- TFT display screen, 9-decade plus sign. Auxiliary display for active functions.
- 0,001 and 0,0001 mm or 0.0001 and 0.00001 in
- 14 mm
- RS 232
- 0°C to 45°C
- -30°C to 70°C
- 75%
- 100 to 240 Vac (-15% to +10%), 50 to 60 Hz
- 211 x 112 x 209 mm (L x H x D)
- ≈ 2,5 kg
- IP40 (IEC 60529)
- Noise acuteness to grade 4 (VDE 0843, Parts 2 and 4)
- EN 55022, class B

Shipping packaging

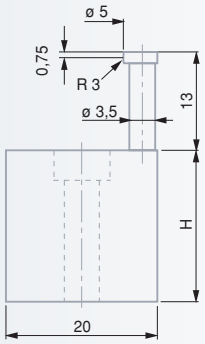
Standard Accessories

Available according to the model supplied.

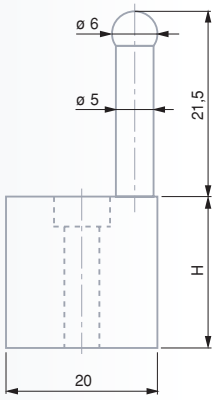
05969024	**1 Pair of standard measuring inserts for external dimensions** 6,5 mm dia. carbide inserts with a flat face
	Standard measuring inserts for internal dimensions from 10 mm 5 mm dia. inserts with stainless steel measuring face, hardened. M4 locking screw.
05969020	1 Pair of inserts for use with the floating table No. 05960015, H = 20 mm.
05969016	1 Pair of inserts for use with the fixed table No. 05969014, H = 12,5 mm.



05969024



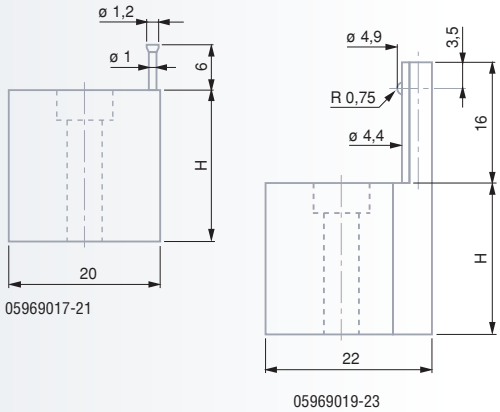
05969016-20



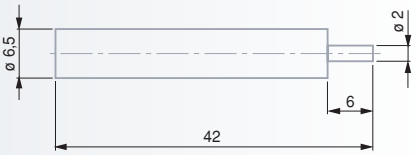
05969018-22

Optional Accessories

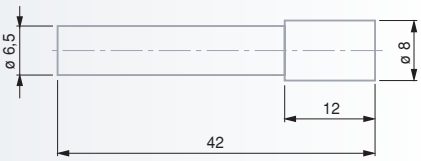
	Measuring inserts for internal measurement using the floating resting table Height H = 20 mm. M4 locking screw.
05969021	**1 Pair for internal dimensions from 2,5 mm** Barrel-shaped inserts with a 1,2 mm dia. carbide ball tip.
05969023	**1 Pair for internal dimensions from 5 mm** Fitted with a 1,5 mm dia. carbide ball tip.
05969022	**1 Pair for internal dimensions from 13 mm** Fitted with a 6 mm dia. carbide ball tip.
	Measuring inserts for internal measurements using the fixed resting table Height H = 12,5 mm. M4 locking screw.
05969017	**1 Pair for internal dimensions from 2,5 mm** Barrel-shaped inserts, with a 1,2 mm dia. carbide ball tip.
05969019	**1 Pair for internal dimensions from 5 mm** Fitted with a 1,5 mm dia. carbide ball tip.
05969018	**1 Pair for internal dimensions from 13 mm** Fitted with a 6 mm dia. carbide ball tip.
05969028	**1 Pair for external dimensions** Tungsten carbide flat measuring face, D = 2 mm.
05969027	**1 Pair for external dimensions** Tungsten carbide flat measuring face, D = 8 mm.
	Attachments for the measuring inserts
05969025	with mounting thread G = M2,5
05969026	G = 4/48 in
	Inserts with special design available on request
	Inserts with M2,5 thread, see pages F-42 to F-44.
	Wires for thread measurement, see page C-24.



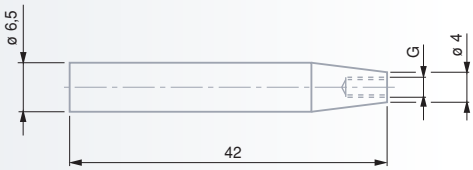
05969017-21
05969019-23



05969028



05969027



05969025/26

05969000	**Bench stand with swivelling plate** For raising the measuring bench from horizontal to vertical position. Accommodates a clamp lever. Length (upright): 295 mm, mass ≈ 20 kg.





05969002



05969001



05969003



05969034



05969005



05969007/8



05969012



05969010



05969009



05969004

05969001	**Base for the computing counter** For heightening the HEIDENHAIN computing counter ND 287 up to 380 mm, mass 5,2 kg.
	Intermediate resting block Features a 10 mm dia.mounting bore for: • resting table No. 05969003 • Holder No. 05969004 for a dial test indicator (lever-type)
	Supporting plate Used for external measurement. 60 x 60 mm surface area with recesses. Hardened, ground steel. Also with a 10 mm dia. fixing pin.
05969034	**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. *Consisting of:*
05969032	Resting table with centres
05969033	Vise support for cylindrical test pins
05969005	**Intermediate resting block** Used in conjunction with the floating mount device No. 05969013.
05969012	**Centring device** Allows to search for the transverse culmination point against the measuring direction. Used with either of both fixed or floating table No. 05969014 or 05969015. Prismatic stop adjustable transversely, max. diameter 110 mm. Counterpressure piece finished with cylindrical stop pins.
	Clamping rods For clamping the instruments that need be calibrated such as dial gauges or precision indicators.
05969010	For fixing shafts with a 8 mm dia.
05969011	$^{3}/_{8}$ in dia.
05969004	**Holder** **for a dial test indicator (lever-type)r** Provided with 2 dovetail clamps, TESATAST-type or in compliance with BS 2795:1981.
05969009	**Spindle for calibrating dial gauges, dial test indicators and the like** Setting range = 50 mm, Spindle rotation = 0,5 mm

✓ Shipping packaging

Surface Roughness Testing









Roughness Parameters Commonly Used in Short

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 counts for the most significant single roughness depths 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 used for testing any surface finish quality have long proven their value in praxis.

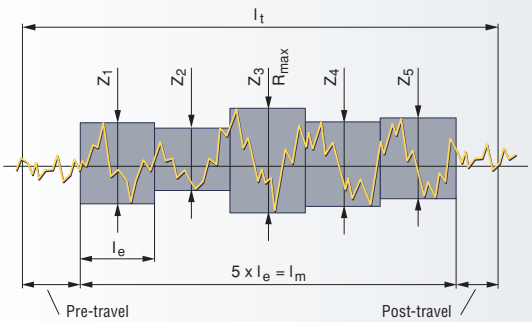
They serve for touch and/or sight comparisons with the surface of work pieces that are produced using the same manufacturing process. Condition is that materials have to be comparable.

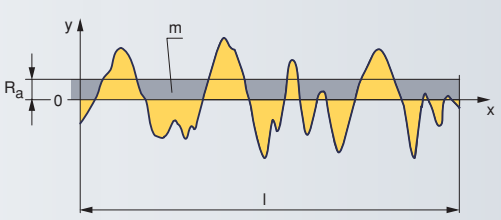
When comparing the workpiece surface against the specimen, roughness is not quantitatively expressed. The assessment of the extent to which the surface finish of both is alike can only be subjective.

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 nail or a small cooper piece like a coin, for instance.







TESA RUGOSURF 10 Roughness Gauge

- ✓
- USB
- ISO 3274 (Cl.1)
- 10°C to 40°C
- -10°C to +50°C
- 122 x 53 x 81 mm (gauge unit alone)
- 590 g
- ✓
- Suited plastic case
- Declaration of conformity

Robust, versatile and compact gauge unit designed for inspecting any work piece surface finish and capturing roughness parameter values – Wide variety of probes for the most varied applications – Possible tolerancing of each parameter available.

- Interchangeable probe, swivelling through to 90° to let you measure even in hard-to-reach recesses.
- Extended autonomy. Can equally be connected to the mains adapter or the battery pack for direct use on a machine-tool.
- Value storage, output or transfer to a PC of up to max. 100 measured values).
- USB data output for full use and further storage of the measurement results.
- Automatic idle mode if the gauge is left unused for 40 seconds. Preserve the battery pack.
- Fast and easy analysis of the results obtained from the measured parameters with assigned tolerances.



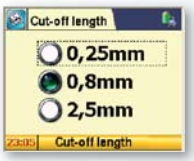
Two probe positions

06930010	**TESA RUGOSURF roughness gauge 10**
delivered with the following standard accessories:	
	Roughness standard, nominal value Ra = 2,97 µm / 117 µin
	Rechargeable battery 8,4 V, 170 mAh, NiMH in PP3 format
	Standard probe, type **SB10**
	Battery charger
	Adapter for universal stand, 8 mm diameter
	Positioning support

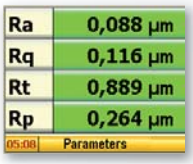
TESA RUGOSURF Roughness Gauge 10G

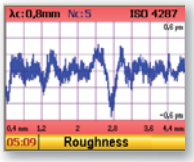
Portable, versatile gauge unit with compact design, well suited for receiving inspection or for use in the production area or the measurement laboratory.

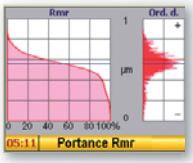
Measures roughness parameters according to ISO 4287:1997/ JIS B0601:2001, DIN and ISO 12085:1998 (MOTIF or CNOMO).





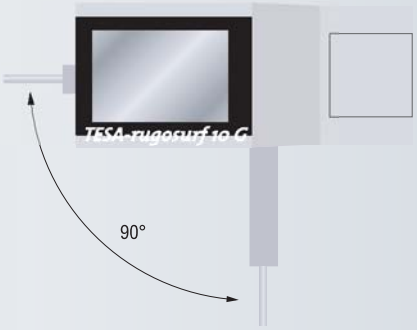






- TFT graphic display for optimum visual representation of any measured parameters and workpiece profiles, size to 2".
- Direct displaying of all measured values and computed profiles.
- 31 roughness parameters available.
- Wide autonomy through mains adapter or battery pack.
- Output, storage or transfer to a PC of the results obtained from a number of measurements as high as 999.
- Possible tolerancing of all parameter values.
- Multilingual menu options.
- USB data output enabling a direct connection to the printer unit or a conventional PC equipped with RUGOSOFT 10 (both are optional).





Two probe positions

✓

USB

ISO 3274 (Cl.1)

10°C to 40°C

-10°C to +50°C

122 x 53 x 75 mm (gauge unit alone)

590 g

✓

Suited plastic case

Declaration of conformity

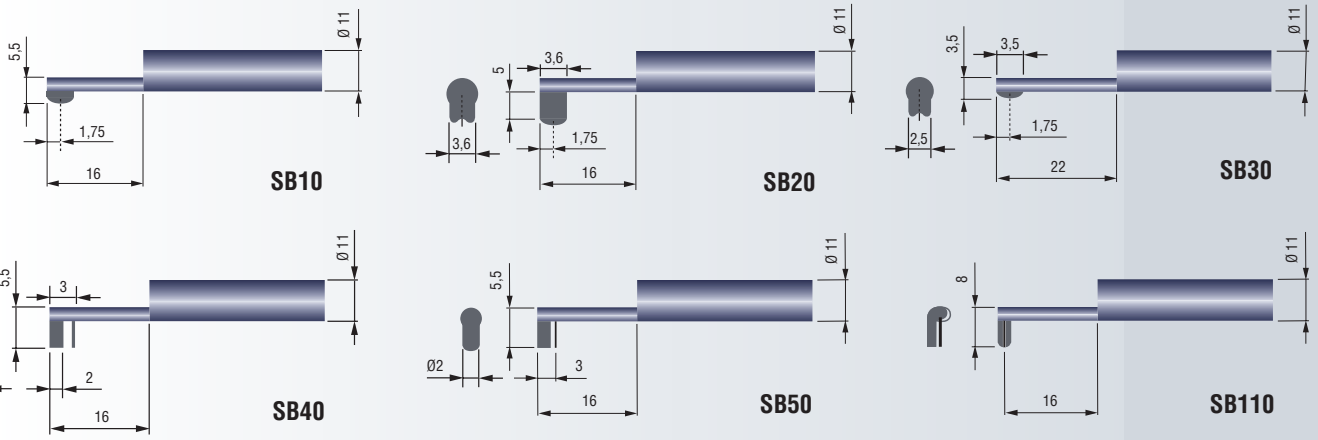
06930011	**TESA RUGOSURF roughness gauge 10G**
Delivered with the following standard accessories:	
	Roughness standard, nominal value Ra = 2,97 µm / 117 µin
	Rechargeable battery 7,2 V, 300 mAh, NiMH in PP3 format
	Standard probe, type **SB10**
	Battery charger
	Adapter for universal stand, 8 mm diameter
	Positioning support

Technical Data

	06930010	06930011
	RUGOSURF 10	**RUGOSURF 10G**
Display	LCD, 2 lines of 16 characters	TFT colour display, 2" in size
Roughness parameters	according to ISO 4287-1997 / JIS B0601 / ASME B46-2002 Ra - Rq (RMS) - Rt - Rz - Rc - Rsm according to ISO 12085 (CNOMO) Pt - R - Rx - AR	according to ISO 4287-1997/JIS B0601:2001 ASME B46-2002 Ra - Rq (RMS) - Rt - Rz - Rp - Rc - Rv - Rsm - Rδc - Pa - Pq - Pt - Pp - Pc - Pv - Psm - Pδc according to PrEN 10049 RPc - PPc according to ISO 13565 Rk - Rpk - Rvk - Mr1 - Mr2 according to DIN 4776 Rmax according to DB N31007 R3z - R3zm according to ISO 12085 (CNOMO) Pt - R - Rx - AR
Measuring span X-axis Z-axis	 16 mm (0.63 in) 160 µm (6300 µin)	 16 mm (0.63 in) 300 µm (11810 µin)
Unit system	mm / in	mm / in
Range of indication	Ra 0 ÷ 40 µm (0 ÷ 1575 µin) Rt 0,05 ÷ 160 µm (0 ÷ 6300 µin)	Ra 0 ÷ 75 µm (0 ÷ 2952 µin) Rt 0,05 ÷ 300 µm (0 ÷ 11810 µin)
Resolution	0,01 µm (0.1 µin)	0,001 µm (0.01 µin)
Cut-off length	0,25-0,8-2,5 mm (0.01-0.03-0.1 inch)	0,25-0,8-2,5 mm (0.01-0.03-0.1 inch)
Numerical filter	Gaussian as per ISO 11562	Gauss as per ISO 11562
Traversing length l_t	(number of cut-offs + 1) x λc	(number of cut-offs + 1) x λc
Cut-off l_c	number of cut-offs x λc	number of cut-offs x λc
Number of selectable cut-offs	1 to 5	1 to 10 cut-offs of 0,25 and 0,8 mm 1 to 5 cut-offs of 2,5 mm
Probing speed Reverse speed	1 mm/s 2 mm/s	1 mm/s 2 mm/s
Keypad	4-key, membrane type key pad, protected against dust particles and liquids	4-key, membrane type key pad protected against dust particles and liquids
Probe	Inductive probe	Inductive probe
Stylus	90° diamond tip	90° diamond tip
Tip radius	5 µm	5 µm
Measuring force	0,75 mN (ISO 3274)	0,75 mN (ISO 3274)
Languages	English, French, German, Spanish, Italian, Portuguese	English, French, German, Spanish, Italian, Portuguese
Memory capacity	max. 100 measured values	max. 999 measured values
Power supply	Battery pack, 8,4 V – 170 mAh	Battery pack, 7,2V – 300 mAh
Power consumption	max. 3 VA at 220 V	max. 6,5 VA at 220 V
Overall dimensions	122 x 53 x 81 mm (gauge unit alone)	122 x 53 x 75 mm (gauge unit alone)
Weight	590 g	590 g

Optional Probes

06960036	SB10	Standard probe for surfaces and bores, internal/external diameters of >10 mm.
06960037	SB20	Probe for grooves, max. depth 5 mm.
06960038	SB30	Probe for small bores from 4 mm dia.
06960039	SB40	Probe with V-skid for cables with external diameter of >1 mm.
06960040	SB50	Probe with front mounted contact skid for concave surfaces. Ideal for 90° measurement.
06960056		Probe extension, 100 mm long (1 single item).
06960057	SB110	Probe for concave or convex surfaces, smaller tip radius to 5 mm.



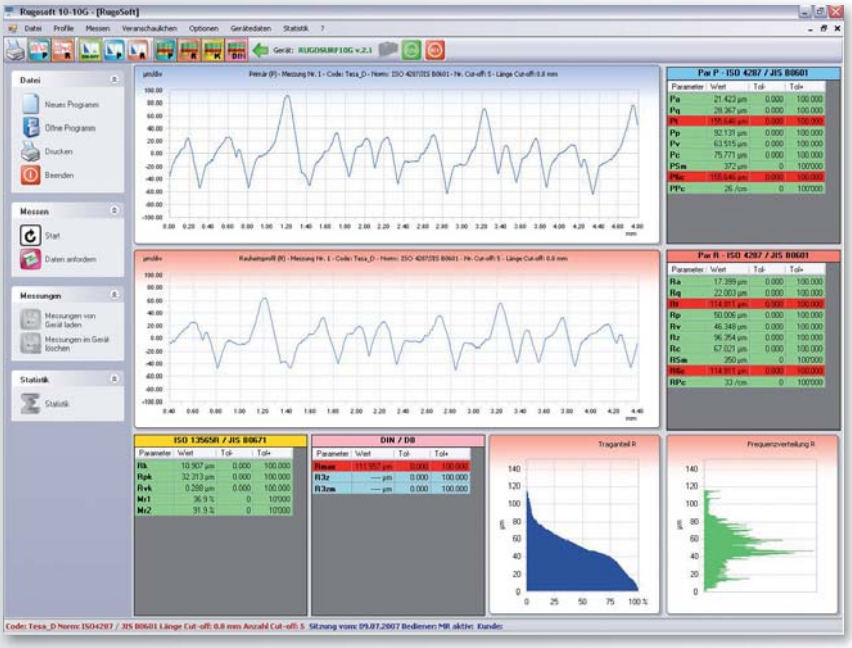
Matrix Printer



06960033	**Matrix printer**, 24 columns
Provided along with:	
	Rechargeable battery pack
	Connecting cable to RUGOSURF 10 / 10G / 90G
06960043	Inked ribbon fort printer (3 items)
06960044	Paper rolls, 57 mm wide (10 units)

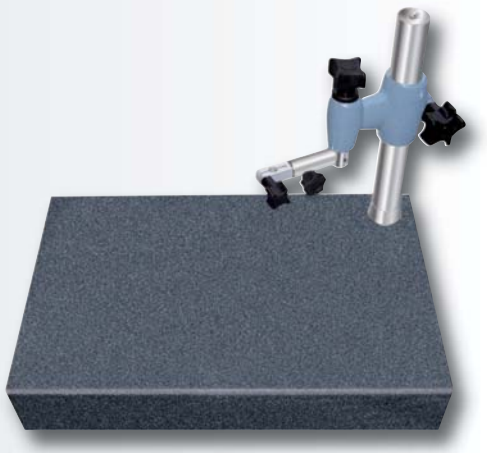
RUGOSOFT 10 Software

06960034	**Rugosoft 10 software**
Provided along with:	
	CD with all instructions for installation, 6 languages available
	Instruction manual plus on-line help (included on the CD)
	USB cable, L = 1,80 m



Additional Accessories

06960035	Support with granite base, 400 x 250 mm
06960041	Roughness standard, nominal value Ra = 2,97 µm / 117 µin
06960042	Remote control
06960045	Battery pack for powering Rugosurf 10G
06960046	Mains adapter, 100 to 240 Vac / 50 to 60 Hz
06960047	Suited plastic case for both Rugosurf 10 and 10G
06960059	Double connector for external power switch and printer
06960063	Battery pack for Rugosurf 10



06960035

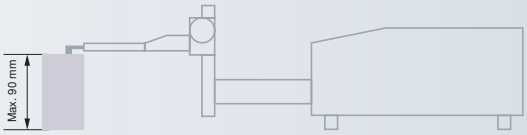


TESA RUGOSURF Roughness Tester 90G

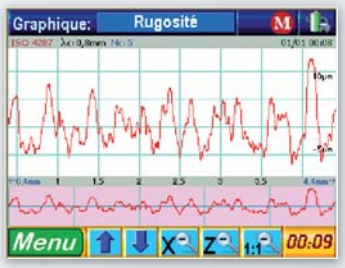
Small-size, versatile roughness tester providing maximum ease of use – Ideally suited for high-precision measurements on the shop floor or in the inspection laboratory.

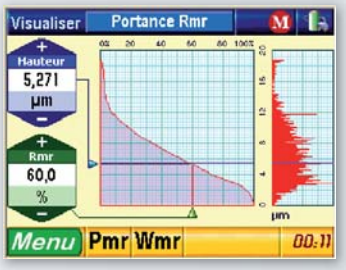
- Measures roughness parameters according to ISO 4287, 12085 (CNOMO), 13565, DIN 4776, JIS B0601:2001 and ASME B46-2002.
- Tactile TFT colour display with size to 3,5".
- Three function keys.
- Graphical interface.
- Direct displaying of all measured values and computed profiles.
- Measuring span to 50 mm/2 in (X-axis) or 1000 µm/39370 µin (Z-axis).
- Interchangeable probe, with or without contact skid.
- Possible input of tolerances.
- USB digital output for data transfer to a PC running TESA Measurement Studio (this software is available as an option).
- Measures up to 90 mm vertically without the need for a special support.
- Profile measurement up to 2 mm (optional accessory).

✓
USB
ISO 3274 (cl. 1)
10°C to 40°C
-10°C to +50°C
270 x 140 x 90 mm (tester alone)
3 kg
✓
Suited plastic case
Declaration of conformity









06930012	**TESA RUGOSURF roughness gauge 90G**	
Supplied with the following standard accessories:		
	Roughness standard, Ra = 2,97 µm / 117 µin	
	Rechargeable built-in battery, 12 V	
	SB60/10 standard probe, with or without contact skid	
	Two-position probe holder	– Locked for probe without skid – Unlocked for probe with skid
	Guiding column, setting range up to 90 mm	
	Battery charger, 100 to 240V, 50/60 Hz	

Technical data

	06930012
	RUGOSURF 90G
Display	Tactile TFT colour display, size 3,5" Resolution 320 x 240 pixels, 256 colours
Roughness parameters	according to ISO 4287:1997/JIS B0601:2001 / ASME B46-2002 Ra – Rq – Rt – Rz – Rp – Rv – Rc – RSm – Rδc Pa – Pq – Pt – Pp – Pv – Pc – PSm – Pδc Wa – Wq – Wt – Wz – Wp – Wv – Wc – WSm – Wδc according to ISO 13565 Rk – Rpk – Rvk – Mr1 – Mr2 according to PrEN 10049 PPc - RPc- WPc according to DIN 4776 Rmax according to DB N31007 R3z – R3zm according to ISO 12085 (CNOMO) Pt – R – AR – Rx – Wte – AW – Wx – Rke – Rpke - Rvke – W – Mrle – Mr2e
Measuring span X-axis Z-axis	 50 mm 1000 µm
System of units	mm / in
Resolution	0,001 µm (0.01 µin)
Cut-offs	0,08 - 0,25 - 0,8 - 2,5 - 8 mm
Numerical filter	Type Gaussian as per ISO 11562
Traversing length l_t	(number of cut-offs + 1) x λc
Cut-off l_c	number of cut-offs x λc
Probing speed	0,5 mm/s – 1 mm/s
Number of selectable cut-offs	1 up to 19 cut-offs of 0,08; 0,25; 0,8; 2,5 mm 1 up to 5 cut-offs of 8 mm
Keypad	Three-key, membrane-type keypad protected against dust particles and liquids
Probing system	inductive probe
Probe tip	90° diamond tip
Tip radius	5 µm
Measuring force	0,75 mN (ISO 3274)
Available languages	English, French, German, Spanish, Italian, Portuguese
Memory capacity	≈ 60 000 measurements
Autonomy	≈ 2 000 measurements / ≈ 10 hours
Power supply	12V integrated Battery pack – Battery charger 100 to 240 Vac, 50/60 Hz
Power consumption	max. 20 VA at 220 V
Overall dimensions	270 x 140 x 90 mm (gauge unit alone)
Weight	3 kg

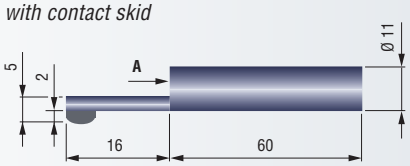


Optional probes (90° diamond tip with a tip radius to 5 µm, unless otherwise specified)

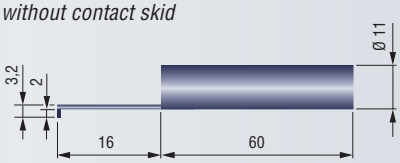
06960049	SB60/10	**Probe with contact skid** For surfaces and bores with external diameter over 10 mm or internal diameter smaller than 6 mm.
		Probe without contact skid For surfaces and small bores with diameter from Ø 4 mm.
06960067	SB60/10	Same as 06960049, but with a diamond tip, R=2 µm.
06960050	SB20 P	Probe for grooves, max. depth 5 mm.
06960051	SB30 P	Probe for small bores from Ø 4 mm.
06960052	SB40 P	Probe with V-skid for cables with external diameter over 1 mm.
06960053	SB50 P	Probe with contact skid for concave surfaces. Ideal for 90° measurement.
06960054	SB120P	Probe for grooves, max. depth 20 mm.
06960058	SB120S	Probe without skid for grooves, max. depth 15 mm
06960061	SB60-D2	Probe for small bores with diameter from 2 mm, L = 30 mm.

SB60/10 Probe

with contact skid



without contact skid

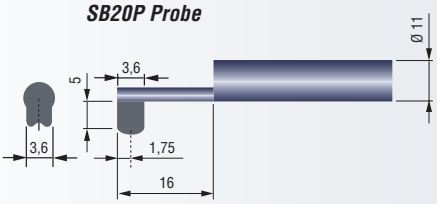


A Undo both screws on the front face to remove the skid. Once done, use the probe very carefully for any further measurement (see Fig. 1).

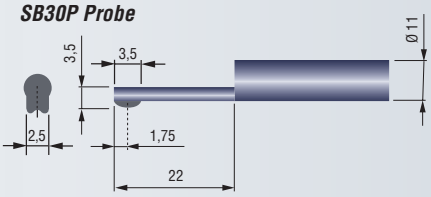


Fig. 1

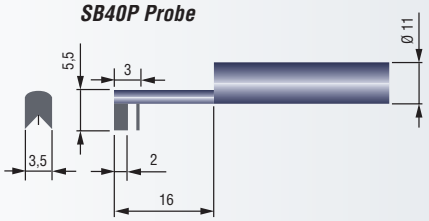
SB20P Probe



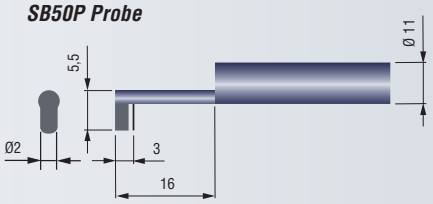
SB30P Probe



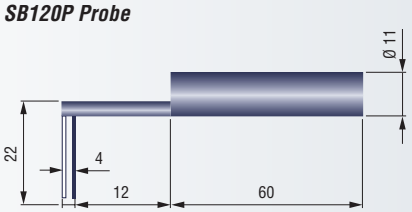
SB40P Probe



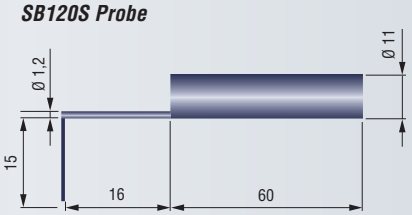
SB50P Probe



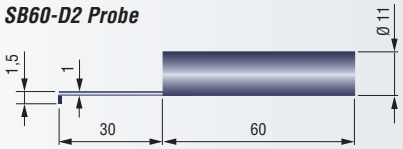
SB120P Probe



SB120S Probe



SB60-D2 Probe



Measurement Studio Software

06960048	**TESA Measurement Studio Software**

provided with :

- Instructions for installation, 6 languages available on the CD
- Instruction manual plus Online Help (also available on the CD)
- USB connecting cable, L = 1,80 m



Additional Accessories

06960041	Roughness standard, Ra = 2,97 µm / 117 µin
06960064	Roughness standard, Ra = 0,1 µm
06960065	Roughness standard, Ra = 0,5 µm
06960066	Roughness standard, Ra = 1 µm
06960055	Support with granite base, 630 x 400 mm. Height adjustment over 200 mm

For printer and remote control, see both pages M-6 and M-7.



OPTIONAL PROFILE MEASUREMENT

Fitted with a probe with special design, your Rugosurf 90G changes into a profile gauge. Simple and accurate, this tool used in connection with its proper software can measure any length, radius or arc of circle on any parts. Sometimes, checking these features is just impossible.

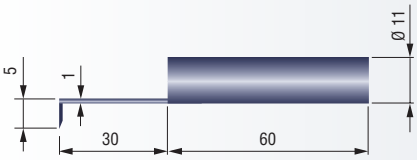
Z = 2 mm
X = 50 mm

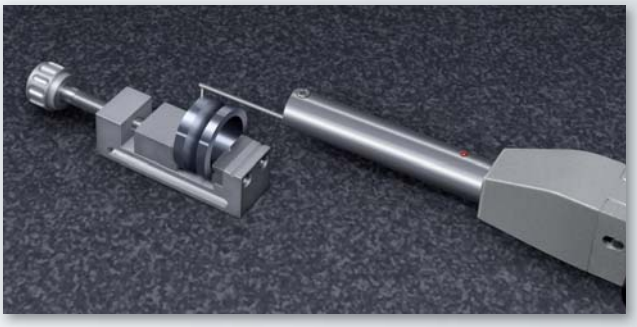
Z = 0,1 µm
X = 0,4 ÷ 4 µm
depending on measured length

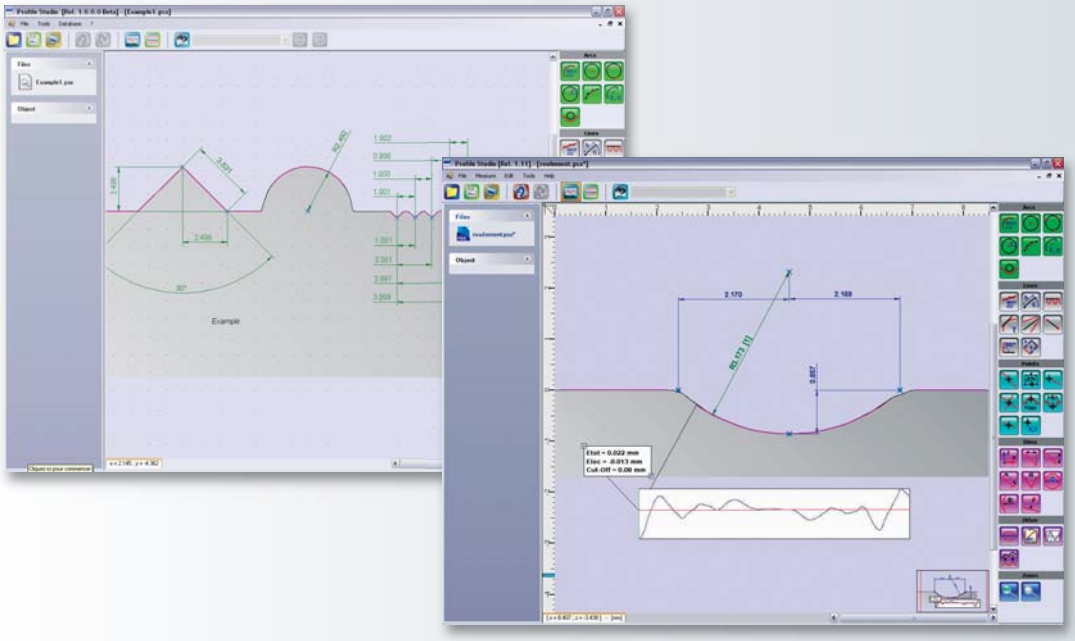
Z =
3,5 + 0,75*H µm,
*H in mm
X = 3,5 + L/10 µm,
L = distance in mm

1 mm/s

70°
(upward probe)
85°
(downward probe)







Fast, easy setting and evaluation of achieved results. Each relevant dimension can be input upon recognition of the part geometry feature (a point, straight line or arc of circle). Both the rotation and symmetry of the profile being checked let it be conveniently aligned.

The use of a measured profile for the evaluation of a new measurement makes all operations easier. Each needed handling is automatically reproduced.

All measurement results, including detailed user-defined reports, are checked at a glance based on specified tolerances.

06960100	**Profile Set 2 mm**
Supplied with :	
06960102	SB 2000 probe
06960103	Setting standard (along with inspection report)
06960101	Profile Studio multilingual software (EN/FR/DE/EN/IT/ES/PT)
	USB connecting cable, L = 1,80 m

RUGOTEST Roughness Comparison Specimens

For touch and/or sight comparisons of the workpiece surface finish.

ISO 2632 Parts 1 and 2

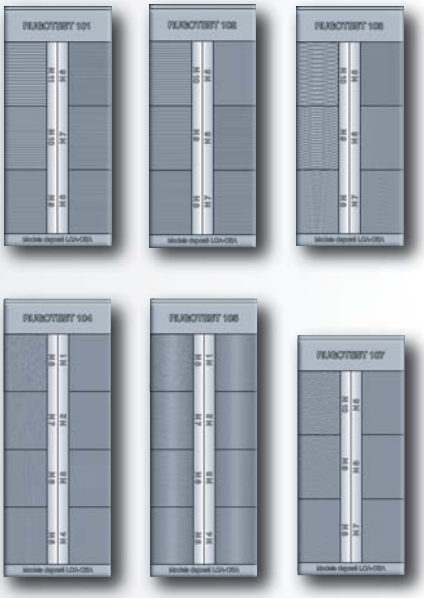
Rust-resistant nickel

Specimens for roughness comparison cannot be used as reference ones. Therefore, they are not suitable for calibrating surface roughness testers.

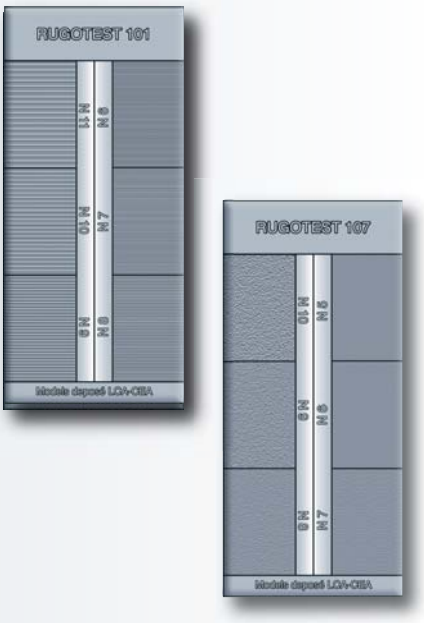
Leather case

Sets of roughness specimens for single machining methods according to ISO roughness parameters

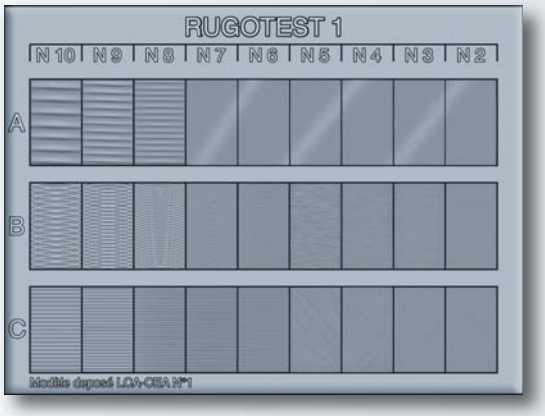
№	=	RUGO-TEST	Number of single specimens	ISO roughness parameters
081112346	**RUGOTEST**	**A4**		
Consisting of the following single specimens:				
081112053	Metal working	1	27	N2 ÷ N10
081112054	Hand grinding	2	6	N6 ÷ N11
081112055	Shot blasting	3	18	N6 ÷ N11
081112056	Hand filing	4	6	N6 ÷ N8
081112345	**RUGOTEST**	**A6**		
Consisting of the following single specimens:				
081112058	Planing	101	6	N6 ÷ N11
081112059	Turning	102	6	N5 ÷ N10
081112060	Face milling	103	6	N5 ÷ N10
081112061	Surface grinding	104	8	N1 ÷ N8
081112062	Circular grinding	105	8	N1 ÷ N8
081112063	Spark erosion	107	6	N5 ÷ N10



№	= RUGOTEST	mm	g
081112053	1	135 x 105	160
081112054	2	120 x 90	160
081112055	3	120 x 90	190
081112056	4	120 x 90	160
081112057	5	120 x 90	200
081112058	101	110 x 50	110
081112059	102	110 x 50	105
081112060	103	110 x 50	110
081112061	104	130 x 50	125
081112062	105	130 x 50	130
081112063	107	110 x 50	110
081112344	12	127 x 27	60
081112346	A4	330 x 250	710
081112345	A6	330 x 250	780



Specimens for individual machining methods according to ISO roughness parameters



	ISO roughness parameters			N0	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11
	Mean roughness value Ra		µm	0,0125	0,025	0,05	0,1	0,2	0,4	0,8	1,6	3,2	6,3	12,5	25
			µin	*0.5*	*1*	*2*	*4*	*8*	*16*	*32*	*63*	*125*	*250*	*500*	*1000*
	Mean roughness value Rz ISO		µm / *µin*	These values are changing depending on the machining method used.											
№	=	RUGO-TEST No.	Number of single-specimens												
081112053	**Metal working**	1	27												
	Side milling		3									●	●	●	
	Face milling		5							●	●	●	●	●	
	Turning/Planing		5							●	●	●	●	●	
	Grinding		6			●	●	●	●	●	●				
	Lapping		4			●	●	●	●						
	Finish grinding/Honing		4		●	●	●	●							
081112054	**Hand grinding**	2	6							●	●	●	●	●	●
081112055	**Shot blasting**	3	18												
	Blasting grains														
	– spherical	coarse	3										●	●	●
		fine	6							●	●	●	●	●	●
	– angular	coarse	3										●	●	●
		fine	6							●	●	●	●	●	●
081112056	**Hand filing**	4	6												
	– straight		3							●	●	●			
	– intersected		3							●	●	●			
081112057	**Hand polishing**	5	10												
	Surface shape														
	– cylindrical		5	●	●	●	●	●							
	– plane		5	●	●	●	●	●							
081112058	**Planing**	101	6							●	●	●	●	●	●
081112059	**Turning**	102	6						●	●	●	●	●	●	
081112060	**Face milling**	103	6						●	●	●	●	●	●	
081112061	**Plane grinding**	104	8		●	●	●	●	●	●	●	●			
081112062	**Circular grinding**	105	8		●	●	●	●	●	●	●	●			
081112063	**Spark erosion**	107	6						●	●	●	●	●	●	

Specimens according to Charmille roughness parameters (VDI 3400)

Charmille roughness parameters			12	15	18	21	24	27	30	33	36	39	42	45
	Mean roughness Ra	µm	0,40	0,56	0,80	1,12	1,60	2,24	3,15	4,5	6,3	9,0	12,5	18,0
№	=	Number of single specimens												
081112344	**Spark erosion**	12	●	●	●	●	●	●	●	●	●	●	●	●



Height Gauges

Made To Measure in the Course of the Manufacturing Process

Height gauges are single-axis handtools made to measure on a surface plate, preferably in granite. The TESA-µHITE version being offered to you in this section clearly shows that combining a surface plate with any height gauge can create a whole measuring system.

Providing the needed 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.

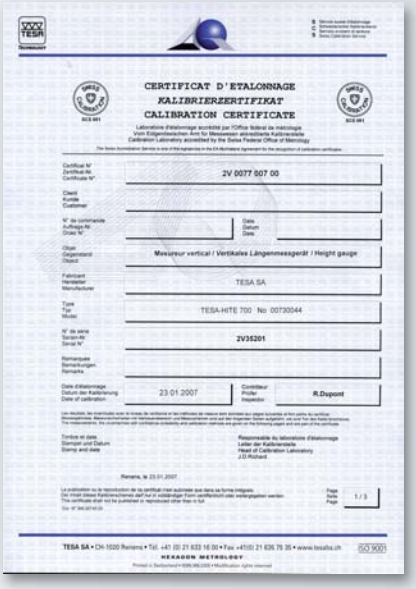
SCS Calibration Certificate

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, so that each height gauge comes with a SCS calibration certificate provided free of charge. The negligible temperature variation (20°C ±0,1°) 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 correction of the measured values during calibration, automatically.*
- *Finally, the relevant calibration certificate is issued based on the values obtained during a new series of measurements taken at another measuring point, 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.





CERTIFICAT D'ETALONNAGE
KALIBRIERZERTIFIKAT
CALIBRATION CERTIFICATE

2V 0077 507 00

Mesureur vertical / Vertikales Längenmessgerät / Height gauge

TESA SA

TESA-HITE 700 No 00730044

2V35201

23.01.2007

R.Dupont

Height Measurement – One of TESA's Strengths

TESA offer the largest range of height gauges for reliable one or two-dimensional measurements. En-Users can choose the convenient model according to the requirements of their metrology applications, but also to their financial ressources. 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.



Height Gauge Models	Details on page	µm (L in m)	Accessory Std (mm)	Accessory Spec. (mm)	Measuring capabilities 1D	Ø	⊥	∢	2D		Moto-rised
TESA-HITE Magna	N-4	8	870	1095	●	●	–	–	–	–	–
TESA-HITE	N-7	2,5+4L	870	1095	●	●	●	–	–	–	–
TESA -HITE plus M	N-10	2,5+3L	860	1085	●	●	●	●	●	●	●
TESA MICRO-HITE	N-12	2+3L	1075	1300	●	●	●	●	●	–	–
TESA MICRO-HITE plus M	N-16	2+1,5L	1075	1300	●	●	●	●	●	●	●
TESA-µHITE	N-21	1/2	160	360	●	●	–	–	–	–	●
TESA-µHITE +Power Panel Plus M	N-25	1/2	160	360	●	●	–	●	●	●	●
ETALON height and scribing gauges	N-30	40	1000	–	●	–	–	–	–	–	–

TESA-HITE magna 400 and 700

Made to withstand severe workshop conditions

Emanating from a well-proven TESA technology, both TESA-HITE magna 400 and 700 are equipped with the patented TESA magna µ system. They are designed to remain unaffected even in the toughest conditions (water and oil splashing, dust particles).

They have exceptional features that make them indispensable for the workshop while also offering the most favourable price-performance relationship. Robust and dependable, their modern design provides the highest resistance for use close to the production area.

Each height gauge is battery-powered and serve to measure height or step dimensions, diameters, centre-to-centre distance of bores or grooves, width of nuts, 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.

0,001/0,005/ 0,01 mm or 0.0001/0.0002/ 0.001 in

12 mm

Metric/Inch conversion

Measuring span, application range and precision: see relevant table on page N-5.

Nickel plated gauge base (chemical coating)

Magnetic scale

(12 ± 1,5) x 10^{-6} K^{-1}

Probing head mounted on a ball-bearing, hand wheel for head displacement, fine setting. Head drive carriage can be locked.

500 mm/s 20 in/s

1,5 ± 0,5 N (at switch point)

RS 232

Rechargeable batteries, 6V

≈ 60 h

10°C to 40°C

-10°C to 60°C

100%

IP55 or IP65 for both electronics and measuring system (IEC 60529)

See table on page N-5

EN 61326, Class B (with disconnected charger)

Shipping packaging

Identification number

Declaration of conformity

SCS calibration certificate

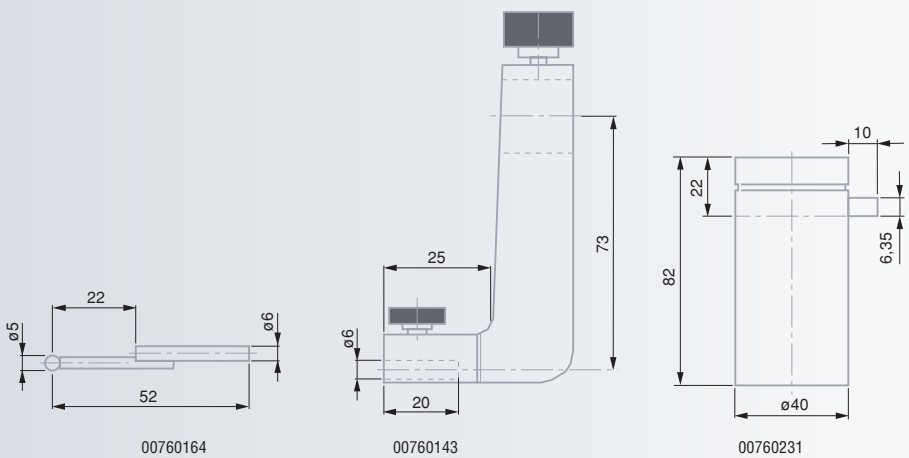
TESA-HITE magna 400 / 700

00730047		**TESA-HITE magna 400 height gauge** Measuring span 415 mm / *16 in* Application range 0 ÷ 570 mm / *0 ÷ 22 in*
00730059		**TESA-HITE magna 700 height gauge** Measuring span of 715 mm / *28 in* Application range of 0 ÷ 870 mm / *0 ÷ 34 in*
Each height gauge is supplied with the following standard accessories:		
00760143	1	Standard probe insert holder
00760164	1	Standard probe insert with a 5 mm dia. tungsten carbide ball tip
00760231	1	Master piece for establishing the probe constant, nominal dimension to 6,350 mm / *0.250 in*
00760157	1	Rechargeable battery, 6V
04761054	1	Mains adapter, 100 ÷ 240 Vac / 50 ÷ 60Hz
04761055	1	Cable EU for mains adapter
04761056	1	Cable US for mains adapter

Technical Data

			TESA-HITE magna 400	700
		mm *in*	415 *16*	715 *28*
	With standard accessory	mm *in*	0 ÷ 570 *0 ÷ 22*	0 ÷ 870 *0 ÷ 34*
	With probe insert holder No. 00760057	mm *in*	0 ÷ 625 *0 ÷ 24*	0 ÷ 925 *0 ÷ 36*
	With probe insert holder No. S07001622	mm *in*	0 ÷ 795 *0 ÷ 31*	0 ÷ 1095 *0 ÷ 43*
	With standard accessory	µm *in*	< 8 *< 0.0003*	< 8 *< 0.0003*
	With standard accessory		on flat surfaces: 2δ = < 3 µm / *<0.00015 in* into bores: 2δ = < 5 µm / *<0.00020 in*	
		kg	15	18

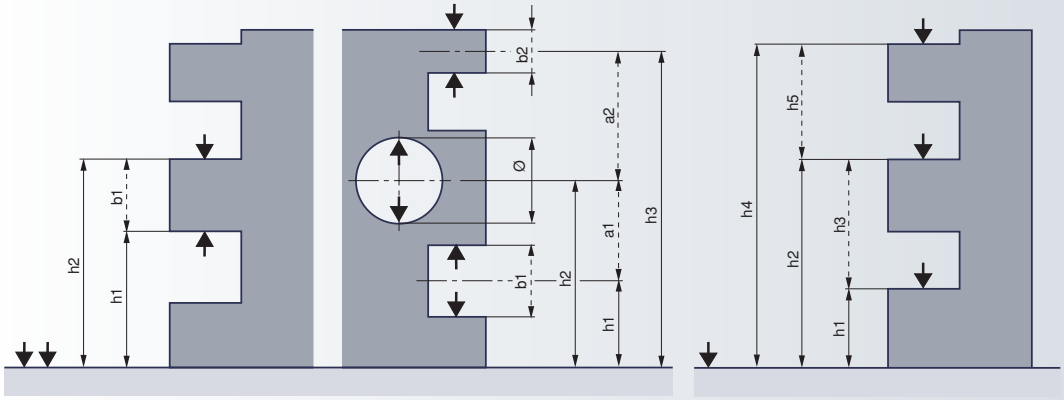
Standard Accessories for TESA-HITE magna 400 / 700



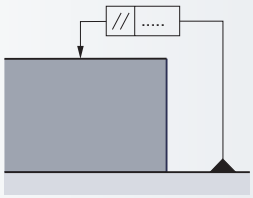
Optional Accessories for TESA-HITE magna 400 / 700

04761052	RS 232 connecting cable for PC and TESA PRINTER SPC
04761063	Connecting cable Sub-D 9pin and USB for PC
	Additionnal accessories: see page N-27

One-Dimensional Measurement



Measurement of Parallelism





✓

Factory standard

83 x 49 mm LC display. 7-decade plus minus sign. Also with graphical symbols for all active functions.

0,0001 / 0.001 / 0,01 mm or 0.00001 / 0.0001 / 0.001 in

12 mm

Metric/Inch conversion

Air-cushion for easy displacement over the surface plate. Measuring span, application range and precision: see table on page N-8.

Nickel plated gauge base (chemical coating) with bottom face including 3 resting points, finely lapped.

Frontal, model 400 < 9 µm, model 700 <13 µm

Incremental glass scale, opto-electronic

(12 ± 1,5) x 10^{-6} K^{-1}

Probing head mounted on a ball-bearing, hand wheel for head displacement, fine setting. Head drive carriage can be locked.

500 mm/s 20 in/s

1,5 ± 0,5 N (at switch point)

RS 232

Rechargeable batteries, 6V

≈ 60 h

10°C to 40°C

-10°C to 60°C

80%, non-condensing

IP40, electronics to IP65 (IEC 60529)

TESA-HITE 400 / 700

Precision in motion

The two TESA-HITE 400 and 700 height gauges are fitted with the patented, opto-electronic TESA's measuring system with incremental glass scale. Due to their robust and reliable construction, they are ideally suited for dimensional inspection on the shop floor.

Full autonomy is ensured through battery power. Each model allows height or step dimensions, diameters, centre-to-centre distances, groove width and the like to be accurately measured. Excellent price/performance ratio.

- Wide application range, two sizes available with measuring span of 415 mm / *16 in* or 715 mm / *28 in*, respectively.
- 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.



TESA-HITE 400 / 700

00730043	**TESA-HITE 400 height gauge** Measuring span 415 mm / *16 in* Application range 0 ÷ 570 mm / *0 ÷ 22 in*	
00730044	**TESA-HITE 700 height gauge** Measuring span 715 mm / *28 in* Application range 0 ÷ 870 mm / *0 ÷ 34 in*	
Each height gauge is supplied with the following standard accessories:		
00760143	1	Standard probe insert holder
00760227	1	Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide
00760219	1	Master piece for establishing the probe constant, nominal dimension to 6,350 mm / *0.2500 in*
00760226	1	Electric pump for creating the air-cushion beneath the gauge base, already mounted
00760157	1	Rechargeable battery, 6 V
04761054	1	Mains adapter, 100 ÷ 240 Vac/50 ÷ 60 Hz
04761055	1	Cable EU for mains adapter
04761056	1	Cable US for mains adapter

See table opposite

EN 61326, Class B (with disconnected charger)

Shipping packaging

Identification number

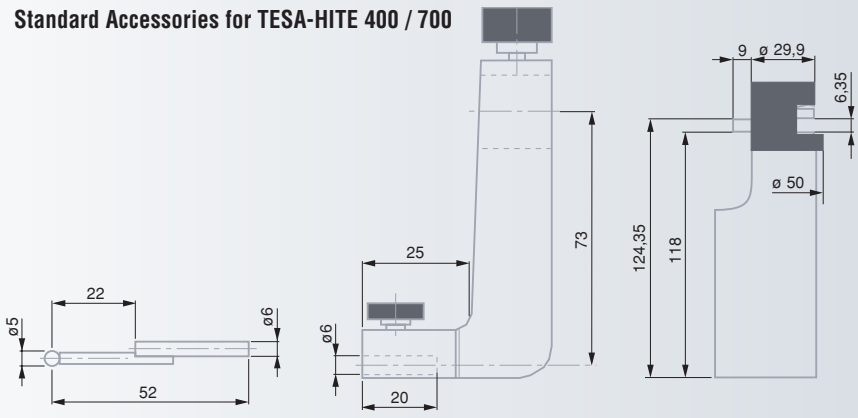
Declaration of conformity

SCS calibration certificate

Technical data

			TESA-HITE 400	TESA-HITE 700
		mm *in*	415 *16*	715 *28*
	With standard accessory	mm *in*	0 ÷ 570 *0 ÷ 22*	0 ÷ 870 *0 ÷ 34*
	With probe insert holder No. 00760057	mm *in*	0 ÷ 625 *0 ÷ 24*	0 ÷ 925 *0 ÷ 36*
	With probe insert holder No. S07001622	mm *in*	0 ÷ 795 *0 ÷ 31*	0 ÷ 1095 *0 ÷ 43*
	With standard accessory	µm *in*	(2,5+4•L) µm (L in m) *(0.0001+0.000004•L) in (L in in)*	
	With standard accessory		on flat surfaces: 2δ = <2 µm / *<0.0001 in* into bores: 2δ = <3 µm / *<0.00015 in*	
	Frontal, mechanical	µm *in*	9 *0.00035*	13 *0.0005*
		kg	27	32

Standard Accessories for TESA-HITE 400 / 700

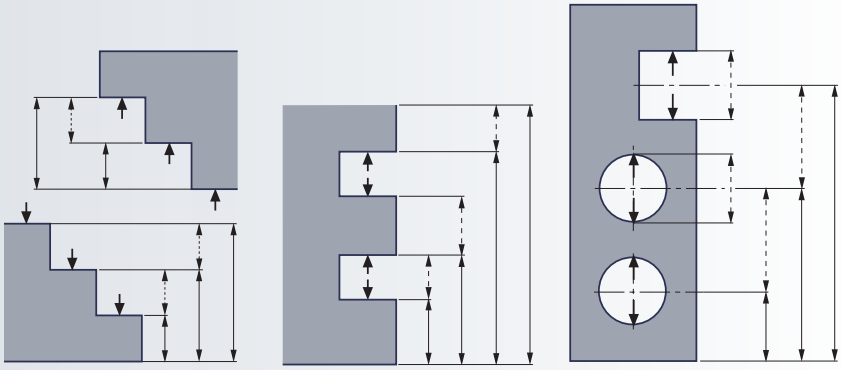


00760227 00760143 00760219

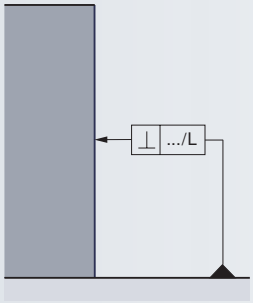
Standard Accessories for TESA-HITE 400 / 700

04760070	RS port. Used to connect a digital sensor for perpendicularity measurement
04761052	RS 232 connecting cable for PC and TESA PRINTER SPC
04761063	Connecting cable Sub-D 9pin and USB for PC
	Additionnal accessories: see page N-27

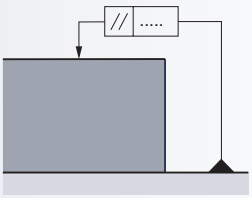
One-Dimensional Measurement



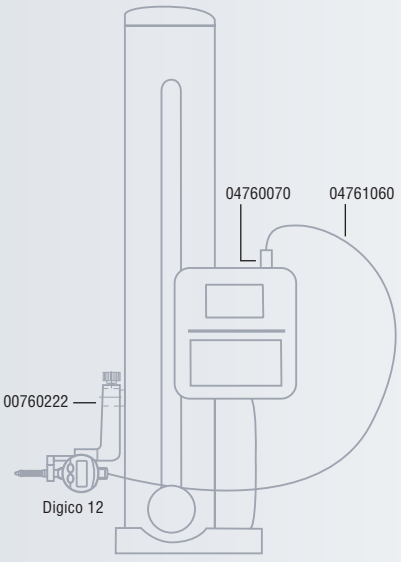
Perpendicularity Measurement

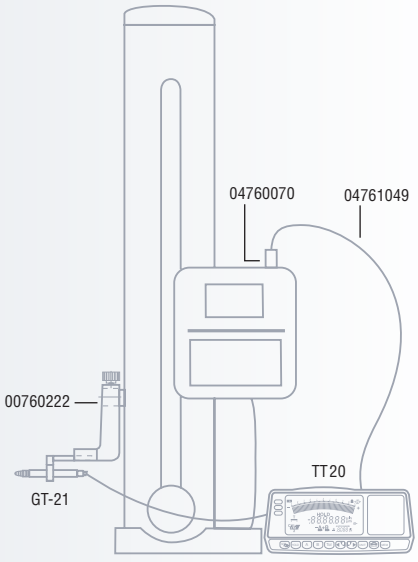


Parallelism Measurement



Configuration for Perpendicularity Measurement





TESA-HITE plus M 400 / 700

Precision in Motion – Motorised Version

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.

7segment display plus minus sign for the measured values.

0,0001 / 0,001 / 0,01 mm or 0.00001 / 0.0001 / 0.001 in

Main display with a size to 12,7 x 6,4 mm or 6,3 x 4,2 mm for auxiliary display.

Metric/Inch conversion

Air bearing for easy displacement on the granite plate.
For measuring span, application range and precision: see the table on page N-11.
30 function keys available on the keyboard.

Rugged nickel plated gauge base having 3 resting points, finely lapped.

Frontal for models
400 = < 8 µm
700 = < 12 µm

Incremental glass scale, opto-electronic data capture

(12 ± 1,5) x 10^{-6} K^{-1}

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.

1 N. Coupled servomotor for triggering the measuring force.

RS 232

Rechargeable batteries, 6V

≈60 h, full charging takes 8 hours



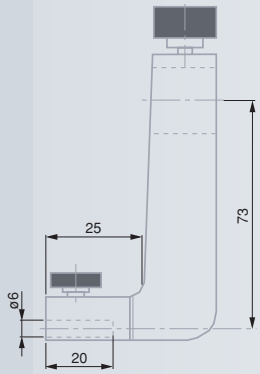
TESA-HITE plus M 400/700

N°		
00730045	TESA-HITE plus M 400 height gauge Measuring span 405 mm / *16 in* Application range 0 to 560 mm / *0 to 22 in*
00730046	TESA-HITE plus M 700 height gauge Measuring span 755 mm / *27 in* Application range 0 to 860 mm / *0 to 33 in*
00730057	TESA-HITE plus M 400 height gauge with built-in printer Same as N° 00730045, but with a built-in matrix printer for results output.
00730058	TESA-HITE plus M 700 height gauge with built-in printer Same as N° 00730046, but with a built-in matrix printer for results output.

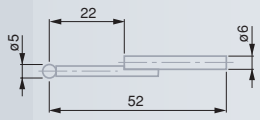
Each height gauge is supplied with the following standard accessories:

00760143	1	Probe insert holder
00760227	1	Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide
00760219	1	Master piece for establishing the probe constant, nominal dimension: 6,350 mm / *0.2500 in*
00760226	1	Electric pump for creating the air cushion under the height gauge base, already mounted
00760157	1	Rechargeable battery, 6V
00761054	1	Mains adapter, 100 ÷ 240 Vac / 50 ÷ 60 Hz
00761055	1	Cable EU for mains adapter
00761056	1	Cable US for mains adapter

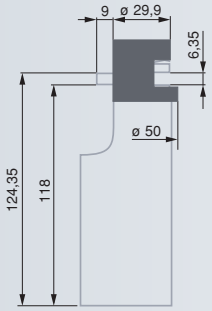
Standard accessories for TESA-HITE plus M 400 / 700



00760143



00760227



00760219

- 10°C to 40°C
- -10°C to 60°C
- 80%, non-condensing
- IP40 or IP65 for the electronic cabinet (IEC 60529)
- See table opposite
- EN 61326, class B (with disconnected battery charger)
- Shipping packaging
- Identification number
- Declaration of conformity
- SCS calibration certificate

Technical Data

		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 N° 00760057	mm *in*	0 ÷ 615 *0 ÷ 24*	0 ÷ 915 *0 ÷ 35*
With probe insert holder N° S07001622	mm *in*	0 ÷ 785 *0 ÷ 31*	0 ÷ 1085 *0 ÷ 42*
With standard accessory	µm *in*	*(0.0001+0.000003 • L) in (L in in)*	
With standard accessory		on flat surfaces: 2δ = <1 µm / *<0.00005 in* into bores: 2δ = <2 µm / *<0.0001 in*	
Frontal, mechanical	µm *in*	8 *0.00031*	12 *0.00047*
	kg	27	32

Optional Accessories for TESA-HITE plus M 400 / 700

N°	
04760070	RS port. Used to connect a digital sensor for perpendicularity measurement
04761052	RS 232 connecting cable for PC and TESA PRINTER SPC
04761063	Connecting cable with Sub-D connector 9-pin – USB type for PC
04765008	Thermal paper roll, 57 mm wide
	For additional accessories, report to page N-27

TESA MICRO-HITE 350 / 600 / 900

The metrology-based reference for the workshop





Stand-alone design – Made to measure any size in in the form of internal, external, height, depth, step and distance dimensions of geometric part features having either a flat, parallel or cylindrical surface.

Automatic capture of the culmination point on bores or shafts – Dynamic probing with memory functions «max.», «min.» plus «max.-min.»

The TESA IG-13 digital probe lets you also measure any deviation from perpendicularity, straightness and parallelism as well as runout errors with result output according to 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.
- RS 232 data output.
- Every height gauge comes with a SCS calibration certificate.

TESA MICRO-HITE 350 / 600 / 900 main gauges

✓

Factory standard

Measuring span, application range and accuracy as stated on page N-14

Rugged nickel plated base with bottom face including 3 resting points finely lapped

Air cushion usable for easy move of the height gauge over the surface plate, if so.

Frontal, model 350 < 7µm, model 600 < 9µm, model 900 < 11µm

Incremental glass scale with reference point, dividing period of 20 µm. Opto-electronic value capture (TESA patent).

11,5 x 10^{-6} K^{-1}

Probing head mounted on a ball-bearing and moved by means of both knurled hand wheel and crank. Head drive system can be locked. Fine adjust device can also be additionally mounted (available as an option). Automatic value capture with a constant measuring force. Visual and acoustic signal for acknowledgment

300 mm/s 12 in/s

1,6 ± 0,25 N (at switch point for value capture)

RS 232, opto-electronic

Continued next page

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

10°C to 40°C

–10°C to 60°C

80% non-condensing

IP40 (IEC 60529)

EN 61326-1, Class B (with disconnected charger)

Net weight (w/o panel nor battery pack)
Main gauges
350: 33 kg
600: 38 kg
900: 45 kg

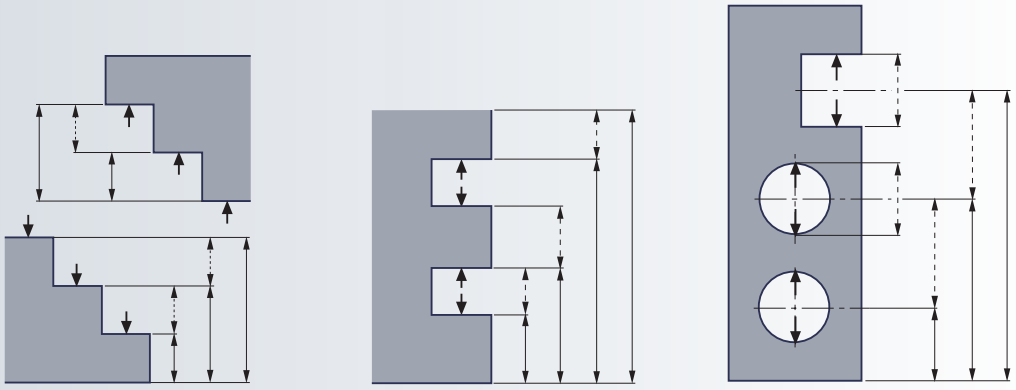
Shipping packaging

Identification number

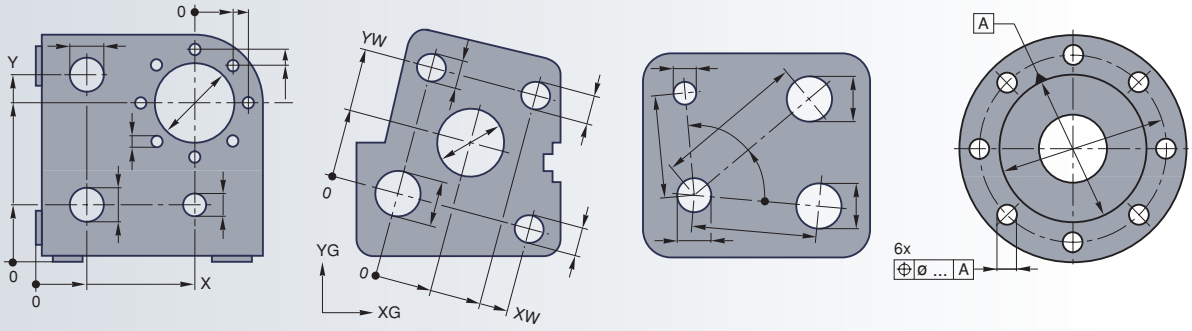
SCS calibration certificate

TESA MICRO-HITE – Efficient and Powerful

One-Dimensional Measurement

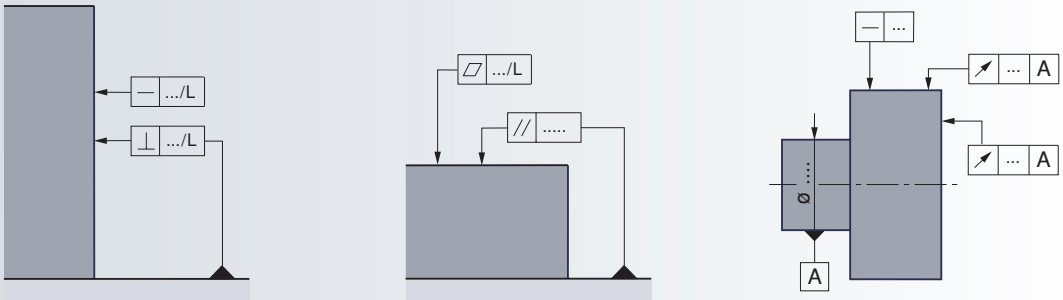


Two-Dimensional Measurement

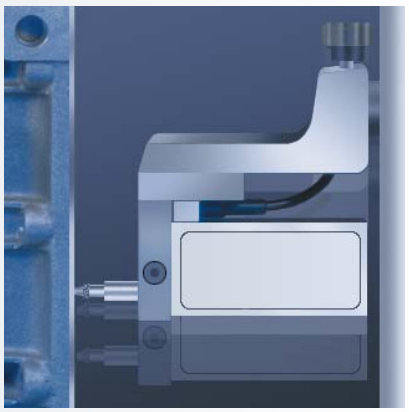


Programme functions for the detection of form and position errors

with use of a TESA IG-13 digital probe





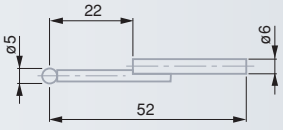


TESA IG-13

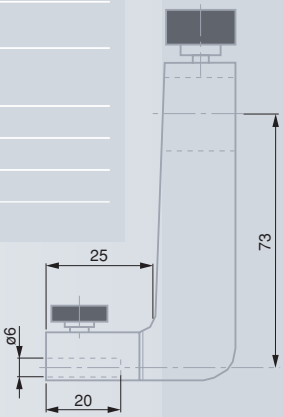
TESA MICRO-HITE 350 / 600 / 900 Height Gauge Sets



No				
00730033	**TESA MICRO-HITE height gauge set**	**350**		
00730034	**TESA MICRO-HITE height gauge set**		**600**	
00730035	**TESA MICRO-HITE height gauge set**			**900**
Each gauge set includes the following components, control panel excluded:				
00730021	1 TESA MICRO-HITE 350 main gauge	●		
00730022	1 TESA MICRO-HITE 600 main gauge		●	
00730023	1 TESA MICRO-HITE 900 main gauge			●
00760143	1 Standard probe insert holder	●	●	●
00760227	1 Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide	●	●	●
00760150	1 Master piece for establishing the probe constant, nominal dimension 20,0000 mm/*0.78740 in*	●	●	●
00760142	1 Electric pump for creating the air-cushion beneath the gauge base, already mounted	●	●	●
00760141	1 Battery pack	●	●	●
04761054	1 Mains adapter, 100 to 240 Vac/50 to 60 Hz	●	●	●
04761055	1 Cable EU for mains adapter	●	●	●
00760151	1 Dust cover for TESA MICRO-HITE 350	●		
00760152	1 Dust cover for TESA MICRO-HITE 600		●	
00760153	1 Dust cover for TESA MICRO-HITE 900			●
Optional Accessories for TESA MICRO-HITE 350 / 600 / 900				
00760144	Add-on fine adjust device for extra fine movement of the measuring head, complete			
00760157	Spare battery pack No. 00760141			
04761056	Cable US for mains adapter			
04761023	RS 232 connecting for PC and TESA PRINTER SPC			
	For additional accessories, see pages N-20 and N-27.			

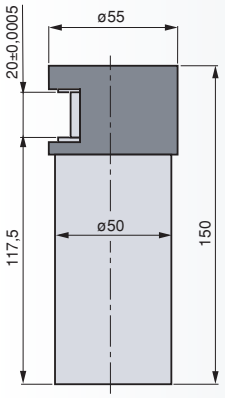


00760227



00760143

Technical Data



00760150

Models		350	600	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		(2 + 3•L) µm		(L in m)
		(0.0001 + 0.000003•L) in		*(L in in)*
With standard accessory		2δ = ≤1 µm / ≤ *0.00005 in*		
Frontal, mechanical	µm	7	9	11
	in	*0.00028*	*0.00035*	*0.00043*
Frontal and lateral using TESA IG-13	µm	6	8	10
	in	*0.00024*	*0.00031*	*0.00039*

POWER PANEL

✓

Dual LC display, 128 x 63 mm in size.
- Upper display field for length values (7-segment/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-decade display plus minus sign for the measured values.

12,7 x 6,4 mm main display, 6,3 x 4,2 mm auxiliary display.

See opposite

Metric/Inch conversion

Floating zero

PRESET function for entering a given value.

Continuous displaying.

Manual or automatic triggering of data transfer.

Output of predefined inspection reports with headings in 5 languages plus A4 format using an external printer unit.

Via TESA MICRO-HITE

IP40 (IEC 60529)

✓

Control Panel for TESA MICRO-HITE 350 / 600 / 900



00760163 **TESA POWER PANEL**

Includes a dedicated programme for measuring in 1 and 2 coordinate directions with geometric combination of the measured values. Lets you measure perpendicularity, straightness and squareness. Provides 99 workpiece oriented measurement cycles including 64 features with related limits of size, programmable. Memory capacity for 2500 measured values. Statistical data processing (SPC). Result output via the built-in matrix printer or in A4 format using an external printer unit.

0,0005 / 0,001 / 0,01 / 0,1 mm
0.00002 / 0.0001 / 0.001 / 0.01 / 0.1 in

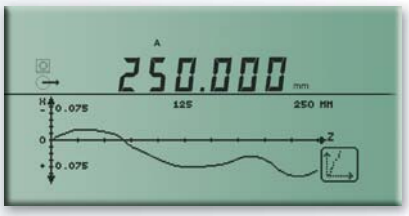
Accessory for TESA POWER PANEL

04765008 Thermal paper roll, 57 mm wide









TESA MICRO-HITE plus M 350 / 600 / 900

Speed of the manual vertical column combined with the precision of the motorised one





All TESA MICRO-HITE plus M height gauges are unique in that they have exceptional metrological capabilities and can be used intuitively with ease. The revolutionary rotary power control combines the speed of the manual concept with the precision of the motorised one.

With their robust and stand-alone design, these electronic height gauges are optimally suited for use on the shop floor as in the inspection laboratory.

Measure lengths in the form of internal, external, height, depth or distance dimensions of geometrical part features having either a plane, parallel or cylindrical surface, whether in one or two coordinate directions – Determine the position of bores in two coordinate directions with output in both polar and Cartesian (rectangular) coordinates – Mechanically adjusted at our plant based on a patented TESA's method used to verify the correct position of the guiding column against the gauge base. 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 a cushion of air, 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 upward 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}).
- RS 232 data output.
- SCS calibration certificate delivered with every height gauge.

TESA MICRO-HITE plus M main height gauges 350 / 600 / 900

✓ Factory standard

Measuring span, application range and accuracy as stated on page N-18

Rugged nickel plated gauge base having 3 resting points, finely lapped

Built-in air-bearing for easy move of the column over the surface plate

Frontal, for models
350 < 5 µm
600 < 7 µm
900 < 9 µm

Incremental glass scale with datum point, 20 µm grating division . Opto-electronic data acquisition (TESA patent).

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.

11,5 x 10^{-6} K^{-1}

1 N Coupled for triggering the measuring force

Continued next page

Rechargeable batteries 6 V, 3,0 Ah or mains adapter 100 to 240 Vac/50 to 60 Hz

≈ 12 hours after full recharging (8 hours)

10 °C to 40 °C

-10 °C to 60 °C

80% non-condensing

IP40 (IEC 60529)

EN 61326-1, Class B (with disconnected charger)

Net weight (w/o control panel nor battery pack) main part 350 = 33 kg, 600 = 38 kg, 900 = 45 kg

Shipping packaging

Identification number

Declaration of conformity

SCS calibration certificate



TESA µ System



⊥ *using TESATAST*



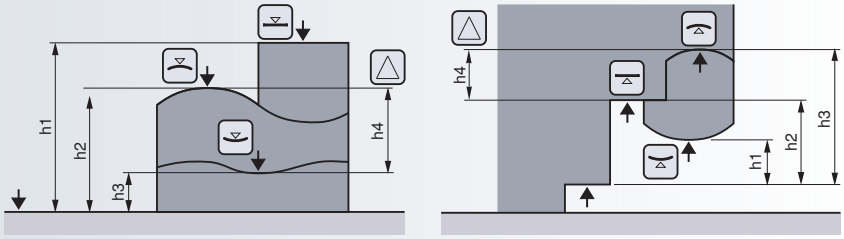
⊥ *using TESA IG-13*

TESA MICRO-HITE plus M

Unrivaled Power, Performances, Ease of use

Measurement without change of the probe direction

Probe constant excluded

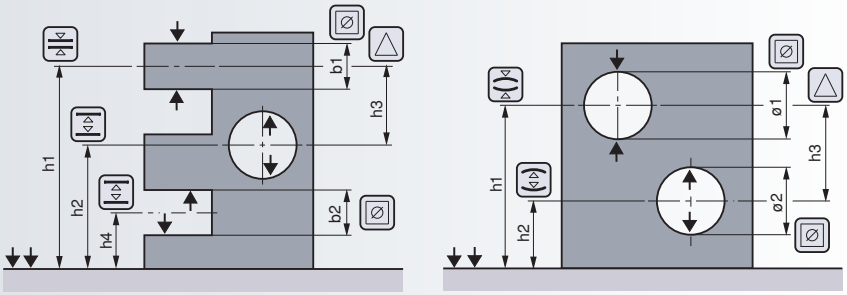


Measurement with change of the probe direction

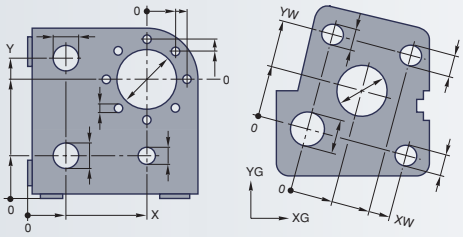
Probe constant included

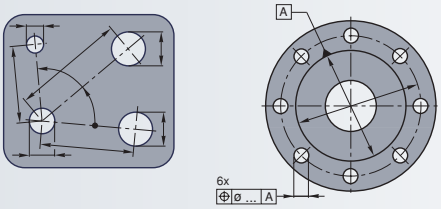
– Disregarding the culmination point

– Considering the culmination point

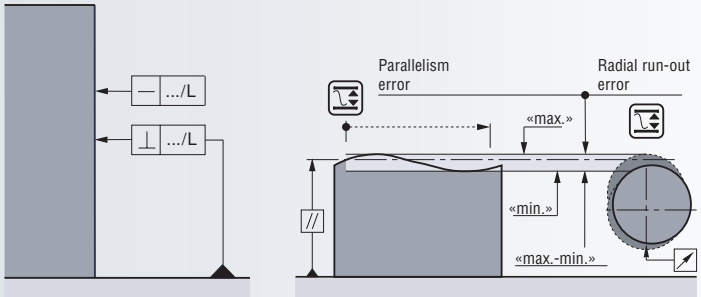


Two-Dimensional Measurement





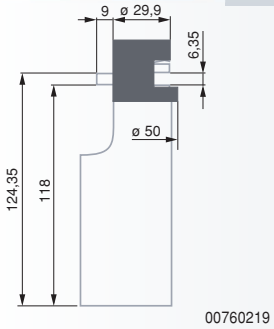
Measurement of Form and Position Errors



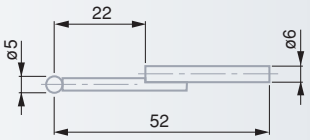
TESA MICRO-HITE plus M
Height Gauge Sets 350 / 600 / 900



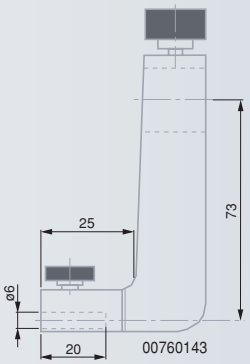
00730063	**TESA MICRO-HITE plus M height gauge set**	**350**		
00730064	**TESA MICRO-HITE plus M height gauge set**		**600**	
00730065	**TESA MICRO-HITE plus M height gauge set**			**900**
Each gauge set includes the following components, control panel excluded:				
00730060	1 TESA MICRO-HITE plus M main gauge	●		
00730061	1 TESA MICRO-HITE plus M main gauge		●	
00730062	1 TESA MICRO-HITE plus M main gauge			●
00760143	1 Standard probe insert holder	●	●	●
00760227	1 Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide	●	●	●
00760219	1 Master piece with nominal dimension 6,350 mm/*0.2500 in*	●	●	●
00760142	1 Electric pump for creating the air cushion beneath the gauge base	●	●	●
00760141	1 Battery pack	●	●	●
04761054	1 Mains adapter, 100 to 240 Vac/50 to 60 Hz	●	●	●
04761055	1 Cable EU for mains adapter	●	●	●
04761056	1 Cable US for mains adapter	●	●	●
00760151	1 Dust cover for Model 350	●		
00760152	1 Dust cover for Model 600		●	
00760153	1 Dust cover for Model 900			●
Optional Accessories for TESA MICRO-HITE plus M 350 / 600 / 900				
00760157	Spare battery for battery pack No. 00760141			
	For additional accessories, report to both pages N-20 and N-27			



00760219



00760227



00760143

Technical Data

Models		350	600	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		(2 + 1,5•L) µm		(L in m)
		(0.0001 + 0.0000015•L) in		*(L in in)*
With standard accessory		on flat surfaces: 2δ = ≤0,5 µm /≤ *0.000025 in* into bores: 2δ = ≤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*

POWER PANEL plus M

✓

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.

12,7 x 6,4 mm main display, 6,3 x 4,2 or 3,8 x 2,9 mm auxiliary display

Keypad with 42 softkeys

See opposite

Metric/Inch conversion

PRESET function for entering a given value.

Acoustic signal.

Manual or automatic triggering of data transfer.

Output of predefined reports with headings in 5 languages (plus a programmable one) using an external printer unit (A4 format).

Bidirectional RS 232, opto-electronic and Centronics

Via TESA MICRO-HITE plus M

IP50 (IEC 60529)

✓

Declaration of conformity

Control Panels for TESA MICRO-HITE plus M 350 / 600 / 900



Nº		
00760221	**TESA POWER PANEL plus M** Includes a part programme for one or two-dimensional measurement. • Captures flatness, parallelism and run-out deviations. • Measures any deviation in perpendicularity or straightness. • Executes angle measurement. • Allows for value input through the keypad and digital value sensor. • Enables automatic programming of the measurement cycles in Teach-in mode. Up to 9999 features distributed in several part programmes (each including max. 999 values) can be stored in the memory. • Memory capacity for up to 25 000 measured values. • Provides SPC capability with output of mean value, range, standard deviation, histogram, comparison nominal value/actual value, number of out-of-tolerance values, control limits, control charts. • Prints reports in A4 format with related tables and graphics. Creates tailor-made headings to suit Users' needs. 0,0001 / 0,001 / 0,01 mm *0.00001 / 0.0001 / 0.001 in*	
00760220	**TESA POWER PANEL plus M with built-in printer** Identical to item Nº 00760221, but with integrated matrix printer for result output.	

Optional Accessories for TESA Power Panel plus M

04761052	RS 232 connecting cable for PC and TESA PRINTER SPC
04761063	USB connecting cable for PC
04765008	Thermal paper roll, 57 mm wide

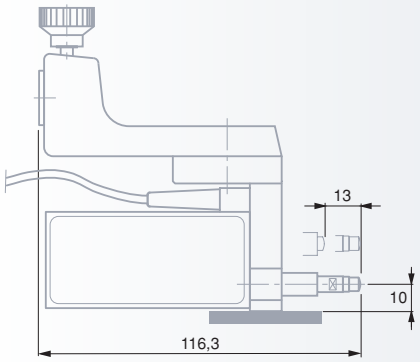
Optional Accessories for TESA MICRO-HITE 350 / 600 / 900 TESA MICRO-HITE plus M 350 / 600 / 900 equipped with Power Panel plus M

For additional optional accessories, see on page N-27.

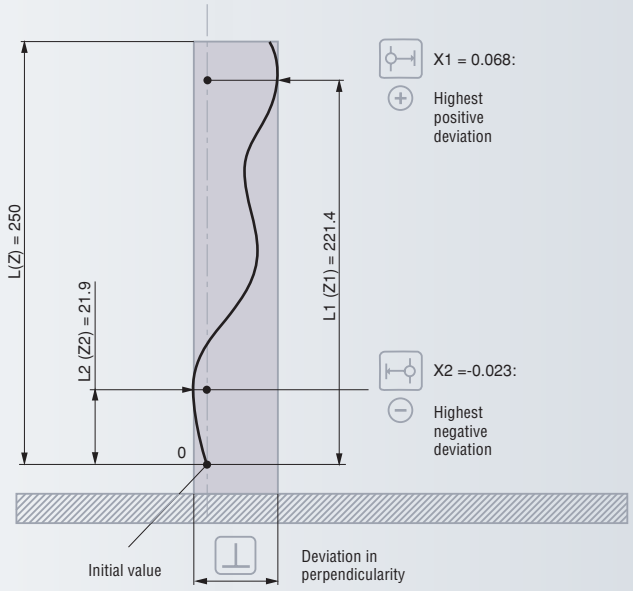
Optional Accessories

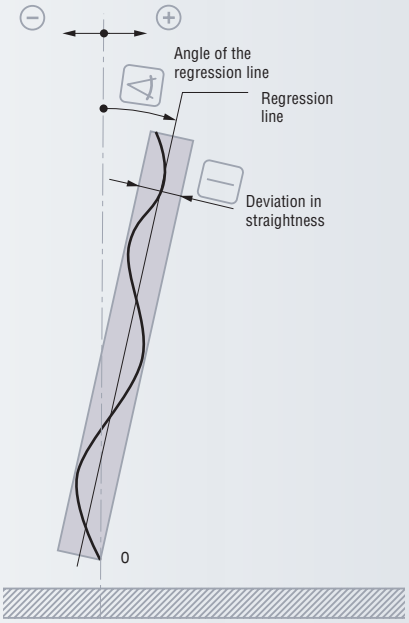
✓ Factory standard

Shipping packaging



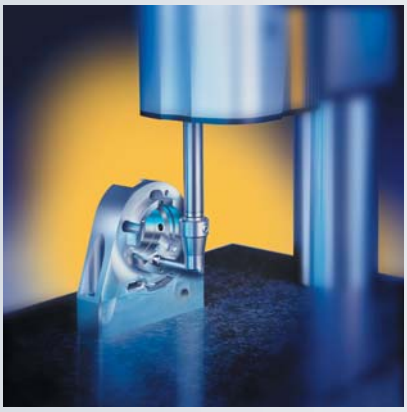
00760140	**TESA IG-13 probe set**
Consisting of:	
00760139	1 TESA IG-13 digital probe
	13 mm/*0.51 in* — 1 µm — 0,45 N at zero, 0,75 N at stop
00760138	1 TESA IG-13 attachment
Accessories:	
01960005	Lift lever for the measuring bolt
03540501	10 mm long extension for the probe insert
04761047	Connecting cable IG-13/Power Panel plus M (1 m)





TESA-µHITE Height Gauge

The solution for the most varied metrology applications





✓

Factory standard

100 mm/4 in

0 to 160 mm
0 to 6.3 in

0,001 mm and 0,0001 mm or 0.0001 in and 0.00001 in

Max. perm. error G: see table page N-23

Repeatability limit r: see table page N-23

Support

Granite measuring table; dull-chrome plated steel column, hardened and ground.

200x300x50 mm measuring table (L x D x H)
50 x 300 mm dia. column.

Finish lapped

Accuracy grade 00 according to DIN 876, Part 1

TESA-µHITE value sensor

Incremental glass scale with opto-electronic value capture.
Grating period: 20 µm

11,5 x 10^{-6} K^{-1}

Electro-motorised gauge head displacement; can also be moved manually.

0,001 mm or *0,0001 in* numerical interval = 10 mm/s; 0,0001 mm or *0,00001 in* = 5 mm/s, fast displacement = 30 mm/s

6 mm dia. x 10 mm long clamp for the meas. insert

0,63 ± 0,1 N or 1 ± 0,1 N, switchable.
Electromotorised activation.

Via control panel

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.».

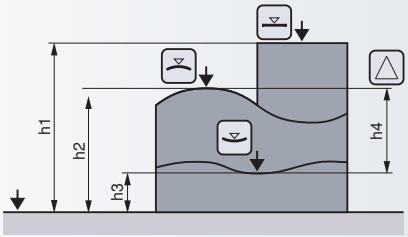
The whole system provides the best solution for measuring straightness, flatness and parallelism or inspecting axial and radial runouts depending on the chosen tool configuration.

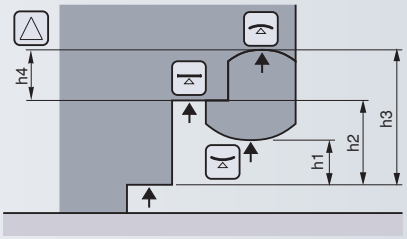
- Ideal for workpiece inspection close to the production area.
- 100 mm measuring span.
- 0,001 mm and 0,0001 mm or 0.0001 in and 0.00001 in scales intervals.
- Max. perm. error as low as 2 µm (or 1 µm when checking coaxiality).
- Integrated temperature sensor so that the coefficient of linear expansion 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.
- RS 232 data output with direct connection to TESA PRINTER SPC.
- Memory capacity for 99 single values.

TESA-µHITE Capabilities

Measurement without change of the probe direction

Probe constant excluded

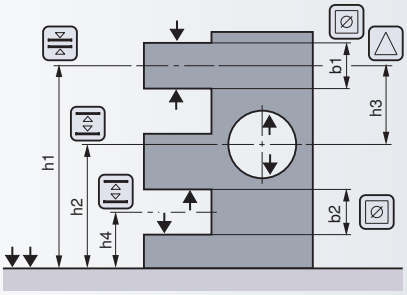




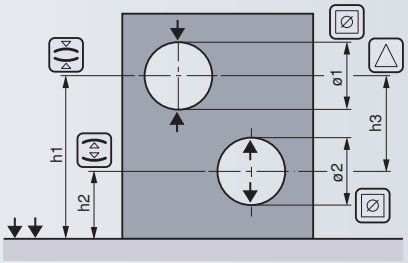
Measurement with change of the probe direction

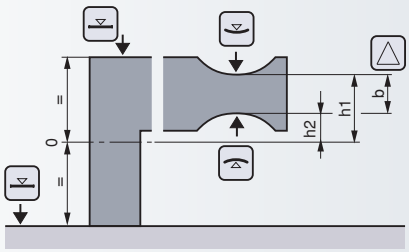
Probe constant included

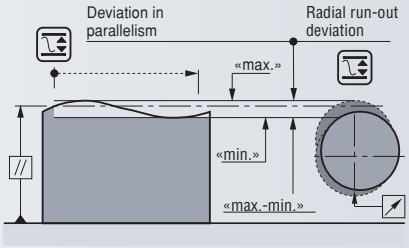
– Disregarding the culmination point



– Considering the culmination point









Control Panel

- 67 x 33 mm LC display. Alphanumerical display: 3-line display 7segment/ digit) plus symbols. Display for measured values: 7-decade display plus minus sign. Auxiliary display 1 or 2: 7 or 4 digits.
- 10 x 4,9 mm (value display), 7,5 x 3,7 or 5 x 2,5 mm (auxiliary display 1 or 2),
- Metric/Inch Conversion
- Keyboard with 20 softkeys
- PRESET function for entering any given value. Acoustic signal. 7 languages available for report headings
- RS 232, opto-electronic and bidirectional
- Mains adapter 100 to 240 Vac / 50 to 60 Hz / 6,6 Vdc / 750 mA (order N° 04761054)

Additional Data

- 5°C to 40°C
- –10°C to 60°C
- 80% non-condensing
- See drawings
- 16,2 kg net (support N° 00760203). 2,6 kg net (TESA-µHITE N° 00730050). 1,45 kg net (control panel N° 00760204 with cable N° 00760191)
- IP50 (IEC 60529)
- EN 61326-1, Class B
- Shipping packaging
- Identification number
- SCS calibration certificate
- Declaration of conformity

		mm	in
00730049	**TESA-µHITE height gauge**	0 ÷ 160	*0 ÷ 6.3*

Provided with the following components:

00760203	**1 TESA measuring support**, granite measuring table, size 200 x 300 x 50 mm
00730054	**1 TESA-µHITE electronic length unit**

Also included:

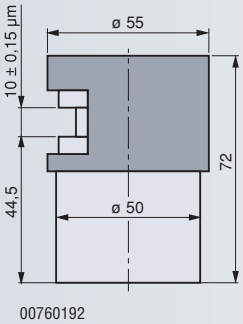
			mm	mm	in	in
00730050	1	TESA-µHITE value sensor	100		*4*	
00760204	1	Control panel. To be connected to TESA-µHITE.		0,001 0,0001		*0.0001* *0.00001*
00760191	1	Connecting cable for TESA-µHITE to control panel				
00760195	1	Porbe insert holder, axial with a M2,5 thread				
03510002	1	Probe insert with a 3 mm dia. tungsten carbide ball tip				
00760197	1	Probe insert with a 5 mm dia. tungsten carbide ball tip, offset				
00760192	1	Master piece for establishing the probe constant, nominal dimension 10 mm/*0.39370*				
04761054	1	Mains adapter, 100 to 240 Vac/50 to 60 Hz				
04761055	1	Cable EU for mains adapter				
04761056	1	Cable US for mains adapter				
038407	1	Suited plastic case				
		For additional accessories, see page N-26.				

Accuracy

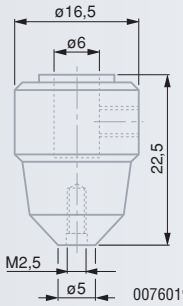
	µm	in	µm	in
Insert's position relative to the axis of the measuring bolt				
coaxial	1,0	*0.00005*	0,5	*0.00002*
offset	2,0	*0.0001*	1,0	*0.00004*

Applicable with used standard accessory.

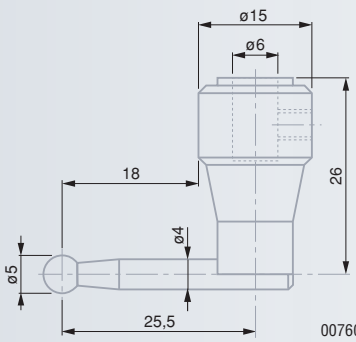




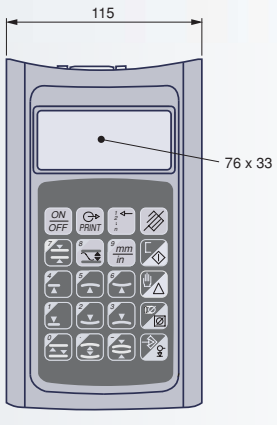
00760192



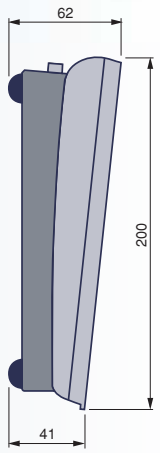
00760195



00760197



00760204



TESA-µHITE

Extended application range up to 360 mm



No			mm	in
		TESA-µHITE height gauge with extended application range	0 ÷ 360	*0 ÷ 14.2*
Provided with the following components (must be ordered under 2 positions)				
S07600163	**1**	**TESA measuring support**, granite measuring table, overall dimensions 300 x 400 x 50 mm. The guiding column has a 50 x 500 mm diameter.		
00730054	**1**	**TESA-µHITE electronic length measuring unit**		

Also included:

No			mm	mm	in	in
00730050	1	TESA-µHITE value sensor	100		*4*	
00760204	1	Control panel, connected to TESA-µHITE.		0,001 0,0001		*0.0001* *0.00001*
00760191	1	Cable for conneting TESA-µHITE to control panel				
00760195	1	Probe insert holder, axial with a M2,5 thread				
03510002	1	Probe unsert with a 3 mm dia. tungsten carbide ball tip				
00760197	1	Probe insert with a 5 mm dia. tungsten carbide ball tip, offset				
00760192	1	Master piece for establishing the probe constant, nominal dimension 10 mm/*0.39370*				
04761054	1	Mains adapter, 100 to 240 Vac/50 to 60 Hz				
04761055	1	Cable EU for mains adapter				
04761056	1	Cable US for mains adapter				
038407	1	Suited plastic case				

Additional accessories, see page N-26.

✓

Factory standard

100 mm/4 in

0 to 360 mm
0 to 14.2 in

0,001 mm and 0,0001 mm or 0.0001 in and 0.00001 in

Max. perm. error G: see table page N-23

Repeatability limit r: see table page N-23

Support

Granite measuring table; dull-chrome plated steel column, hardened and ground.

300 x 400 x 50 mm measuring table (L x D x H).
50 x 500 mm dia. column.

Finish lapped

33 kg net (support N° S07600163)
2,6 kg net (TESA-µHite N° 00730050)
1,45 kg net (control panel N° 00760204 with cable N° 00760191)

Accuracy grade 00 according to DIN 876, Part 1

TESA-µHITE value sensor

Incremental glass scale with opto-electronic data acquisition.
Grating period: 20 µm.

11,5 x 10^{-6} K^{-1}

Electro-motorised gauge head displacement; can also be moved manually.

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

6 mm dia. x 10 mm long attachment for the probe insert

0,63 ± 0,1 N and 1 ± 0,1 N, switchable.
Electromotorised activation.

Via the control panel

✓

Factory standard

100 mm/4 in

0 to 160 mm/ 0 to 6.3 in

0,001 mm and 0,0001 mm or 0.0001 in and 0.00001 in

Max. perm. error G: see table page N-23

Repeatability limit r: see table page N-23

Support

Granite measuring table; dull-chrome plated steel column, hardened and ground.

200 x 300 x 50 mm measuring table (L x D x H). 50 x 300 mm dia. column.

Finish lapped

16,2 kg net (support N° 00760203) 2,6 kg net (TESA-µHite N° 00730050)

Accuracy grade 00 according to DIN 876, Part 1

TESA-µHITE value sensor

Incremental glass scale with opto-electronic data acquisition. Grating period: 20 µm.

11,5 x 10^{-6} K^{-1}

Electro-motorised gauge head displacement; can also be moved manually.

0,001 mm/*0,0001 in* = 10 mm/s; to 0,0001 mm/ *0,00001 in* = 5 mm/s; fast displacement = 30 mm/s

6 mm dia. x 10 mm long attachment for the measuring insert

0,63 ± 0,1 N and 1 ± 0,1 N, switchable. Electromotorised activation.

Via control panel

TESA-µHITE

Strong, user-friendly with Power Panel plus M

Capable to operate using all TESA POWER PANEL plus M measuring functions, those for perpendicularity measurement excepted (more details on both pages N-17 and N-19).



N°	=		mm	*in*
		TESA-µHITE height gauge, plus M version	0 ÷ 160	*0 ÷ 6.3*
Provided with the following components (must be ordered under 3 positions):				
00760203	**1**	**TESA measuring support**, granite table, 200 x 300 x 50 mm (large-size support No. S07600163 can alternately also be used)		
00760221	**1**	**POWER PANEL plus M** Related features listed on page N-19 (can alternately also be used with host printer No. 00760220)		
S07010288	**1**	**TESA-µHITE** electronic length measuring unit, without control panel		

Also included:

N°	=		mm	*in*
00730050	**1**	TESA-µHITE value sensor	100	*4*
00760191	**1**	Cable for connecting TESA-µHITE to control panel		
00760195	**1**	Probe insert holder, axial for probe inserts with a M2,5 thread		
03510002	**1**	Probe insert with a 3 mm dia. tungsten carbide ball tip		
00760197	**1**	Probe insert with a 5 mm dia. tungsten carbide ball tip, offset		
00760192	**1**	Master piece for establishing the probe constant, nominal dimension 10 mm/*0.39370*		
04761054	**1**	Mains adapter 100 to 240 Vac/50 to 60 Hz		
04761055	**1**	Cable EU for mains adapter		
04761056	**1**	Cable US for mains adapter		
038407	**1**	Suited plastic case		

For additional accessories, see page N-26.

For measuring applications, see page N-17.

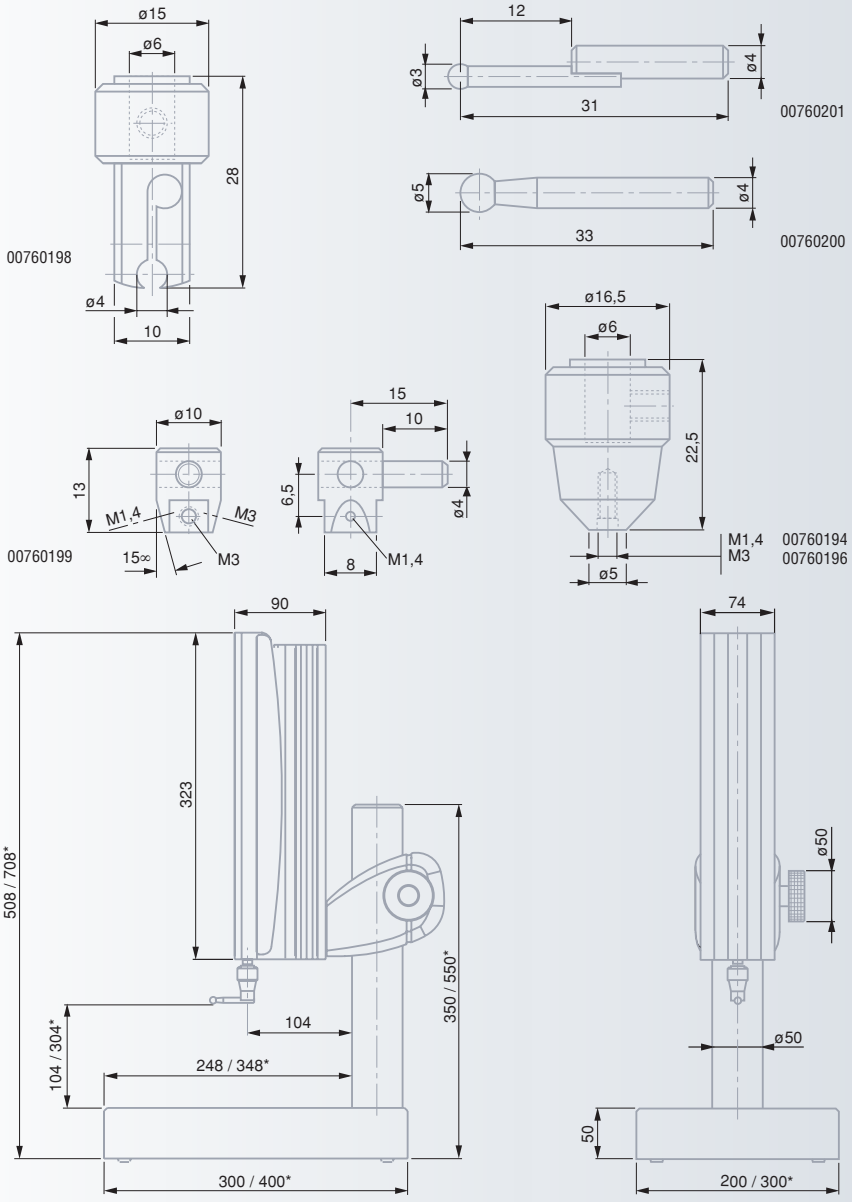
Optional Accessories

Nº	=
00760186	Set of special probe inserts (see page N-29).
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 conjunctionr 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 No. 00760198.
00760201	Probe insert with a 3 mm dia. tungsten carbide ball tip. Also with a 4 mm dia. fixing rod for use with radial probe holder No. 00760198.
04768001	Foot switch for triggering data transfer or letting a measuring function be repeated.
00760207	Swivel support for control panel
00760202	Spare batteries for control panel Nº 00760204, 6 Vdc/1,2 Ah.
00761052	RS 232 connecting cable for PC and TESA PRINTER SPC
00761063	Sub-D connector 9-pin – USB type for PC



Factory standard

Shipping packaging



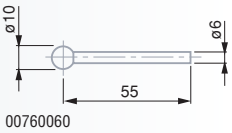
* With measuring support No. S07600163

Shipping packaging

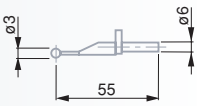
Declaration of conformity

Optional Accessories for
TESA MICRO-HITE plus M 350 / 600 / 900
TESA MICRO-HITE 350 / 600 / 900
TESA-HITE 400 / 700 – TESA-HITE plus M 400 / 700
TESA-HITE magna 400 / 700

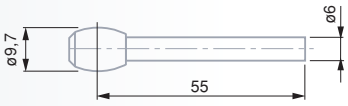
Nº			
00760173	**Partial accessory set**	●	
00760148	**Full accessory set**		●
Supplied in a suited plastic case with the following items:			
00760061	1 Probe insert with a 3 mm dia. carbide ball tip	●	●
00760060	1 Probe insert with a 3 mm dia. carbide ball tip	●	●
	Probe inserts with carbide, barrel-shaped measuring faces for cylindrical bores as well as for determining the position of metric inside threads (or similar).		
00760066	1 item with a 2,2 mm diameter (for M3 to M16 threads)		●
00760067	1 item with a 4,5 mm diameter (for M6 to M48 threads)		●
00760068	1 item with a 9,7 mm diameter for M12 to M150 threads)		●
	Probe inserts with a carbide disc tip for grooves, slots, centring shoulders etc.		
00760074	1 Item, E = 1 mm / 4,5 mm diameter		●
00760075	1 Item, E = 2 mm / 14 mm diameter	●	●
00760076	1 Item, E = 3 mm / 19 mm diameter		●
00760082	1 2 mm dia. probe insert with a small cyl. carbide face		●
00760093	1 Probe insert with a cylindrical, tungsten carbide measuring face (10 mm dia., 12 mm long). Stainless steel body, hardened.	●	●
	Probe insert holder for depth increase		
00760086	1 Item for depth up to 110 mm (L = 75 mm)		●
00760087	1 Item for depth up to 185 mm (L = 150 mm)		●
00760057	1 Probe insert holder for extending the application range		●
00760094	1 Probe insert with a stainless steel shank, hardened. Also with one flat and one spherical carbide measuring face. Interchangeable shank.	●	●
	Probe inserts with shank and ball tip in tungsten carbide		
00760228	1 Item with a 1 mm tip diameter	●	●
00760229	1 Item with a 2 mm tip diameter	●	●
00760230	1 item with a 3 mm tip diameter	●	●
S07001622	Probe insert holder for extending the range of application		



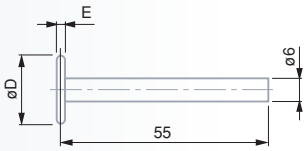
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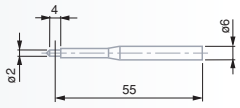
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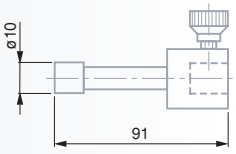
00760066/00760068



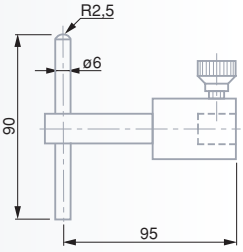
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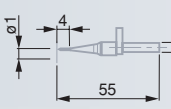
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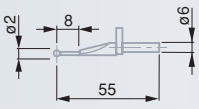
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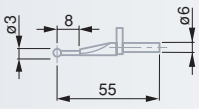
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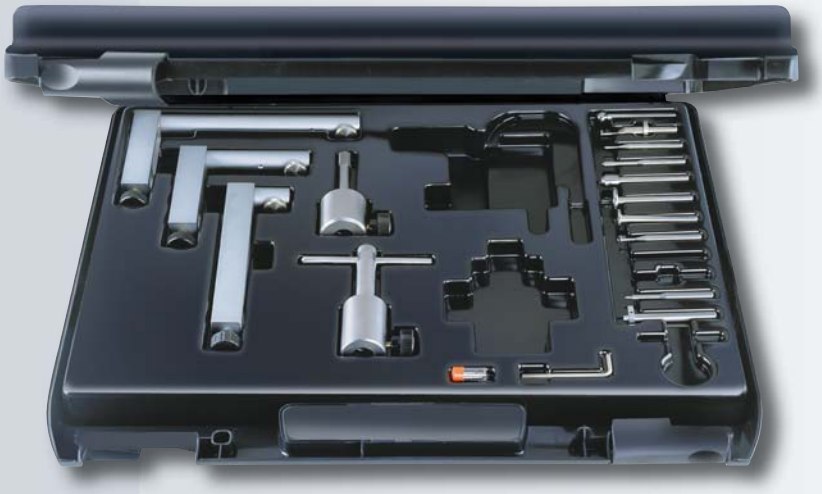
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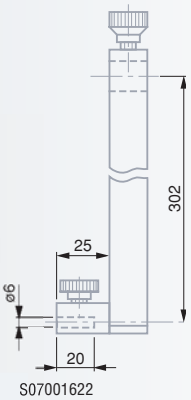


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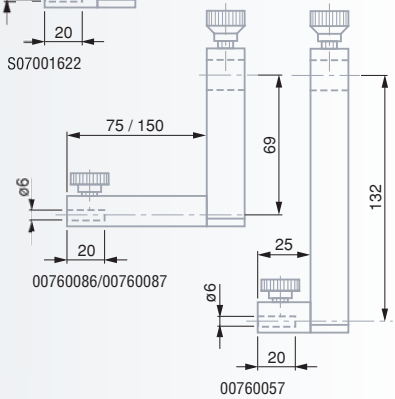


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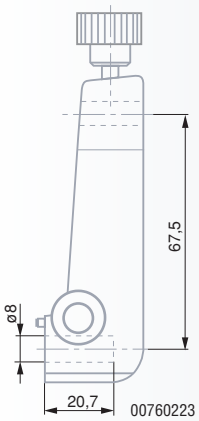
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00760086/00760087
00760057

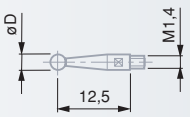


No	=	
00760096		1 Holder for TESATAST probe inserts with a M1,4 thread or any other ones with a M2,5 thread.
		TESATAST probe inserts, carbide ball tip, M1,4 thread
01860201		1 Item with a 1 mm probe tip diameter
01860202		1 Item with a 2 mm probe tip diameter
01860203		1 Item with a 3 mm probe tip diameter
01860307		1 Wrench

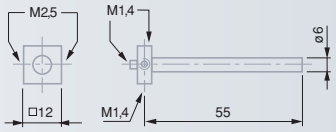


00760223


01860307



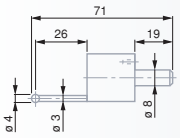
01860201/01860203



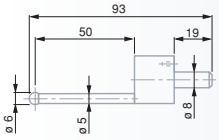
00760096

Optional accessories for use with insert holder No. 00760223

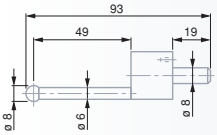
No	=	
00760223		Holder for use with any probe insert listed below
0071684825		Probe insert with a 6 mm dia. tungsten carbide ball tip



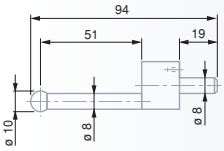
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0071684816

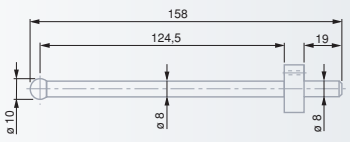


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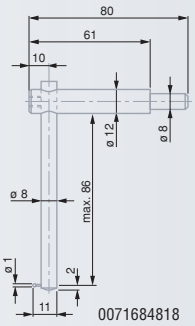


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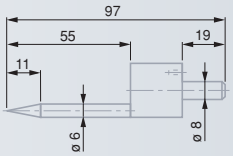
No	=	
0071684815		1 Probe insert with a 4 mm dia. tungsten carbide ball tip
0071684816		1 Probe insert with a 6 mm dia. tungsten carbide ball tip
0071684832		1 Probe insert with a 8 mm dia. tungsten carbide ball tip
0071684829		1 Probe insert with a 10 mm dia. tungsten carbide ball tip
0071684817		1 Long probe insert with a 10 mm dia. tungsten carbide ball tip
0071684826		1 Attachment for interchangeable inserts with M1,4 thread. Supplied with 1 insert No. 01860201 having a 1 mm dia. carbide ball tip.
0071684820		1 Probe insert with cylindrical measuring face in hardened steel, 12 mm diameter, 2 mm long.
0071684827		1 Probe insert with disc-shaped face in hardened steel for blind bores or short centring shoulders, 12 mm in diameter, 3 mm wide.
0071684822		1 Probe insert with cone-shaped measuring face in hardened steel, for diameters from 0,5 up to 5,5 mm.
0071684819		1 Probe insert with cone-shaped measuring face in hardened steel, for diameters from 5 up to 20 mm.
0071684828		1 Attachment for interchangeable inserts with M1,4 thread. Supplied with 2 probe inserts No. 01860202 having a 2 mm dia. carbide ball tip
0071684818		1 Probe insert with a 1 mm dia. steel tip, hardened. Also with adjustable shank for depth measurement.



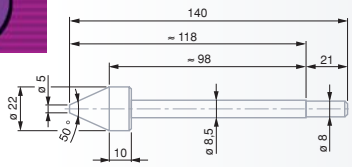
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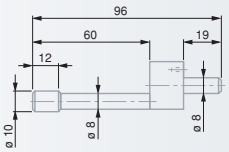
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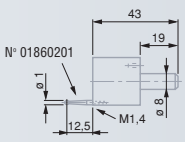
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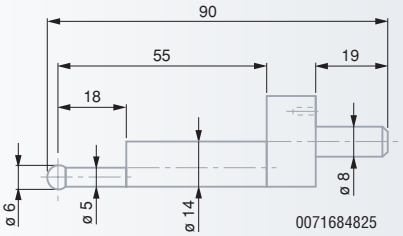
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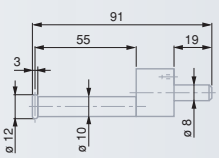
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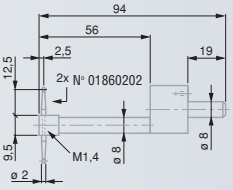
0071684826



0071684825



0071684827



0071684828

Factory standard

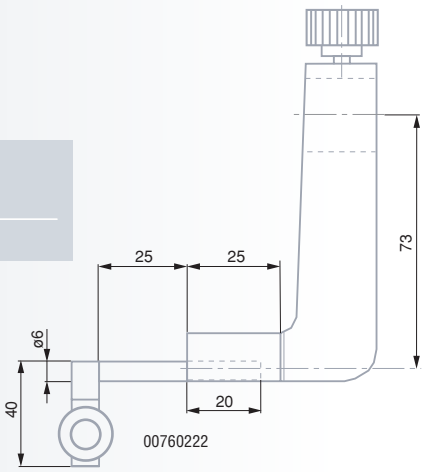
Shipping packaging



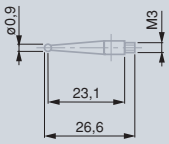
Accessories for measuring perpendicularity by means of a dial test indicator

(Used with TESA MICRO-HITE plus M, TESA MICRO-HITE, TESA-HITE 400/700 and TESA-HITE plus M 400/700)

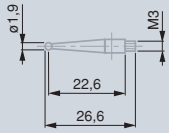
00760222	Probe insert holder for a dial test indicator (lever-type)



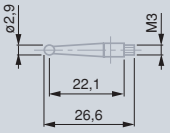
00760222



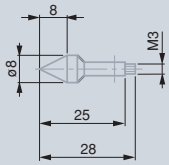
00760180



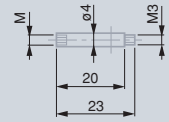
00760181



00760182



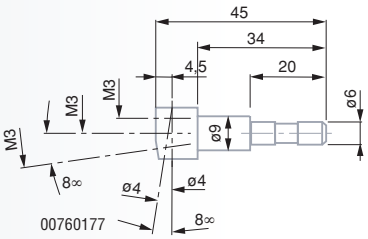
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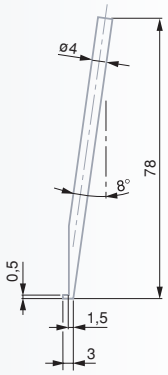
00760184/00760185

Optional Accessories

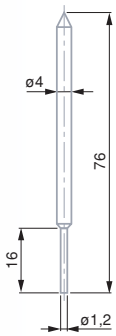
00760175	Set of porbe inserts for TESA-HITE, TESA-HITE plus M, TESA-HITE magna, MICRO-HITE and MICRO-HITE plus M	●	
00760186	Set of probe inserts for TESA-µHITE		●
	Provided in a suited plastic case including:		
00760177	1 Probe insert holder	●	
00760187	1 Probe insert holder		●
00760178	1 Hardened steel rod for grooves, centring shoulders, blind bores etc., angled through 8°	●	●
00760179	1 Tungsten carbide cylindrical rod for depth measurement	●	●
	Probe inserts, each with hardened steel ball tip		
00760180	1 Item with a 0,9 mm tip diameter	●	●
00760181	1 Item with a 1,9 mm tip diameter	●	●
00760182	1 Item with a 2,9 mm diameter	●	●
00760183	1 Hardened steel probe insert with a cone-shaped measuring face, 8 mm diameter	●	●
	Extensions, 20 mm		
00760184	1 Extension with a M3 thread for M3	●	●
00760185	1 Extension with a M3 thread for M2,5	●	●



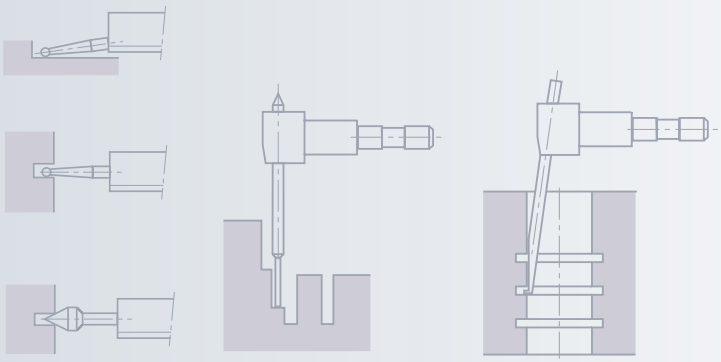
00760177

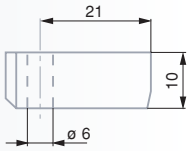


00760178



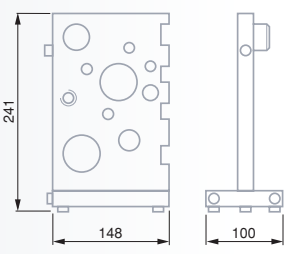
00760179





00760187

00760124	Practice piece For one or two-dimensional measurements. Also for measuring straightness, perpendicularity and parallelism errors. Each User's manual POWER PANEL and POWER PANEL plus M includes some examples of programmed measurement cycles.



00760124

ETALON Height and Scribing Gauges with Digital Display

Electronic height and scribing gauges

- Resolution to 0,01 mm/0.005 in
- RS 232 interface

	Size	mm	in	Column mm	Base (L x H x W) mm
ETALON height and scribing gauges with digital display					
07739001	300	0 ÷ 300	*0 ÷ 12*	25 x 6	60 x 40 x 100
07739002	600	0 ÷ 600	*0 ÷ 24*	30 x 12	110 x 50 x 160
07739003	1000	0 ÷ 1000	*0 ÷ 40*	30 x 12	110 x 50 x 160



Optional Accessories

		Suitable for models	Length mm
07769001	Scriber	300	65
07769003	Scriber	600, 1000	75
	Holder for a dial gauge, axial probe, dial test indicator (lever-type) etc., 8 mm dia. fixing bore.		
07769005	Can be mounted instead of the scriber		
07769006	Rotating and tilting version with a 8 mm dia. shank		



✓

Factory standard

Slider with interchangeable 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.

Steel base, hardened

DIN 862
For lengths up to
600 mm = 30 µm
1000 mm = 40 µm

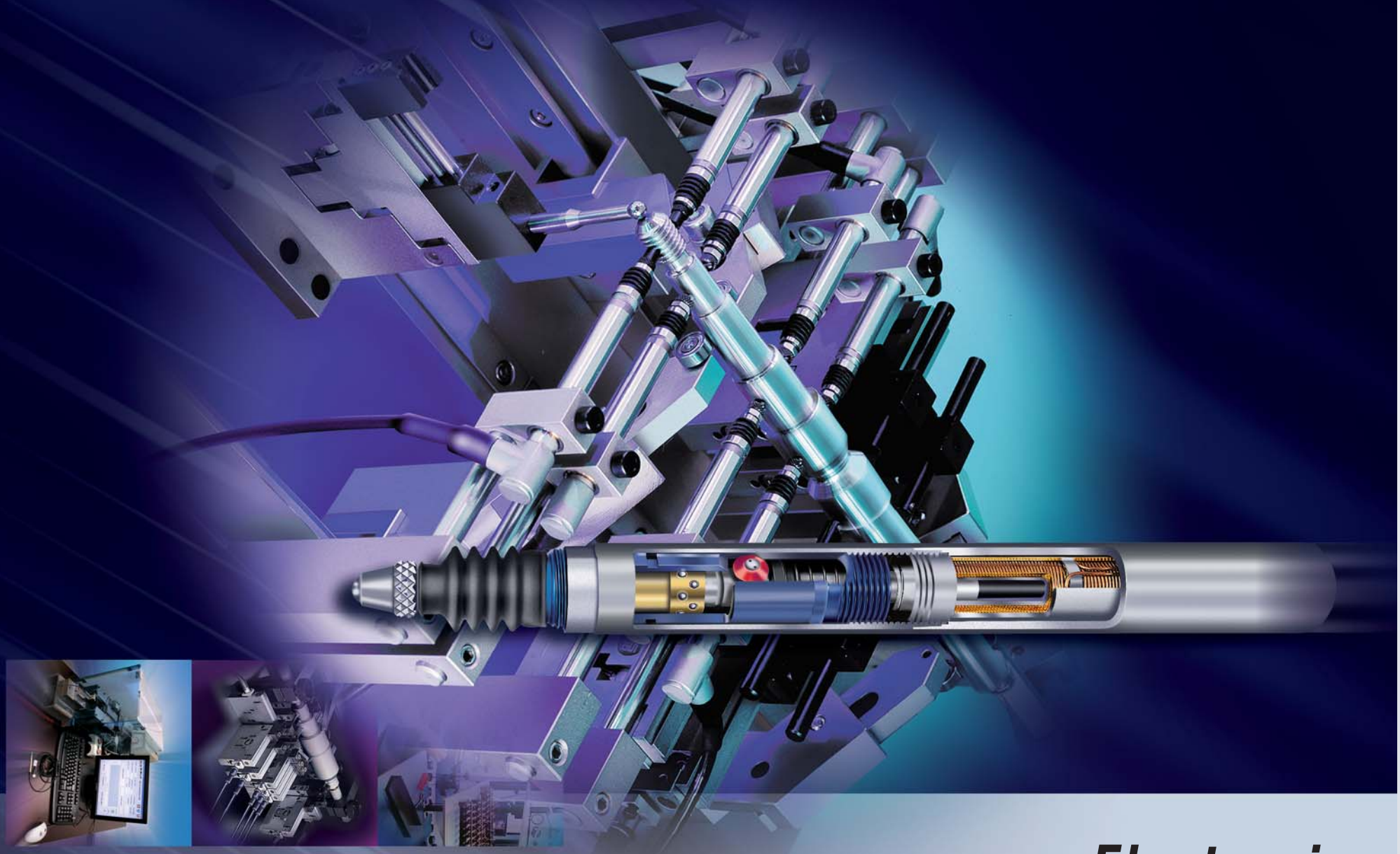
Floating zero

Preset and Hold functions

Wooden case

Identification number

Declaration of conformity



Electronic Length Measuring Equipment

TESA LENGTH MEASURING EQUIPMENT WITH INDUCTIVE PROBES

*TESA offers a complete family of value sensors (electronic probes) as well as dedicated measuring instruments for the most demanding applications. Our **standard probes** – also known as **half-bridge probes** – operate according to the electrical principle. They do not require any special setting.*

Electronic probes that are used in conjunction with measuring instruments from other manufacturers work partly on the basis of a differential transformer. These probes are known as LVDT (Linear Variable Differential Transformer) probes. TESA also offer a full range of this kind of probes which, however, need to be fitted with a convenient socket and further adapted, accordingly.

For more details about TESA half-bridge or LVDT inductive probes, read the information that follows.

Countless Measuring Capabilities

All TESA electronic probes can either be used with hand-held tools, whether internal or external, or in conjunction with other typical measuring devices and supports.

TESA can supply such executions as axial probes with linear displacement of the measuring bolt, angled probes with inclinable lever or probes with parallel guiding that are specially designed for multigauging devices as well as any other equipment for in-process inspection – thus allowing to spare many assembly components.

With a very few exceptions, these probes perform comparative measurement, essentially. Based on a master standard, which can either be a gauge block, a setting ring or any other workpiece accepted as such, a number of sizes are compared on the test piece.

- *All measurements are taken with high accuracy. The bias errors usually count for very little in the uncertainty budget since the comparison is made between two values nearly equal to the measurand.*
- *Random errors are also significantly reduced as display setting and all subsequent measurements are usually made under the same conditions.*
- *TESA provide measuring instruments equipped with an analogue and/or digital display, depending on their type.*

Internal Data Processing

The measurement signals are processed differently, depending on the measuring application.

Mathematical Data Processing

Signal processing can equally be made with positive or negative polarity signs. 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».

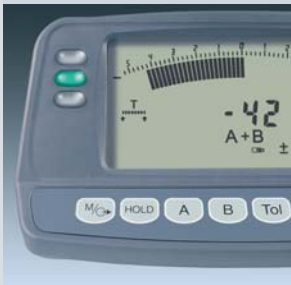


Value Storage

Provides the needed safety for your dynamic measurement cycles. The smallest or highest value as well as the difference between both values are some of the part features that are questioned when capturing form and position errors.

Value Classification

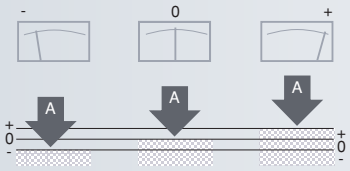
Uses limit deviations to classify the measured values while producing additional control signals usable through a remote unit.



MEASURING FUNCTIONS – OVERVIEW

Single measurements with positive polarity sign (+A)

Measuring external dimensions with use of a measuring stand, snap gauge etc.

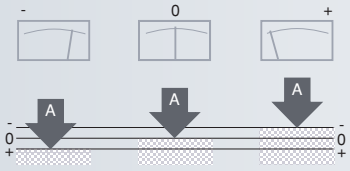


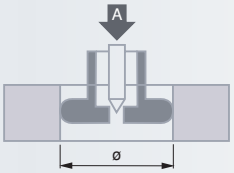




Single measurements with negative polarity sign (-A)

Inspecting sizes with change of the polarity sign. Display shows a low value for a small bore or a high value for a large diameter.

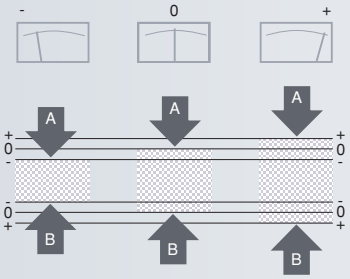


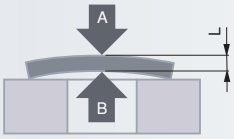




Sum measurements with positive polarity signs (+A +B)

Measuring external dimensions regardless of form and position errors.

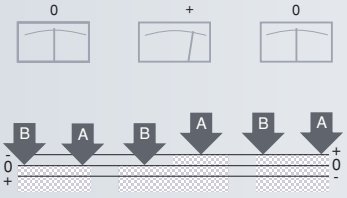


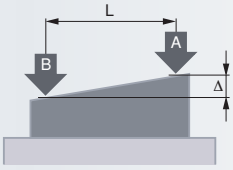




Difference measurements with opposite polarity signs (+A -B)

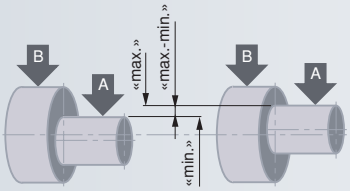
Performing step, cone and inclination measurements.

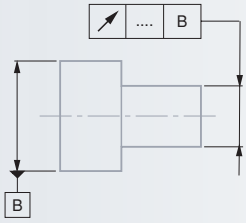


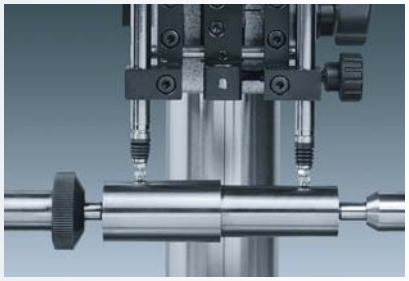




Establishing form and position errors such as runout errors with use of the memory function «max.-min.» as shown in this example.



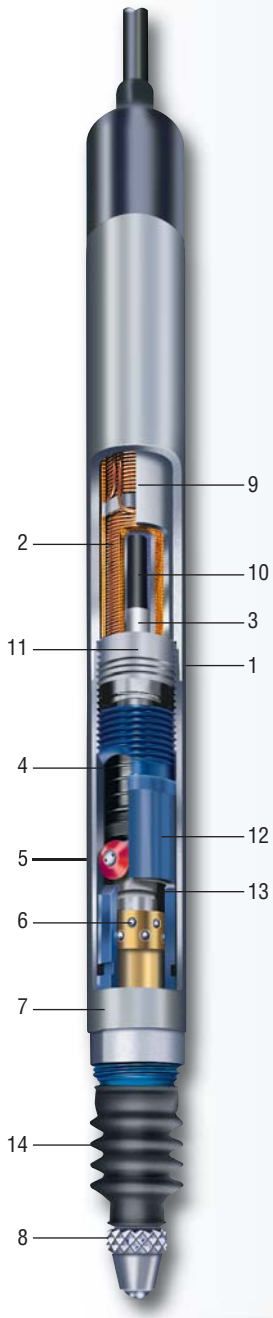




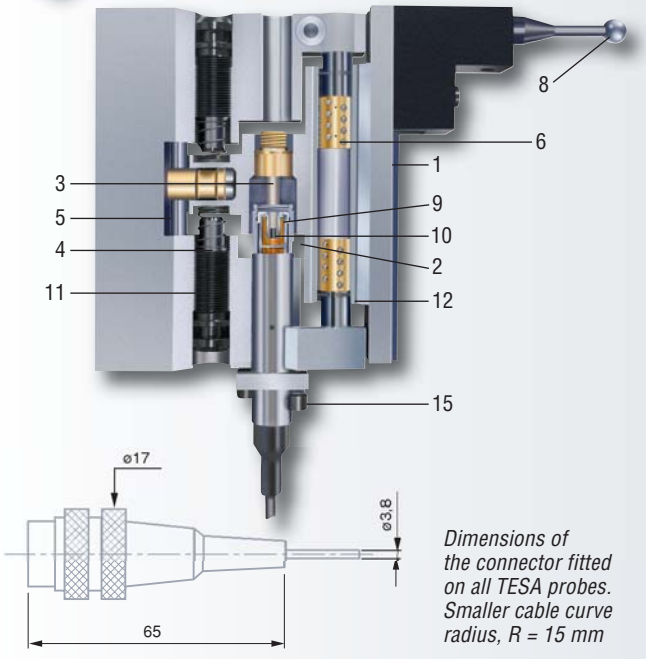
TESA Electronic Probes at the Forefront in Precision Measurement

TESA is a leading designer, manufacturer and user of inductive probes for more than 40 years. Its high-precision electronic probes are made to withstand the stresses sustained in the production environment where they can be constantly used for series inspection. But, these probes are also designed for high accuracy measurements such as those performed in gauge block calibration, for instance.

- *All electronic probes are mounted on ball-bearings, except for miniature axial probes.*
- *Ball-bearings are virtually insensitive to radial forces.*
- *Probe guide system is efficiently protected against the penetration of solid and liquid contaminants by sealing rubber bellows. In normal conditions of use, nitrile elastomer bellows are sufficient. For applications where the probes remain permanently in contact with cooling and lubricating agents, we would recommend the use of Viton rubber bellows.*
- *Sealing bellows ensure full airtightness so that the measuring bolt is retracted by throwing off the air contained in the probe. This provides optimum protection of the guiding system as no mechanical device is used.*
- *Electronic signal amplification produces excellent repeatability and low hysteresis.*
- *Resolution is as high as 0,01 µm.*



1 Mounting stem or probe housing
2 Coil system
3 Element mounted between the ferro-magnetic 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



Dimensions of the connector fitted on all TESA probes. Smaller cable curve radius, R = 15 mm

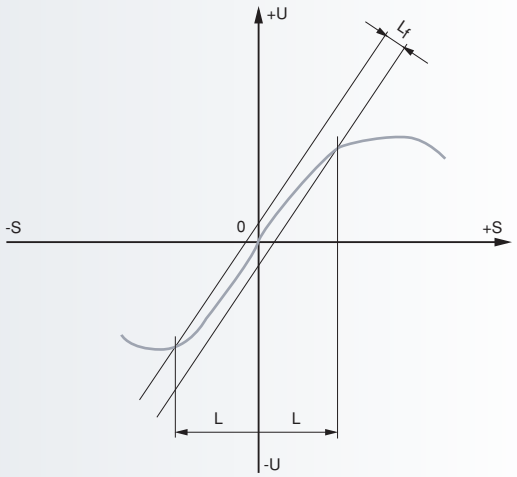
Sensitivity of standard half-bridge probes used in conjunction with TESA electronic probes

All given values are valid for the following reference conditions:

• Drive voltage	3 V
• Drive frequency	13 kHz
• Adjustment load	2 kΩ
	mV/V/mm
For any probe type	73,75
except probe series:	
• GT 61/62	29,5
• GT 61S/62S	7,375
• FMS 130/132	49,17

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 ferromagnetic 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).

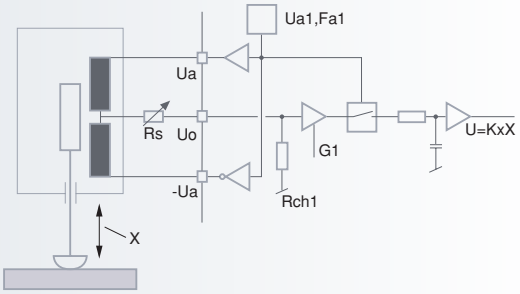


Inductive measuring
s Travel
U Output current
0 Electrical zero
L Linearity range
Lf Linearity error

The linearity range L, which is the range within which the max. perm. errors are contained, is equal to the measuring range. The max. perm. errors are limiting values given for the linearity errors.

TESA Standard Half-Bridge Probes for TESA Electronic Equipment

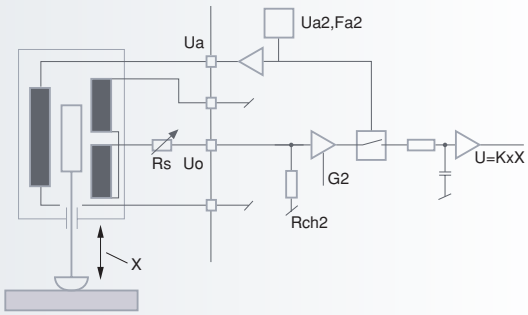
These probes have two serial coils with middle output mounted side by side, which are energized by a sinusoidal alternation at 13 kHz. Both are linked together to a Wheatstone bridge over an additional half-bridge.



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

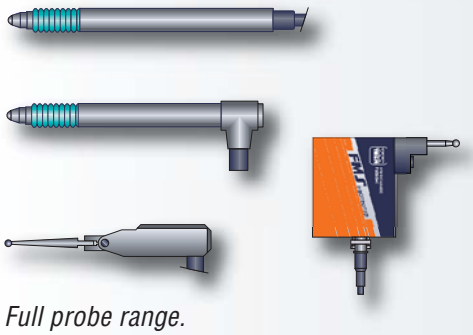


Wiring plan of LVDT probes

Compatible Probes

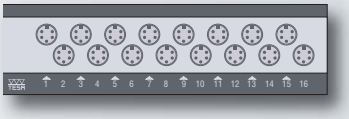
Upon request, all TESA's probes can be made available with a data output compatible with any electronic equipment from other makers.

TESA Half-Bridge Probes



Full probe range.

See pages O-8 to O-13.



TESA BPI interface box

Modular system for connecting up to 64 TESA half-bridge probes.

Setting and operating the system requires the use of a host computer.

See pages O-48 to O-49.



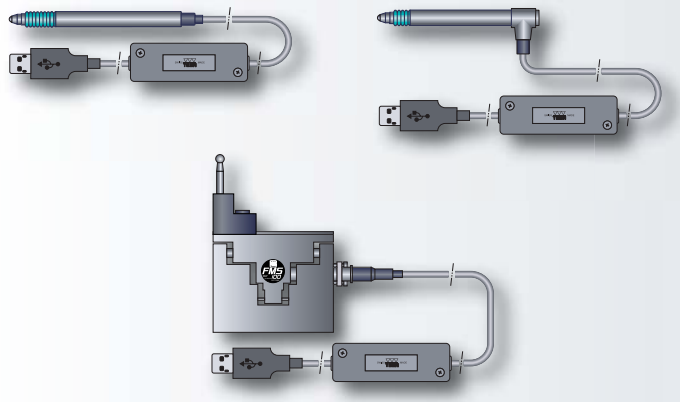
Display unit with 2 connected probes TESATRONIC

Measurements and value display with value classification.

See pages O-42 to O-47.



TESA USB Probes

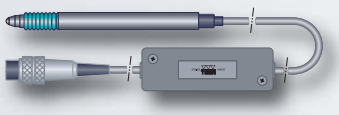


Direct connection to host computer

Easy-to-use and effective for single accurate and multi-gauging devices.

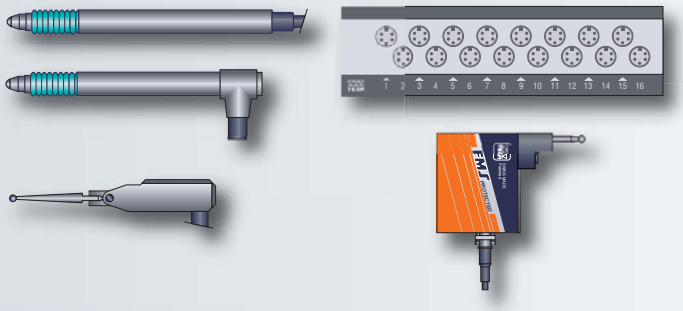
See pages O-14 to O-15.

TESA DC Probes



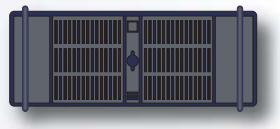
DC probes.

See page 0-16.

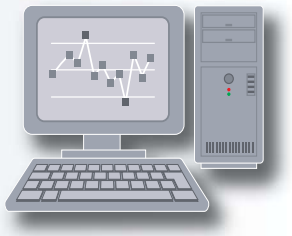


Interface boxes for TESA half-bridge probes. Analogue data output as for DC probes.

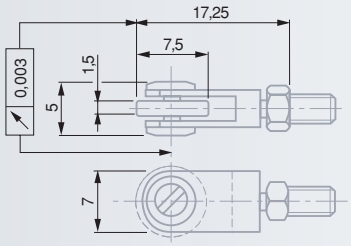
See page 0-50.

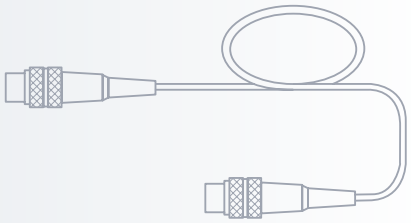


SPC or computer with analog board.



TESA Accessories





Accessories for TESA's probes.

See pages 0-34 to 0-41.

TESA Software Tools

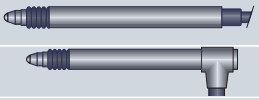
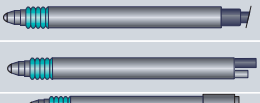
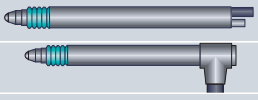
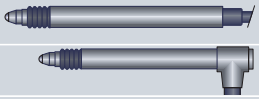
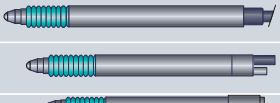
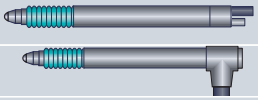
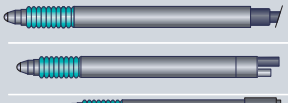
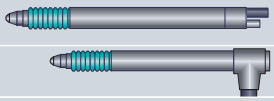


Software tools for data capture and data analysis (settings, measurements, inspection reports).

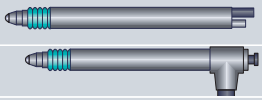
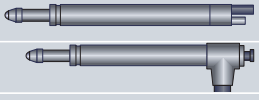
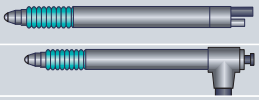
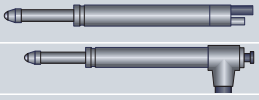
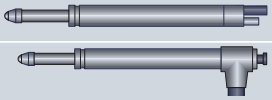
See chapter A – Connectivity

TESA Standard Probes – Overview

8 mm diameter axial probes with ball-bearing measuring bolt

	№	=	Measuring range (mm)	mm	Cable exit	Measuring bolt retraction	Sealing bellows
Standard probes							
	03210904	GT 21	± 2	4,3	axial	mechanical	Nitrile
	03210924	GT 22	± 2	4,3	radial	by vacuum	Nitrile
	03230057	GTL 21	± 2	4,3	axial	mechanical	Viton
	03230072	GTL 211	± 2	4,3	axial	by vacuum	Viton
	03230056	GTL 22	± 2	4,3	radial	by vacuum	Viton
Standard high-precision probes							
	03230036	GT 21HP	± 0,2	4,3	axial	mechanical	Nitrile
	03230021	GT 22HP	± 0,2	4,3	radial	by vacuum	Nitrile
Standard long-travel probes							
	03230027	GT 27	± 2	10,3	axial	mechanical	Viton
	03230073	GT 271	± 2	10,3	axial	by vacuum	Viton
	03230026	GT 28	± 2	10,3	radial	by vacuum	Viton
Probes with extended measuring range							
	03230041	GT 61	± 5	10,3	axial	mechanical	Viton
	03230074	GT 611	± 5	10,3	axial	by vacuum	Viton
	03230042	GT 62	± 5	10,3	radial	by vacuum	Viton

...with activation of the measuring bolt by pneumatic pressure

	№	=	Measuring range (mm)	mm	Cable exit	Pressure (bar) nominal	maximum	Sealing bellows
Standard probes								
	03230060	GTL 212	± 1,5	3,2	axial	0,7	1,0	Viton
	03230054	GTL 222	± 1,5	3,2	radial	0,7	1,0	Viton
	03230067	GTL 212-A	± 1,5	3,2	axial	0,25	6,0	none
	03230063	GTL 222-A	± 1,5	3,2	radial	0,25	6,0	none
Long-travel probes								
	03230061	GT 272	± 2	10,3	axial	1,1	1,5	Viton
	03230053	GT 282	± 2	10,3	radial	1,1	1,5	Viton
	03230068	GT 272-A	± 2	10,3	axial	1,0	6,0	none
	03230069	GT 282-A	± 2	10,3	radial	1,0	6,0	none
Probes with extended measuring range								
	03230062	GT 612	± 5	10,3	axial	1,1	1,5	Viton
	03230055	GT 622	± 5	10,3	radial	1,1	1,5	Viton
	03230070	GT 612-A	± 5	10,3	axial	1,0	6,0	none
	03230071	GT 622-A	± 5	10,3	radial	1,0	6,0	none

** Nominal value of the measuring force at electrical zero, max. deviation ±25%.
*** Highest mechanical frequency valid for the final value of the measuring range, amplified by 10%.
**** Linearity related max. permissible errors.

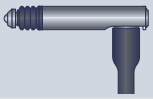
N**	Moving mass (g)	Frequency limit Hz***	Dismount-able	µm	(L in mm) µm****	°C	IEC 60529	
0,63	6	60	●	0,01	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-17
0,63	6	60	●	0,01	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-18
0,63	6	60	●	0,01	$0,2 + 2,4 \cdot L^2$	–10 ÷ 65	IP65	O-17
0,63	6	60	●	0,01	$0,2 + 2,4 \cdot L^2$	–10 ÷ 65	IP65	O-17
0,63	6	60	●	0,01	$0,2 + 2,4 \cdot L^2$	–10 ÷ 65	IP65	O-18
0,63	6	60	–	0,01	$0,07 + 0,4 \cdot L$	10 ÷ 40	IP64	O-17
0,63	6	60	–	0,01	$0,07 + 0,4 \cdot L$	10 ÷ 40	IP64	O-18
0,63	8	60	●	0,05	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-19
0,63	8	60	●	0,05	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-19
0,63	8	60	●	0,05	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-19
0,9	8	60	●	0,05	$1 + 4 \cdot L$	–10 ÷ 65	IP65	O-20
0,9	8	60	●	0,05	$1 + 4 \cdot L$	–10 ÷ 65	IP65	O-20
0,9	8	60	●	0,05	$1 + 4 \cdot L$	–10 ÷ 65	IP65	O-20

N**	Moving mass (g)	Frequency limit Hz***	Dismount-able	µm	(L in mm) µm****	°C	IEC 60529	
1,2	6	60	●	0,015	$0,2 + 2,4 \cdot L^2$	–10 ÷ 65	IP65	O-21
1,2	6	60	●	0,015	$0,2 + 2,4 \cdot L^2$	–10 ÷ 65	IP65	O-21
0,2	6	60	●	0,015	$0,2 + 2,4 \cdot L^2$	–10 ÷ 65	IP50	O-21
0,2	6	60	●	0,015	$0,2 + 2,4 \cdot L^2$	–10 ÷ 65	IP50	O-21
1,0	8	60	●	0,05	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-22
1,0	8	60	●	0,05	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-22
0,85	8	60	●	0,05	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP50	O-22
0,85	8	60	●	0,05	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP50	O-22
2,0	8	60	●	0,05	$1 + 4 \cdot L$	–10 ÷ 65	IP65	O-23
2,0	8	60	●	0,05	$1 + 4 \cdot L$	–10 ÷ 65	IP65	O-23
1,0	8	60	●	0,05	$1 + 4 \cdot L$	–10 ÷ 65	IP50	O-23
1,0	8	60	●	0,05	$1 + 4 \cdot L$	–10 ÷ 65	IP50	O-23

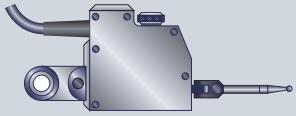
Miniature axial probes, 8 mm dia. probe housing

			Measuring range mm	mm	Cable exit	Measuring bolt retraction	Sealing bellows
Measuring bolt hanging from diaphragm springs							
	**03230001**	**GT 41**	± 0,3	0,7	axial	without	Nitrile
	**03230002**	**GT 42**	± 0,3	0,7	radial	vacuum	Nitrile
Measuring bolt mounted on a plain bearing							
	**03230035**	**GT 43**	± 1	2,1	axial	mechanical	Viton
	**03230017**	**GT 44**	± 1	2,1	radial	vacuum	Viton

Axial probes with measuring bolt mounted on a ball-bearing, with no brand name

			Measuring range mm	mm	Cable exit	Measuring bolt retraction	Sealing bellows
Standard probes							
	**03230490**	**490**	± 1,5	4,3	axial/radial	mechanical	Viton
Standard probes with short body							
	**96410012**	**410**	± 1	2,5	axial/radial	mechanical	Nitrile
Standard probes with short body, 6 mm dia. fixing shank							
	**96160013**	**160**	± 1	3,3	axial	mechanical	Viton
Miniature probes, 8 mm dia. fixing shank							
	**96430029**	**430**	± 0,5	1,25	axial	mechanical	Nitrile
	**96441041**	**451**	± 0,5	2,1	radial	vacuum	Nitrile

Lever probes

			Measuring range mm	mm	Cable exit	Measuring bolt retraction	Sealing bellows
	**96420004**	**420**	± 0,15	0,525	parallel	without	none
	**96499007**	**499**	± 0,5	1,2	parallel	without	none

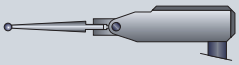
N**	Moving mass g	Frequency limit Hz***	Dismount-able	µm	(L in mm) µm****	°C	IEC 60529	
0,63	2	60	–	0,01	$0,2 + 5 \cdot L^2$	–10 ÷ 65	IP65	O-24
0,63	2	60	–	0,01	$0,2 + 5 \cdot L^2$	–10 ÷ 65	IP65	O-24
0,4	2	60	–	0,1	$0,2 + 5 \cdot L^2$	5 ÷ 65	IP65	O-24
0,4	2	60	–	0,1	$0,2 + 5 \cdot L^2$	5 ÷ 65	IP65	O-24

N**	Moving mass g	Frequency limit Hz***	Dismount-able	µm	%****	°C	IEC 60529	
0,63	6	60	●	0,02	0,2	–10 ÷ 65	IP65	O-25
0,6	3,1	58	–	0,1	0,2	0 ÷ 60	IP62	O-26
0,6	2,5	60	–	0,1	0,2	0 ÷ 60	IP62	O-27
0,75	1,9	60	–	0,1	0,2	0 ÷ 60	IP62	O-27
0,6	3	60	–	0,1	0,2	0 ÷ 60	IP62	O-27

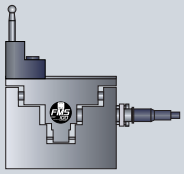
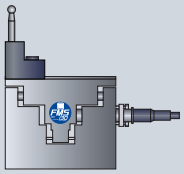
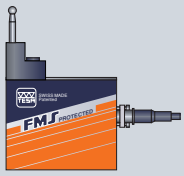
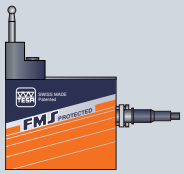
N**	Moving mass g	Frequency limit Hz***	Dismount-able	µm	%****	°C	IEC 60529	
1,8	2,5	10	–	0,5	0,3	0 ÷ 60	IP40	O-28
0,02 ÷ 0,2	10,6	10	–	0,25	0,6	0 ÷ 60	IP40	O-28

** Nominal value of the measuring force at electrical zero, max. deviation ± 25%.
*** Highest m mechanical frequency valid for the final value of the measuring range, amplified by 10%.
**** Linearity related max. permissible errors.

TESA probe with inclinable lever

			Measuring range (mm)	mm	Cable exit	Measuring bolt retraction
	03210802	GT 31	± 0,3	0,7	angled	without

TESA universal probes

			Measuring range (mm)	mm	Cable exit	Measuring bolt retraction (accessory)
Standard probes						
	03230019	FMS 100	± 2	5,8	parallel	air pressure
	03230028	FMS 102	± 2	5,8	angled	air pressure
	03230049	FMS 130	± 2,9	5,8	parallel	air pressure
	03230050	FMS 132	± 2,9	5,8	angled	air pressure
Probes «FMS Protected»						
	03230037	FMS 100-P	± 2	5,8	parallel	air pressure
	03230038	FMS 102-P	± 2	5,8	angled	air pressure
	03230051	FMS 130-P	± 2,9	5,8	parallel	air pressure
	03230052	FMS 132-P	± 2,9	5,8	angled	air pressure

* Position against the measuring direction

N**	Moving mass (g)	Frequency limit Hz***	Dismount-able	µm	(L in mm) µm****	°C	IEC 60529	
0,1	12	25	–	0,1	$0,2 + 50 \cdot L^2$	5 ÷ 60	IP40	O-29

N/mm	Moving mass (g)	Frequency limit Hz***	Dismount-able	µm	(L in mm) µm****	°C	IEC 60529	
2	110	25	●	0,5	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP50	O-31
2	110	25	●	0,5	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP50	O-32
2	110	25	●	0,5	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP50	O-31
2	110	25	●	0,5	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP50	O-32
2	110	25	●	0,5	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP54	O-31
2	110	25	●	0,5	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP54	O-32
2	110	25	●	0,5	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP54	O-31
2	110	25	●	0,5	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP54	O-32

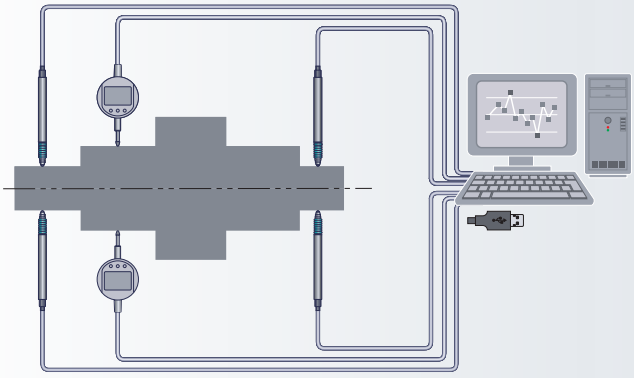
** Nominal value of the measuring force at electrical zero, max. deviation ±25%.
*** Highest mechanical frequency valid for the final value of the measuring range, amplified by 10%.
**** Linearity related max. permissible errors.

TESA PROBES WITH DIRECT USB CONNECTION

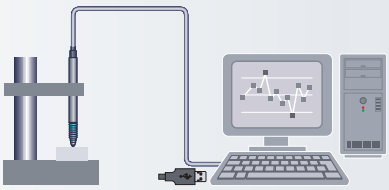
New generation of TESA's USB probes for a surprising ease of use

These probes can be directly connected to your host computer over the widely known USB interfaces. The highest number of connectable probes depends on the USB ports available. Since interface boxes or cards are no longer necessary, the use of a USB multiplexer provides Users with a flexible and affordable solution.

Each probe will be identified as a standard peripheral device, using an RS232 protocol for communicating. Electronics is optimized, thus guaranteeing high accuracy throughout the measuring range. Making use of this technology will allow you to fit and combine your inspection means according to given requirements for precision and probe travel.



Most of the software tools available for data processing are able to process the values obtained from the measurements taken in static multigauging.
The USB technologie is convenient for these devices besides complex metrology applications, but also for simple gauging operations where high precision is critical.



Software for data acquisition and data processing.
See chapter A – Connectivity

TESA's probes available in the USB version and Half-bridge probes have the same dimensions. Their range of standard accessories is also identical.

✓

DIN 32876 Part 1

See table

Any position of use

Distance between stops and electrical zero can not be set.
Cable length: 2,9 m.

0,1 µm

USB 2.0 RS 232, virtual

20 ±0,5°C

–10°C to 40°C

80%

IP65 as per IEC 60529
IP50 for
GT222-A
GT622-A
FMS 100-102

Shipping packaging

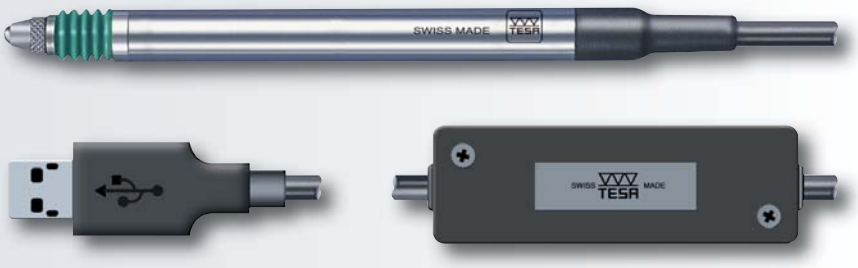
Identification number

Inspection report with a declaration of conformity

TESA USB Probes

Probes for use with a USB interface.

- Easy and quick connection to the USB port. Data transmission uses a virtual port along with any RS 232 protocol.



		Measuring range (mm)	Bolt retraction	Sealing bellow
03230200	**GTL 21 USB**	+/- 2	mechanical	Viton
03230201	**GTL 22 USB**	+/- 2	mechanical	Viton
03230202	**GTL 222 USB**	+/- 1,5	air pressure	Viton
03230203	**GTL 222-A USB**	+/- 1,5	air pressure	–
03230204	**GT 61 USB**	+/- 5	mechanical	Viton
03230205	**GT 62 USB**	+/- 5	vacuum	Viton
03230206	**GT 622 USB**	+/- 5	air pressure	Viton
03230207	**GT 622-A USB**	+/- 5	air pressure	–
03230208	**FMS 100 USB**	+/- 2	air pressure	–
03230209	**FMS 102 USB**	+/- 2	air pressure	–

	Mechanical displacement	Precision (µm)	µm	Standard execution	Technical data sheets
GTL 21 USB	4,3	1,2	<0,1	O-17	03200587
GTL 22 USB	4,3	1,2	<0,1	O-18	03200588
GTL 222 USB	3,1	1,2	<0,1	O-21	03200589
GTL 222-A USB	3,1	1,2	<0,1	O-21	03200590
GT 61 USB	10,3	3	<0,24	O-20	03200591
GT 62 USB	10,3	3	<0,24	O-20	03200592
GT 622 USB	10,3	3	<0,24	O-23	03200593
GT 622-A USB	10,3	3	<0,24	O-23	03200594
FMS 100 USB	5,8	1,2	<0,1	O-31	03200597
FMS 102 USB	5,8	1,2	<0,1	O-32	03200597

Data acquisition on the PC: 20 to 80 ms depending on used mode – No synchronisation in dynamic measurement.

Note: – Adapter for standard probe to USB interface, see page O-50.
– Adviced limite of amount; 49 probes on 2 Hub levels.

TESA DC Probes

Provided with a DC output for direct connection to a host computer or a peripheral fitted with an analogue input.

✓

DIN 32876 Part 1

See table

Any position of use

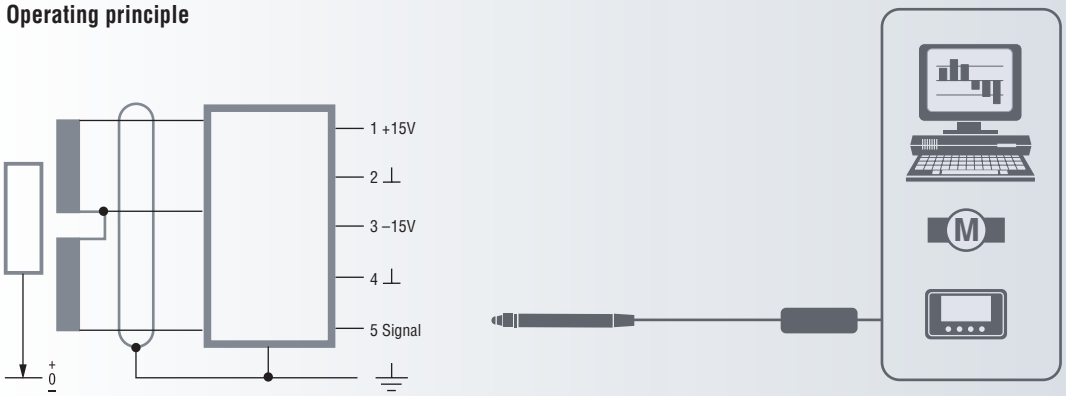
Drive voltage: ±15 V
Consumption: 15 mA
Adjustment load: > 1 kΩ
Sensitivity: see table

See table

See table

Additional data: see standard probes

Operating principle



No		Measuring range (mm)	Output voltage V	Sensitivity V/mm	µm	(L in mm) µm*	Technical data sheets
Standard probes							
03230059	**GTL 21 DC**	± 2	± 2	1	0,1	$0,2 + 3,5 \cdot L^2$	03200396
03230058	**GTL 22 DC**	± 2	± 2	1	0,1	$0,2 + 3,5 \cdot L^2$	03200397
Probes with extended measuring range							
03230086	**GT 61 DC**	± 5	± 5	1	0,1	$1 + 4 \cdot L$	03200519
03230087	**GT 62 DC**	± 5	± 5	1	0,1	$1 + 4 \cdot L$	03200520
Miniature probes with measuring bolt hanging from a diaphragm spring							
03230082	**GT 41 DC**	± 0,3	± 0,3	1	0,1	$0,2 + 5 \cdot L^3$	03200516
Miniature probes with measuring bolt mounted on a plain bearing							
03230085	**GT 44 DC**	± 1	± 1	1	0,1	$0,2 + 5 \cdot L^3$	03200518
Probes with inclinable lever							
03230081	**GT 31 DC**	± 0,3	± 0,3	1	0,1	$0,2 + 50 \cdot L^2$	03200484

* Linearity related max. permissible errors.

Note: Other existing probe types and versions are available on request (2 V/mm, 5 V/mm, 10 V/mm or 0 to + 10 V; max. output voltage 10 V).

TESA Axial Probes

Standard Probes

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.

✓

DIN 32876 Part 1

See in the table

Any position of use

8 mm dia. fixing shank. 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.

Nickel-plated housing. Stainless steel measuring bolt, hardened.

Sealing bellows made from resistant nitrile or high-resistance elastomer (Viton)

Moved mass 6 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency to 60 Hz.

0,15 µm/ °C or 0,2 µm / °C for GTL 21 and GTL 211

20 ± 0,5°C

-10°C to 65°C 10°C to 40°C for GT 21 HP

80%

IP65(IEC 60529), IP64 for GT 21 HP

Shipping packaging

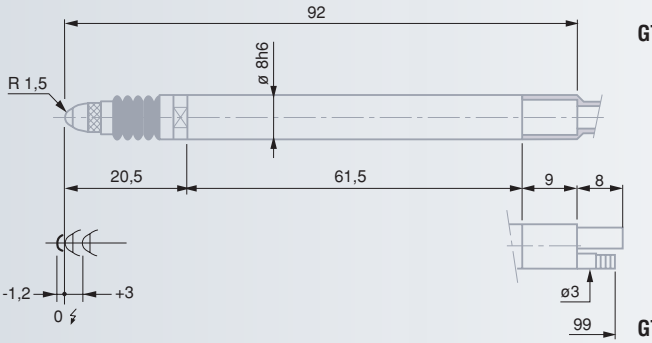
Identification number

Inspection report with a declaration of conformity

GT 21 and GTL 21 probes with axial cable exit

		Measuring range (mm)	N*	Bolt retraction	Sealing bellows
Standard probes					
03210904	**GT 21**	± 2	0,63	mechanical	nitrile
03210905	**GT 21**	± 2	1,0	mechanical	nitrile
03210906	**GT 21**	± 2	1,6	mechanical	nitrile
03210907	**GT 21**	± 2	2,5	mechanical	nitrile
03210908	**GT 21**	± 2	4,0	mechanical	nitrile
03230057	**GTL 21**	± 2	0,63	mechanical	nitrile
03230072	**GTL 211**	± 2	0,63	vacuum	Viton
High-precision standard probes					
03230036	**GT 21 HP**	± 0,2	0,63	mechanical	nitrile

* Nominal value at electrical zero, max. ± 25%.Valid in upright assembly position, with downward oriented measuring bolt, as well as in static measuring.



GT 21/GTL 21

GTL 211



GT 21 **GTL 21**

	Lower stop of the measuring bolt**, adjustable from... mm	to mm	ex-factory mm	mm	µm	µm	µm***	Technical data sheets
GT 21	–2,2	0,1	–1,2	4,3	0,01	0,02	$0,2 + 3 \cdot L^3$	03200249
GTL 21	–2,2	0,1	–1,2	4,3	0,01	0,02	$0,2 + 2,4 \cdot L^2$	03200391
GTL 211	–2,2	0,1	–1,2	4,3	0,01	0,02	$0,2 + 2,4 \cdot L^2$	03200435
GT 21 HP	–2,2	0,1	–1,2	4,3	0,01	0,01	$0,07 + 0,4 \cdot L$	03200264

** Distance from electrical zero. *** Linearity related max. perm. errors (L in mm).

GT 22 and GTL 22 probes with radial cable exit

		Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellows
Standard probes					
03210924	**GT 22**	± 2	0,63	vacuum	nitrile
03210921	**GT 22**	± 2	0,16	vacuum	nitrile
03210922	**GT 22**	± 2	0,25	vacuum	nitrile
03210923	**GT 22**	± 2	0,4	vacuum	nitrile
03210925	**GT 22**	± 2	1,0	mechanical	nitrile
03210926	**GT 22**	± 2	1,6	mechanical	nitrile
03210927	**GT 22**	± 2	2,5	mechanical	nitrile
03210928	**GT 22**	± 2	4,0	mechanical	nitrile
03230056	**GTL 22**	± 2	0,63	vacuum	Viton
03230076	**GTL 22**	± 2	1	vacuum	Viton
High-precision standard probes					
03230021	**GT 22 HP**	± 0,2	0,63	vacuum	nitrile

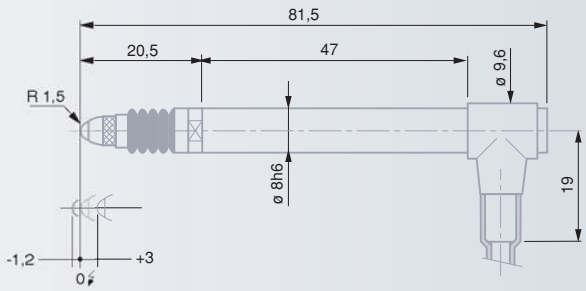
* Nominal value at electrical zero, max. ± 25%. Valid in upright assembly position, with downward oriented measuring bolt, as well as in static measuring.



GT 22

GTL 22

GT 22/GTL 22



	Lower stop of the measuring bolt**, adjustable from... mm	to mm	ex-factory mm	mm	µm	µm	µm***	Technical data sheets
GT 22	–2,2	0,1	–1,2	4,3	0,01	0,02	$0,2 + 3 \cdot L^3$	03200250
GTL 22	–2,2	0,1	–1,2	4,3	0,01	0,02	$0,2 + 2,4 \cdot L^2$	03200392
GT 22 HP	–2,2	0,1	–1,2	4,3	0,01	0,01	$0,07 + 0,4 \cdot L$	03200265

** Distance from electrical zero. *** Linearity related max. perm. errors. (L in mm).

✓

DIN 32876 Part 1

See in the table

Any position of use

8 mm dia. fixing shank. Ball-bearing measuring bolt.

Distance from electrical zero of both stops is either adjustable (downward) or depends 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.

Nickel-plated housing. Stainless steel measuring bolt, hardened.

Sealing bellows made from resistant Nitrile or high-resistance Viton (elastomer)

Moved mass 6 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency to 60 Hz.

0,15 µm/ °C or 0,2 µm / °C for GTL 22

20 ± 0,5°C

–10°C to 65°C 10°C to 40°C for GT 22 HP

80%

IP65 (IEC 60529) or IP64 for GT 22 HP

Shipping packaging

Identification number

Inspection report with a declaration of conformity

✓

DIN 32876 Part 1

See in the tables

Any position of use

8 mm dia. fixing shank. 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. Standard probes with a 5-pin DIN 45322 connector.

Nickel-plated housing. Stainless steel measuring bolt, hardened.

Viton bellows in high-resistance elastomer

Moving mass 8 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency to 60 Hz.

0,15 µm/ °C

20 ± 0,5 °C

-10°C to 65°C

80%

IP65 (IEC 60529)

Shipping packaging

Identification number

Inspection report with a declaration of conformity

TESA Axial Probes with Long Retraction Travel

Standard Probes

Universal inductive probes for common applications, especially those using multigauging devices.

- Long retraction travel to prevent the probe from being damaged.

LVDT probes compatible with measuring equipment from other makers also available on request.

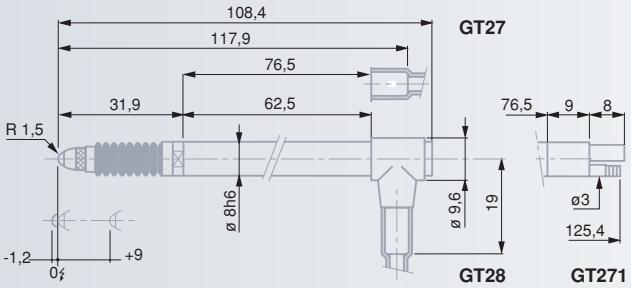
GT 27 probes with axial cable exit

		Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellows
Standard probes					
03230027	**GT 27**	± 2	0,63	mechanical	Viton
03230073	**GT 271**	± 2	0,63	vacuum	Viton

GT 28 probes with radial cable exit

		Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellows
Standard probes					
03230026	**GT 28**	± 2	0,63	vacuum	Viton

* Nominal value at electrical zero, max. ±25%. Valid in upright assembly position, with downward oriented measuring bolt, as well as in static measuring.





	Lower stop of the measuring bolt**, adjustable from... mm	to mm	ex-factory mm	mm	µm	µm	µm***	Technical data sheets
GT 27	–2,2	0,1	–1,2	10,3	0,05	0,05	$0,2 + 3 \cdot L^3$	03200251
GT 271	–2,2	0,1	–1,2	10,3	0,05	0,05	$0,2 + 3 \cdot L^3$	03200436
GT 28	–2,2	0,1	–1,2	10,3	0,05	0,05	$0,2 + 3 \cdot L^3$	03200252

** Distance from electrical zero. *** Linearity related max. perm. errors (L in mm).

TESA Axial Probes with Extended Measuring Range

Standard Probes

Designed for long travels and low resolutions – Specially suited for use on multigauging devices.

- Correction factor appplied to get the true value is 2,5x (10x for the S probe version).

LVDT probes compatible with measuring equipment from other makers also available on request.

GT 61 probes with axial cable exit

		Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellows
Standard probes					
03230041	**GT 61**	± 5	0,9	mechanical	Viton
S32070041	**GT 61S**	± 5	0,9	mechanical	Viton
03230074	**GT 611**	± 5	0,9	vacuum	Viton



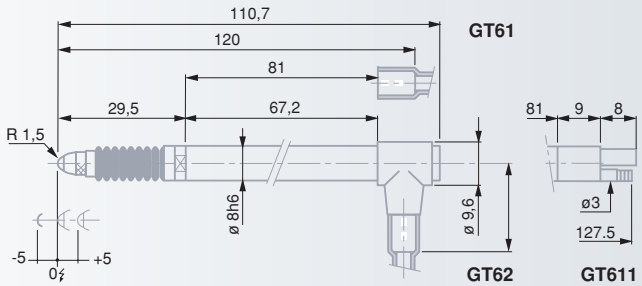
GT 62

GT 61

GT 62 probes with radial cable exit

		Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellows
Standard probes					
03230042	**GT 62**	± 5	0,9	vacuum	Viton
S32070042	**GT 62S**	± 5	0,9	vacuum	Viton
S32080861	**GT62**	± 5	0,16	mechanical	none

* Nominal value at electrical zero, max. ± 25%. Valid for upright assembly position, with downward oriented measuring bolt, as well as in static measuring.



	Measuring bolt stops** lower stop (mm)	upper stop (mm)	mm	µm	µm	µm***	Technical data sheets
GT 61	–5,1	5,2	10,3	0,05	0,05	1 + 4 · L	03200294
GT 611	–5,1	5,2	10,3	0,05	0,05	1 + 4 · L	03200437
GT 62	–5,1	5,2	10,3	0,05	0,05	1 + 4 · L	03200295

** Distance from electrical zero. *** Linearity related max. perm. errors (L in mm).

✓

DIN 32876 Part 1

See in the tables

Any position of use

Signal combination with probes having a standard resolution may require your special attention to needed correction

8 mm dia. fixing shank. Ball-bearing measuring bolt

Both lower and upper stops are fixed.

Interchangeable measuring insert with a 3 mm dia. tungsten carbide ball tip. M2,5 thread.

2 m long cable.

5-pin DIN 45322 connector.

Nickel-plated housing. Stainless steel measuring bolt, hardened.

Viton bellows in high-resistance elastomer

Moved mass 8 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency to 60 Hz.

0,09 µm/°C

20 ± 0,5 °C

–10 °C to 65 °C

80%

IP65 (IEC 60529)

Shipping packaging

Identification number

Inspection report with a declaration of conformity

✓

DIN 32876 Part 1

See in the tables

Any position of use

8 mm dia. fixing shank. Ball-bearing measuring bolt.

Both lower and upper stops are fixed.

Interchangeable measuring insert with a 3 mm dia. tungsten carbide ball tip. M2,5 thread.

2 m long cable.

Standard probes with a 5-pin DIN 45322 connector.

Nickel-plated housing. Stainless steel measuring bolt, hardened.

Viton bellows in high-resistance elastomer

Moved mass 6 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency to 60 Hz.

0,2 µm/ °C

20 ± 0,5 °C

–10°C to 65°C

80%

IP65(IEC 60529) or IP50 for GTL 212-A and GTL 222-A

Shipping packaging

Identification number

Inspection report with a declaration of conformity

TESA Axial Probes with Measuring Bolt Activation by Pneumatic Pressure

Standard Probes

These probes are intended for use with measuring devices providing full or half-assisted inspection routines.

LVDT probes compatible with measuring equipment from other makers also available on request.

GT 212 probes with axial cable exit

		Measuring range (mm)	N*	Measuring bolt activation	Sealing bellows
Standard probes					
03230060	**GTL 212**	± 1,5	1,2	▼	▲ Viton
03230067	**GTL 212-A**	± 1,5	0,2	▼	▲ none

GT 222 probes with radial cable exit

		Measuring range (mm)	N*	Measuring bolt activation	Sealing bellows
Standard probes					
03230054	**GTL 222**	± 1,5	1,2	▼	▲ Viton
03230063	**GTL 222-A**	± 1,5	0,2	▼	▲ none

* Nominal value at electrical zero, max. ± 25%. Valid for upright assembly position, with downward oriented measuring bolt, as well as in static measuring

▼ Downward movement of the measuring bolt activated by pneumatic pressure.

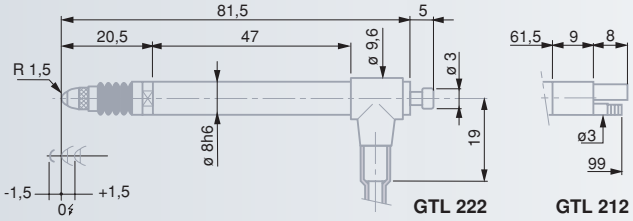
▲ Upward movement of the measuring bolt activated under the spring force only.



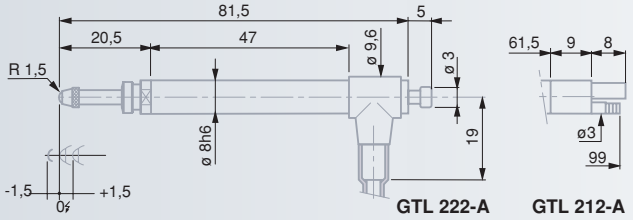
GTL 222



GTL 212-A



GTL 222 GTL 212



GTL 222-A GTL 212-A

	Air pressure (bar) nominal	maximum	mm	µm	µm	µm***	Technical data sheets
GTL 212	0,7	1,0	3,2	0,015	0,02	0,2 + 2,4 · L^2	03200413
GTL 212-A	0,25	6,0	3,2	0,015	0,02	0,2 + 2,4 · L^2	03200430
GTL 222	0,7	1,0	3,2	0,015	0,02	0,2 + 2,4 · L^2	03200393
GTL 222-A	0,25	6,0	3,2	0,015	0,02	0,2 + 2,4 · L^2	03200422

*** Linearity related max. perm. errors (L in mm).

TESA Long-Travel Probes with Measuring Bolt Activation by Pneumatic Pressure

Standard Probes

Made for use with measuring devices providing full or half-assisted inspection routines.

LVDT probes compatible with measuring equipment from other makers also available on request.



GT 282

GT 272-A

GT 272 probes with axial cable exit

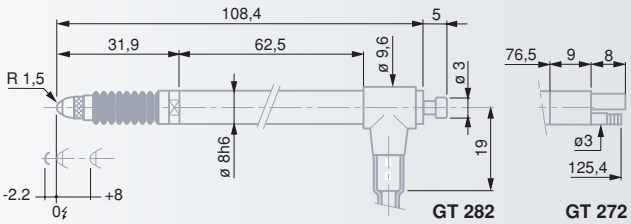
		Measuring range (mm)	Upper travel (mm)*	N**	Measuring bolt activation	Sealing below
Standard probes						
03230061	**GT 272**	± 2	8,1	1,0	▼ ▲	Viton
03230068	**GT 272-A**	± 2	8,1	0,85	▼ ▲	none

GT 282 probes with radial cable exit

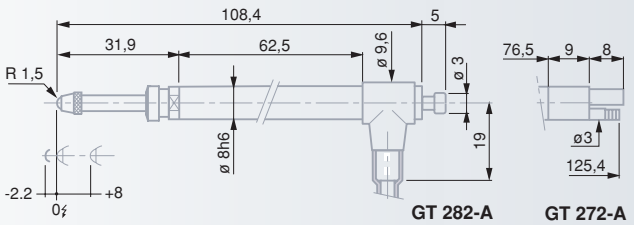
		Measuring range (mm)	Upper travel (mm)*	N**	Measuring bolt activation	Sealing below
Standard probes						
03230053	**GT 282**	± 2	8,1	1,0	▼ ▲	Viton
03230069	**GT 282-A**	± 2	8,1	0,85	▼ ▲	none

* Travel from the electrical zero up to the upper stop.
** Nominal value at electrical zero; max. deviation ±25%. Valid in upright assembly position with downward oriented measuring bolt, as well as in static measuring.

▼ Downward movement of the measuring bolt activated by pneumatic pressure.
▲ Upward movement of the measuring bolt activated under the spring force only.



GT 282 GT 272



GT 282-A GT 272-A

	Air pressure (bar) nominal	Air pressure (bar) maximum	mm	µm	µm	µm***	Technical data sheets
GT 272	1,1	1,5	10,3	0,05	0,05	$0,2 + 3 \cdot L^3$	03200414
GT 272-A	1,0	6,0	10,3	0,05	0,05	$0,2 + 3 \cdot L^3$	03200431
GT 282	1,1	1,5	10,3	0,05	0,05	$0,2 + 3 \cdot L^3$	03200390
GT 282-A	1,0	6,0	10,3	0,05	0,05	$0,2 + 3 \cdot L^3$	03200432

*** Linearity related max. permissible errors (L in mm).

✓
DIN 32876 Part 1
See in tables
Any position of use
8 mm dia. fixing shank. Ball-bearing measuring bolt.
Both lower and upper stops are fixed.
Interchangeable insert with a 3 mm dia. carbide ball tip. M2,5 thread.
2 m long cable.
5-pin DIN 45322 connector.
Nickel-plated housing.
Stainless steel measuring bolt, hardened.
Viton bellows in high-resistance elastomer
Moved mass 8 g
13 kHz (±5%) drive frequency. Highest mechanical frequency to 60 Hz.
0,15 µm/ °C
20 ± 0,5°C
–10°C to 65°C
80%
IP65 (IEC 60529) or IP50 for GT 272-A plus GT 282-A
Shipping packaging
Identification number
Inspection report with a declaration of conformity

✓

DIN 32876 Part 1

See in tables

Any position of use

8 mm dia. fixing shank. Ball-bearing measuring bolt.
Both lower and upper stops are fixed.

Interchangeable insert with a 3 mm dia. carbide ball tip. M2,5 thread.

Cable length: 2 m.

5-pin DIN 45322 connector.

Nickel-plated housing.
Stainless steel measuring bolt, hardened.

Viton bellows in high-resistance elastomer

Moved mass 8 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency 60 Hz.

0,09 µm/ °C

20 ± 0,5°C

–10°C to 65°C

80%

IP65 (IEC 60529) or IP50 for GT 612-A plus GT 622-A

Shipping packaging

Identification number

Inspection report with a declaration of conformity

TESA Probes with Extended Measuring Range and Bolt Activation by Pneumatic Pressure

Standard Probes

Probes intended for use with measuring devices providing full or half-assisted inspection routines.

LVDT probes compatible with measuring equipment from other makers also available on request.

GT 612 probes with axial cable exit

		Measuring range (mm)	N*	Measuring bolt activation		Sealing bellow
Standard probes						
03230062	**GT 612**	± 5	2,0	▼	▲	Viton
03230070	**GT 612-A**	± 5	1,0	▼	▲	none

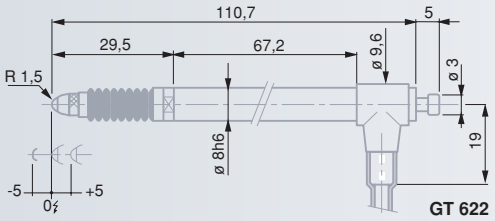
GT 622 probes with radial cable exit

		Measuring range (mm)	N*	Measuring bolt activation		Sealing bellow
Standard probes						
03230055	**GT 622**	± 5	2,0	▼	▲	Viton
03230071	**GT 622-A**	± 5	1,0	▼	▲	none

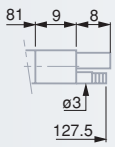
* Nominal value at electrical zero, max. ± 25%. Valid in upright assembly position with downward oriented measuring bolt, as well as in static measuring.

▼ Downward movement of the measuring bolt activated by pneumatic pressure.

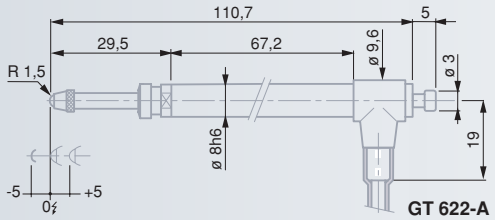
▲ Upward movement of the measuring bolt activated under the spring force only.



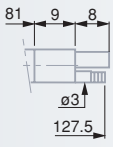
GT 622



GT 612



GT 622-A



GT 612-A



GT 612-A

	Air pressure (bar) nominal	maximum	mm	µm	µm	µm**	Technical data sheets
GT 612	1,1	1,5	10,3	0,05	0,05	1 + 4 · L	03200415
GT 612-A	1,0	6,0	10,3	0,05	0,05	1 + 4 · L	03200433
GT 622	1,1	1,5	10,3	0,05	0,05	1 + 4 · L	03200394
GT 622-A	1,0	6,0	10,3	0,05	0,05	1 + 4 · L	03200434

** Linearity related max. permissible errors (L in mm).

TESA Axial Miniature Probes

Standard probes

Compact probes specially designed for use where there's no room for longer probes – Possible assembly on measuring heads for bore measurement and the like.



GT 41 GT 43

GT 41 and GT 43 probes with axial cable exit

		Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellows
Measuring bolt hanging from a diaphragm spring					
03230001	**GT 41**	± 0,3	0,63	without	nitrile
Measuring bolt mounted on a plain bearing					
03230035	**GT 43**	± 1	0,4	mechanical	Viton



GT 42

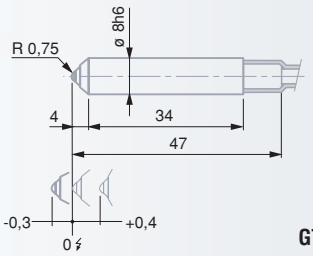


GT 44

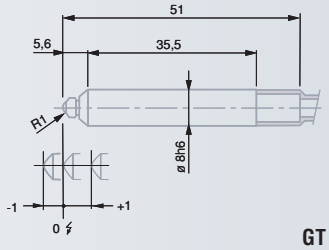
GT 42 and GT 44 probes with radial cable exit

		Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellows
Measuring bolt hanging from a diaphragm spring					
03230002	**GT 42**	± 0,3	0,63	vacuum	nitrile
Measuring bolt mounted on a plain bearing					
03230017	**GT 44**	± 1	0,4	vacuum	Viton

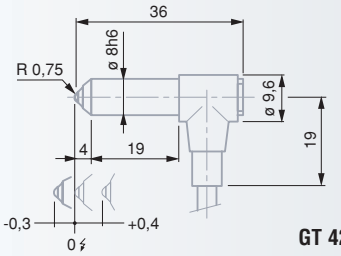
* Nominal value at electrical zero, max. ±25%. Valid in upright assembly position with downward oriented measuring bolt, as well as in static measuring.



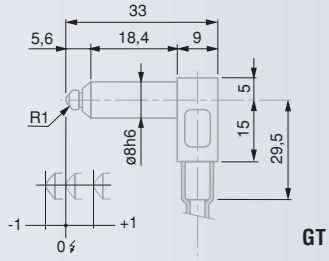
GT 41



GT 43



GT 42



GT 44

	Measuring bolt stops** lower (mm)	upper (mm)	mm	µm	µm	µm***	Technical data sheets
GT 41	–0,3	0,4	0,7	0,01	0,01	$0,2 + 5 \cdot L^2$	03200258
GT 43	–1,05	1,05	2,1	0,1	0,15	$0,2 + 5 \cdot L^2$	03200260
GT 42	–0,3	0,4	0,7	0,01	0,01	$0,2 + 5 \cdot L^2$	03200259
GT 44	–1,05	1,05	2,1	0,1	0,15	$0,2 + 5 \cdot L^2$	03200261

** Distance from electrical zero. *** Linearity related max perm. errors (L in mm).

✓

DIN 32876 Part 1

See in tables

Any position of use

8 mm dia. fixing shaft. Measuring bolt guided on a plain bearing or hanging from diaphragms.

Both lower and upper stops are fixed.

GT 41 or GT 42 with a fixed measuring insert; spherical carbide measuring face, R = 0,75 mm.
GT 43 or GT 44 with a selectable measuring insert; spherical carbide face, R = 1 mm.
M2 coupling thread.

Cable length: 2 m.

5-pin DIN 45322 connector.

Nickel-plated fixing shank. Sealing bellows: Resistant nitrile or high-resistance elastomer (Viton).

Moved mass 2 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency 60 Hz.

0,1 µm/ °C

20 ± 0,5°C

-10°C to 65° for GT 41 and GT 42; 5°C to 65°C for GT 43 and GT 44.

80%

IP65 (IEC 60529)

Shipping packaging

Identification number

Inspection report with a declaration of conformity

TESA Axial Probes – Serie 490

Probes with no brand name for TESA's electronic equipment

Universal probes to suit common but constraining applications.

- 8 mm diameter probe body that can be clamped over its entire length.
- Measuring bolt mounted on a ball-bearing.
- Probe body made in steel, nickel-plated.
- Degree of protection to IP65.
- 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.

✓

DIN 32876 Part 1

See in tables

Axial probes usable in any position

8 mm body diameter. Measuring bolt mounted on a ball-bearing.

Adjustable distance between both lower stop and electrical zero.

Interchangeable measuring insert with M2,5 thread. 3 mm dia. carbide ball tip.

Cable length: 2 m.

DIN 45322 connector.

Nickel-plated body. Steel measuring bolt, hardened.

Sealing bellow: high-resistance elastomer (Viton)

Moved mass 6 g

Force increase 0,2 N/mm

Highest mechanical frequency to 60 Hz

0,2 µm/ °C

-10°C to 65°C

-20°C to 65°C

IP65 (IEC 60529)

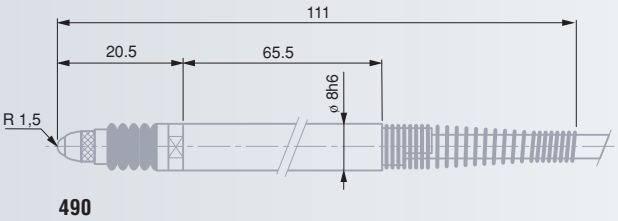
Shipping packaging

Identification number

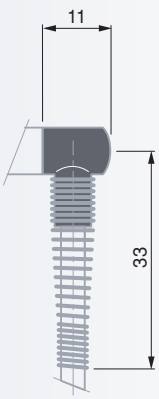
	Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellow
*Probe series 490 with axial/radial** cable exit*				
03230490	± 1,5	0,63	mechanical	Viton

* Nominal value at electrical zero; max. deviation ± 0,15 N. Valid in upright assembly position with downward oriented measuring bolt, as well as in static measuring. Also available upon request: Probes 410 with measuring force to 0,4, 1,0, 1,6, 2,5 or 4 N.

** Using the right angle adaptor that came with the probe.



490





		Lower stop of the measuring bolt***, adjustable from... mm	to mm	ex-factory mm	mm	µm	%****	Technical data sheet
490	**TESA**	–2	0	–1,7	4,3	0,02	0,2	03200456

*** Distance from electrical zero.

**** Linearity related max. perm. errors within the measuring span of 3 mm (measuring range ±1,5 mm).

Axial Probes with Short Body – Serie 410

Probes for TESA's electronic equipment

Universal probes for common but constraining applications.

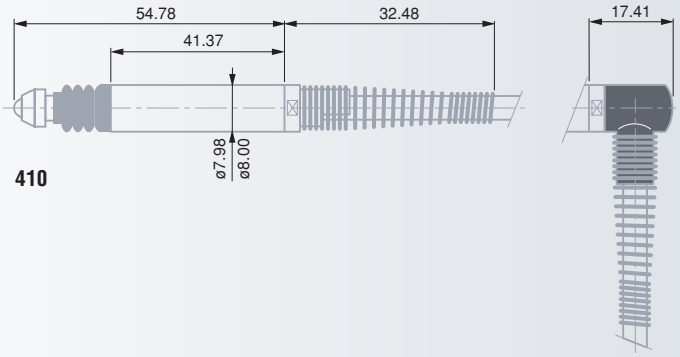
- 8 mm diameter probe body that can be clamped over its entire length.
- Ball bearing measuring bolt.
- Hardened steel body, hard-chrome plated.
- Degree of protection to IP62.
- Flexible axial cable exit fitted with a steel spring to prevent the cable from breaking.

Other probes compatible with measuring equipment from other makers also available on request.



	Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellow
*Probe series 410 with axial/radial cable exit***				
96410012	± 1	0,6	mechanical	nitrile

* Nominal value at electrical zero; max. deviation ± 0,15 N. Valid in upright assembly position, with downward oriented measuring bolt, as well as in static measuring. Also available upon request: Probes 410 with measuring force to 1,0 or 1,6 N.
** Using the right angle adaptor that came with the probe.



410

		Lower stop of the measuring bolt***, adjustable from... mm	to mm	ex-factory mm	mm	µm	%****	Technical data sheet
410	**TESA**	–1,2	0	–1,08	2,5	0,1	0,2	F96410012

*** Distance from electrical zero.
**** Linearity related max. perm. errors; within the measuring span of 2 mm (measuring range ±1 mm).

✓
DIN 32876 Part 1
See in tables
Axial probes usable in any position
8 mm body diameter. Measuring bolt mounted on a ball-bearing.
Adjustable distance between both lower stop and electrical zero.
Interchangeable probe insert with a M2,5 mounting thread. 3 mm dia. tungsten carbide ball tip.
Cable length: 2 m.
DIN 45322 connector.
Hardened steel probe body, hard-chrome plated. Stainless steel bolt, hardened.
Sealing bellow: resistant nitrile
Moved mass 3,1 g
Force increase 0,15 N/mm
Highest mechanical frequency to 60 Hz
0,025 µm/°C
0 °C to 65 °C
–40 °C to 65 °C
IP62 (IEC 60529)
Shipping packaging
Identification number

Axial Probes with Short Body – Series 160, 430 and 451

Probes for TESA's electronic equipment

Their compact size and robust construction make them the ideal probes for a frequent use.

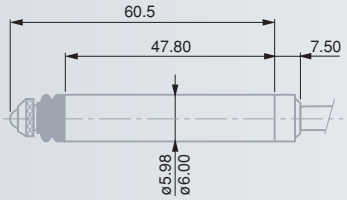
- 8 mm diameter probe body (6 mm for probe series 160) that can be clamped over its entire length.
- Chrome-plated, hardened steel body. Ball-bearing probe insert.

Other probes compatible with measuring equipment from other makers also available on request.

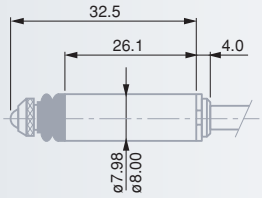


	Measuring range mm	N*	Measuring bolt retraction	Sealing bellows
Series 160 – Probes with short body, axial cable exit				
96160013	± 1	0,6 ± 0,15	mechanical	Viton
Series 430 – Miniature probes with axial cable exit				
96430029	± 0,5	0,75 ± 0,2	mechanical	nitrile
Series 451 – Miniature probes with radial cable exit				
96441041	± 0,5	0,6 ± 0,15	mechanical	nitrile

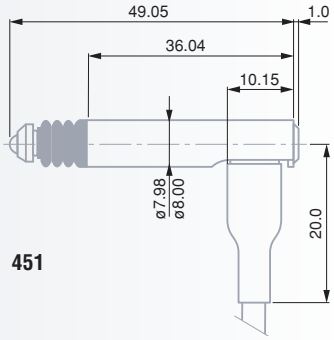
* Nominal value at electrical zero; max. deviation ± 0,15 N. Valid in upright assembly position with downward oriented measuring bolt, as well as in static measuring.



160



430



451

		Lower stop of the measuring bolt**, adjustable from... mm	to mm	ex-factory mm	mm	µm	%***	Technical data sheets
160	**TESA**	–1,2	0	–1,08	3,3	0,1	0,2	F96160013
430	**TESA**	–0,7	0	–0,58	1,25	0,2	0,2	F96430029
451	**TESA**	—	—	–0,58	2,1	0,1	0,2	F96441041

** Distance from electrical zero.
*** Linearity related max. perm. errors; within either of both measuring spans of 2 mm (measuring range ±1 mm) and 1 mm (measuring range ±0,5 mm).

✓

DIN 32876 Part 1

See in tables

Axial probes usable in any position

6 and 8 mm probe housing diameters for both series 160 and 430/45, resp.

Ball-bearing measuring bolt.

Distance between both stops and electrical zero is either adjustable (series 160, but lower stop only) or fixed (series 451).

Interchangeable probe insert.

M2 thread for series 160 or M2,5 for both series 430 and 451

3 mm dia. tungsten carbide ball tip.

2 m long cable.

DIN 45322 connector.

Hardened steel probe body, chrome plated.

Measuring bolt in stainless steel, hardened.

Sealing bellows in resistant nitrile or high-resistance elastomer (Viton).

Moved mass 2,5 g (series 160) 1,9 g (series 430) 3,0 g (series 451)

Force increase to 0,3 N/mm (series 160), 0,25 N/mm (series 430) or 0,15 N/mm (series 451)

Highest mechanical frequency to 60 Hz

0,025 µm/ °C

0°C to 60°C

–40°C to 60°C

IP62 (IEC 60529)

Shipping packaging

Identification number



Lever Probes – Series 420 and 499

Probes for TESA's electronic equipment

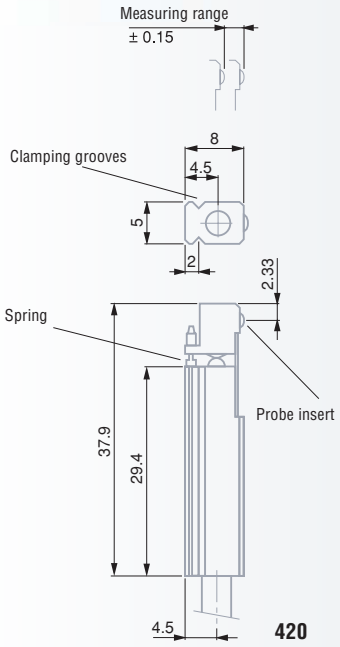
Probe series 420

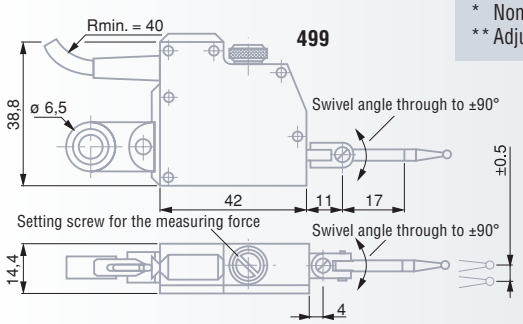
- Very short body that can be recessed into a fixture or a plug gauge.
- Probe insert mounted on leaf springs.

Probe series 499

- Parallel guiding of the measuring bolt moving in both probing directions.
- Interchangeable probe insert. Any of those having a varying length can equally be used with no influence on the leverage.
- Used where probes with measuring bolt moving lengthwise cannot easily be handled.
- Without switch-over feature for the probing direction.

Other probes compatible with measuring equipment from other makers also available on request.





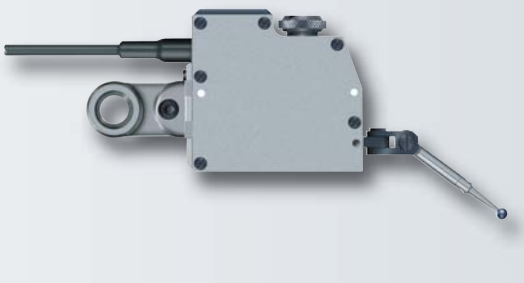
No		Measuring range (mm)	N*
Series 420 – Miniature lever probes			
96420004		± 0,15	1,8 ± 0,4
Series 499 – Lever probes with parallel guiding			
96499007		± 0,5	0,02 ÷ 0,2**

Accessories for probe series 499

No		⌀ mm		mm
03238401	Measuring insert	0,8	carbide	12,3
03238402	Measuring insert	1,6	carbide	12,3
03238403	Measuring insert	3,2	carbide	12,3
03238411	Measuring insert	0,8	carbide	37,7
03238412	Measuring insert	1,6	carbide	37,7
03238413	Measuring insert	3,2	carbide	37,7
01840105	Cylindrical clamp	8		

For other clamping items, report to page G-6.

* Nominal values at electrical zero. Valid in static measuring.
** Adjustable with probe housing and lever lying horizontally.



		Lower stop of the measuring insert***, adjustable from... mm	to mm	ex-factory mm	mm	µm	%****	Technical data sheets
420	**TESA**	—	—	–0,225	0,525	0,5	0,3	F96420004
499	**TESA**	0,6	0	0,6	1,2	0,25	0,6	F96499007

*** Distance from electrical zero.
**** Linearity related max. perm. errors; within either of both measuring spans of 0,3 mm (measuring range ±0,15 mm) and 1 mm (measuring range ±0,5 mm).

✓
DIN 32876 Part 1
See in tables
Any position of use
Series 420 with a clamping groove.
Leaf-spring mounted articulation.

Series 499:
2 dovetails with mounting lug or clamping rod.
Probe insert on a leaf-spring bearing. 2 x 90° friction clutches for smooth displacement of the probe insert.
Triple protection against damages in both probing directions.

Series 499 with Interchangeable insert fitted with a 10 BA coupling thread.
2 m long cable.
DIN 45322 connector.
Stainless steel probe body, hardened (series 420). Dull-chrome plated housing (series 499).
Tungsten carbide ball tip
Moved mass 2,5 g (series 420) or 10,6 g (series 499)
Force increase: 0,2 N/mm (420) 0,25 N/mm (499)
Highest mechanical frequency 10 Hz
0,025 µm/ °C for series 420 or 0,25 µm/ °C for series 49
0 °C to 60 °C
–40 °C to 60 °C
IP40 (IEC 60529)
Series 499 along with a 3,2 mm dia. probe insert (No. 03238403) plus lug (No. 03238013)
Shipping packaging
Identification number

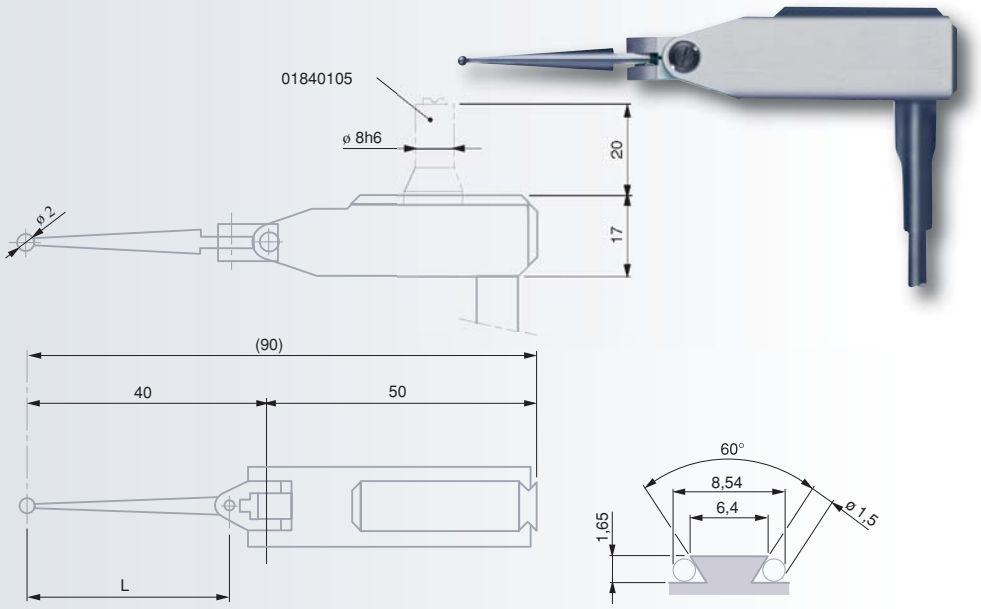
TESA GT 31 Lever Probes

Models with inclinable probe insert for measuring in two directions – Well suited for use where probes with measuring bolt moving lengthwise can not be conveniently operated.

- Ball-bearing balanced lever.
- Interchangeable probe insert fitted with a tungsten carbide ball tip, inclinable through to 180°.
- Automatic reversal of the probing direction while that of the indication remains unchanged.
- Protected against shocks by 2 safety clutches.
- One-piece housing provided with 2 dovetails.

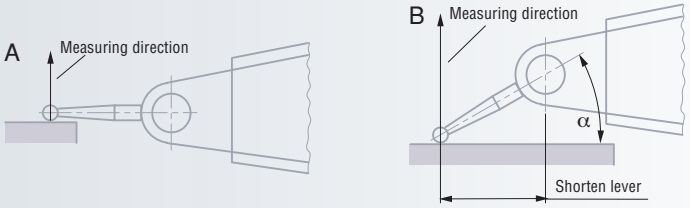
№		Measuring range (mm)	N*
03210802	**GT 31**	± 0,3	**0,1** (standard)
03210801	**GT 31**	± 0,3	**0,02**
03210803	**GT 31**	± 0,3	**0,2**

* Nominal value at electrical zero; max. deviation ±25%. Valid with probe housing and lever lying horizontally, as well as in static measuring.



	mm	µm	µm	µm*	Technical data sheet
GT 31	0,7	0,1	0,25	$0,2 + 50 \cdot L^2$	03200266

* Linearity related max permissible error (L in mm).



Note

With the insert lying parallel to the workpiece surface (Fig. A), the leverage matches 1:1. Therefore, no correction of the measured values is needed.
Any other position (angle α, Fig. B) will change the effective lever length, so that read values must be corrected. With regard to this, also report to the instructions for use that came with your electronic probes.

✓

DIN 32876 Part 1

± 0,3 mm

Any position of use

2 dovetail attachments. Both lower and upper stops are fixed.

Probe inserts with removable stainless steel shaft. Also with a 2 mm carbide ball tip.

For all other inserts, see under optional accessories on next pages.

2 m long cable.

5-pin DIN 45322 connector.

All-metal housing, matt-chromium finish

Moved mass 12 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency to 25 Hz

20 ± 0,5°C

5 °C to 60 °C

80%

IP40 (IEC 60529)

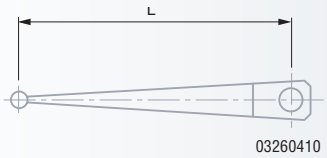
Equipped with a 2 mm dia. probe insert (No. 03260410) plus a 8 mm dia. fixing shaft No. 01840105.

Shipping packaging

Identification number

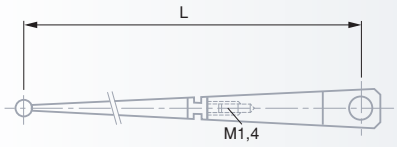
Declaration of conformity

Accessories for TESA Probes GT 31

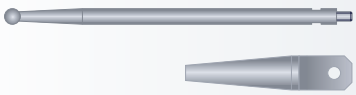


03260410


03260410



03590003


03590007

Probe inserts

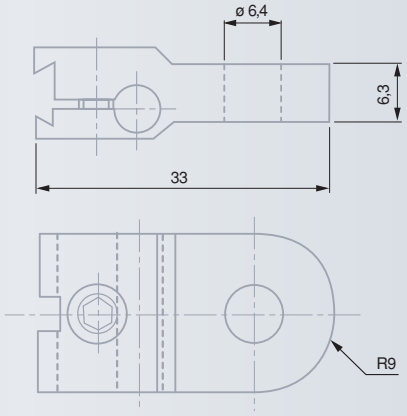
	Ball tip mm	Lever – amplification	Length L in mm
Standard probes with a one-piece shaft			
03260402	1	1 : 1	32
03260410	2	1 : 1	32
03260403	3	1 : 1	32
Special probes with a two-piece shaft			
03590002	1	1 : 1	32
03590003	2	1 : 1	32
03590004	3	1 : 1	32
03590005	4	1 : 1	32
03590006	1	1 : 2	72
03590007	2	1 : 2	72
03590008	3	1 : 2	72
03590009	4	1 : 2	72

✓ Stainless steel insert holder, tungsten carbide ball tip

Shipping packaging

03240100 **Fixing brackets**
Features both a dovetail and cylindrical bore.

✓ Shipping packaging



03240100

✓

DIN 32876 Part 1

See tables

Any position of use

4 coupling threads M6. Linear ball-bearing guiding with fixed stops.

Insert holder attachment with dovetail.

Cable length: 2 m.

5-pin connector including a feature matching DIN 45322 for signal adjustment.

Hardened steel probe body, nickel-plated

Moved mass: 110 g

13 kHz (± 5%) drive frequency. Up to 25 Hz mechanical frequency.

–0,14 µm/°C

20 ± 0,5°C

–10°C à 65°C

80%

IP50 for standard probes or IP54 for protected probes (IEC 60529)

Shipping packaging

Identification number

Inspection report with a declaration of conformity

TESA Probes with Parallel Guiding

Standard or protected FMS probes

Universal probes for multigauging devices. Let you capture the values measured on machines or other fixtures for in-process inspection.

- Long-life probes featuring a small-size, rugged design.
- Modular construction to eliminate the need for many assembly components.
- Ball-bearing probe displacement.
- Direction of the probing force and probe retraction depending on used accessory.
- Wide variety of measuring inserts and supports for optimum adaptation to your measuring job.

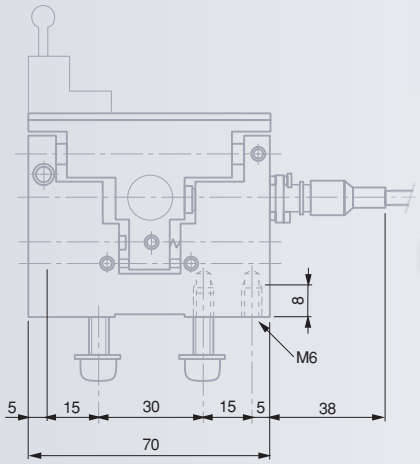
Other probes compatible with measuring equipment from other makers also available on request.



FMS probes with parallel cable exit

		Measuring range (mm)	N*	Measuring bolt retraction (accessory)
Standard probes				
03230019	**FMS 100**	± 2	2	air pressure
03230049	**FMS 130**	± 2,9	2	air pressure
Probes «FMS protected»				
03230037	**FMS 100-P**	± 2	2	air pressure
03230051	**FMS 130-P**	± 2,9	2	air pressure

* Nominal value at electrical zero; max. deviation ± 25%. Valid for probing movement exerted horizontally or in static measuring.





	Mechanical stop** lower mm	upper mm	mm	µm	µm	µm***	Technical data sheets
FMS 100	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200253
FMS 100-P	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200283
FMS 130	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200342
FMS 130-P	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200344

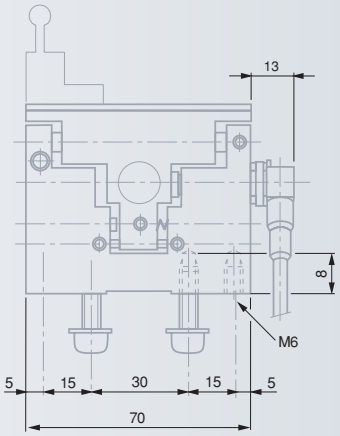
** Distance from electrical zero. *** Linearity related max. perm. errors (L in mm).

FMS probes with angled cable exit

		Measuring range (mm)	N*	Measuring bolt retraction (accessory)
Standard probes				
03230028	**FMS 102**	± 2	2	air pressure
03230050	**FMS 132**	± 2,9	2	air pressure
Probes «FMS protected»				
03230038	**FMS 102-P**	± 2	2	air pressure
03230052	**FMS 132-P**	± 2,9	2	air pressure

* Nominal value at electrical zero; max. deviation ±25%. Valid for probing movement exerted horizontally or in static measuring.









	Mechanical stop** lower mm	upper mm	mm	µm	µm	µm***	Technical data sheets
FMS 102	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200254
FMS 102-P	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200289
FMS 132	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200343
FMS 132-P	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200345

** Distance from electrical zero. *** Linearity related max. perm. errors (L in mm).

✓

DIN 32876 Part 1

See in tables

Any position of use

4 coupling threads M6. Linear ball-bearing guiding with fixed stops.

Insert holder attachment with dovetail.

Cable length: 2 m.

5-pin connector including a feature matching DIN 45322 for signal adjustment.

Hardened steel probe body, nickel-plated

Moved mass 110 g

13 kHz (± 5%) drive frequency. Highest mechanical frequency to 25 Hz

0,15 µm/°C

20 ± 0,5 °C

–10 °C to 65 °C

80%

IP50 for standard probes or IP54 for protected probes (IEC 60529)

Shipping packaging

Identification number

Inspection report with a declaration of conformity

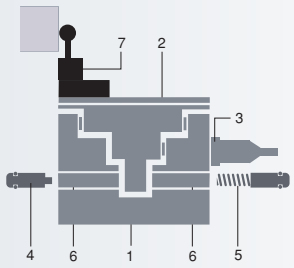
Configuration and Use of TESA FMS Probes

The following examples provide you with a number of possibilities to activate and retract the measuring insert during your measurement cycles.

Example A

- Moving the probe insert toward the part to be inspected using the measuring force produced through the compression spring.
- No insert's retraction.

Effect
The insert remains into position. Exchanging parts is made with mechanical contact of the probe under the measuring force.

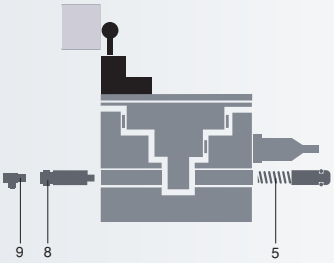


1 *Fixed probe body*
2 *Moving probe body*
3 *Measuring element with fine adjust*
4 *Adjustable stop*
5 *Spring set for the measuring force*
6 *Mounting bores*
7 *Holder for the probe insert*

Example B

- Moving the probe insert toward the part to be inspected using the measuring force produced through the compression spring.
- Insert's retraction by pneumatic pressure.

Effect
Exchanging parts is made with no mechanical contact of the probe.



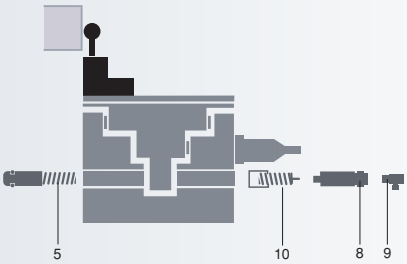
5 *Spring set for the measuring force*
8 *Pneumatic jack, No. 03260440*
9 *Connector (No. 024388, page O-41)*

Example C

- Activating the measuring insert towards the part to be inspected by air pressure using the measuring force produced by the compression spring.
- Insert's retraction by disabling the pneumatic pressure.

Effect
Exchanging parts is made with no mechanical contact of the probe, thus providing absolute security since the probe insert retract itself due to a lack of air pressure.

This configuration is also applied where there is no room on the left side for the pneumatic jack (as shown in the example B).

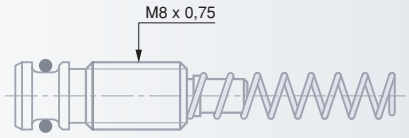


5 *Spring set for the measuring force*
8 *Pneumatic jack, No. 03260440*
9 *Connector (No. 024388, page O-41)*
10 *Auxiliary spring-loaded element, No. 03260445*

The force of the spring set (5) must be equivalent to the force of the auxiliary spring-loaded element (10).

Accessories for TESA FMS Probes

Spring set for the measuring force



Spring set for the measuring force

Examples A to C
Item 5

	N	
*	2,0	nickel-plated
03260448	0,4	red
03260449	0,63	yellow
03260450	1,0	green
03260451	1,6	blue
03260452	2,5	brown
03260453	4,0	black

* Provided with FMS probes

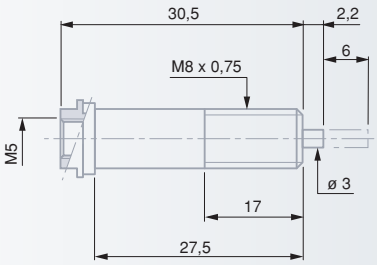
✓

All values given in the table for the measuring force equal nominal values at electrical zero; max. deviation ± 25%. Valid for probing movements exerted horizontally as well as in static measuring.

Shipping packaging

Accessories for Pneumatic Activation of the Mobile Probe Body

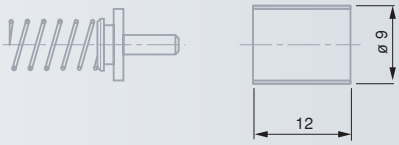
03260440	**Pneumatic jack** Operates the mobile probe body. Force under a pressure of 4 bars = 11 N Examples B and C Item 8



Auxiliary spring-loaded element

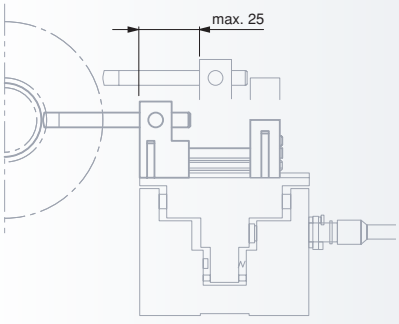
Example C
Item 10

	N	
03260441	0,4	red
03260442	0,63	yellow
03260443	1,0	green
03260444	1,6	blue
03260445	2,0	nickel-plated
03260446	2,5	brown
03260447	4,0	black



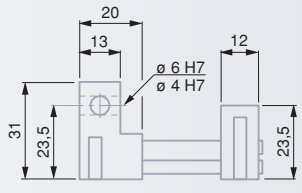
Probe Insert Holder with Fine Adjustment

Helps you to set the probe – Setting and locking screws remain accessible even when several probes are mounted side by side.

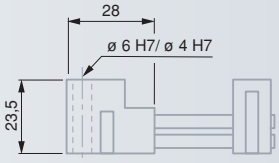


Mounting bores for probe inserts

	mm	Number	Position	mm
02630053	4	2	horizontal	25
02630055	4	1	vertical	25
02630052	6	2	horizontal	25
02630054	6	1	vertical	25



02630052/53



02630054/55

✓

Width of the insert holder. 12 mm

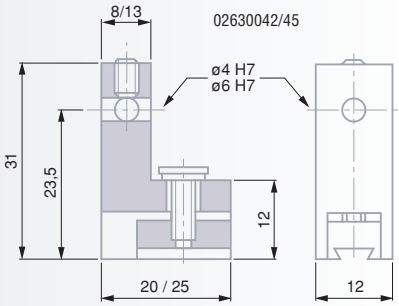
Shipping packaging

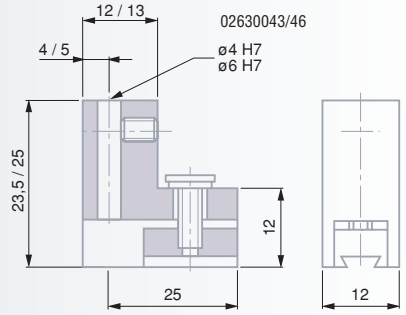
Shipping packaging

Fixed probe insert holder

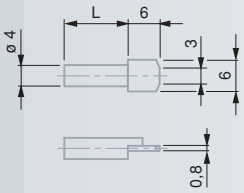
Mounting bores for probe inserts

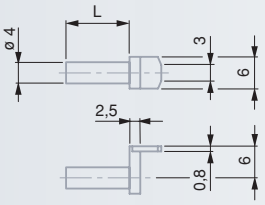
	mm	Number	Position
02630042	4	2	horizontal
02630043	4	1	vertical
02630045	6	2	horizontal
02630046	6	1	vertical

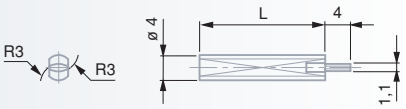




Probe inserts with a 4 mm diameter mounting shaft







Centred probe inserts with a flat, right-angle measuring face

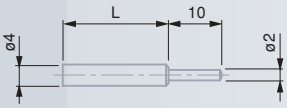
		L mm
02660066	Carbide	12
02660068	Carbide	25

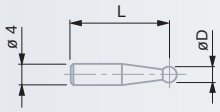
Off-centre probe inserts with a flat, right-angle measuring face

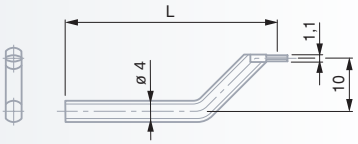
		L mm
02660067	Carbide	12
02660069	Carbide	25

Centred probe inserts with 2 cylindrical measuring faces

		L mm
02660070	Carbide	20
02660071	Carbide	40
02660072	Carbide	60







Probe inserts with a 2 mm dia. contact pin with spherical measuring face

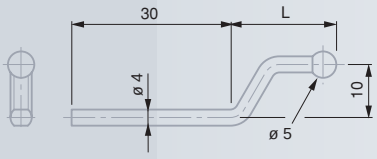
		L mm
02660073	Carbide	20
02660074	Carbide	40
02660075	Carbide	60

Inserts with a tungsten carbide ball tip

	mm	L mm
02660076	3	20
02660077	3	40
02660078	3	60
02660079	5	20
02660080	5	40
02660081	5	60

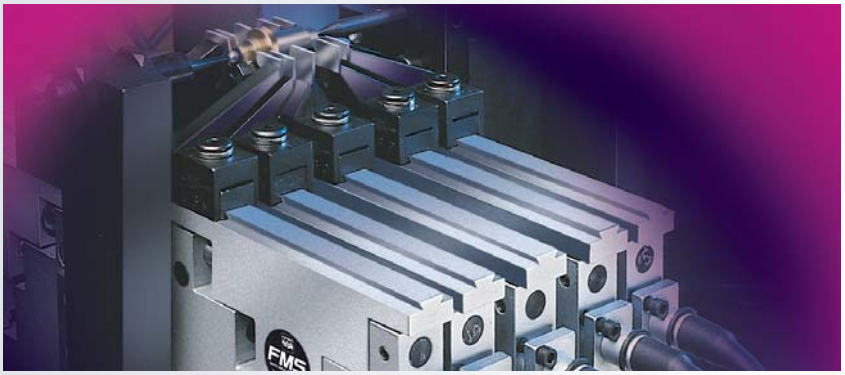
Off-centre probe inserts with 2 cylindrical measuring faces

		L mm
02660082	Carbide	40
02660083	Carbide	60



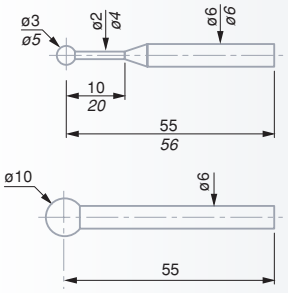
Off-centre probe inserts with a tungsten carbide ball tip

	mm	L mm
02660084	5	20
02660085	5	33
02660086	5	48



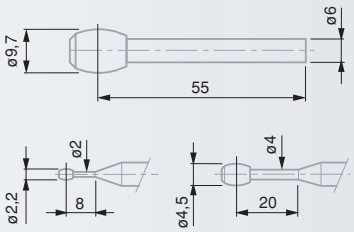
Probe inserts with a 6 mm diameter mounting shaft

Shipping packaging



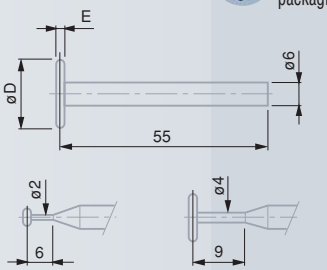
Probe inserts with a carbide ball tip

№	⌀ mm
00760058	3
00760059	5
00760060	10



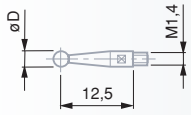
Probe inserts with a barrel-shaped measuring face for cylindrical bores. Also serve for determining the position of internal threads.

№	⌀ mm	For threads
00760066	2,2	M3 ÷ M16
00760067	4,5	M6 ÷ M48
00760068	9,7	M12 ÷ M150



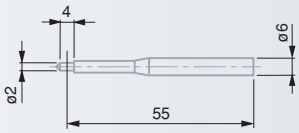
Probe inserts with a tungsten carbide disc for grooves, nuts, centering shoulders etc.

№	⌀ mm	E mm
00760074	4,5	1
00760075	14	2
00760076	19	3



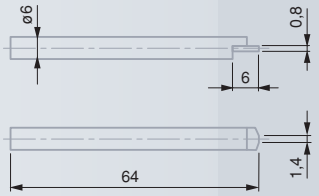
TESATAST probe inserts with a tungsten carbide ball tip. M1,4 mounting thread.

№	⌀ D mm	L mm
01860201	1	12,53
01860202	2	12,53
01860203	3	12,53
01860307	Wrench	



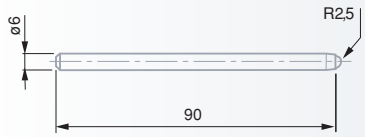
Probe insert with small cylindrical measuring face

№		⌀ mm
00760082	Carbide	2



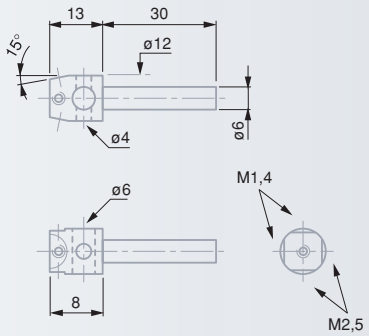
Centred probe insert with a small flat, right angle measuring face

№		mm
S26074380	Carbide	64



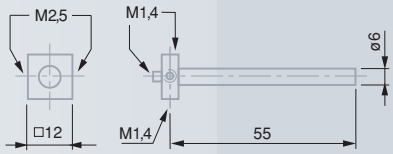
Probe inserts with one flat and one spherical measuring faces

№		mm
025589	Carbide	64



Universal probe insert holder specially designed for various types of clamps

№	
S26074372	1 x Ø 4 mm 1 x Ø 6 mm 2 M1,4 threads 2 M2,5 threads

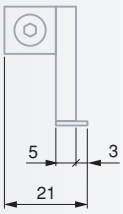


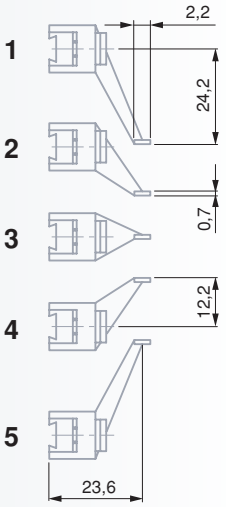
Universal probe insert holder with 2 mounting threads

№	
00760096	M1,4; M2,5

Shipping packaging

Probe inserts with offset measuring face





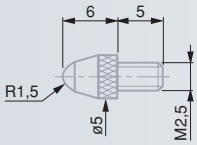
Probe inserts with a flat, right-angle measuring face in tungsten carbide, whether centred or offset

	As shown opposite
02630047	1
02630048	2
02630049	3
02630050	4
02630051	5

Shipping packaging

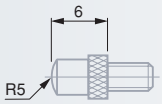
Measuring Inserts for Axial Probes, Dial Gauges and the Like

Models with a M2,5 mounting thread



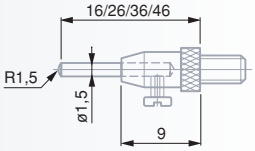
Standard probe inserts with a ball tip

		L mm
03510001	Steel	6
03510002	Carbide	6



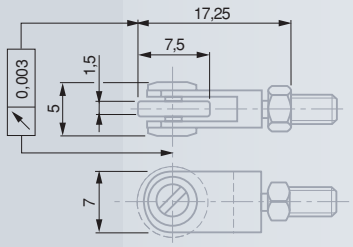
Probe inserts with a spherical measuring face

		R mm
03510101	Steel	5
03510102	Carbide	5



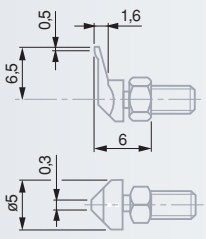
Probe insert with 4 interchangeable steel pins. Spherical face, R = 1,5 mm

		L mm
03510201	Steel	16, 26, 36, 46



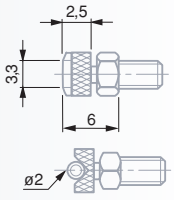
Probe inserts with a ball-bearing steel roller.
Counternut for radial alignment.

		Shape
03560010	Steel	cylindrical
03560011	Steel	domed



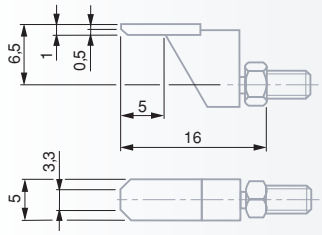
Off-centre probe insert (A) with pointed measuring face.
Counternut for radial alignment.

		A mm
03510401	Steel	6,5



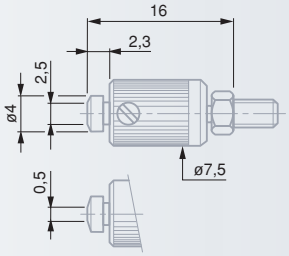
Probe insert with cylindrical measuring face. Counternut for radial alignment.

03510502	Carbide



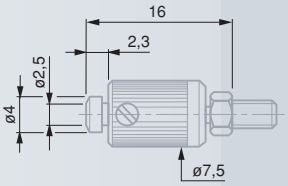
Offset probe insert with a narrow measuring face. Counternut for radial alignment.

		B mm
03510602	Carbide	0,5



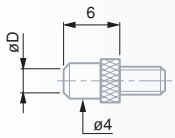
Probe insert with a narrow measuring face, parallel adjustable. Counternut for radial alignment.

		B mm
03510702	Carbide	0,5



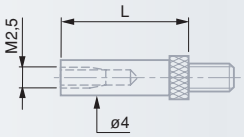
Probe insert with a flat measuring face, parallel adjustable. Counternut for radial alignment.

		mm
03510902	Carbide	2,5



Probe inserts with a flat measuring face

		D mm
03510801	Steel	2,5
03510802	Carbide	2,5
03560022	Steel	3,4
03560023	Carbide	3,4

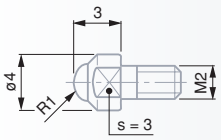


Extensions for probe inserts

	L mm
03540501	10
03540502	15
03540503	20
03540504	40

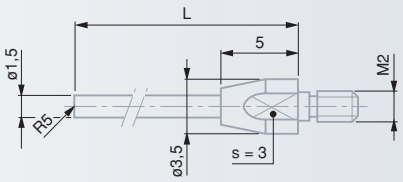
Additional probe inserts as well as extensions with M2,5 coupling thread as listed on the pages F-42 to F-44.

Probe Inserts with a M2 Coupling Thread for GT 43 and GT 44 Miniature Probes as well as Probes with Short Body, Series 160



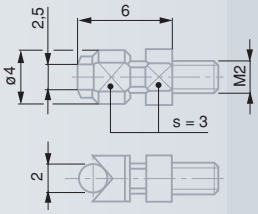
Probe inserts with spherical measuring face. Also with a M2 thread.

		mm
03510204	Carbide	R 1
03510103	Carbide	R 5



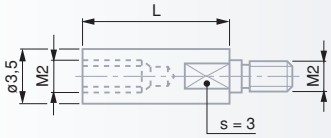
Probe inserts with a spherical measuring face (R5). Also with a M2 thread.

		mm
03510202	Carbide	16
03510203	Carbide	26



Probe insert with cylindrical measuring face. Counternut for radial alignment. M2 thread.

03510503	Carbide



Extensions for inserts with a M2 thread

	L mm
03540505	10
03540506	15

Accessories for TESA 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, as well as in static measuring.

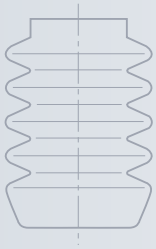
Plastic sleeve marked with force related data

Shipping packaging

№	N
Probes GT 22 and GTL 22	
03260419	0,16
03260420	0,25
03260421	0,40
Probes GT 21, GT 22, GTL 21, GTL 211, GTL 22 plus probe series 490	
03260457	0,63
03260422	1,0
03260423	1,6
03260424	2,5
03260425	4,0

№	N
Probes GT 27, GT 271 and GT 28	
03260458	0,63
03260459	1,0
03260460	1,6
03260461	2,5
Probes GT 61, GT 611 and GT 62	
03260483	0,8
03260463	1,0
03260464	1,6
03260465	2,5

Spare Bellows for Axial Probes



Nitrile: resistant synthetic sealing for normal use.

Viton: high-resistance synthetic sealing used where probes are permanently exposed to cooling and lubricating agents.

Safety rings plus washer.

Shipping packaging

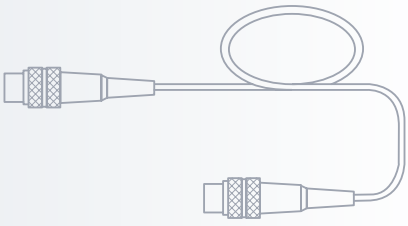
Complete set with safety ring and washer

№		№	
Probes GT 21, GT 22, GTL 21, GTL 211, GTL 22 plus probe series 490		*Probes GT 27, GT 271, GT 28, GT 61, GT 611 plus probe series GT 62*	
03260468	nitrile	**03260491**	Viton
03260470	Viton	*Probes GT 272, GT 282, GT 612, GT 622*	
Probes GTL 212 and GTL 222		**03260490**	Viton
03260489	Viton		

Bellows supplied individually

№	
Probes GT 43 and GT 44	
037608	Viton

Extension cable



For high accuracy requirements, we recommend to adjust each part of your measuring equipment all together

Shipping packaging

№	m
03240201	1
03240202	2
03240203	3

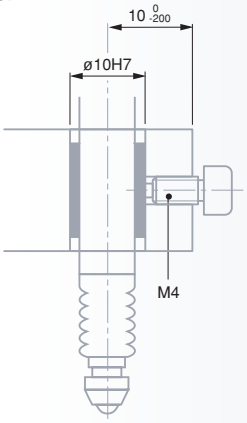
Other cable lengths available on request

Clamping Elements for Axial Probes

Provided with 3 clamping faces – Prevent the metrology properties of the guiding system from being altered due to possible distortion.

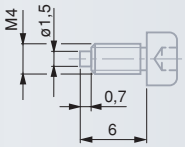
All dimensions shown in the drawing must be respected

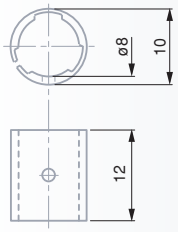
Shipping packaging



VKD clamp screw

№	⌀
02611013	M4



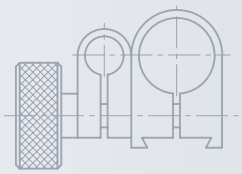


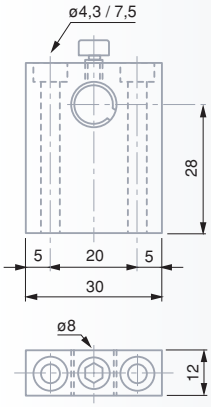
VKE clamp

№	⌀ mm
02611014	8

Clamp collar

№	Fastening points mm
01860401	5,6 or 9,5 in diameter with dovetail





VDE clamps with fastening sleeve and screw included

№	⌀ mm
02660048	8

Manually Operated Devices for Retracting the Measuring Bolt

Shipping packaging





№	=	
03540104		**Mechanical retraction device**
Consisting of:		
03540101		1 Lift lever
03540102		1 Washer

№	=	
03260401		**Pneumatic retraction device** Suited for probes GT 22, 271, 28, 42, 44, 611, 62 – GTL 211, 22
Consisting of:		
		1 Hand-operated vacuum pump
03540405		1 Air tube, 4,7 mm in diameter, 1 m long

Electropneumatic Systems for Activating the Measuring Bolt

✓

Suited for 20 probes GT 22, 42 and 44 series or max. 10 probes GT 28 and 62.

230 V, 50 Hz

✓

Shipping packaging

✓

230 ± 10% V, switchable to 115 ± 10% V

Needed pressure: 1 to 7 bars

190 x 170 x 310 mm

3,5 kg

✓

Shipping packaging

Electropneumatic vacuum pump

For lifting up to 20 measuring bolts simultaneously with a measuring force up to 0,63 N

03260432	Operated via the mains powered foot switch
03260433	Externally controlled

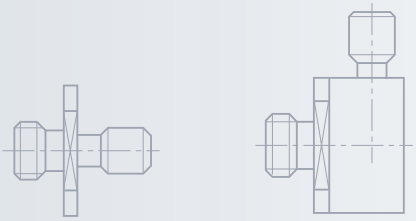


FMS-C electropneumatic vacuum pump

Uses vacuum or air pressure; allows simultaneous connection of up to 30 TESA probes.
Ideal for use with FMS probes with parallel guiding.

03260486	Controlled electrically through a TESA's electronic unit or manually

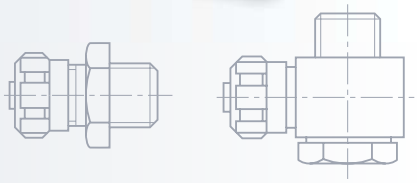




Air tube connectors for TESA probes GT 22, 271, 28, 42, 44, 611, 62 – GTL 211, 22

M4 coupling threads; suited for a 4,7 / 2 mm dia. air pipe (No. 03540405)

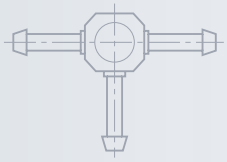
	Connector type
03560000	straight
03560002	angled



Air tube connectors for TESA FMS probes

M5 coupling threads; suited for a 4,7 / 2 mm dia. air pipe (No. 03540405)

	Connector type
026522	straight
024388	angled



Connecting T-piece

	For air pipe diameter
03540403	Ø 4,7 / Ø 2 mm (Nº 03540405)



Vacuum release delay valve

For controlling the lowering speed of axial probes

	For air pipe diameter
03540404	Ø 4,7 / Ø 2 mm (Nº 03540405)

TESATRONIC Length Measuring Instruments – General Overview

Dedicated compact units having either an analogue or a numerical display – Usually applied in association with precision handtools or on stationary devices for shop floor inspection and maintenance, but also in the measuring room.



TESATRONIC	TT 10	TT 20	TT 60	TT 80	TT 90	TTA 20
N°	04430008	04430009	04430010	04430011	04430012	04430003
Number of probe inputs	1	2	2	2	2	2
– Automatic recognition	—	●	●	●	●	—
Number of measuring ranges	3	7	7	9	9 / 6	6
– Lowest value	± 5 µm	± 5 µm	± 5 µm	± 0,5 µm	± 0,5 µm	± 3 µm
– Highest value	± 500 µm	± 5000 µm	± 5000 µm	± 5000 µm	± 5000 / ± 100 µm	± 1000 µm
– Zoom function (5x)	●	—	—	—	—	—
– Automatic conversion	●	●	●	●	●	—
Digital display	●	●	●	●	●	—
Numerical interval – lowest value	0,1 µm	0,1 µm	0,1 µm	0,01 µm	0,01 / 0,001 µm	—
– highest value	10 µm	0,1 µm	0,1 µm	0,01 µm	0,01 / 0,001 µm	—
Analogue display	●	●	●	●	●	●
Scale value – lowest value	0,1 µm	0,2 µm	0,2 µm	0,02 µm	0,02 µm	0,1 µm
– highest value	10 µm	200 µm	200 µm	200 µm	200 / 10 µm	50 µm
Metric/Inch unit systems	●	●	●	●	●	●
Value classification	—	●	●	●	● / –	●
– Number of classes		3	> 42	> 42	> 42 / –	3
– Signal outputs		●	●	●	● / –	●
Memory	—	—	●	●	●	—
Digital output	RS232	RS232	RS232	RS232	RS232	—
Analogue output	—	—	●	●	●	●
Power supply	Batteries	Adapter	Adapter	Adapter	Adapter	Mains

TESATRONIC TT 10

Pocket-sized, battery-operated electronic unit for use on the move – Perfect for your measurement tasks on the surface plate, in the inspection room right next to the production floor or directly on the machine – Provides full portability where there's no room for cumbersome power cable.

- Simple-to-use function keys used in conjunction with the combined analogue/digital indication providing easy reading.
- LCD, pointerless display for high repeatability and negligible hysteresis.
- 3 measuring ranges, switchable manually or automatically depending on the size of the measured value.
- Metric and inch conversion.
- Additional signal amplification (5x) for easy display setting.
- Quick zero-setting through to digital technology.
- Signal input for one probe.
- Opto-coupled RS 232 compatible digital output.





- ✓
- DIN 32876 Part 1
- 66 x 57 mm LC display
- 9 x 4,5 mm
- Response time of display ≤ 100 ms. Hold time ≥100 ms
- Zero drift* ≤ ± 0,005%/ °C. Frequency limit of display based on the signal input: 10 Hz
- Max. indication error*: 2%
- ± 1 numerical interval
- Opto-coupled RS 232 compatible output
- 3,5 V to 4,5 V, 3 batteries, type LRC 6, 1,5 V, AA. Power consumption: ≈ 7 mW/3,5 V
- Self-controlled voltage fluctuation.
- Drive voltage of the probe: 0,7 V
- Drive frequency: 13 ±0,65 kHz
- 0 °C to 60 °C
- –10 °C to 70 °C
- 80%, with no condensation
- IP42 (IEC 60529)
- EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2
- 95 x 170 x 68 mm (W x D x H)
- 490 g (incl. batteries)
- Shipping packaging
- Identification number
- Declaration of conformity

* With reference to 20°C as well as a relative humidity of ≤ 50%..

04430008	**TESATRONIC TT 10** Electronic measuring unit with both analogue and numerical display; 3 measuring ranges, switchable from metric to inch; 1 probe input; RS 232 data output.
Provided with following accessories:	
04768002	3 batteries, 1,5 V, type LRC 6, AA
04460007	1 Visual template for value classification

Measuring ranges with numerical intervals

	Zoom function	Used for	µm	µm	*in*	*in*
1	without 5x	measuring setting	± 500 ± 100	10 2	*± 0.025* *± 0.005*	*0.0005* *0.0001*
2	without 5x	measuring setting	± 50 ± 10	1 0,2	*± 0.0025* *± 0.0005*	*0.00005* *0.00001*
3	without	measuring	± 5	0,1	*± 0.00025*	*0.000005*

TESATRONIC TT 20, TT 60, TT 80 and TT 90

Feature most advanced technology – Provide functional reliability – Simple to use – Essential for shop floor inspection or in the measurement laboratory.

TESATRONIC TT 20

Includes a combined analogue/numerical display – Two probe inputs for single, sum or difference measurements.

- Large LC display for error-free reading.
- Better repeatability and negligible hysteresis as the analogue display has no mechanical pointer.
- Choice between pointer or bargraph.
- All measuring functions are readable on the LC display.
- 7 measuring ranges, selectable manually or automatically according to the size of the measured value.
- Direct conversion from metric to inch units.
- Zeroing with just one touch button for each measuring channel.
- Setting of tolerances over the keyboard.
- 3 quality classes displayed through LEDs with control signal outputs.
- Lockable display for step by step measurement routines.
- Automatic recognition of the connected TESA's probe with direct adaptation of the measurement signals to the right output (only for TESA probes made in 1997 or later).
- Opto-coupled RS 232 output, bidirectional.
- Power supply through mains adapter.



TESATRONIC TT 60

Same features as TESATRONIC TT 20, but with added functions that include:

- Memory for retaining extreme values «max.», «min.», «max.-min.» along with mean value obtained from «max.» minus «min.».
- Dynamic measurement with acquisition of more than 100 single values/s.
- Value classification with output signals through contact relay for 5, 10, 20 or 40 good classes.
- Remote signal processing using the analogue output.

TESATRONIC TT 20, TT 60, TT 80, TT 90
✓
DIN 32876 Part 1
126 x 62 mm LC display
110 mm scale length
50 scale divisions
2,2 mm
6-decade display plus minus sign
12,5 x 6,6 mm
Zero drift plus drift of the signal amplification*: ≤ ± 0,005%/°C. No drift for registered values.
± 1 numerical interval
RS232 opto-coupled output
6,5 Vdc up to 7,3 Vdc. Consumption: 2 W Self-controlled voltage fluctuation. Drive voltage of the probe: 3 V
0°C to 60°C
–10°C to 70°C
80%, non-condensing
Resistant plastic
Front face protected to IP54 (IEC 60529, DIN 40 050)
IEC/EN 61326-1 USA: CFR47, Part 15, Subpart B, Class B, Digital Device
255 x 235 x 120 mm (W x D x H)
1,1 kg

* With reference to 20°C as well as a relative humidity of ≤ 50%.

Shipping packaging

Identification number

Declaration of conformity

Additional data on TESATRONIC TT 20

Response time* of analogue display with pointer and digital display: ≤ 80 ms.

Holding time of digital display: 80 ms

Frequency limit for all displays with reference to the signal input: 12,5 Hz

Limit value* for analogue display: ≤ 2%.

Digital display and output: ≤ 0,3%

Dive frequency 13 ±0,65 kHz

Additional data on TESATRONIC TT 60

Response time* of analogue display with pointer and digital display: ≤ 80 ms.

Holding time of digital display: 80 ms.

Response time of analogue signal output with reference to the analogue display: ≤ 30 ms.

Response time of the LEDs used for value classification: ≤ 80 ms

Frequency limit for all displays with reference to the signal input: 12,5 Hz

Frequency limit with reference to the signal input: 20 Hz for the analogue output or 100 Hz for the memory

Limit value* for analogue display: ≤ 2%.

Digital display, analogue and digital outputs: ≤ 0,3%

Voltage range: ± 2 V up to ±10 V

* With reference to 20°C as well as a relative humidity of ≤ 50%.





04430009	**TESATRONIC TT 20** Electronic length measuring unit with both analogue and digital display; 7 measuring ranges, switchable from metric to inch; value classification with 1 good class; signal output through contact relay; 2 probe inputs; RS 232 data output.
04430010	**TESATRONIC TT 60** Same features as model TT 20, but with added memory; dynamic measuring and signal output through contact relay for 5, 10, 20 or 40 good classes; analogue output.

Delivery includes the following items:

04761054	1 Mains adapter, 100 to 240 Vac, 50 to 60 Hz, 6,6 Vdc, 750 mA
04761055	1 Adapter cable EU

Optional accessory

Adapter for 5, 10, 20 or 40 classes available on request



Measuring ranges along with scale divisions or numerical intervals (TESATRONIC TT 20 and TT 60)

µm	µm	µm	*in*	*in*	*in*
± 5000	0,1	200	*± 0.200*	*0.000005*	*0.01*
± 2000	0,1	100	*± 0.100*	*0.000005*	*0.005*
± 500	0,1	20	*± 0.02*	*0.000005*	*0.001*
± 200	0,1	10	*± 0.01*	*0.000005*	*0.0005*
± 50	0,1	2	*± 0.002*	*0.000005*	*0.0001*
± 20	0,1	1	*± 0.001*	*0.000005*	*0.00005*
± 5	0,1	0,2	*± 0.0002*	*0.000005*	*0.00001*

TESATRONIC TT 80 / TT 90

High resolution electronic units – Combined analogue/digital display – Two probe inputs for single, sum and difference measurements.

Both models have the same features as TESATRONIC TT 20 besides additional ones, i.e.:

- 9 measuring ranges with numerical interval to 0,01 µm or 0.000001 in.
- Memory for storing each extreme value «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.
- Value classification with output signals through contact relay for 5, 10, 20 or 40 good classes.
- Remote signal processing through the analogue output.

The specifications of the switchable TESATRONIC TT 90 are identical to those of the TT 80 model or the UPC mode, except for the following added features:

- 6 measuring ranges with numerical interval to 0,001 µm or 0.5 µin.
- Output for the control of the bolt retraction.
- Selectable waiting period for temperature stabilisation between the measurement cycles.
- RS data output for all values to the micron.





№	
04430011	**TESATRONIC TT 80** High-resolution electronic length measuring unit featuring a combined analogue/digital display. RS 232 interface with analogue output.
04430012	**TESATRONIC TT 90** Same as the TT 80 model, except for the specific UPC mode providing improved resolution and additional external controls.
Furnished with:	
04761054	1 Mains adapter, 100 to 240 Vac, 50 to 60 Hz, 6,6 Vdc, 750 mA
04761055	1 Mains adapter EU
Optional accessories	
	Adapter for 5, 10, 20 or 40 good classes available on request. Accessories for UPC applications, see page L-11.

Measuring ranges with scale divisions or numerical intervals

TT 80 / TT 90			*TT 90 switched to the UPC mode*		
µm / *in*	µm / *µin*	µm / *µin*	µm / *in*	µm / *µin*	µm / *in*
± 5000 /± *0.200*	0,01 / *1*	200 / *0.010*			
± 2000 / ± *0.100*	0,01 / *1*	100 / *0.005*			
± 500 / ± *0.020*	0,01 / *1*	20 / *0.001*			
± 200 / ± *0.010*	0,01 / *1*	10 / *0.0005*	± 100 / ± *0.005*	0,001 / *0.5*	10 / *0.0005*
± 50 / ± *0.002*	0,01 / *1*	2 / *0.0001*	± 50 / ± *0.002*	0,001 / *0.5*	2 / *0.0001*
± 20 / ± *0.001*	0,01 / *1*	1 / *0.00005*	± 20 / ± *0.001*	0,001 / *0.5*	1 / *0.00005*
± 5 / ± *0.0002*	0,01 / *1*	0,2 / *0.00001*	± 5 / ± *0.0002*	0,001 / *0.5*	0,2 / *0.00001*
± 2 / ± *0.0001*	0,01 / *1*	0,1 / *0.000005*	± 2 / ± *0.0001*	0,001 / *0.5*	0,1 / *0.000005*
± 0,5 / ± *0.00002*	0,01 / *1*	0,02 / *0.000001*	± 0,5 / ± *0.00002*	0,001 / *0.5*	0,02 / *0.000001*

Output current: ≤ 2 mA

Permissible adjustment load: ≥ 5 kΩ

Residual ripple (with probe at zero point): ≤ 1 mV

Reference voltage level: analogue earth 0 V

Drive frequency: 13 ±0,65 kHz

Additional data on the two TESATRONIC TT 80/TT 90

Response time of the analogue/digital display as well as the classification LEDs: ≤ 100 ms

Holding time of digital display: 100 ms

Response time of the signal of analogue output with reference to analogue display: ≤ 30 ms

Frequency limit for all types of display as well as the memory with reference to the signal input: 10 Hz

Limit values*: 2% for analogue display

0,15% for digital display

0,3% for analogue output

0,15% for digital output

Voltage range: ±2 V to ±10 V

Output current: ≤ 2 mA

Permissible adjustment load: ≥ 5 kΩ

Residual ripple (with probe at zero point): ≤ 1 mV

Reference voltage level: analogue earth 0 V

Drive frequency: 13 kHz ±0,5%

* With reference to 20°C as well as a relative humidity of ≤ 50%.

TESATRONIC TTA 20

Compact design with analogue indication and value classification facility – Aluminium housing for harsh shop floor environment – Easy Handling.

- Easy-to-read analogue display with mirror strip in order to avoid parallax error.
- 6 measuring ranges.
- Metric/Inch conversion.
- Easy display setting through electrical zero.
- 2 probe inputs for single, sum or difference measurements.
- 1 auxiliary signal input, e.g. for all correction values.
- LEDs for signalling the relevant quality class with green for «Good», yellow for «Rework» and red for «Scrap».
- Potentiometer for setting limit deviations.
- Polarity selector switch for the classification signals (internal or external dimensions).
- Switch for locking or unlocking a displayed value.
- Analogue output for the connection of a remote displaying or scribing unit.



✓

DIN 32876 Part 1

≈ 100 mm scale length

Response time: ≤ 1 s (display), 20 ms (analogue output), 10 ms (output signal of classification)

Zero drift* ≤ ± 0,005%/°C
Frequency limit*: 1 Hz (display) 50 Hz (analogue output) 30 Hz (value classification)

Limit value*: 1,5% (display), 0,3% (analogue output).

Negligible for display or 5% for classification signals).

Voltage: ± 1V, output current ≤ 3 mA, perm. adjustment load ≥ 2 kΩ.

Residual ripple (at zero): ≤ 1 mV.

Reference voltage level: analogue earth (0 V)

230 or 115 V –10% to 20%, 50 to 60 Hz

Power consumption: ≤ 20 VA

Drive voltage of probe: 1,5 Veff –10% to 5%

Drive frequency: 13 ± 0,65 kHz

0°C to 50°C

–10°C to 70°C

IP40 (IEC 60529)

EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2

258 x 190 x 158 mm (W x D x H)

3,4 kg

Shipping packaging

Identification number

Declaration of conformity

* With reference to 20°C as well as a relative humidity of ≤ 50%.

04430003	**TESATRONIC TTA 20** Electronic length measuring unit with analogue display; 6 measuring ranges; switchable from metric to inch; value classification with 1 good class; signal output through contact relay; 2 probe inputs.

Supplied with either of the following cables depending on the country where goods are to be delivered (must be specified on ordering):

03160015	Mains cable fitted with SEV connector, 3-wire cable type, 2 m long
03160016	Mains cable fitted with VDE connector, 3-wire cable type, 2 m long
03160017	Mains cable without connector, 3-wire cable type, 2 m long

Optional accessory

04460004	15-pin connector for the analogue output and classification signal

Measuring ranges and scale divisions

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*

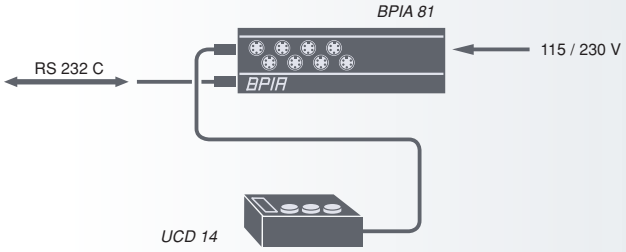
TESA Probe Interface Boxes

Modular system that consists of three basic models acting as probe interfaces for the preparation and further transmission of the measurement signals to a computer, whether in their digital or analogue form – All models are key components for multigauging fixtures applied in centralised process control.

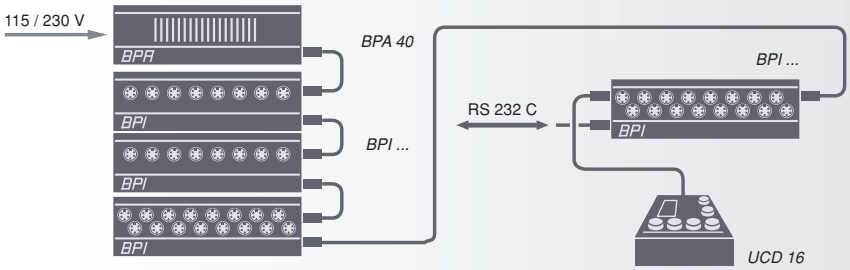
BPI Series

Signal inputs – TESA standard probes (half-bridge)
Signal outputs – RS 232 digital outputs

- Direct connection to the computer's serial port.
- Programmable operating functions over the integrated microprocessor.
- Possible connection of up to 64 probes for optimum adaptation to your metrology applications.
- High functional reliability and precision.
- Total immunity to negative environmental effects, e.g. electrical interferences, liquid and solid contaminants.







№		Number of probe inputs	Number of control inputs/outputs	Integrated power supply
05030004	**BPIA 81** Probe interface box	8	6/8	●
05030002	**BPI 161** Probe interface box	16	6/8	—
05030003	**BPI 88** Probe interface box with quick signal processing in both static and dynamic measuring	8*	6/8	—
05031000	**BPA 40** Power unit for 1 up to 4 interfaces BPI 161 and BPI 88			

* Each measurement signal includes a demodulator.

✓
RS232
2 mm, 0,2 mm
1 µm, 0,1 µm
± 0,3% with reference to each measuring span
7 ms per probe or 0,2 ms per probe for BPI 88
Housing cases in anodized aluminium except for stackable BPIA 81
0 °C to 40 °C
–10 °C to 70 °C
95%, non-condensing
IP51 (IEC 60529)
EN 50081-1 EN 50082-2
Shipping packaging
Identification number
Declaration of conformity

	Number of inputs/ outputs	Power supply	mm	kg
BPIA 81	6 / 8	220 ÷ 240 Vac, 100 ÷ 120 Vac, 50 ÷ 60 Hz, 25 VA	94 x 322 x 134	2,5
BPI 161	6 / 8	Via BPA 40	94 x 322 x 134	2,1
BPI 88	6 / 8	Via BPA 40	94 x 322 x 134	2,1
BPA 40		115 ÷ 230 Vac ± 20%, 50 ÷ 60 Hz, 140 VA	94 x 322 x 134	2,4

Accessories for BPI series

04866009	**BSF 10**	Stacking set for BPI 88 and BPI 161 interface boxes
05061001	**BSF 20**	Stacking set for both BPA 40 and BPIA 81 power units

		mm	Number of pins
	Connecting cables		
05060007	BPI – BPI	0,3	
05060008		2	
05060003	BPI – PC	2	25 / 9
05060002		5	25 / 9

USB Interface

Allows for a quick and easy connection to any TESA's standard probe to a USB port.

Signal inputs – TESA standard probes (Half-bridge)
Signal outputs – digital



No					Zero drift
03260500	USB-Adapter	± 2 mm	73,75	0,3% ± 0,1 µm*	± 0,01%/°C*
03260501	USB-Adapter	± 5 mm	29,5	0,3% ± 0,1 µm*	± 0,01%/°C*

* With reference to the temperature of 20°C and relative humidity of ≤ 50%.

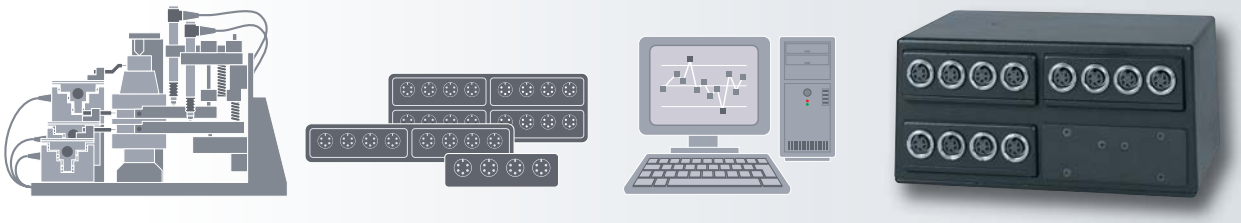
Note: Total deviation must include that of both the standard probe and adapter.

✓
DIN 32876 Part 1
See table
Any position of use
Distance between both stops and electrical zero can not be set.
Cable length: 1,2 m.
0,1 µm
USB 2.0 RS232, virtual
2 Veff 13 kHz ± 0,5%
20 ± 0,5°C
–10°C to 40°C
80%
IP51 (IEC 60529)
Shipping packaging
Identification number

M4P-2 series

Signal inputs – TESA standard probes (Half-bridge)
Signal outputs – analogue

- System for connecting 32 TESA standard probes
- Can be linked to a PC through the A/D transducer



No			mm	kg
S48001721	**M4P-2**	Probe interface • 4 probe inputs with a demodulator included • Sensitivity: 73,75 mV/V/mm • Analogue outputs: ± 1 V/mm, ± 2,5 V/mm, ± 5 V/mm and ± 10 V/mm	36 x 100 x 120	0,6
S48001722	**R2M-1**	Rack housing including 2 M4P-2 probe interfaces • 2 x 4 = 8 probe inputs	55 x 212 x 144	0,9
S48001723	**R4M-1**	Rack housing including 4 M4P-2 probe interfaces • 4 x 4 = 16 probe inputs	160 x 212 x 144	1,2
S48001724	**MA4-2**	Power unit • 230 ± 10% Vac, 50 Hz • Output voltage: ± 15 V for 32 probes	85 x 222 x 146	1,1
S48001731	**MA4-2**	Power unit • 110 ± 10% Vac, 60 Hz • Output voltage: ± 15 V for 32 probes	85 x 222 x 146	1,1
Accessories				
S48001725	**CB37-1**	Connection cable to host computer, 2 m long. Provided with two connectors, 37-pin male/female		

✓
±0,5% with reference to the measuring span
≤ ±100 ppm/°C, stability at zero = ≤ ±0,2 µm/°C
±10 to ±15 Vdc, 60 mA
15°C to 40°C
–10°C to 70°C
30 to 80% (non-condensing)
IP50 (IEC 60529)
Shipping packaging

TESATRONIC TT90
Electronic unit

✓

Technical data and details: see page O-46

Calibration devices

Designed for calibrating and setting TESA length measuring equipment fitted with standard TESA inductive probes (half-bridge).

Calibration of TESA inductive probes

The regular system consists of the following components:

- 1 TESATRONIC TT90 length measuring instrument (N° 04430012).
- 1 Set of calibration probes No. S41077249 with nominal values of ±0 µm, ±100 µm and ±1000 µm.
- 1 Measuring support such as INTERAPID UP 160 (No. 01639041) equipped with the UPZ 40 measuring table (No. 01640405).
- 1 Set of gauge blocks, accurate to calibration grade K (see section K).
- 1 Precision digital voltmeter, min. 5 ½ digits.

N°	
04430012	TESATRONIC TT90 length measuring instrument (see page O-46)

Calibration probes

✓

73,75 mV/V/mm dummy probes (half-bridge).
Suited for equipment having the following features:
Frequency to 13 ± 0,65 kHz.
Voltage 3 ±0,015 Veff (2 symmetrical voltages of 1,5 Veff).
Impedance:
≤ 0,2 Ω (output) or 2000 Ω, (input).

Input impedance 970 ± 50 Ω (13 kHz) or 2150 ± 50 Ω (standard 0 µm)

Phase at 13 kHz: 71 ± 2°.

Input resistance: 100 ±5 Ω.

Output impedance at 13 kHz: 1000 ± 2 Ω.

Phase at 13 kHz: 0,2°

±3 ppm/°C.
Ageing: ± 30 ppm/a

20 ± 0,5°C, stabilisation time = 8 h

10°C to 35°C

–10°C to 70°C

Calibration: 40% to 60%.
Operating: 20% to 80%.
Storage: 5% to 95%.
Non-condensing.

18 mm dia., 118 mm long

≈ 45 g

IP40 (IEC 60529)

Inspection report

Calibration of measuring instruments

Calibration probes available as single or in sets

N°	µm	Marked with
S41078077	± 0	03270700
S41078079	± 3	03270704
S41078228	± 100	03270701
S41078230	± 190	03270717
S41078087	± 300	03270707
S41078332	± 500	03270716
S41078751	± 1000	03270702
S41078752	± 1900	03270719

N°	µm	µm	µm
Set of 3 calibrating standards			
S41077249	± 0	± 100	± 1000
Set for calibrating TESATRONIC			
S41078654	± 190	± 1900	

Calibration Probes

Also called «Dummy Probes», these probes serve as resistance dividers producing a given length dimension, electrically simulated with high accuracy.

The whole system provides both positive and negative values. All those given in the table are matching nominal values.

These products, which have been adequately calibrated, come with an inspection report that shows the values (actual values) as measured during calibration with related uncertainty of measurement.

Their connection to the instrument replaces that of a regular probe.
Calibration and setting operations, if needed, are subject to a number of criteria that must be respected.
For a further information with regard to this, refer to the instruction manual or ask for our specialists.

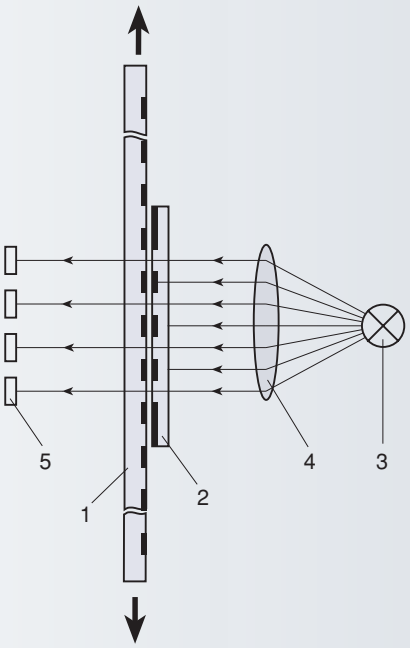


The way they work

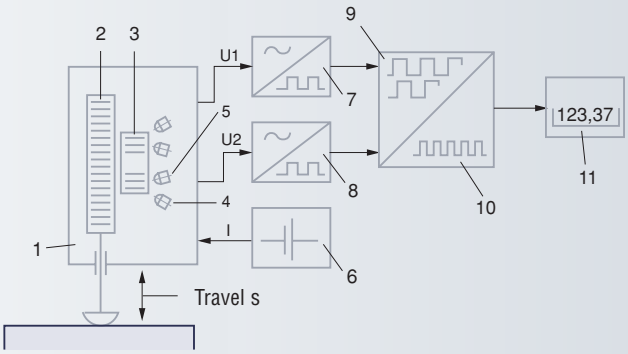
All electronic length measuring systems shown in this part of our catalogue work on the basis of value sensors in the form of digital probes with axial displacement. These probes generate the digital capture of measured physical quantities (i.e. measurands), which are changing as the incremental linear scale lying in front of the scanning unit and fitted with a reticle is moved. Divisions on both features are identical. The opto-electronic detection of these changes uses transmitted light.

Optical material measures are made up of quality glass gratings with a number of divisions distributed over the entire length. These divisions consist alternately of lines and blanks, which represent each individual increment. The distance from line to line or blank to blank is the dividing period, e.g. 20 µm or 40 µm.

As the gratings of both the scale and reticule are moved in relation to one another, the opaque divisions on the scanning reticle are covered alternately by the lines and blanks on the linear scale, which serves as material measure. This provides a bright/dark information, which is then converted into electrical signals. After their analogue/digital conversion, these signals are shown on the computing counter as the sum of counting impulses equal to the amount of changes of the measured quantity. So as to increase the resolution that results from the dividing periods, the probe signals are split by the electronics (interpolation).

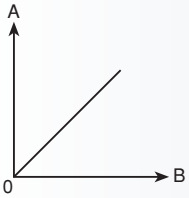


1 Incremental linear scale (material measure) associated with the measuring bolt
2 Divided scanning unit
3 Light source
4 Condenser
5 Photodiode



1 Probe housing
2 Linear scale divided into increments
3 Divided reticle
4 Light source
5 Photodiodes
6 Power supply
7 Conversion of U1 signal
8 Conversion of U2 signal
9 Signal scanning
10 Multiple evaluation of the signal (interpolation) plus direction discrimator
11 Numerical display





Typical linearity where digital capture of the measurands is based on incremental linear scales.
A Counting impulses
B Travel

TG Computing Counter

✓

DIN 32876 Part 2

Up/down counter with one probe input

LC display with illuminated colour background for value classification with green, amber and red.

37 x 37 mm display size. 6 decades plus minus sign

0,001 mm and 0,0005 mm or 0.00001 in.

For probes from another maker with dividing periods of 10 µm = 0,0002 instead of 0,0005 mm or of 2 µm = 0,0001 instead of 0,0005 mm

9 x 4,5 mm

According to chosen tolerance range

40 mm scale length

25

20 keys available for entering values and selecting functions. Power supply 5 Vdc (measuring system).

Output: ±5 ±1% Vdc depending on selected tolerance range.

Max. excess voltage: 25% in relation to ±5 Vdc

Output impedance: < 100 Ω

Resolution: 12 bits

RS232, bidirectional

Power supply: 7 Vdc. Power consumption: 0,3 A

10 °C to 40 °C

–10 °C to 50 °C

80%

IP40 (IEC 60529)

Continued on next page

TESA TG Digital Measuring System

Ideal for long measuring travels – Incremental probes with a 30 or 60 mm measuring span – Numerical display to 0,001 or 0,0005 mm – Analogue display with illuminated colour background for value classification – Value storage – PRESET function – To name just a few.



TESA TG - C10 Computing Counter

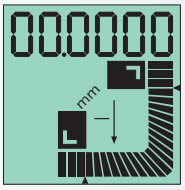


№	
04630004	**TESA TG - C10 computing counter** Up/down computing counter with numerical display*, resolution to 0,001 and 0,0005 mm or 0.00001 in. Features 1 probe input. Also with value classification and value storage capabilities. RS232 data output.
04630009	**TESA TG - C10 computing counter (HEIDENHAIN)** Same execution as above, but compatible with HEIDENHAIN probe MT-1201/2501 only*.

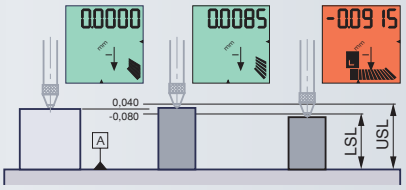
Each unit is supplied with the following accessories:

04761054	1 mains adapter 100 to 240 Vac, 50 to 60 Hz, 6,6 Vdc, 750 mA
04761055	1 EU adapter cable

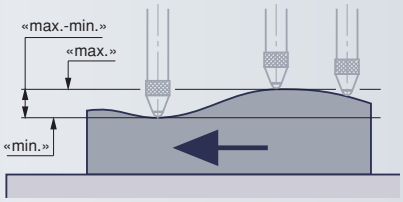
* Compatible with equivalent HEIDENHAIN probes with same connector shape and signal.

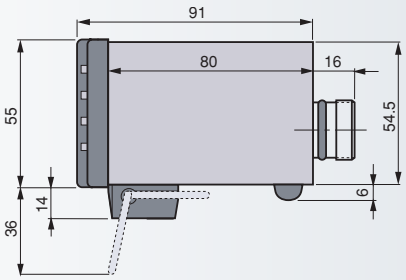


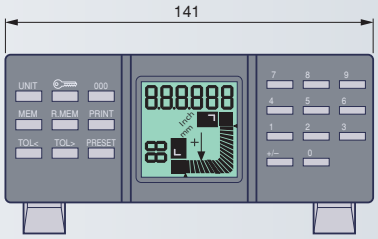
Input of the lower and upper specification limits (LSL and USL)



Digital capture of both extreme values «max.» and «min.» along with the difference between «max.-min.» in dynamic measurement







EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2

TG - C10: ≈ 650 g

Shipping packaging

Identification number

Declaration of conformity



TESA TG 30 and TG 60 Digital Probes

	Digital Probes* Axial probes with incremental glass scale
04630006	**TESA TG 30** 30 mm measuring span
04630007	**TESA TG 60** 60 mm measuring span

Each probe is supplied with the following item:

01960005	1 Retract lever for the measuring bolt

* Compatible with equivalent HEIDENHAIN probes with same connector shape and signal.

TG probes

✓

DIN 32876 Part 2

Axial probe usable in any position. Measuring bolt guided on a plain bearing.

Probe insert with M2,5 mounting thread.

Measuring bolt retraction:
- mechanical retraction, see under standard accessories
- pneumatic retraction, see table

4,3 mm dia. x 3 m cable. Max. cable extension 10 m.

Incremental glass scale

0,002%/°C

10°C to 40°C

–10°C to 50°C

80%, non-condensing

IP54* (IEC 60529) *probe housing only

5 ± 10% Vdc

Output signal ± 11 µApp, sinusoidal

Shipping packaging

Identification number

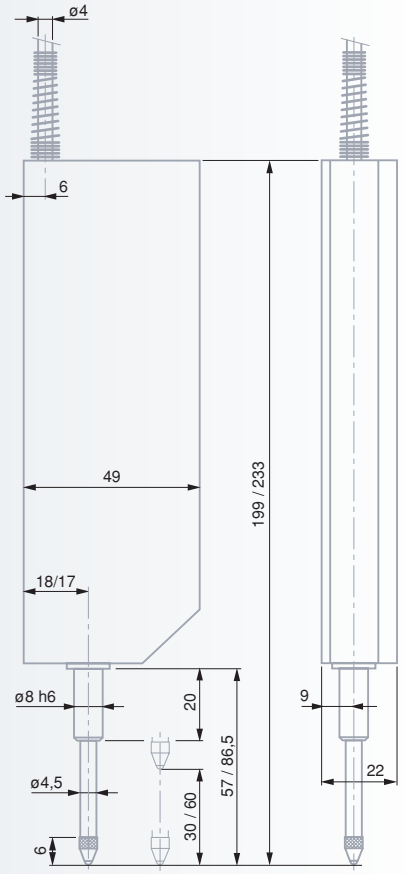
Inspection report

Declaration of conformity

TESA electronic probes		TG 30	TG 60
	mm	30	60
	mm	30,4	60,4
Dividing and signal periods	µm	20	40
	µm	1,0	2,0
	µm	1,0	1,0
	µm	1,0	1,0
Close to			
– lower stop of the measuring bolt*	N N	0,85 ± 0,15	0,90 ± 0,20
– upper stop of the measuring bolt*	N N	1,10 ± 0,20	1,45 ± 0,25
Force hysteresis*	N	0,1	0,15
Max. transverse force	N	2,0	2,0
Pneumatic retraction of the measuring bolt by vacuum or air pressure			
Position of use			**
– vertical	bar	0,55 ÷ 0,70	0,60 ÷ 0,75
– horizontal	bar	0,42 ÷ 0,57	0,52 ÷ 0,67
– vertical (in suspension)	bar	0,30 ÷ 0,45	0,45 ÷ 0,60
	m/s	1,4	2,0
	g	350	365
Moved mass	g	28	27

* Applicable with the probe used in vertical position with downward oriented measuring bolt, as well as in static measuring.

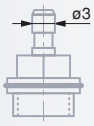
** TG 60 cannot be used with compressed air.



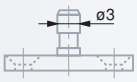


Optional accessories

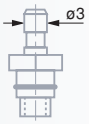
	Connectors for lifting the measuring bolt by vacuum
01960009	Suitable for TESA TG 30 (No. 04630006)
01960008	Suitable for TESA TG 60 (No. 04630007)
	Connector for lifting the measuring bolt by air pressure
01960010	Suitable for TESA TG 30 (No. 04630006)



01960009



01960008



01960010

Optical Measurement



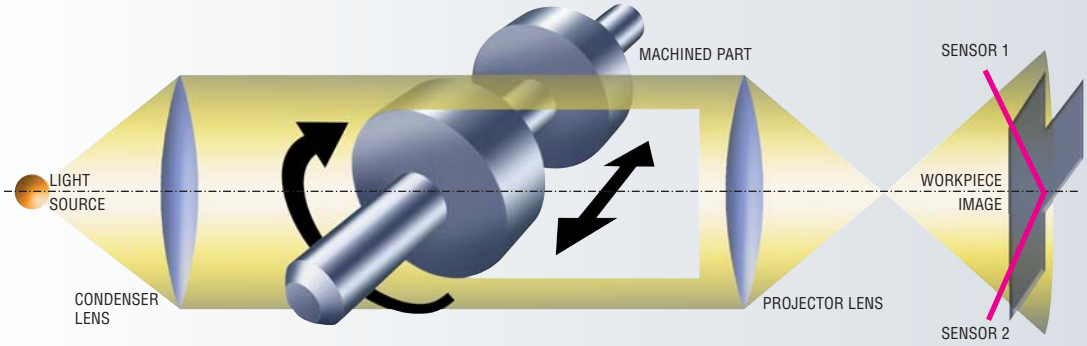
FAST ROUND PART INSPECTION

The whole TESA-SCAN family offers a complete solution for round part inspection. Various systems such as those used on profile projectors or measuring microscopes have been integrated into a single unit. This range of TESA's products are designed to measure round parts with diameters from 0,25 up to 52 mm and can be as long as 500 mm.



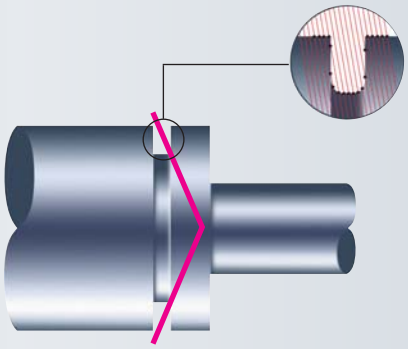
Operating Principle

All TESA-SCAN incorporate high-resolution CCD linear sensors that combine lines of 14 000 pixels (equivalent to a 200 megapixels CCD camera). As the part profile is projected, these sensors, which are capable to detect the slightest changes at pixel level, act as a light sensitive ruler.
The part is scanned using a parallel green light. The part image is then projected onto the linear sensors, which get all needed information for analysis of the part geometry.



2D Measurement

The part profile is obtained from a scanning method applied along the part axis. Both diameter and length of the part are measured simultaneously, thus producing a 2D video image.
One of the main characteristics of the TESA's concept lies in the slanted position of the linear sensors. With an angle to 7,5° against the part axis, these sensors ensure a precise data capture when inspecting diameters, angles, radii and other geometric part features with parallel or slopped surfaces.



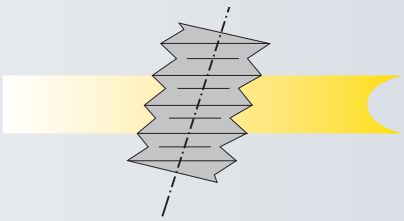
Dynamic Measurement

Rotation during the inspection process allows for a peripheral examination of the part geometry and contour, each being captured at high speed and high accuracy.



Thread Measurement

External threads are an important feature of round parts, and their measurement is an intensive labour operation. A true thread profile can be obtained from any TESA-SCAN.



TESA-SCAN 52 REFLEX-Click

This model includes the ultimate power of all TESA-SCAN machines, offering high technological performances combined with unmatched ease of use and exceptional price/quality relationship.

Thanks to the added functionality for automatic recognition of the parts to be measured, the REFLEX-Click mode allows them to be quickly and reliably inspected with a single click. The colour coded classification of the measured values enables the analysis of the measurement results at a glance, rendering part inspection especially easy to execute.

Another unique function available in the REFLEX-Click mode is the ability to measure lengths and diameters speedily, making the machine ideally suited for use on the shop floor.

- ✓
- H x L x D 840 x 1000 x 435 mm or 33 x 39,5 x 17 in
- 0,5 s for lengths and diameters
- Performances: see page P-4
- 24 VDC
- 10 to 40 °C
- < 80%
- ✓
- 103 kg
- Max. workpiece size (D x L): 100 x 300 mm. Max. workpiece weight: 4 kg.
- < 70 dB (A)
- Shipping packaging
- Inspection report with a declaration of conformity



	D	L	*D*	*L*
	0,5 ÷ 52 mm	300 mm	*0,02 ÷ 2.0 in*	*11.8 in*
	0,0001 mm	0,0005 mm	*0.000004 in*	*0.00002 in*
20°C ±1°C	(2 + D/100) µm (D in mm)	(5 + L/100) µm (L in mm)	*(0.08 + D/100) / 1000 in (D in in)*	*(0.2 + L/100) / 1000 in (L in in)*
2 σ	1 µm	2,5 µm	*0.00004 in*	*0.0001 in*

Performances are based on the results obtained from clean, ground components measured at 20°C. They may be affected by the component shape and surface finish.

№	
02430090	**TESA-SCAN 52 REFLEX-Click** (Ø 52 x 300 mm). Measuring machine including 2 male centres TL02-0001. Supplied with PC, mouse, US keyboard, **Windows XP Multilingual** operating system, 20-inch TFT monitor.
02430091	**TESA-SCAN 52 REFLEX-Click** with rotary headstock

TESA-REFLEX Scan Software

The TESA-REFLEX family has expanded through the addition of the Scan version provided with intuitive graphical interface. The use of the Composer mode allows complex measurements of geometrical part features such as those listed below to be carried out in a simple way.

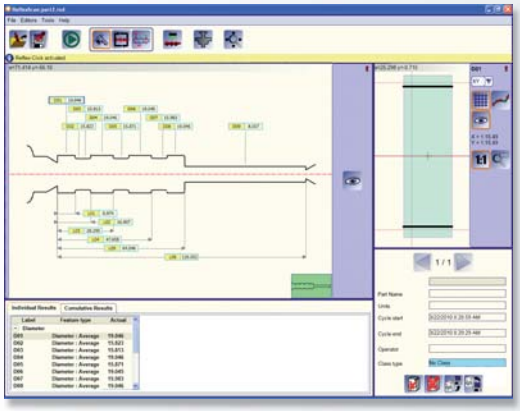
- Diameters
- Lengths
- Radii
- Angles
- Chamfers
- Threads

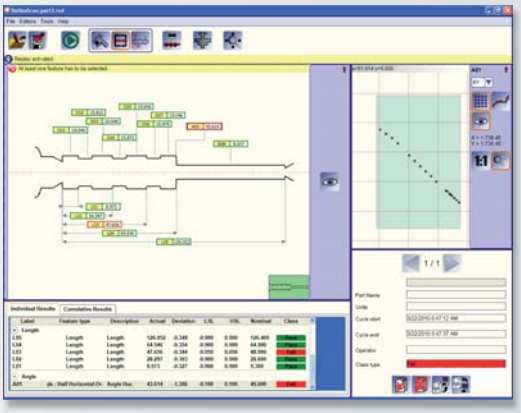
Equipped with a rotation axis available as an option, this machine will let you inspect additional features such as:

- Runout
- Coaxiality
- Across-flats

Key Features

- Automatic measurement of lengths and diameters using the REFLEX-Click function.
- Automatic recognition of the parts being measured or the programmes used.
- Intelligent detection of the relevant measurement zones.
- Management of the operator and programming modes.
- Value storage.
- Dynamic displaying of the measurement results.
- Flexible reporting.





✓

TESA-SCAN 25: H800 x L640 x P500 mm, H32 x L25 x P20 in
TESA-SCAN 50: H1055 x L800 x P580 mm, H41 x L32 x P23 in

Diameter : 0,5 s
Length : 0,5 s

Performances: see page P-8

100/110-220/240 VAC 50/60 Hz

10 to 35 °C 50 to 95 °F

< 80%

✓

TESA-SCAN 25: 67 kg, 148 lbs
TESA-SCAN 50: 130 kg, 290 lbs

Max. workpiece size (D x L): 59 x 270 mm; 100 x 290 mm.
Max. workpiece weight: 2 kg; 4 kg.

< 70 dB (A)

Shipping packaging

Inspection report with a declaration of conformity

Performances are based on the results obtained from clean, ground components measured at 20 °C. They may be affected by the component shape and surface finish.

For information on Pro-Measure, see page P-9.

TESA-SCAN 25

TESA-SCAN 50



Technical Data

TESA-SCAN 25	D	L	*D*	*L*
	0,25 ÷ 25 mm	200 mm	*0,01 ÷ 1.0 in*	*8.0 in*
	0,0001 mm	0,001 mm	*0.000004 in*	*0.00004 in*
20°C ±1°C	(1,5 + D/100) µm (D in mm)	(5 + L/100) µm (L in mm)	*(0.06 + D/100)/ 1000 in (D in in)*	*(0.2 + D/100)/ 1000 in (L in in)*
2 σ	1 µm	2,5 µm	*0.00004 in*	*0.0001 in*

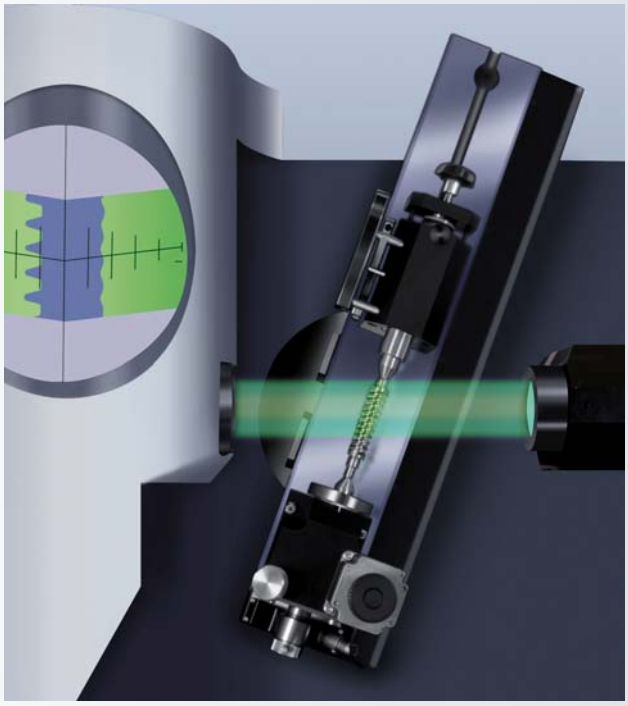
TESA-SCAN 50	D	L	*D*	*L*
	0,5 ÷ 50 mm	275 mm	*0,02 ÷ 1.96 in*	*10.8 in*
	0,0001 mm	0,001 mm	*0.000004 in*	*0.00004 in*
20°C±1°C	(2 + D/100) µm (D in mm)	(5 + L/100) µm (L in mm)	*(0.08 + D/100)/ 1000 in (D in in)*	*(0.2 + D/100)/ 1000 in (L in in)*
2 σ	1 µm	2,5 µm	*0.00004 in*	*0.0001 in*

02430000	**TESA-SCAN 25** (Ø 25 x 200 mm). Measuring machine with part rotation, including 1 rotary headstock, 1 tailstock, 2 male centres TL02-0001. Supplied with PC, mouse, **Windows XP Multilingual** operating system, 20-inch TFT monitor, US keyboard, Pro-Measure software with User's manual E-F-D on a CD (order No. 02460011).
02430010	**TESA-SCAN 50** (Ø 50 x 275 mm). Measuring machine with part rotation, main part including 1 rotary headstock, 1 tailstock, 2 male centres TL02-0002. Supplied with PC, mouse, **Windows XP Multilingual** operating system, 20-inch TFT monitor, US keyboard, Pro-Measure software with User's manual E-F-D on a CD (order No. 02460011).

TESA-SCAN 50 CE Plus

Measuring capacity: D = 50 mm, L = 275 mm

Equipped with slewing mechanism for thread measurement through advanced functions (slide tilted through 30°) .



✓

H1055 x L800 x P580 mm
H41 x L32 x P23 in

Diameter : 0,5 s
Length : 0,5 s

Performances: see page P-8

100/110-220/240 VAC 50/60 Hz

10 to 35 °C
50 to 95 °F

< 80%

✓

140 kg, 310 lbs

Max. workpiece size (D x L): 100 x 290 mm.
Max. workpiece weight: 4 kg.

< 70 dB (A)

Shipping packaging

Inspection report with a declaration of conformity

Technical Data

		D	L	*D*	*L*
		0.5 ÷ 50 mm	275 mm	*0,02 ÷ 1.96 in*	*10.8 in*
	Tilting for thread measurement	max. 30°			
		0,0001 mm	0,001 mm	*0.000004 in*	*0.00004 in*
	20°C ±1°C	(2 + D/100) µm (D in mm)	(5 + L/100) µm (L in mm)	*(0.08 + D/100)/ 1000 in (D in in)*	*(0.2 + D/100)/ 1000 in (L in in)*
	2 σ	1 µm	2,5 µm	*0.00004 in*	*0.0001 in*

Performances are based on the results obtained from clean, ground components measured at 20 °C. They may be affected by the component shape and surface finish.

N°	
02430030	**TESA-SCAN 50 CE Plus** (Ø 50 x 275 mm). Measuring machine with part rotation and slewing mechanism for thread measurement. Main part including 1 rotary headstock, 1 tailstock, 2 male centres TL02-0002. Supplied with PC, mouse, **Windows XP Multilingual** operating system, 20-inch TFT monitor, US keyboard, Pro-Measure software with User's manual E-F-D on a CD (order No. 02460011).

For information on Pro-Measure, see page P-9.

TESA-SCAN 50 Plus

Measuring volume: D = 50 mm, L = 500 mm

Equipped with a slewing mechanism acting on the slide for thread measurement through advanced functions.



✓

H1455 x L800 x P580 mm
H57 x L32 x P23 in

Diameter : 0,5 s
Length : 0,5 s

Performances: see page P-8

100/110-220/240 VAC 50/60 Hz

10 to 35 °C
50 to 95 °F

10 to 80%

✓

180 kg, 398 lbs

Max. workpiece size (D x L): 100 x 515 mm.
Max. workpiece weight: 6 kg

< 70 dB (A)

Shipping packaging

Inspection report with a declaration of conformity

Technical Data

	D	L	*D*	*L*
	0,5 ÷ 50 mm	500 mm	*0,02 ÷ 1.96 in*	*19.7 in*
Tilting for thread measurement	max. 15°			
	0,0001 mm	0,001 mm	*0.000004 in*	*0.00004 in*
20°C ±1°C	(2 + D/100) µm (D in mm)	(5 + L/100) µm (L in mm)	*(0.08 + D/100)/ 1000 in (D in in)*	*(0.2 + D/100)/ 1000 in (L in in)*
2 σ	1 µm	2,5 µm	*0.00004 in*	*0.0001 in*

Performances are based on the results obtained from clean, ground components measured at 20 °C. They may be affected by the component shape and surface finish.

02430040	**TESA-SCAN 50 Plus** (Ø 50 x 500 mm). Measuring machine with part rotation and slewing mechanism for thread measurement. Main part including 1 rotary headstock, 1 tailstock, 2 male centres TL02-0002. Supplied with PC, mouse, **Windows XP Multilingual** operating system, 20-inch TFT monitor, US keyboard, Pro-Measure software with User's manual E-F-D on a CD (order No. 02460011).

For information on Pro-Measure, see page P-9.

Performances

(Valid for the TESA-SCAN 25 or TESA-SCAN 50 product range)

Static measurement

Diameters, lengths, intersection points, gauge diameters, radii, angles etc.
Two-axes workpiece alignment – Creating a workpiece axis based on two datum diameters.

Dynamic measurement

Concentricity – Parallel or interrupted diameters, tapers, parallel thread profiles or on maxi form.
Runout – Plain or interrupted diameters.
Diameters with rotation, ovality, max, min and average diameters of plain or interrupted diameters.
Hexagon – Across-flats, symmetry of flats to axis, max. dimension across corners.
Section analysis with rotation – Longest and shortest section of radii, angular location.
Three-axes workpiece alignment – Creating a workpiece axis with reference to plain diameters or thread lengths.

Thread measurement – With no mechanical slewing – Main Features (TESA-SCAN 25 or TESA-SCAN 50)

- *Parallel, vee-shaped threads*
  - *Major diameter*
  - *Flank diameter*
  - *Flank angle*
  - *Pitch*
- *Taper threads*
  - *Pitch*
  - *Flank angle*
  - *Included taper angle*
  - *Gauge length*
  - *Usable thread length*
  - *Pitch diameter*
  - *Major diameter*
  - *Conicity on diameter*

Thread and worm thread measurement – With mechanical slewing – Main Features (TESA-SCAN 50 CE plus or TESA-SCAN 50 plus)

- *Parallel threads*
  - *Major diameter*
  - *Flank diameter*
  - *Pitch*
  - *Minor diameter*
  - *Flank angle*
  - *Root radius*
  - *Crest radius*
  - *Circularity*
  - *Lead error*
- *Taper threads*
  - *Pitch diameter*
  - *Major diameter*
  - *Minor diameter*
  - *Taper*
  - *Crest diameter*
- *Double-threads, parallel*
  - *Major and minor diameters*
  - *Half pitch*
  - *Flank angle*
  - *Crest radius*
  - *Root radius*
- *Worm threads (on request)*
  - *Pitch*
  - *Major and minor diameters*
  - *Over Wire diameter*
  - *Tooth thickness*
  - *Pressure angle*
  - *Addendum*
  - *Dedendum*
  - *Thread depth*
  - *Runout*
- *Ball screws (on request)*
  - *Pitch*
  - *Lead error*
  - *Over wire diameter*

Pro-Measure Software

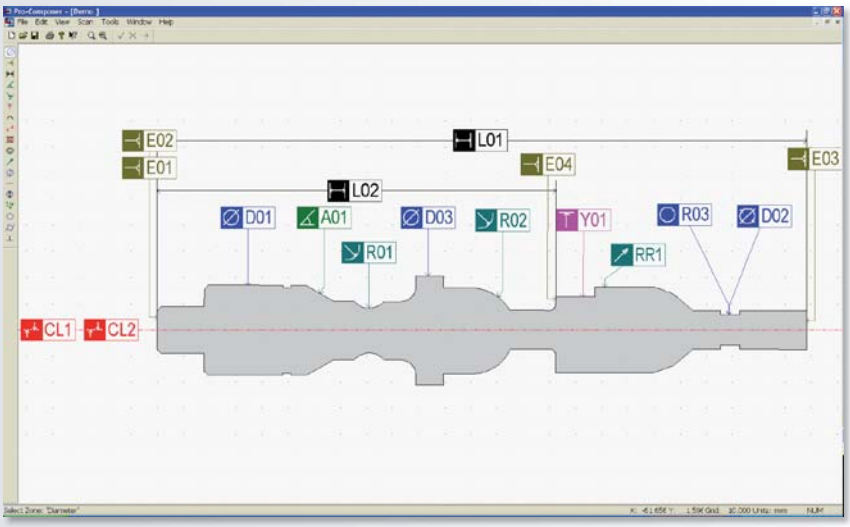
Complex metrology-based applications involving form and shape measurement are easily performed due to a flexible programming.

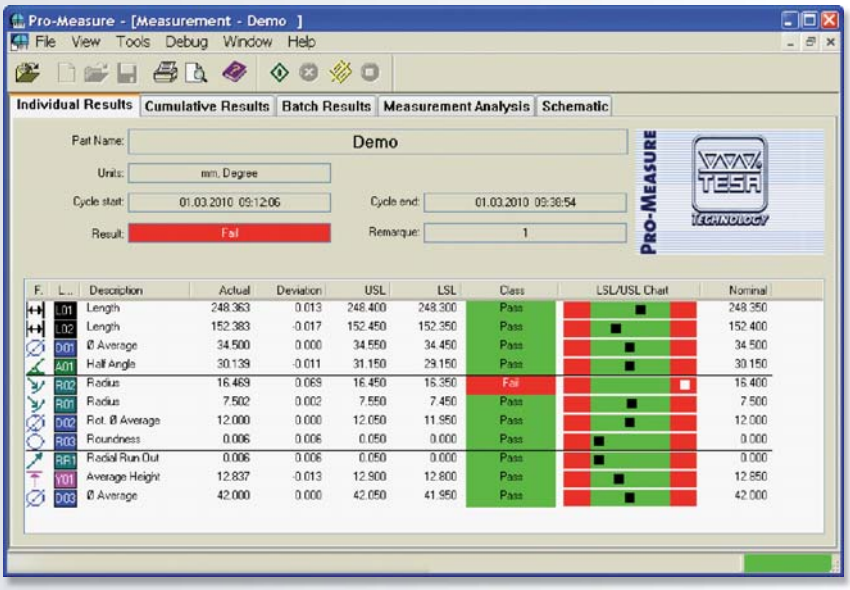
Pro-Measure enables a visual comparison of the true form as captured. This function makes the analysis of any existing manufacturing problems easier. It also provides the operator with the needed assistance when creating part programs. This simple software tool can either be installed directly on the PC coupled with the machine or networked to a workstation enabling a part program to be prepared off-line.

Pro-Measure uses the graphic representation of the part profile, created by scanning the part or importing the required geometry from a CAD file. A library of icons, each representing a geometric function, guides the user throughout the part programming sequence. Tolerance and setting values for cylindrical parts or threads can be retrieved from a database of international standards in order to be entered, accordingly.

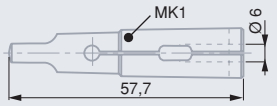
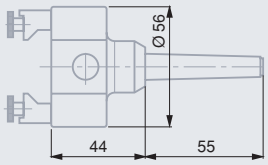
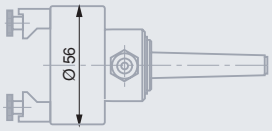
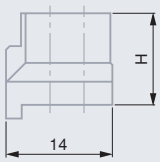
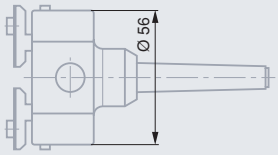
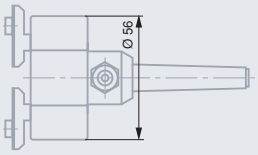
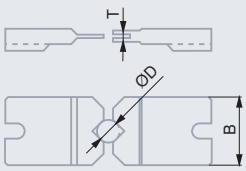
Key Features

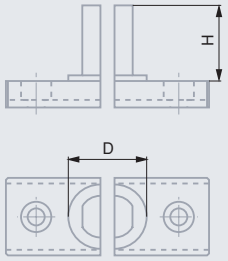
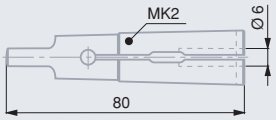
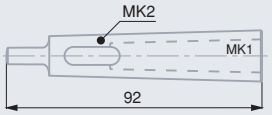
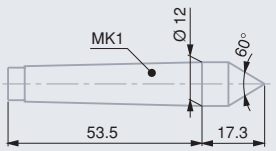
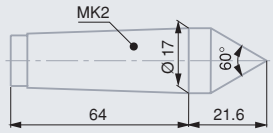
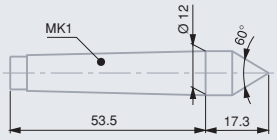
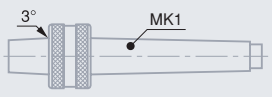
- User-friendly interface for part programming.
- Wide variety of measuring functions.
- Statistical follow up for optimum monitoring of the manufacturing process.
- Full control of multiple levels of use.
- Flexible reporting.

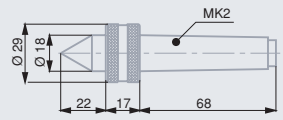
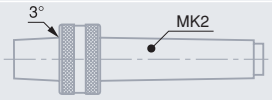
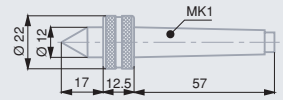
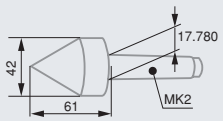
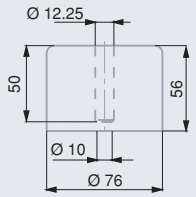
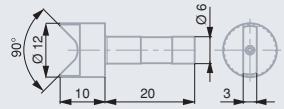
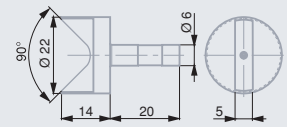
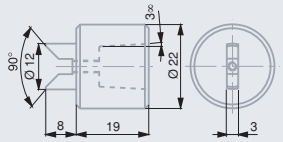
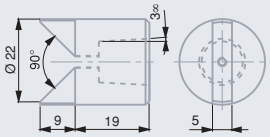
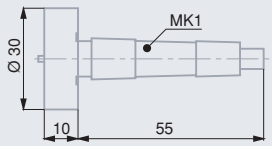
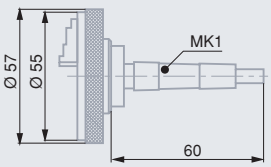
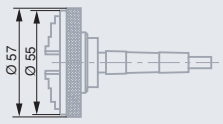


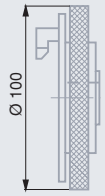
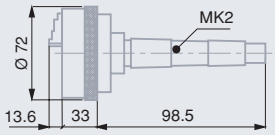
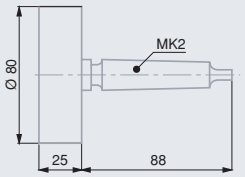
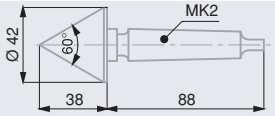
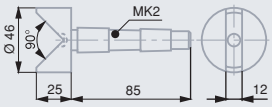
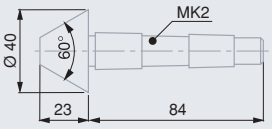
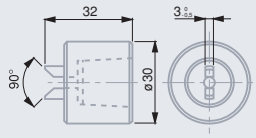
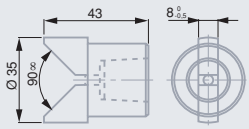
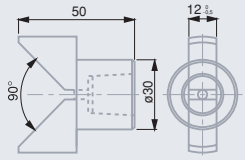
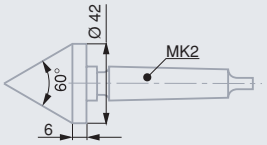


Accessories

Order Number		Morse 1 TESA-SCAN 25	Morse 2 TESA-SCAN 50 TESA-SCAN 52 REFLEX-Click	Notes	Description
TL01-0002		●	–	–	Centre adapter with a 6 mm dia. coupling bore
TL01-0003		●	● Requires TL01-0027	External clamping for manual use	Two-jaw gripper
TL01-0004		●	● Requires TL01-0027	External clamping for use with air pressure	Two-jaw gripper
TL01-0005 H = 18 **TL01-0006** H = 22		For TL01-0003 TL01-0004	–	–	Raising blocks for external jaws, in pairs
TL01-0007		●	● Requires TL01-0027	Internal clamping for manual use	Two-jaw gripper
TL01-0008		●	● Requires TL01-0027	Internal clamping for use with air pressure	Two-jaw gripper
TL01-0009 0÷6 mm T = 1,5 **TL01-0010** 0÷6 mm T = 3 **TL01-0011** 6÷12 mm T = 3 **TL01-0012** 12÷18 mm T = 6 **TL01-0013** 18÷24 mm T = 9 **TL01-0038** 0÷6 mm T = 6 **TL01-0039** 0÷6 mm T = 15 **TL01-0040** 6÷12 mm T = 15		For TL01-0003 TL01-0004	–	–	External jaws, in pairs
TL01-0021	Set of jaws including: TL01-0009 TL01-0010 TL01-0011 TL01-0012 TL01-0013	For TL01-0003 TL01-0004	–	–	External jaws, in pairs

Order Number		Morse 1 TESA-SCAN 25	Morse 2 TESA-SCAN 50 TESA-SCAN 52 REFLEX-Click	Notes	Description
TL01-0015 D = 4-5 mm H = 6,6 mm **TL01-0016** D = 5-6 mm H = 8,6 mm **TL01-0017** D = 6-8 mm H = 11,5 mm **TL01-0018** D = 8-11 mm H = 17,5 mm **TL01-0019** D = 11-15 mm H = 20 mm **TL01-0020** D = 15-19 mm H = 20,2 mm		For TL01-0007 TL01-0008	–	–	Internal jaws, in pairs
TL01-0022	Set of jaws including: TL01-0015 TL01-0016 TL01-0017 TL01-0018 TL01-0019 TL01-0020	For TL01-0007	–	–	Internal jaws, in pairs
TL01-0026		–	●	–	Centre adapter with a 6 mm dia. coupling bore
TL01-0027		–	●	–	Reduction sleeve, Morse 2 to 1
TL02-0001		●	–	2 items provided with TESA-SCAN 25	Extra male centre, 10 mm
TL02-0002		–	●	2 items provided with TESA-SCAN 50 and TESA-SCAN 52 Reflex-Click	Extra male centre, 17 mm
TL02-0003		●	–	Diamond coated 10 mm	Drive centre
TL02-0016		●	–	For added sleeves Z173- 0922/0923	Rotation centre with a B12 male taper plus a Morse 1 taper shank

Order Number		Morse 1 TESA-SCAN 25	Morse 2 TESA-SCAN 50 TESA-SCAN 52 REFLEX-Click	Notes	Description
TL02-0017		–	●	–	Rotation centre, Morse 2
TL02-0018		–	●	–	Rotation centre with a B12 male taper plus a Morse 1 shank
TL02-0019		●	–	–	Rotation centre, Morse 1
TL02-0021		–	●	–	Rotation centre, Morse 2
Z173-0908		For TL01-0003 TL01-0004 TL01-0007 TL01-0008	–	Ensures stable positioning for mounting jaws	Vertical support
Z173-0920		● Requires TL01-0002	● Requires TL01-0026	–	Female centre, 10 mm dia.
Z173-0921		● Requires TL01-0002	● Requires TL01-0026	–	Female centre, 20 mm dia.
Z173-0922		● Requires TL02-0016	–	–	Female centre, 10 mm dia. Also with internal B12 taper
Z173-0923		● Requires TL02-0016	–	–	Female centre, 10 mm dia. Also with internal B12 taper
Z173-0961		●	–	–	Platten, 30 mm dia.
Z173-2020		●	● Requires TL01-0027	Clamping capacity: outside 1÷15 mm inside 11÷26 m	3-jaw chuck, clamping range 1÷15 mm
Z173-2024		–	●	–	6-jaw chuck , clamping range 0,7÷15 mm
Z173-2025		●	–	–	

Order Number		Morse 1 TESA-SCAN 25	Morse 2 TESA-SCAN 50 TESA-SCAN 52 REFLEX-Click	Notes	Description
Z178-2009		–	●	Used to drive components between fixed centres. Directly fitted on the headstock.	Drive mechanism
Z178-2020		–	●	Clamping capacity: outside 2÷50 mm inside 23÷50 mm	3-jaw chuck with Morse 2 taper shank, clamping range 2÷50 mm
Z178-2025		–	●	–	Platten, 80 mm dia. Also with a Morse 2 taper shank
Z178-2026		–	●	Diamond coated	Drive centre, Ø 40 mm. Also with a Morse 2 taper shank
Z178-0607		–	●	–	Female centre, 40 mm dia. Also with a Morse 2 taper shank
Z178-0610		–	●	–	Male centre, 15÷40 mm dia. Also with a Morse 2 taper shank
Z178-0940		–	● Requires TL02-0018	–	Female centre, 10 mm dia., Also with a B12 internal taper
Z178-0941		–	● Requires TL02-0018	–	Female centre, 10 mm dia., Also with a B12 internal taper
Z178-0942		–	● Requires TL02-0018	–	Female centre, 10 mm dia., Also with a B12 internal taper
Z178-3028		–	●	–	Drive centre, 42 mm dia. max.

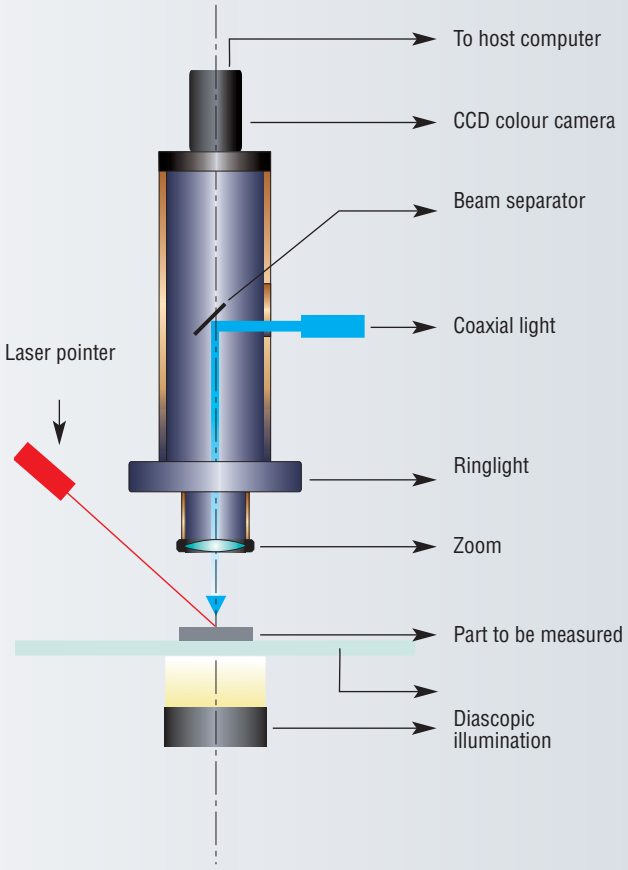
TESA-VISIO OPERATING PRINCIPLE

The Vision technology consists in inspecting a test object lying on a glass plate support by means of an optical system fitted with a camera besides additional zoom-like lenses. Since this technology is based on image analysis, light illumination of the part being inspected is crucial.

For this reason, three different light illuminations will be used:

- ***Diascopic illumination** mounted under the glass plate, making it possible for the user to view the part profile.*
- ***Ringlight** for a detailed visualisation of the upper surface of the part being checked.*
- ***Coaxial light** to view inside a blind bore or a cavity or to measure cylindrical parts in upright position.*

The laser pointer serves for locating, at a glance, the measurement area on the part lying in the object field of the camera. Using beam separators, the coaxial light can pass through the zoom.



Different Light Illuminations

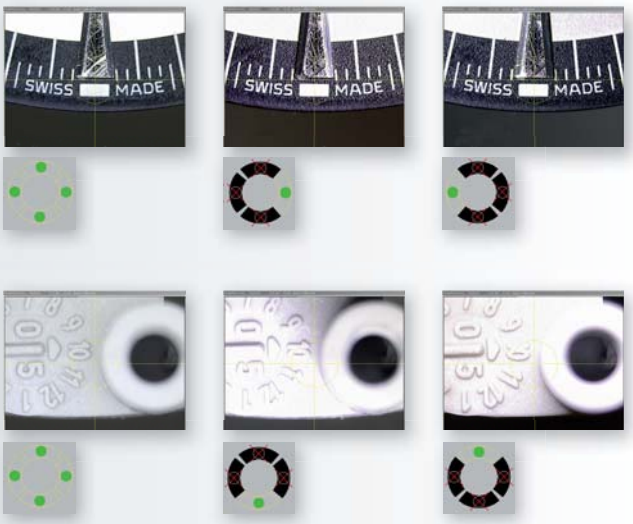
Episcopic illumination

The episcopic illumination, or incident light is particularly useful for inspecting part features such as millings, bores, chamfers and rounded edges.

This type of illumination may vary, according to the chosen machine version.

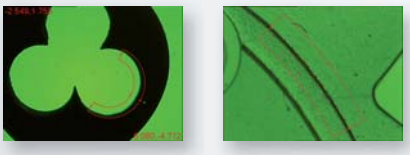
- *On a TESA-VISIO 200 GL, the ringlight is divided into 4 segments of 90°.*
- *On a TESA-VISIO 300 GL, the ringlight includes two circular rows. The outer row is divided into 8 segments of 45° whilst the inner one has 4 segments of 90°.*

Each segment is programmable separately over the software.



Diascopic illumination

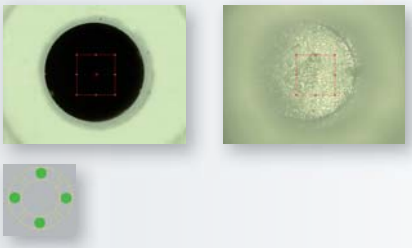
The diascopic illumination, or transmitted light is projected under the part being measured to create a silhouette image of the profile. Also used for the measurements based on transparency.



Illuminated contour

Coaxial light

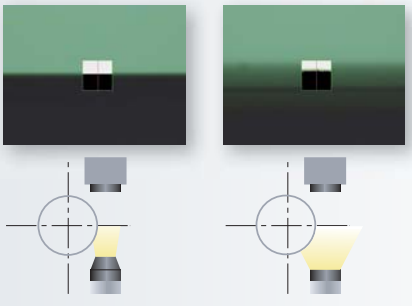
This light is projected from above through the zoom. The collimated light beams produce an illuminated field useful for inspecting blind bores or cylindrical parts.



On the left, the inside of a blind bore cannot be inspeted using the ringlight.

Parallel diascopic illumination

This illumination is projected from the bottom, using a special lens to create parallel light rays.
With this type of illumination, multiple light reflections can virtually be eliminated. This results in sharpe edges when checking round parts.



Visualisation with parallel diascopic illumination

Visualisation without parallel diascopic illumination

TESA-VISIO – THE VISION MACHINES FROM TESA FOR PRECISE OPTICAL MEASURING

The TESA-VISIO GL family provides Users with a full range of vision machines designed to meet their needs, from the simple inspection job to the sophisticated metrology application.

With a 200 x 100 mm measuring table, the manual TESA-VISIO 200 GL will fulfil the expectations of modern workshops.

Solidly built with a granite structure, TESA-VISIO 300 GL is worth investing in. This version has a 300 x 200 mm measuring table, and can either be operated manually or using the servomotors (DCC).



Main Features

- *Compact, ergonomic design – Fruit of a thorough mechanical investigation.*
- *Machine base and column in granite – Ensure superior stability.*
- *TESA's patented system for optical reading.*
- *Intuitive, user-friendly Software tools made easily accessible.*



TESA-VISIO sales programme

Machine version	**200 GL**	**200 GL**	**300 GL**	**300 GL**
Order number	**06830401**	**06830428**	**06830601**	**06830634**
Displacements	manual	manual	manual	motorised
Manual zoom, indexable	6,5 x	–	–	–
Motorised zoom	–	6,5 x	6,5 x 12 x (optional)	6,5 x 12 x (optional)
Software	TESA-REFLEX Vista	TESA-REFLEX Vista	TESA-REFLEX Vista	TESA-REFLEX Vision
Ringlight	4 x 90°	4 x 90°	4 x 90° + 8 x 45°	4 x 90° + 8 x 45°
Coaxial light	●	●	●	●

Two TESA-REFLEX programme versions

These two versions do not derogate from the rule to be the reference for simplicity, making the TESA-REFLEX software different. Easy to learn and to understand - it takes only a few hours - each version provides the reliability needed for visual part inspection.

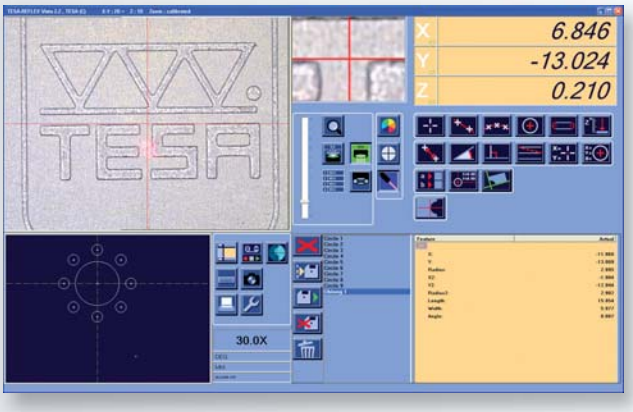
TESA-REFLEX Vista or TESA-REFLEX Vision will measure the highest number of geometrical elements quickly and accurately.

Main Features

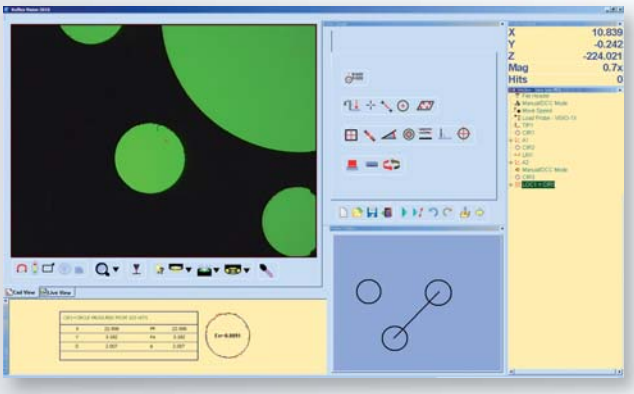
- Intuitive software tools.
- User-friendly, icon-based interface.
- Simple programming.
- Automatic measuring mode.
- On-line help in the Z-axis.
- True three-axis alignment.
- Visual comparison of the part against its CAO file (Compar option available from TESA-REFLEX Vista).

The following two versions are supplied according to used machine type:

- TESA-REFLEX Vista for manual vision machines.
- TESA-REFLEX Vision for DCC vision machines.



TESA-REFLEX Vista



TESA-REFLEX Vision

Sales Programme

06860046	TESA-REFLEX Vista
06860187	Compar option for TESA-REFLEX Vista
06860380	TESA-REFLEX Vision

The ambitious TESA's programme initiated some years ago with the development of a full range of machines for non-contact measurement has resulted in a growing demand for systems capable to measure forms and shapes or soft materials where mechanical probing is just impossible. To meet this demand, the latest hand-operated TESA-VISIO 200 GL has been made smaller, but with no compromise on the metrological performances. Equipped with the TESA-REFLEX Vista programme version, learned in less than one day, this machine is the perfect multi-tasking, multi-users tool for part inspection.



Main Features

- *Exceptional Quality/Price ratio*

Each machine has been specially designed for highest quality standard and accuracy.

- *Optics*

Available with a manual indexable zoom or a motorised zoom for greater comfort. Also provided with a CCD colour camera.

- *Light illuminations*

All light sources are fitted with LEDs producing a cold light, also long-lasting.

– Diascopic illumination for checking profiles as well as for transparency-based measurements.
– Ringlight (4 x 90°) for millings, bores, chamfers and round edges.
– Coaxial light for blind bores and cylindrical parts.

Each light source can be set separately over the software.

- *Swiss mechanics*

Granite structure to ensure the rigidity and stability required for any high-precision measuring system.

Basic machine

✓

Rigid granite structure

Opto-electronic measuring systems with incremental glass scales, resolution to 0,05 µm

$MPE_{X,Y}$* (E_X, E_Y) = (2 + 10 L/1000) µm
MPE_{XY}* (E_{XY}) = (2,9 + 10 L/1000) µm
MPE_Z*/** (E_Z) = (2,9 + 10 L/1000) µm
* L in mm
** Mechanical precision with no displacement in X-Y

Measuring volume (X/Y/Z): 200 x 100 x 150 mm

Display resolution: 0,001 mm

Manual

10°C to 40°C

20°C ±1°C

80%, non-condensing

115 to 230 Vac ±10%; 50 to 60 Hz

98 kg

✓

Calibration certificate

Declaration of conformity

Delivered fully assembled

Shipping packaging (W x D x H): 800 x 1200 x 1100 mm

Measuring table

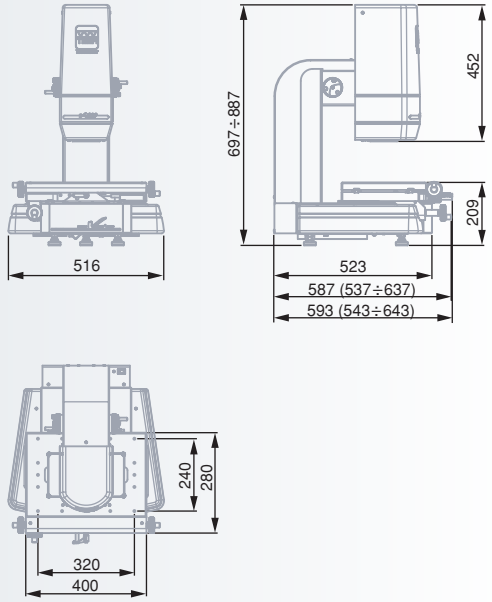
Anodised aluminium

Table surface (X/Y): 400 x 280 mm

Max. load capacity: 10 kg

Indicative values for a 20-inch monitor with a 6,5x magnification (0,7x to 4,5x), also with additional lens

Order number	**06860030**	**06860031**	none	**06860032**	**06860033**
Lenses	0,5x	0,75x	–	1,5x	2x
Magnification	20 ÷ 70	26 ÷ 105	40 ÷ 140	60 ÷ 210	80 ÷ 280
Working distance (W) in mm	150	100	60	30	20
Max. height (H) in mm	0 ÷ 60	0 ÷ 120	0 ÷ 150	0 ÷ 180	15 ÷ 195
Max. field of view in mm	9,8 x 7,3	7,2 x 5,4	4,9 x 3,6	3,2 x 2,4	2,4 x 1,8
Min. field of view in mm	2,8 x 2,1	1,8 x 1,3	1,4 x 1	0,9 x 0,7	0,7 x 0,5

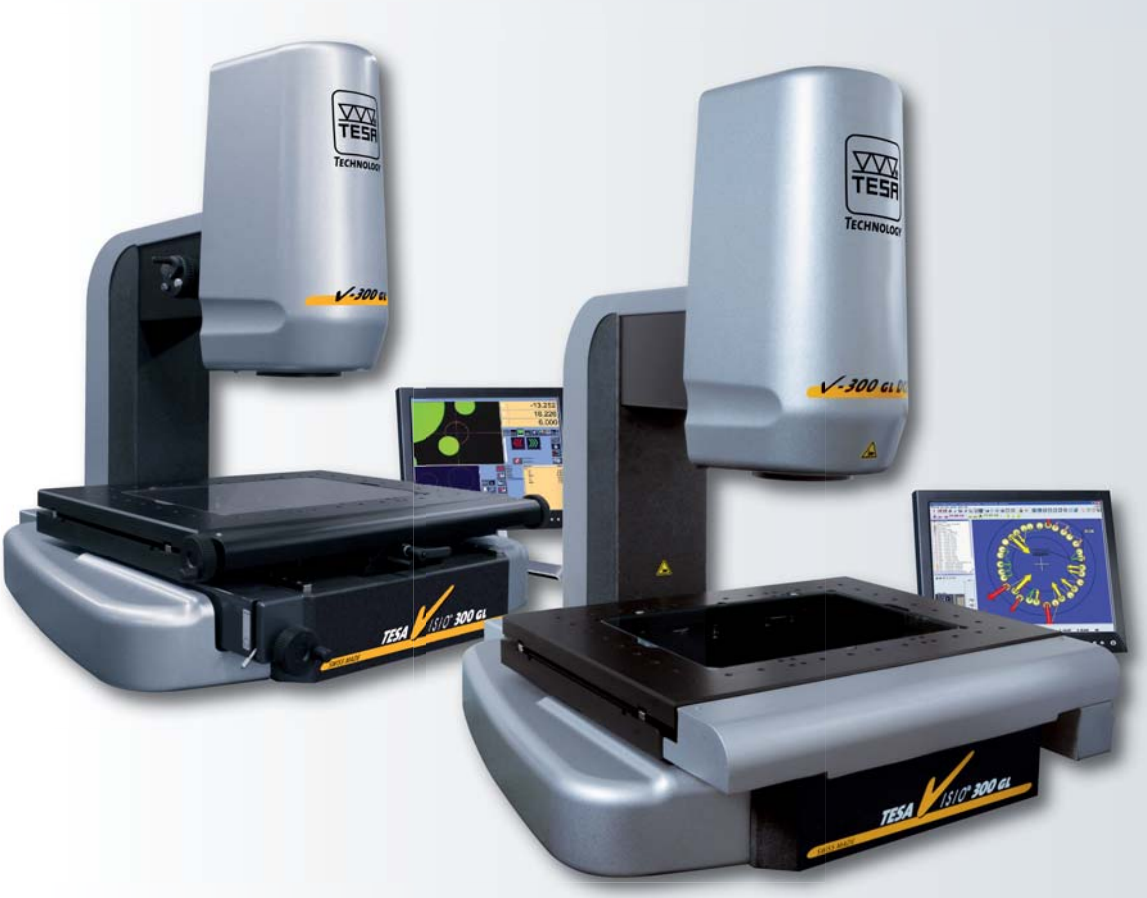


Nº	=	**VISIO 200 GL 06830401** manual	**VISIO 200 GL 06830428** manual
04760079	PC DELL Optiplex	●	●
04760091	Monitor 20”	●	●
055074	Manual zoom, indexable (6,5x)	●	–
051638	Motorised zoom (6,5x)	–	●
054926	Coaxial light	●	●
054925	Ringlight (4 x 90°)	●	●
06860046	TESA-REFLEX Vista software	●	●

TESA-VISIO 300 GL

The TESA-VISIO 300 GL reflects the expertise from TESA in vision machines. Besides a compact and ergonomic design, this version provides a 300 x 200 x 150 mm measuring volume that covers a large part of the demands from industry in this specific field.

Available in two distinct models for manual or motorised operations, the TESA-VISIO 300 GL offer to demanding metrologists all the functionalities they need for occasional or part series inspection. All hand-operated machine versions running the user-friendly TESA-REFLEX Vista are made for multi-tasking and multi-users operations. Running TESA-REFLEX Vision, your measurements will be rapidly and easily executed.



Main Features

- *Optics*

Includes a motorised zoom along with a CCD colour camera as standard equipment.

All light sources are fitted with LEDs producing a cold light, also long-lasting.

– Diascopic illumination for checking profiles as well as for transparency-based measurements.
– Ringlight (4 x 90° + 8 x 45°) for millings, bores, chamfers and round edges.
– Coaxial light for blind bores and cylindrical parts.

Each light source can be set separately over the software.

- *Swiss mechanics*

Granite structure to ensure the rigidity and stability required for any high-precision measuring system.

Basic machine

✓

Rigid granite structure

Opto-electronic measuring systems with incremental glass scales, resolution to 0,05 µm

Manual version:
$MPE_{X,Y}$* (E_X, E_Y) = (2 + 4 L/1000) µm
MPE_{XY}* (E_{XY}) = (2,5 + 4 L/1000) µm
MPE_Z*/** (E_Z) = (2,9 + 5 L/1000) µm
Motorised version:
$MPE_{X,Y}$* (E_X, E_Y) = (1.6 + 4 L/1000) µm
MPE_{XY}* (E_{XY}) = (2 + 4 L/1000) µm
MPE_Z*/** (E_Z) = (2,9 + 5 L/1000) µm
* L in mm
** Mechanical precision

Measuring volume (X/Y/Z): 300 x 200 x 150 mm

Display resolution: 0,001 mm

10°C to 40°C

20°C ±1°C

80%, non-condensing

115 to 230 Vac ±10%; 50 to 60 Hz

170 kg

✓

Calibration certificate

Declaration of conformity

Delivered fully assembled

Shipping packaging (W x D x H): 1630 x 1140 x 1360 mm

Measuring table

Anodised aluminium

Table surface (X/Y): 550 x 430 mm

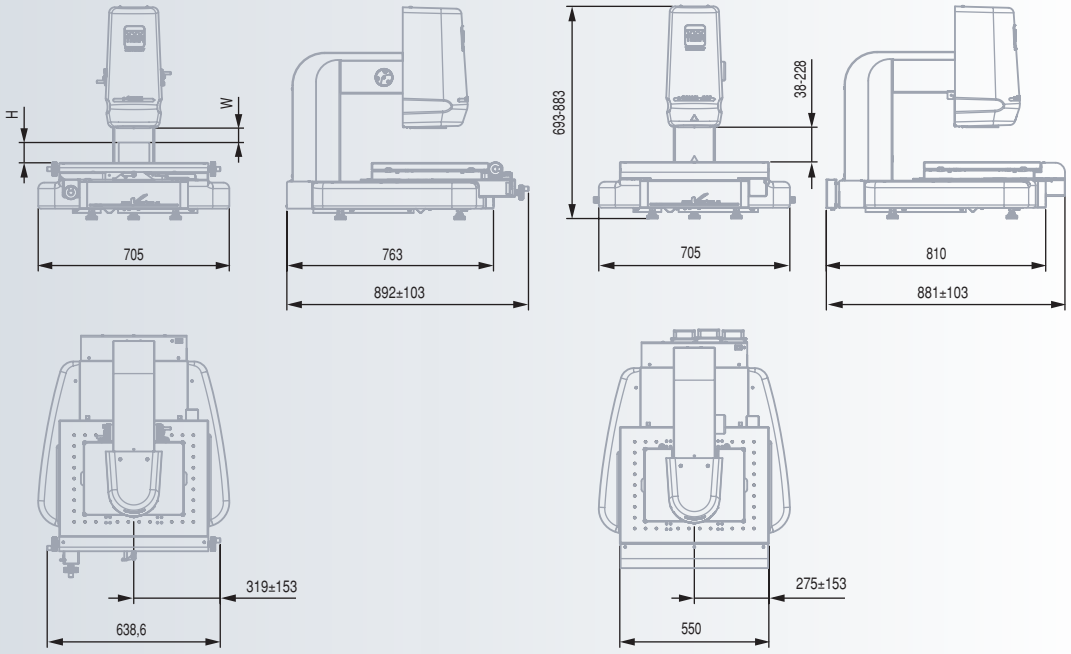
Max. load capacity: 20 kg

Indicative values for a 20-inch monitor with a 6,5x magnification (0,7x to 4,5x), also with additional lens

Order numbers	**06860030**	**06860031**	none	**06860032**	**06860033**
Lenses	0,5x	0,75x	–	1,5x	2x
Magnifications	20 ÷ 70	26 ÷ 105	40 ÷ 140	60 ÷ 210	80 ÷ 280
Working distance (W) in mm	150	100	60	30	20
Max. height (H) in mm	0 ÷ 60	0 ÷ 120	0 ÷ 150	0 ÷ 180	15 ÷ 190
Max. field of view in mm	9,8 x 7,3	7,2 x 5,4	4,9 x 3,6	3,2 x 2,4	2,4 x 1,8
Max. field of view in mm	2,8 x 2,1	1,8 x 1,3	1,4 x 1	0,9 x 0,7	0,7 x 0,5

Indicative values for a 20-inch monitor with a 12x magnification (0,58x to 7x), also with additional lens

Order numbers	**06860287**	**06860288**	none	**06860289**	**06860290**
Lenses	0,5x	0,75x	–	1,5x	2x
Magnifications	19 ÷ 190	25 ÷ 276	33 ÷ 367	50 ÷ 550	67 ÷ 74
Working distance (W) in mm	150	95	65	40	25
Max. height (H) in mm	0 ÷ 60	0 ÷ 120	0 ÷ 150	0 ÷ 180	15 ÷ 190
Max. field of view in mm	16 x 12	10,8 x 8	8,1 x 6,1	5,4 x 4	4 x 3
Max. field of view in mm	1,4 x 1	1 x 0,7	0,75 x 0,55	0,5 x 0,36	0,37 x 0,27



NO		**VISIO 300 GL 06830601** manual	**VISIO 300 GL 06830634** motorised
04760079	PC DELL Optiplex	●	–
04760053	PC DELL Precision	–	●
04760091	Monitor 20"	●	●
06860049	Motorised zoom (6,5x) + coaxial light	●	●
06860158	Ringlight, 4 x 90° + 8 x 45°	●	●
06860380	TESA-REFLEX Vision software	–	●
06860046	TESA-REFLEX Vista software	●	–

	06830401	06830428	06830601	06830634
TESA-VISIO 200 GL	●	●	–	–
TESA-VISIO 300 GL	–	–	●	●
Displacements	manual	manual	manual	motorised
TESA-REFLEX Vista	●	●	●	–
TESA-REFLEX Vision	–	–	–	●
Measuring volume X/Y/Z (mm)	200x100x150	200x100x150	300x200x150	300x200x150
Encoder resolution X/Y/Z (µm)	0,05	0,05	0,05	0,05
Joystick controlled servomotors in the 3 coordinate axes	–	–	–	●
Machine base and column in granite	●	●	●	●
Fine adjustment in the Z-axis	●	●	●	–
X/Y measuring table in anodised aluminium (mm)	400x280	400x280	550x430	550x430
Thickness of the glass plate (mm)	10	10	10	10
Stage with possible resting attachment and removable glass plate	●	●	●	●
Max. load capacity (kg)	10	10	20	20
Precision				
$MPE_{X, Y}$ (E_X, E_Y) (µm) (L in mm)**	2+10 L/1000	2+10 L/1000	2+4 L/1000	1,6+4 L/1000
MPE_{XY} (EX_Y) (µm) (L in mm)**	2,9+10 L/1000	2,9+10 L/1000	2,5+4 L/1000	2+4 L/1000
MPE_Z (E_Z) (µm) (L in mm)*/**	2,9+10 L/1000	2,9+10 L/1000	2,9+5 L/1000	2,9+5 L/1000
* Mechanical precision ** m ≤5 Kg				
Camera and optics				
CCD colour camera, 752 x 582 pixels	●	●	●	●
Manual zooms, indexable, 6,5x	●	–	–	–
Motorised zoom, 6,5x	–	●	●	●
Motorised zoom, 12x	–	–	Optional	Optional
Diascopic illumination, green LED	●	●	●	●
Diascopic illumination, parallel	Optional	Optional	Optional	Optional
Coaxial light	●	●	●	●
Segmented ringlight, (4 x 90°), white LEDs	●	●	–	–
Segmented ringlight, (4 x 90° + 8 x 45°), white LEDs	–	–	●	●
Laser pointer	●	●	●	●
Additional data				
Weight (machine alone) (kg)	98	98	170	170
Velocity in both XY coordinate axes (mm/s)	–	–	–	160
Acceleration in both XY coordinate axes (mm/s^2)	–	–	–	640
Velocity in the Z-axis (mm/s)	–	–	–	160
Acceleration in the Z-axis (mm/s^2)	–	–	–	500
Power supply	100 ÷ 240 V ±10% 50 ÷ 60 Hz 5 ÷ 12V, continuous	100 ÷ 240 V ±10% 50 ÷ 60 Hz 5 ÷ 12V, continuous	100 ÷ 240 V ±10% 50 ÷ 60 Hz 5 ÷ 12V, continuous	110 ÷ 240 V ±10% 50 ÷ 60 Hz 24 V, continuous
Masse (machine alone) (W x D x H) (in mm)	800x1200x1100	800x1200x1100	1630x1140x1360	1630x1140x1360
Reference temperature	20°C ±1°C	20°C ±1°C	20°C ±1°C	20°C ±1°C
Operating temperature range	10°C ÷ 40°C	10°C ÷ 40°C	10°C ÷ 40°C	10°C ÷ 40°C
Relative humidity (non-condensing)	≤80%	≤80%	≤80%	≤80%

Optional accessories

		TESA-VISIO	
		200 GL	300 GL
Light illumination			
06860145	Diascopic illumination, parallel	●	●
Optics			
06860323	Motorised zoom, 12x (on the purchase of a vision machine)	–	●
06860315	Zoom upgrade, 6,5x to 12x (machine retrofit)	–	●
06860030	Additional lens, 0,5x for a 6,5x zoom	●	●
06860031	Additional lens, 0,75x for a 6,5x zoom	●	●
06860032	Additional lens, 1x for a 6,5x zoom	●	●
06860033	Additional lens, 2x for a 6,5x zoom	●	●
06860287	Additional lens, 0,5x for a 12x zoom	–	●
06860288	Additional lens, 0,75x for a 12x zoom	–	●
06860289	Additional lens, 1x for a 12x zoom	–	●
06860290	Additional lens, 2x for a 12x zoom	–	●
Additional accessories			
S68900025	Monitor 22" instead of 20"	●	●
06860186	Foot switch for data point acquisition	●	Manual version
04760077	Joystick	–	Motorised version
06860317	Suited case for Visiofix light accessory set	●	●
06860316	Suited case for Visiofix standard accessory set	●	●
06860318	Visiofix accessory set, steel rails 200	●	–
06860320	Visiofix accessory set, steel rails 300	–	●



06860316



06860317

TESA-SCOPE II 300V or 300V Plus

Perfect for checking parts with flat surfaces or any other component used in precision mechanics.



- Profile projectors with vertical illumination.
- 360° rotary viewing screen in frosted glass, 300 mm diameter. 30°, 60° or 90° crossline reticle along with 4 overlay chart clips.
- Screen rotation with built-in sexagesimal and decimal reading, resolution in minutes – RAZ ABS/INC.
- Profile illumination with green filter included. Enhances image contrast, makes the measurement easier, reduces all effects due to the operator.
- Surface illumination through adjustable fibre optic for a perfect image projection.
- Save Lamp system for automatic shut down of the lamps whenever the projector remains unused for several minutes (thus increasing the life of the lamps by 5).
- Objectives with bayonet mount for quick exchange.
- Coordinate table equipped with incremental glass scales, opto-electronic. Resolution to 0,001 mm.
  Measuring span:
  – 200 x 100 for standard model
  – 300 x 150 for model **Plus**
  – X-axis fitted with a clutch mechanism for fast displacement.
  – Control handle for left hand and right hand operator (X-axis motion).
  – Workload capacity up to 10 kg.
- Lateral paper sheet holder.

Main Part

✓

Heavy duty all steel structure

Measuring system with incremental glass, scale, opto-electronic. Resolution 0,001 mm.

Optics precision ± 0,05% (profile illumination); ± 0,10% (surface illumination).

Resolution 0,001 mm

Profile illumination: 24 V / 150 W bulb. Also with thermal filter included.
Surface illumination: adjustable fibre optic, 24 V / 200 W bulb. Also with thermal filter included.

10°C to 40°C

19°C to 21°C

80%, non-condensing

115 to 230 Vac ± 10%; 50 to 60 Hz

110 kg

IP40

IEC 61010
EN 60204
EN 61326-1

Serial number

TESA Inspection report

Declaration of conformity

Provided fully mounted, but without objective (must be ordered separately).

Shipping packaging

Small Table

- Anodised aluminium
- Table surface 350 x 210 mm (X/Y)
- Measuring span: 200 x 100 mm (X/Y)
- In one coordinate direction: (4,5 + L/40) µm ≤ 8 µm (L in mm)
- Max. workload capacity 10 kg

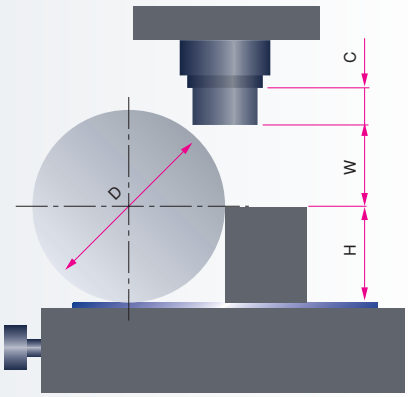
Large Table

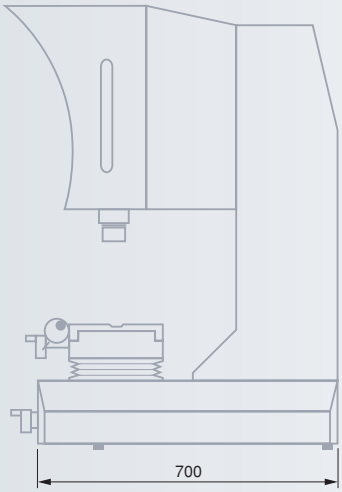
- Anodised aluminium
- Table surface 440 x 282 mm (X/Y)
- Measuring span: 300 x 150 mm (X/Y)
- In one coordinate direction: ± 5,0 + L/20 (L in mm)
- Max. workload capacity 10 kg

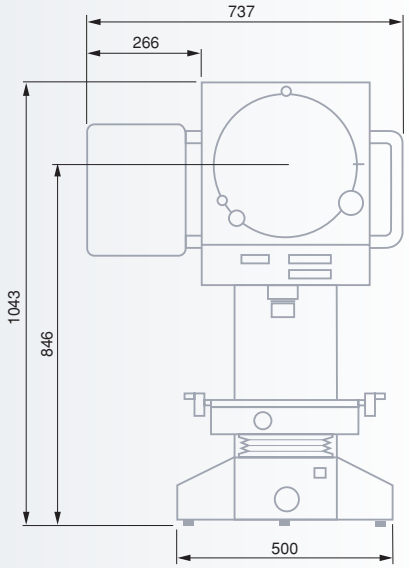
		Base	Measuring Table		Digital Readout / Control Panel		
			X=200 mm Y=100 mm	X=300 mm Y=150 mm	TS100	TS300	TS300E
	№						
TESA-Scope II 300V	**06830041**	●	●	–	●	–	–
TESA-Scope II 300V	**06830042**	●	●	–	–	●	–
TESA-Scope II 300V	**06830043**	●	●	–	–	–	●
	№						
TESA-Scope II 300V Plus	**06830044**	●	–	●	●	–	–
TESA-Scope II 300V Plus	**06830045**	●	–	●	–	●	–
TESA-Scope II 300V Plus	**06830046**	●	–	●	–	–	●

Telecentric Objectives

	10 x	20 x	25 x	31,25 x	50 x	100 x
№	06860001	06860002	06860003	06860004	06860005	06860006
Object-field	30 mm	15 mm	12 mm	9,6 mm	6 mm	3 mm
working distance (W)	80 mm	82 mm	70 mm	56 mm	53 mm	43 mm
Maximum height (H)	83 mm	83 mm	83 mm	83 mm	83 mm	83 mm
Maximum Diameter (D)	166 mm	166 mm	166 mm	166 mm	166 mm	166 mm
Objective length (C)	37 mm	35 mm	47 mm	61 mm	64 mm	74 mm

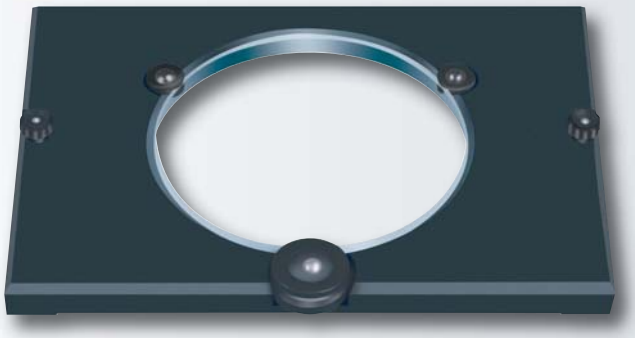




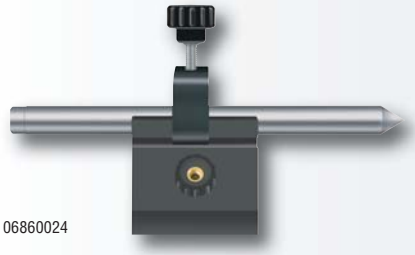


Accessories

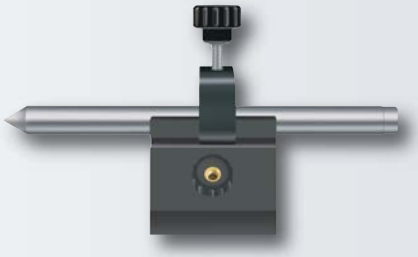
Nº	=
06860015	200 x 100 mm glass plate
06860016	300 x 150 mm glass plate
06860017	300 mm diameter viewing screen with 4 overlay chart clips
06860020	Profile lamp, 24 V – 150 W
06860021	Surface lamp, 24 V – 200 W
06860022	150 mm dia. rotary table. Used with the 200 x 100 mm measuring table.
06860029	150 mm dia. rotary table. Used with the 300 x 150 mm measuring table.
06860024	V-blocks and centres
06860025	Vise stage
06860027	TESA practice piece
06860060	90 mm rotary table. Used with the 200 x 100 mm measuring table.
06860061	90 mm rotary table. Used with the 300 x 150 mm measuring table.
06869055	Measuring foil, type RA, for radius, circle, bending radius
06869056	Measuring foil, type PO, for radius and angle
06869057	Measuring foil, type ISO M2, for thread measurement

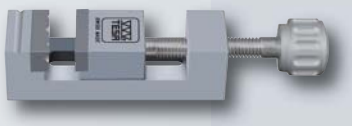


06860022/29



06860024





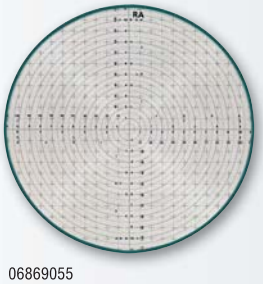
06860025



06860061



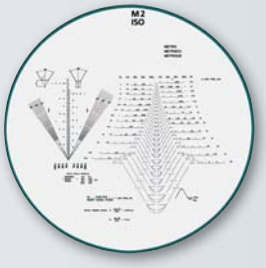
06860060



06869055



06869056



06869057

Main Part

✓

Heavy duty all steel structure

Measuring system with incremental glass, scale, opto-electronic. Resolution 0,001 mm.

Optics precision ± 0,05% (profile illumination); ± 0,10% (surface illumination).

Focusing 80 mm

Resolution 0,001 mm

Profile illumination: 24 V / 150 W bulb. Also with thermal filter included.
Surface illumination: adjustable fibre optic, 24 V / 200 W bulb. Also with thermal filter included.

10 °C to 40 °C

19 °C to 21 °C

80%, non-condensing

115 to 230 Vac ± 10%; 50 to 60 Hz

110 kg

IP40

IEC 61010
EN 60204
EN 61326-1

Serial number

TESA Inspection report

Declaration of conformity

Provided fully mounted, but w/o objective (must be ordered separately)

Shipping packaging

TESA-SCOPE II 355H or 355H Plus

Designed for checking round parts.

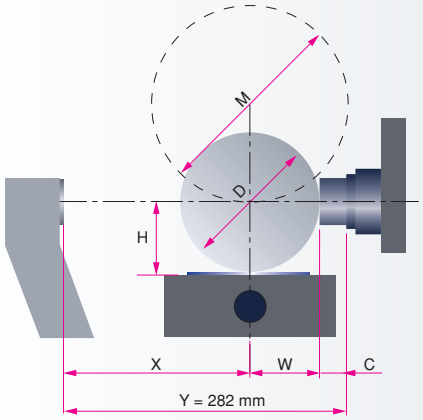


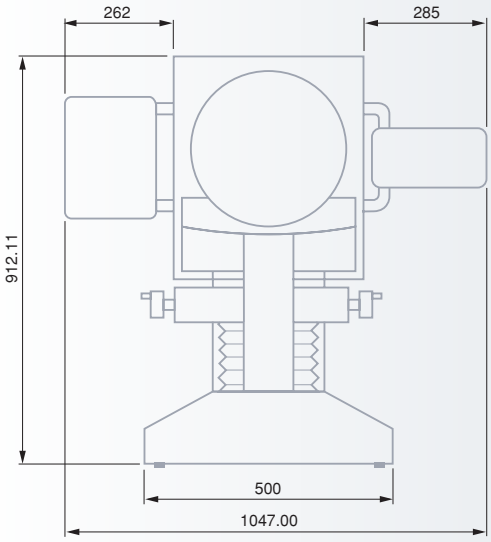
- Profile projectors with horizontal illumination.
- 360° rotary viewing screen in frosted glass, 355 mm diameter. 30°, 60° or 90° crossline reticle along with 4 overlay chart clips.
- Screen rotation with built-in sexagesimal and decimal reading, resolution in minutes – RAZ ABS/INC.
- Profile illumination with green filter included. Enhances image contrast, makes the measurement easier, reduces all effects due to the operator.
- Surface illumination through adjustable fibre optic for a perfect image projection.
- Save Lamp system for automatic shut down of the lamps whenever the projector remains unused for several minutes (thus increasing the life of the lamps by 5).
- Objectives with bayonet mount for quick exchange.
- Coordinate table equipped with incremental glass scales, opto-electronic. Resolution to 0,001 mm.
  Measuring span:
  – 200 x 100 for the standard model
  – 300 x 100 for the model **Plus**
  – X-axis fitted with a clutch mechanism for fast displacement.
  – Control handle for left hand and right hand operator (X-axis motion).
  – Workload capacity up to 10 kg with no loss of accuracy.
- Lateral paper sheet holder.

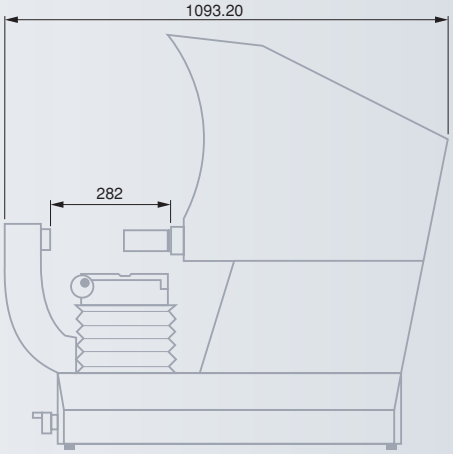
		Base	Measuring table		Digital Readout / Control Panel		
			X=200 mm Y=100 mm	X=300 mm Y=100 mm	TS100	TS300	TS300E
	No						
TESA-Scope II 355H	**06830051**	●	●	–	●	–	–
TESA-Scope II 355H	**06830052**	●	●	–		●	–
TESA-Scope II 355H	**06830053**	●	●	–	–	–	●
	No						
TESA-Scope II 355H Plus	**06830054**	●	–	●	●	–	–
TESA-Scope II 355H Plus	**06830055**	●	–	●	–	●	–
TESA-Scope II 355H Plus	**06830056**	●	–	●	–	–	●

Telecentric Objectives

	10 x	20 x	25 x	31,25 x	50 x	100 x
No	06860001	06860002	06860003	06860004	06860005	06860006
Object-field	35 mm	17,5 mm	14 mm	11,2 mm	7 mm	3,5 mm
working distance (W)	80 mm	82 mm	70 mm	56 mm	53 mm	43 mm
Maximum height (H)	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Maximum diameter (D)	200 mm	200 mm	200 mm	200 mm	200 mm	200 mm
Objective length (C)	37 mm	35 mm	47 mm	61 mm	64 mm	74 mm
Max. width of component X=Y-(W+C)	165 mm	165 mm	165 mm	165 mm	165 mm	165 mm







Small Table

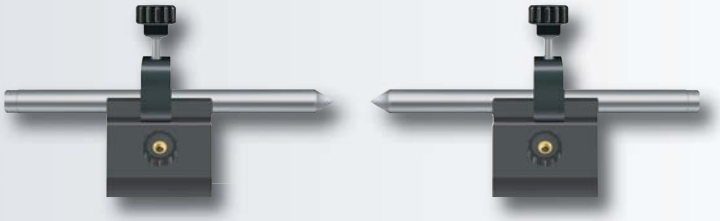
- Anodized aluminium
- Table surface 350 x 100 mm (X/Y)
- Measuring span 200 x 100 mm (X/Y)
- In one coordinate direction: (4,5 + L/40) µm ≤ 8 µm (L in mm)
- Max. workload capacity 10 kg

Large Table

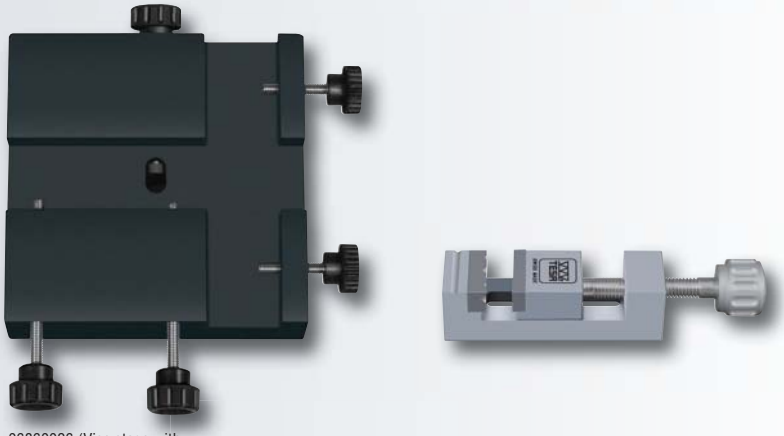
- Anodized aluminium
- Table surface 440 x 100 mm (X/Y)
- Measuring span 300 x 100 mm (X/Y)
- In one coordinate direction: ± 5,0 + L/20 (L in mm)
- Max. workload capacity 10 kg

Accessories

Nº	
06860018	355 mm dia. viewing screen with 4 overlay chart clips
06860020	Profile lamp, 24 V – 150 W
06860021	Surface lamp 24 V – 200 W
06860024	V-blocks and centres
06860025	Vise stage
06860026	Vise stage with base
06860056	Rotary table for model 355H
06860057	Prism for rotary table Nº 06860056
06860058	Vise for rotary table Nº 06860056
06860059	Vertical support for glass plate



06860024



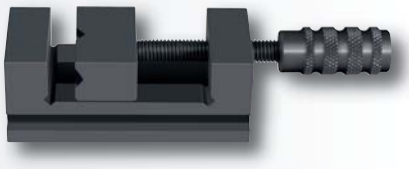
06860026 (Vise stage with base 06860025)



06860056



06860057



06860058



06860059

TS-300 or TS-300E Control Panel

Each unit is able to run TESA-REFLEX 2D – The Reference in terms of simplicity and reliability.

- Geometric form elements
  - Point – Line – Circle
- Measuring functions
  - Alignment – Input of reference values – Translation – Rotation
- Construction features
  - Intersection – Bolt hole circle – Line
- Result output
  - Data transfer through the RS232 output
  - Possible conversion into DXF format
  - Statistical data processing etc.

✓

89 x 118 mm display field with illuminated background

7-decade digit display plus sign for all measured values.

Icon-based User's guidance

RS232

Shipping packaging





06830031	TS-100 Digital readout
06830034	TS-300 Control panel
06830035	TS-300-E Control panel with edge detector

✓

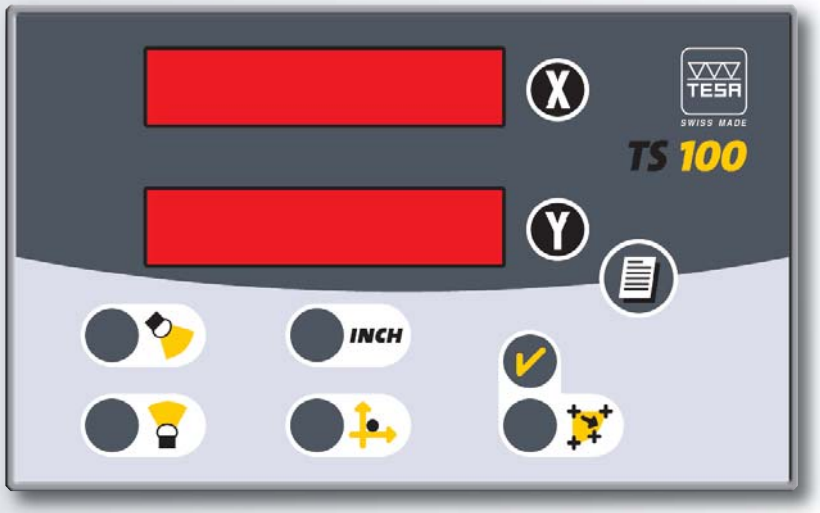
RS232

Model 300V: integrated into the unit.
Models 355H: single unit

Shipping packaging

TS-100 Digital Readout

- Numerical display (X/Y axes)
- Resolution to 0,001 mm
- Inch/metric conversion
- Separate zeroing of display in both X/Y-axes
- ABS/INC measuring mode
- Linear correction of scaling errors (X/Y-axes)
- Control option for both profile and surface illumination
- RS232 digital output (SPC Printer)



Measuring functions

- **Diameter** 3 to 10 data points
- **Radius** 3 to 10 data points
- **Centre distance** Centre-to-centre distance of the last measured feature (radius or diameter)
- **Auto Enter** Automatic value acquisition



Brown & Sharpe V-Blocks and Clamps

V-Blocks have a frame for clamping cylindrical parts with diameters ranging from 0,7 to 40 mm– Used for workpiece inspection or machining.

✓ Hardened steel

Ground resting faces and vee faces

Not available as single items

Suited plastic case



Nº		Clamping range mm
06769007	Set of Brown & Sharpe V-blocks	0,7 ÷ 40
Supplied with:		
	1 Pair of V-blocks	5 ÷ 40
	1 Extra V-block	3 ÷ 8
	1 Extra V-block	1,5 ÷ 5
	5 Extra V-blocks	0,7 ÷ 3,5
	2 In-between bridges	
	2 Large frames	
	1 Small frame	



✓

Components with additives free from chlorine, fluorine or sulfur. Being non-toxic and non-polluting can be used with no special restriction

20 °C

Polymerization will not occur below 10 °C

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.

PLASTIFORM

Non Destructive Control through Print Molding



The products «PLASTIFORM Soft» allow print molding of complex internal machined parts, which can then be viewed and checked using an optical, non-contact measuring equipment.

The products «PLASTIFORM with Additives» consist of two components, which have to be mixed in equal proportion to ensure a proper polymerization.

The test object to be reproduced by print molding must be perfectly clean as well as non-greasy before applying Plastiform.



06869122 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

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





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 ●
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. Uneasy to cut with a 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.

Accessories

N°	=
06869101	BAD PLASTIFORM, 8 double cartridges, 50 ml
06869102	DAV PLASTIFORM, 8 double cartridges, 50 ml
06869119	PLASTIFORM Test Kit BAD 10 double cartridges of 5 ml + 15 mixer-injectors + 2 rings for mould removal
06869120	PLASTIFORM Test Kit DAV 10 double cartridges of 5 ml + 15 mixer-injectors + 2 rings for mould removal
06869118	RGX80 PLASTIFORM S50, 8 double cartridges, 50 ml
06869121	LKAD PLASTIFORM in packs of 2 boxes, 750 g each
06869106	Mixer-injectors in packs of 50
06869107	Mixer-injectors in packs of 100
06869108	Mixer-injectors in packs of 200
06869109	Injector nozzles in packs of 20
06869110	PLASTIN (200 g). Malleable under normal conditions. Used to make «stops» or «retainers» when executing sectorial prints. Reusable.
06869111	Cutter, special with two parallel blades spaced 1 mm apart over a usable length of 60 mm.
06869112	DS 50 injection handle
06869113	DN1 spot remover, aerosol can, 400 ml





Coordinate Measuring Machines



TESA MICRO-HITE 3D – THE WAY TO ACCESS 3D MEASUREMENT

Made to provide Users with absolute ease of use, the TESA MICRO-HITE 3D fills up opportunely the free space between the common gauge and the sophisticated CMM. This measuring machine with remarkable capabilities is best used in industrial applications where dimensional conformity of workpieces either produced as single parts or in small to medium part series requires due approval.

Featuring a modern, yet time-tested design, the machine is based on high quality raw materials and components, thus ensuring its long-term reliability. Being able to identify the shape of the part feature being measured, the intuitive TESA-REFLEX software is easily learn, taking a few hours only.

Launched six years ago,the manual version continues to be a success since then. Three additional versions have been made available meanwhile, all equipped with the TESA-REFLEX software:

- ***Standard** machine version with manual displacement.*
- ***Remote Control** version with manual or motorised displacement.*
- ***Recorder** version with manual and/or automatic reproduction of part programmes.*



Common Features

- *CMM with moving bridge; light alloy machine base; granite measuring table.*
- *22 air bearings ensuring frictionless motion.*
- *Triangular-shaped bridge guaranteeing high stability.*
- *TESA's patented opto-electronic measuring system based on incremental glass scales.*







	MH3D 454	MH3D 474	MH3D 454 Remote Control	MH3D 474 Remote Control	MH3D 454 Recorder
Fine adjust device	●	●	●	●	–
Displacement	Manual	Manual	Manual/Motorised	Manual/Motorised	Manual/Automated
Measuring volume (mm)	460 x 510 x 420	460 x 710 x 420	460 x 510 x 420	460 x 710 x 420	440 x 490 x 390
MPE_E (µm) (L in mm)	3 + 4 L/1000	3 + 4 L/1000	3 + 4 L/1000	3 + 4 L/1000	Manual: 3 + 4 L/1000 Auto: 2,5 + 3,9 L/1000
Overall dimensions (machine) L x P x H (mm)	970 x 930 x 1620	970 x 1130 x 1660	970 x 930 x 1700	970 x 1130 x 1730	1030 x 1100 x 1680
Shipping box L x P x H (cm)	115 x 110 x 220	140 x 158 x 220	135 x 135 x 220	140 x 158 x 220	135 x 135 x 220
Gross weight (kg)	300	445	300	445	350
Net weight (kg) incl. granite table	210	315	210	315	225
Software	TESA-REFLEX MH3D	TESA-REFLEX MH3D	TESA-REFLEX MH3D	TESA-REFLEX MH3D	TESA-REFLEX Recorder
Remote control	–	–	●	●	Optional
Warranty	1 year	1 year	1 year	1 year	1 year
Maintenance agreement	On request	On request	On request	On request	On request

TWO PROGRAMME VERSIONS

The TESA-REFLEX software is the reference for user-friendliness and reliability. Easy and quick to learn and to run, it lets Users choose between a large number of options:

- *Several modes: measuring, scanning, pass-through.*
- *Summon and save part programmes.*
- *Qualification of several probe positions.*
- *Different ways to save the measurement results: USB stick, RS232 digital output or printer.*
- *Automated operation (TESA-REFLEX Recorder only).*

Two software versions are available, depending on the used CMM:

- ***TESA-REFLEX MH3D** for the Micro-Hite 3D.*
- ***TESA-REFLEX Recorder** for the Micro-Hite 3D Recorder.*

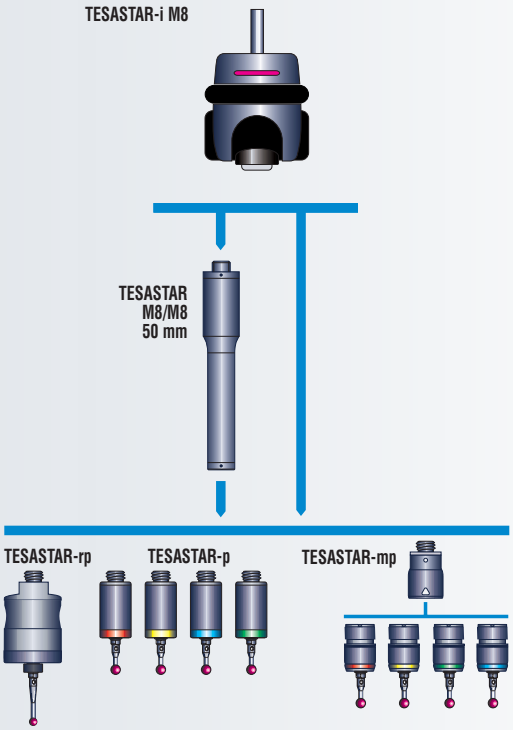


THREE MANUALLY OPERATED PROBE HEADS

All TESA CMM's can accept 3 different manual probe heads to offer the solution that meets each User's need. Each probe head is available from the TESASTAR dedicated programme that also includes a full range of touch-trigger probes besides high precision SWISS MADE accessories fitting any type of CNC CNC hand-operated measuring machines.

(For a detailed information on these probe heads, see page Q-10).





TESA Micro-Hite 3D manual Machine Version 454 or 474

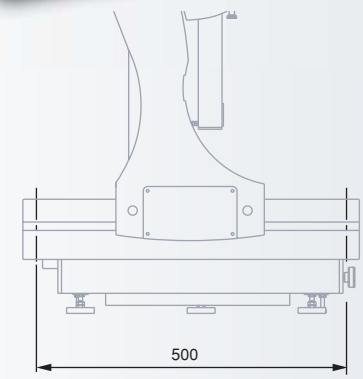
- Fast and easy workpiece alignment.
- Point-to-point part probing or manual scanning.
- ZMouse for significant time savings.
- Fine adjust device.
- TESA-REFLEX MH3D software.

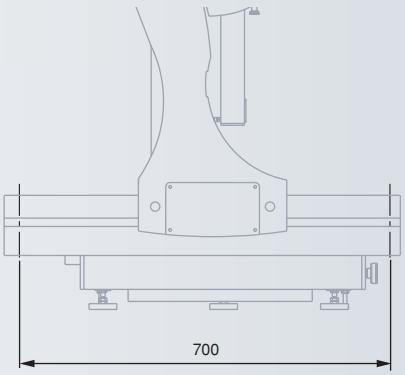
Main Features

- Three probe heads are available:
  - TESASTAR with adjustable trigger force
  - Indexable TESASTAR-i
  - Indexable TESASTAR-i M8 with matching coupling thread (optional)









General

✓

EN ISO 10360-2

CMM with moving bridge.
Measuring systems along with air bearing guiding in the three axes.

Measuring volume (X/Y/Z):
Machine version 454
460 x 510 x 420 mm
Machine version 474
460 x 710 x 420 mm

TESA-REFLEX MH3D:
0,001 mm or 0.00001 in

Manual or motorised
(RC version only)

Light alloy machine base; measuring table in granite.

Opto-electronic measuring systems based on incremental glass scales

0,039 µm (system)

Manual version: 760 mm/sec.
RC version:
1 µm/pas, 10 or 20 mm/sec.

TESA-REFLEX MH3D Control Panel

154 x 116 mm display field with illuminated background

7-decade display (digits) plus sign for the measured values.
Icon-based graphic User's interface .

RS232

MPE_E* = (3 + 4 L/1000) µm
MPE_P = 3 µm
* L in mm

TESA Micro-Hite 3D 454 or 474, Remote Control Machine Version

A well-timed addition to the existing range of TESA small CMMs for exact positioning on small workpieces having a complex shape – Three servo-motors individually controlled over a joystick ensure a correct displacement in each coordinate axis with a positioning accuracy down to the micron – Manual displacement through the fine adjust option – Value acquisition through a single button – Specially recommended for those vision based applications using a CCD camera.

Workpiece-oriented features

Overall dimensions: (W x D x H):
Machine version 454
600 x 750 x 430 mm
Machine version 474
600 x 990 x 430 mm

Maximum weight:
Versions 454: 227 kg
Versions 474: 200 kg

CMM-oriented features

Mass (W x D x H):
Machine version 454, manual
970 x 930 x 1620 mm
Machine version 474, manual
970 x 1130 x 1660 mm
Machine version 474, RC
970 x 930 x 1700 mm
Machine version 474, RC
970 x 1130 x 1730 mm

Net weight:
Versions 454/474 = 210/315 kg (granite tables included).
Tables alone: 99/120 kg.
Gross weight: 300/445 kg.

Air pressure:
3,9 bars (60 à 120 psi).
Air absorption:
60 Nl/min.

115 to 230 Vac ± 10%, 50 to 60 Hz

20° ±1°C

13°C to 35°C

✓

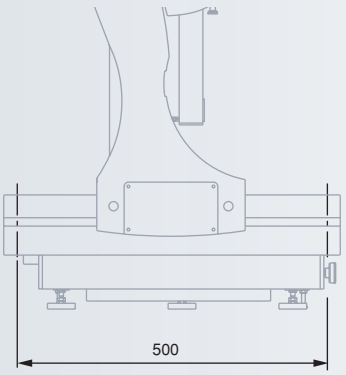
Shipping box (W x D x H):
Version 454, manual
1100 x 1150 x 2200 mm
Version 454, RC
1350 x 1350 x 2200 mm
Versions 474, manual + RC
1580 x 1400 x 2200 mm

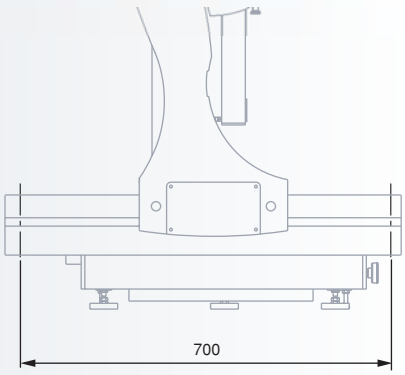
Inspection report



Main Features

- Motorised displacement in the three axes X/Y/Z at a selectable speed of 1 µm/step, 10 mm/sec. or 20 mm/sec.
- Manual displacement in the three coordinate axes at the speed of 760 mm/sec.
- Fine adjust device.
- TESASTAR-i probe head, indexable.
- TESA Reflex software learned in a few hours.
- Joystick with integrated ZMouse.





TESA Micro-Hite 3D 454, Recorder Machine Version

The Recorder coordinate measuring machine is the latest development in the whole range of small TESA MICRO-HITE 3D. An added functionality makes it possible for the operator to control the servomotors in the three coordinate axes, but also to reproduce a programme sequence of the machine displacements in the automatic mode. Each displacement can either be operated manually or using the joystick. No preliminary programming is needed.

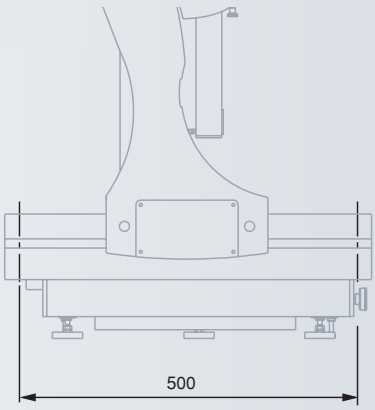
Through the evolution of their manual CMM, TESA provide today a flexible and user-friendly machine version for hand-operated and/or automated measurements.

Main Features

- Fast and easy workpiece alignment.
- Point-to-point part probing or manual scanning.
- ZMouse for significant time savings.
- Manual displacement in the 3 coordinate axes.
- Automatic reproduction of the manual machine displacement.
- Displacement speed in automatic mode: 200 mm/sec.
- TESA-REFLEX Recorder application software.
- TESASTAR-i indexable probe head.







General

✓ EN ISO 10360-2

CMM with moving bridge.
Measuring systems along with air bearing guiding in the three axes.

Measuring volume (X/Y/Z): 440 x 490 x 390 mm

TESA-REFLEX Recorder: 0,001 mm or 0.00001 in

Manual probing movements.
Manual or motorised execution of a part programme.

Light alloy machine base; granite measuring table.

Opto-electronic measuring systems based on incremental glass scales

0,039 µm (system)

Manual version: 760 mm/sec.
Motorised version: 200 mm/sec.

TESA-REFLEX Recorder Control Panel

154 x 116 mm display field with illuminated background

7-decade display (digits) plus sign for the measured values.
Icon-based graphical User interface.

RS232

Manual mode:
MPE_E* = (3 + 4 L/1000) µm
MPE_P = 3 µm
Motorised mode:
MPE_E* = (2,5 + 3,9 L/1000) µm
MPE_P = 2 µm
* L in mm

Additional technical Data on the page opposite.

Workpiece-oriented features

Overall dimensions: (W x D x H): 600 x 750 x 430 mm

Maximum weight: 227 kg

CMM-oriented features

Mass (W x P x H): 1030 x 1100 x 1680 mm

Net weight: 225 kg (granite table included). Table alone: 99 kg. Gross weight: 350 kg

Air pressure: 3,9 bars (60 à 120 psi). Air absorption: 60 Nl/min.

115 to 230 Vac ±10%, 50 to 60 Hz. Air absorption: 0,3 to 0,7 A

20°C ±1°C

13°C to 35°C

✓

Shipping box (W x D x H): 1350 x 1350 x 2200 mm

Inspection report

EN ISO 10360-2

Sales programme

		03939042	03939242	03939043	03939243	03939120	03939122	03939169
	Machine version	**MH3D F**	**MH3D F**	**MH3D Fi**	**MH3D Fi**	**MH3D RC**	**MH3D RC**	**MH3D Recorder**
	Machine type	**454**	**474**	**454**	**474**	**454**	**474**	**454**
Consisting of:								
	Fine adjust device	●	●	●	●	●	●	–
03939020	TESASTAR probe head	●	●	–	–	–	–	–
03939030	TESASTAR-i probe head	–	–	●	●	●	●	●
03969040	M3 probe styli kit	●	●	●	●	●	●	●
03960381	TESA REFLEX MH3D Control panel plus software	●	●	●	●	●	●	–
03960303	TESA REFLEX Recorder Control panel plus software	–	–	–	–	–	–	●
03969011	Reference sphere	●	●	●	●	●	●	●
82-703-1	Granite table	●	●	●	●	●	●	●
049746	Air filter and regulator	●	●	●	●	●	●	●
052283	Joystick (RC version)	–	–	–	–	●	●	–
M1604.6011	Joystick (Recorder version)	●	–	–	–	–	–	–
01962003	USB-Stick	●	●	●	●	●	●	●

Optional Accessories for Manual CMMs

03939020	TESASTAR probe head
03939030	TESASTAR-i probe head
03939031	TESASTAR-i M8 probe head
03969009	ReflexScan software
03969007	RS 232 connecting cable
03960309	RS232 adapter cable for TESA-REFLEX Recorder control panel
03969001	Cabinet with top mounted table
03939170	TESASTAR-mp touch-trigger probe LF, 0,055 N, L = 10 mm
03939171	TESASTAR-mp touch-trigger probe SF, 0,08 N, L = 10 mm
03939172	TESASTAR-mp touch-trigger probe MF, 0,10 N, L = 25 mm
03939173	TESASTAR-mp touch-trigger probe EF, 0,10 N, L = 50 mm
03939174	TESASTAR-mp probe body
03960175	Air saver
03939210	TESASTAR-mp probe kit (2 TESASTAR-mp probes, type SF + 1 TESASTAR-mp probe body)
82-1631	TESA practice piece
03969095	Hexagon practice piece
03969003	Dust cover
03969040	M3 styli kit
03960223	Camera kit with cross line generator included
03969047	Straight probe, Ø 6,35 mm

TESA MULTI-GAGE

Portable 6-axis gauge that offers a flexible solution for multi-axis inspection. Expanding money in this versatile, high accuracy gauge is rapidly profitable.

The TESA MULTI-GAGE is well suited for checking complex workpieces. No need to be an expert in metrology. Its software is easy to learn and to understand.

Main Features

- No special on-site installation needed.
- Easy to use, quick to learn.
- Intuitive operation.
- Modular design with many interchangeable accessories.



General

✓ CE

EN ISO 10362-2

6-axis gauge

1200 mm dia.

0,001 mm

Manual data acquisition or using a touch-trigger probe

Base in light silvery-gray metal.
Glass fibre arm.
Plastic housing.

TESA-REFLEX MULTI-GAGE control panel

154 x 116 mm display field with illuminated background

7-decade display (digits) plus sign for the measured values.
Icon-based graphical User interface.

RS232

MPE_E* = (5 + L/40) ≤18 µm
MPE_P = 8 µm
* L in mm

Additional technical Data on opposite page.

№	
03820000	**TESA MULTIGAGE**
Furnished with :	
03862000	TESA-REFLEX MULTI-GAGE control panel and software
03860068	Straight probe in stainless steel, Ø 15 mm
03860069	Straight probe with a ruby ball tip, Ø 6 mm
03860032	Reference sphere with calibration certificate, Ø 25,4 mm

Gauge-oriented additional features

- 12,85 kg
- 100 to 240 Vac 50 to 60 Hz 1,5 A max.
- 3 h
- 20°C ±3,3°C
- 0°C to 50°C
- -30°C to +70°C
- ≤ 80%, non-condensing
- CE ✓
- Travel case (L x D x H): 1000 x 850 x 600 mm
- Inspection report

Accessories for TESA MULTI-GAGE

Nº	=
03860067	TTP probe holder, already programmed for use with a M2 probe stylus fitted with a ruby ball tip, L = 20 mm, 3 mm dia.
03860068	Straight reference probe, steel ball tip, L = 50 mm, 15 mm dia.
03860069	Straight probe, ruby ball tip, L = 50 mm, 6 mm dia.
03860070	Straight probe, ruby ball tip, L = 50 mm, 3 mm dia.
03860096	Straight probe, ruby ball tip, L = 50 mm, 2 mm dia.
050667	TKJ tightening key
03860036	Probe kit
03939350	TESASTAR-rp touch-trigger probe
03939072	TESASTAR-p touch trigger probe MF
03860051	Magnet set (3 items)
03860049	WiFi option



All probe heads and touch trigger probes from the TESASTAR range, compatible with the TESA-VISIO vision machines, TESA MICRO-HITE CMMs and TESA MULTI-GAGE 6-axis gauge are shown on the pages that follow.

For a further information on the full range, including every motorised probe head and the automatic probe changer for CNC measuring machines, see in the catalogue containing all HEXAGON Metrology Sensors or visit our website at ***www.tesastar.com.***



03939020

TESASTAR Probe Head

Ideally suited for use on small-sized coordinate measuring machines – Its excellent price/performance relationship is a contributing factor for this compact and cost-effective probe head with adjustable trigger force.

Key Features

- High-precision probe head with adjustable triggering force.
- Tilting in one coordinate direction.



03939030



03939031

TESASTAR-i and TESASTAR-i M8 Probe Heads

Each model emanates from the latest TESASTAR concept based on a probe head coupled with a touch trigger probe. Their indexation by increment of 15° in two coordinate axes makes it possible for the stylus to be redirected in a number of positions as high as 168. Touch triggering is generated by the built-in sensor with a repeatability guaranteeing highly accurate measurements. The operator is constantly informed about the angular probe position. Also with single-handed release.

TESASTAR-i M8 can be fitted with any type of accessories featuring a M8 coupling thread, especially:

– every TESASTAR-mp for quick swapping of the probe modules;
– the TESASTAR-rp for measuring applications requiring the use of long styli up to 100 mm;
– the probe extension with a length 50 mm.

Main Features

- High-precision, indexable probe head.
- Touch probe with adjustable triggering force.
- Excellent positional repeatability. No need for in-between requalification.
- Indexing capability through to 168 positions by increment of 15°.
- Clearly visible indexation.

✓

EN ISO 10360-1

Manual

M3

Storage temperature range: -30°C to 60°C.

Operating temperature range: 10°C to 40°C (relative humidity 80%).

5 directions: ±X, ±Y, +Z

Free stylus travel: X/Y ±20°, Z + 6 mm

Shipping box

Inspection report with a declaration of conformity

TESASTAR-i

168 indexing positions

Indexation in increment of 15° clearly visible

Probe orientation: **A** = 0 up to 90° **B** = ±180°

Each axis can be locked by means of 2 push-buttons

www.tesastar.com

TESASTAR, TESASTAR-i, TESASTAR-m Probe Heads

		Unidirectional	µm				Positions	Positioning
03939020	TESASTAR	≤ 0,75	–	0,1÷0,3 N	M3	–	–	manual
03939030	TESASTAR-i	≤ 0,35	≤ 1,5	0,1÷0,3 N	M3	15°	168	manual
03939031	TESASTAR-i M8	–	≤ 1,5	–	M8	15°	168	manual

✓

TESASTAR-p
M2 thread
TESASTAR-rp
M3 thread

TESASTAR-p
13,2 mm
TESASTAR-rp
25 mm

TESASTAR-p
L = 26,3 mm
TESASTAR-rp
L = 41 mm

5 directions
±X, ±Y, +Z

TESASTAR-p
9,5 g
TESASTAR-rp
43 g

600 µA
(external supply)

Free
stylus
travel:
X/Y ±14°, Z + 4 mm
(TESASTAR-p)
X/Y ±22°, Z + 5,5 mm
(TESASTAR-rp)

IP50

10°C to 40°C

-10°C to 70°C

Shipping
box

Inspection
report with
a declaration
of conformity

www.tesastar.com

TESASTAR-p Touch Trigger Probes For Probe Heads

Consist of a small-size module with integrated probe and touch force triggered in 5 directions – M8 thread for coupling any existing probe head, whether manually operated or motor driven – Four models available with a trigger force varying from 0,05 up to 0,10 N.





№				
03939070	TESASTAR-p LF – Low Force	0,055 N, L = 10 mm	Red	0,35 µm
03939071	TESASTAR-p SF – Standard Force	0,08 N, L = 10 mm	Yellow	0,35 µm
03939072	TESASTAR-p MF – Medium Force	0,10 N, L = 25 mm	Green	0,5 µm
03939073	TESASTAR-p EF – Extended Force	0,10 N, L = 50 mm	Blue	0,65 µm
03939074	Probe kit = 4 items			

Styli not included in the delivery scope

Probe Extension

№				
Probe extension with a M8 thread				
03969065	TESASTAR M8	50 mm	25 g	ALU

TESASTAR-rp Robust Probe For Probe Heads

TESASTAR-rp is a complete, robust an precise touch trigger probe, which can be used on any manual or motorised CMM as well as in any manufacturing environment, even the most hostile. Adjustable triggering force for optimum efficiency according to chosen configuration for the stylus. This force also allows for the use of styli whose weight and length are above normal.



№		Unidirectional µm		Styli length mm
03939350	TESASTAR-rp	≤ 0,35	0,1÷0,3 N	≤ 100

TESASTAR-mp Magnetic Probes For Probe Heads

These touch trigger probes include two main parts, i.e. the stylus and the probe body. The isostatic and magnetic system coupling both parts provides a positioning repeatability that let the probe be changed either manually or automatically, without the need for requalification for the stylus.

Four models of the same size, but with a varying triggering force for optimum adaptation to the widest number of metrology applications are available.

TESASTAR-mp can be directed in 5 directions (±X, ±Y, +Z), no matter what the used model is.





No				
03939170	TESASTAR-mp LF – Low Force	0,055 N, L = 10 mm	Red	0,35 µm
03939171	TESASTAR-mp SF – Standard Force	0,08 N, L = 10 mm	Yellow	0,35 µm
03939172	TESASTAR-mp MF – Medium Force	0,10 N, L = 25 mm	Green	0,5 µm
03939173	TESASTAR-mp EF – Extended Force	0,10 N, L = 50 mm	Blue	0,65 µm
03939174	TESASTAR-mp probe body			
03939175	Kit of 4 touch trigger probes (LF, SF, MF, EF) plus 1 TESASTAR-mp probe body			



✓

M8 (probe body) or M2 (stylus) coupling threads

15 mm

37,1 mm in length

5 directions ±X, ±Y, +Z

13,6 g (probe body) 11 g (stylus)

600 µA (external supply)

Stylus tilting through X/Y ±14°, Z + 4 mm

Triggering force: 10N

IP30

10°C to 40°C

-30°C to 60°C

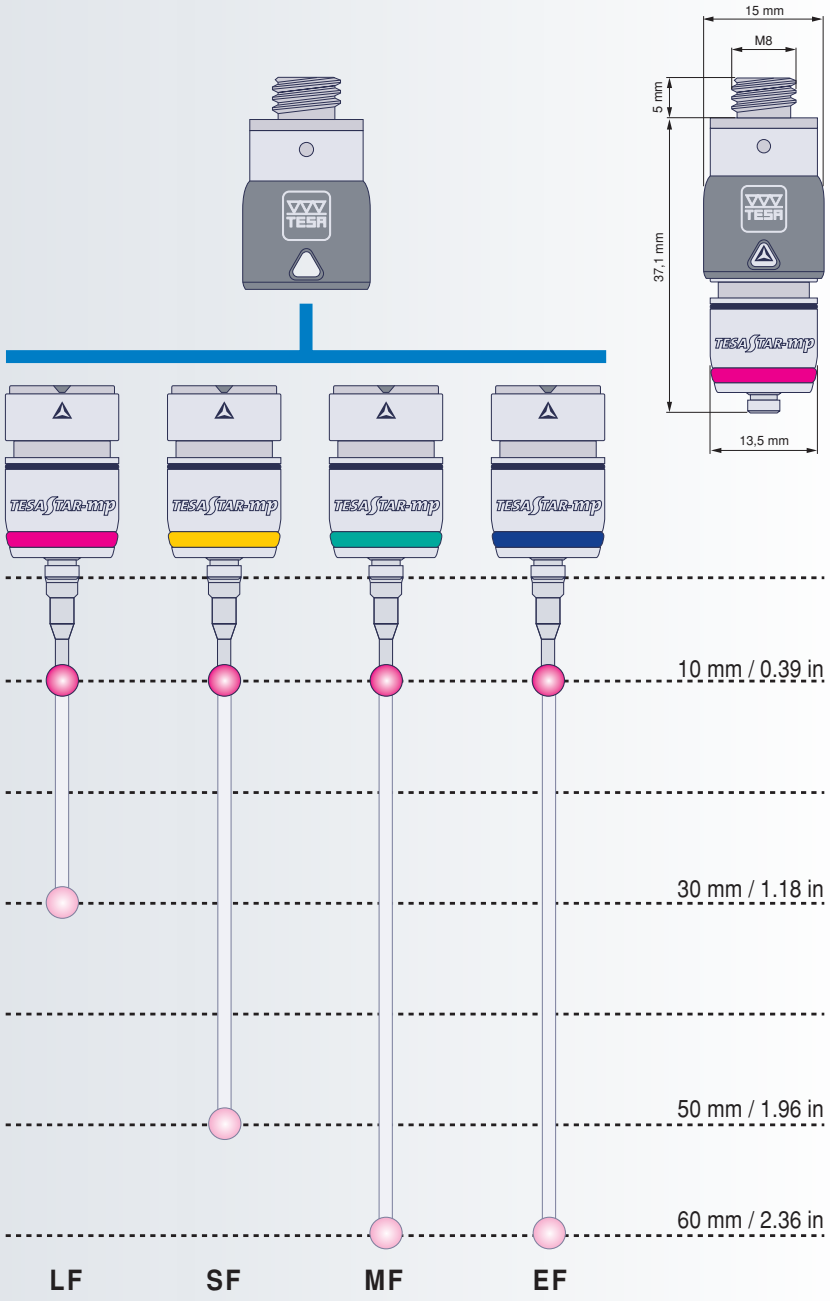
Shipping packaging

Inspection report with a declaration of conformity

www.tesastar.com

Probe Kits

Nº	=
03939210	Probe kit including 2 items (SF, SF) + 1 TESASTAR-mp probe body
03939211	Probe kit including 2 items (SF, MF) + 1 TESASTAR-mp probe body
03939212	Probe kit including 2 items (SF, EF) + 1 TESASTAR-mp probe body
03939213	Probe kit including 2 items (MF, MF) + 1 TESASTAR-mp probe body
03939214	Probe kit including 2 items (EF, MF) + 1 TESASTAR-mp probe body
03939215	Probe kit including 2 items (EF, EF) + 1 TESASTAR-mp probe body
03939216	LF-type probe + 1 TESASTAR-mp probe body
03939217	SF-type probe + 1 TESASTAR-mp probe body
03939218	MF-type probe + 1 TESASTAR-mp probe body
03939219	EF-type probe + 1 TESASTAR-mp probe body



Probe styli for probe heads

www.tesastar.com

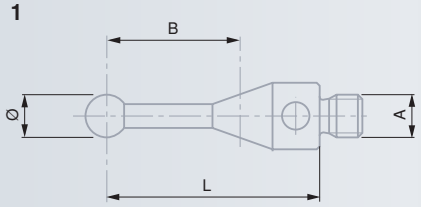
		Relevant drawing	A	Ø mm	L	B	g	Probe shaft
1 M2 coupling thread, L = 10 mm								
03969201	Stylus with ruby ball tip, 1 mm dia.	1	M2	1	10	4,5	0,3	Stainl.steel
03969202	Stylus with ruby ball tip, 2 mm dia.	1	M2	2	10	6	0,3	Stainl.steel
03969203	Stylus with ruby ball tip, 3 mm dia.	1	M2	3	10	7,5	0,4	Stainl.steel
03969204	Stylus with ruby ball tip, 4 mm dia.	1	M2	4	10	10	0,5	Stainl.steel
03969205	Stylus with ruby ball tip, 5 mm dia.	1	M2	5	10	10	0,7	Stainl.steel
03969206	Stylus with ruby ball tip, 6 mm dia.	1	M2	6	10	10	1	Stainl.steel
03969208	Stylus with ruby ball tip, 8 mm dia.	1	M2	8	11	11	1,5	Stainl.steel
03969225	Stylus with ruby ball tip, 2,5 mm dia.	1	M2	2,5	10	6	0,3	Stainl.steel
03969268	Stylus with ruby ball tip, 0,3 mm dia.	1	M2	0,3	10	2	0,3	Carbide
03969267	Stylus with ruby ball tip, 0,7 mm dia.	1	M2	0,7	10	4	0,3	Carbide
03969220	Stylus with ruby ball tip, 0,5 mm dia.	1	M2	0,5	10	3	0,3	Carbide
1 M2 coupling thread, L = 20 mm								
03969212	Stylus with ruby ball tip, 2 mm dia.	1	M2	2	20	14	0,5	Stainl.steel
03969213	Stylus with ruby ball tip, 3 mm dia.	1	M2	3	20	17	0,5	Stainl.steel
03969214	Stylus with ruby ball tip, 4 mm dia.	1	M2	4	20	20,2	0,8	Stainl.steel
03969226	Stylus with ruby ball tip, 2,5 mm dia.	1	M2	2,5	20	14	0,4	Carbide
03969272	Stylus with ruby ball tip, 1,5 mm dia.	1	M2	1,5	20	12,5	0,5	Carbide
03969271	Stylus with ruby ball tip, 1 mm dia.	1	M2	1	20	12,5	0,41	Carbide
03969269	Stylus with ruby ball tip, 0,5 mm dia.	1	M2	0,5	20	7	0,48	Carbide
03969221	Stylus with ruby ball tip, 1 mm dia.	1	M2	1	20	7	0,6	Carbide
03969222	Stylus with ruby ball tip, 2 mm dia.	1	M2	2	20	15	0,45	Carbide
1 M2 coupling thread, L = 30 mm								
03969259	Stylus with ruby ball tip,12 mm dia.	1	M2	1	27	20,5	0,4	Carbide
03969262	Stylus with ruby ball tip, 2 mm dia.	1	M2	2	30	25	0,99	Carbide
03969263	Stylus with ruby ball tip, 3 mm dia.	1	M2	3	30	25	1,49	Carbide
03969261	Stylus with ruby ball tip, 1,5 mm dia.	1	M2	1,5	30	25	0,58	Carbide
03969286	Stylus with ruby ball tip, 6 mm dia.	2	M2	6	30	30	0,96	Carbon
1 M2 coupling thread, L = 40 mm								
03969282	Stylus with ruby ball tip, 2 mm dia.	1	M2	2	40	35	1,29	Carbide
03969283	Stylus with ruby ball tip, 3 mm dia.	1	M2	3	40	35	1,97	Carbide
03969284	Stylus with ruby ball tip, 3 mm dia.	1	M2	3	40	35	2,04	Carbide
1 M2 coupling thread, L = 50 mm								
03969293	Stylus with ruby ball tip, 3 mm dia.	1	M2	3	50	42,5	2,44	Carbide
03969294	Stylus with ruby ball tip, 4 mm dia.	1	M2	4	50	42,5	2,52	Carbide
03969295	Stylus with ruby ball tip, 5 mm dia.	1	M2	5	50	42,5	3,75	Carbide
03969223	Stylus with ruby ball tip, 3 mm dia.	1	M2	3	50	42,5	0,83	Ceramic
03969224	Stylus with ruby ball tip, 4 mm dia.	1	M2	4	50	42,5	0,91	Ceramic
03969260	Stylus with ruby ball tip, 4 mm dia.	2	M2	4	50	3	1	Carbon
03969276	Stylus with ruby ball tip, 6 mm dia.	2	M2	6	50	50	1,2	Carbon
03969220	Stylus with ruby ball tip, 5 mm dia.	1	M2	0,5	10	3	0,3	Carbide
1 M3 coupling thread, L = 10 mm								
03969324	Stylus with ruby ball tip, 3 mm dia.	–	M3	3	10	–	–	Stainl.steel
03969326	Stylus with ruby ball tip, 6 mm dia.	–	M3	6	10	–	–	Stainl.steel
1 M3 coupling thread, L = 21 mm								
03969301	Stylus with ruby ball tip, 1 mm dia.	1	M3	1	21	4	1,1	Stainl.steel
03969302	Stylus with ruby ball tip, 2 mm dia.	1	M3	2	21	8	1,1	Stainl.steel
03969303	Stylus with ruby ball tip, 3 mm dia.	1	M3	3	21	12	1,1	Stainl.steel
03969304	Stylus with ruby ball tip, 4 mm dia.	1	M3	4	21	17	1,4	Stainl.steel
03969305	Stylus with ruby ball tip, 5 mm dia.	1	M3	5	21	21	1,55	Stainl.steel
03969310	Stylus with ruby ball tip, 0,5 mm dia.	1	M3	0,5	21	3	1,1	Carbide
03969312	Stylus with ruby ball tip, 2 mm dia.	1	M3	2	21	15	0,8	Carbide
03969332	Stylus with ruby ball tip, 2,5 mm dia.	1	M3	2,5	21	12,5	1,3	Carbide

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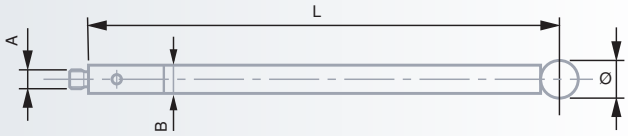
Probe styli for probe heads

	Relevant drawing	A	Ø	L	B	g	Probe shaft
1 M3 coupling thread, L = 40 mm							
03969343 Stylus with ruby ball tip, 3 mm dia.	1	M3	3	40	32,5	2,3	Carbide
1 M3 coupling thread, L = 50 mm							
03969353 Stylus with ruby ball tip, 3 mm dia.	1	M3	3	50	42,5	2,78	Carbide
1 M4 coupling thread, L = 20 mm							
03969402 Stylus with ruby ball tip, 2 mm dia.	1	M4	2	19	8	2,3	Stainl. steel
1 M4 coupling thread, L = 50 mm							
03969408 Stylus with ruby ball tip, 8 mm dia.	1	M4	8	50	–	5,4	Ceramic
1 M4 coupling thread, L = 100 mm							
03969418 Stylus with ruby ball tip, 8 mm dia.	1	M4	8	100	–	7	Ceramic

1



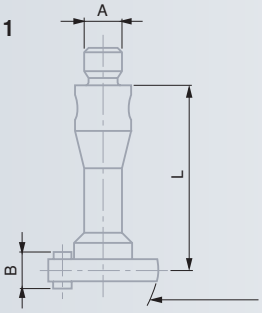
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Probe styli with a probe disc

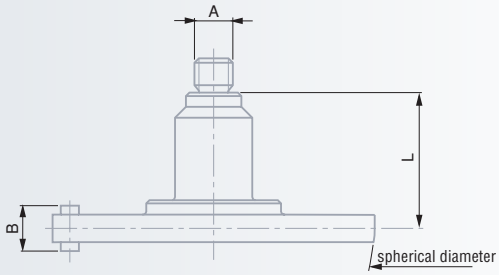
	Relevant drawing	A	Ø	L	B	g	Probe shaft
1 M2 coupling thread,							
03969241 Stylus with ruby ball tip, 6 mm dia.	1	M2	6	10	2	0,6	Stainl. steel
03969242 Stylus with ruby ball tip, 18 mm dia.	1	M2	18	7,55	2,5	3,1	Carbide
03969243 Stylus with ruby ball tip, 18 mm dia.	2	M2	18	3,7	3	2,7	Stainl.steel

1



03969241

2



03969242

Pointer probe styli

	Relevant drawing	A	Ø	L	B°	g	Probe shaft
1 M2 coupling thread, L = 30 mm							
03969200 Stylus with ruby ball tip, 6 mm dia.	1	M2	3	15	30	0,7	Stainl. steel
03969141 Stylus with ruby ball tip, 18 mm dia.	1	M2	1,4	10	30	1	Carbide

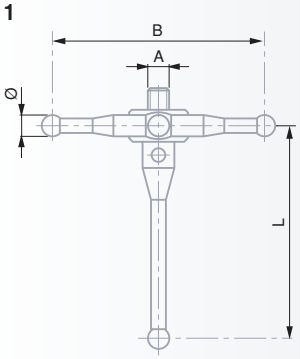
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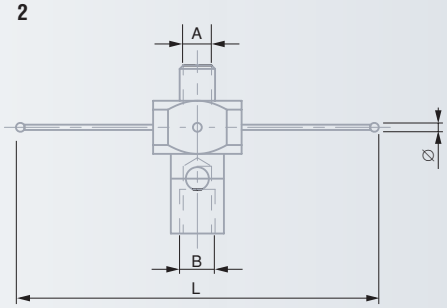
Star probe styli

	Drawing	mm A	Ø	L	B	g	Probe shaft
1 M2 coupling thread, 5-way probe styli							
03969081	1	M2	2	18	20	1,3	Stainl. steel
03969055	1	M2	2	20	20	1,5	Stainl. steel
03969082	1	M2	2	18	30	1,7	Stainl. steel
03969056	1	M2	2	20	30	1,8	Stainl. steel
1 M2 coupling thread, 4-way probe stylus							
03969210	2	M2	0,5	20	M2	0,7	Stainl. steel
1 M3 coupling thread, 5-way probe styli							
03969083	1	M2	2	18	20	2,2	Stainl. steel
03969057	1	M2	2	20	20	2,2	Stainl. steel
03969084	1	M2	2	18	30	2,5	Stainl. steel
03969058	1	M2	2	20	30	2,5	Stainl. steel

1



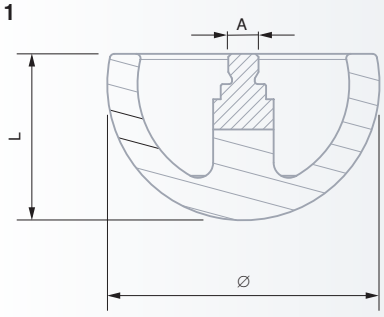
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Hollow ball probe styli

		Relevant drawing	mm A	Ø	L	B	g	Probe shaft
03969218	M2 coupling thread	1	M2	18	11	–	3,3	Ceramic
03969330	M3 coupling thread	1	M3	30	17	–	13	Ceramic

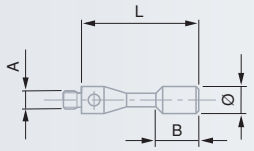
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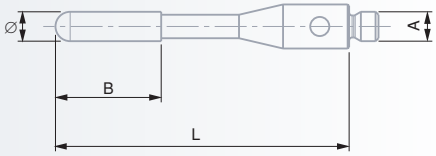
Cylindrical probe styli

		Relevant drawing	A	Ø	L	B	g	Probe shaft
			mm					
03969253	M2 coupling thread	1	M2	3	13	4	0,5	Stainl. steel
03969251	M2 coupling thread	1	M2	1,5	11	1,5	0,3	Stainl. steel
03969252	M2 coupling thread	1	M2	3	13	3,8	0,6	Stainl. steel
03969292	M2 coupling thread	2	M2	2	20	7,2	0,5	Carbide

1



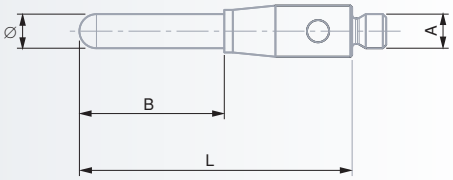
2



Parallel probe styli

		Relevant drawing	A	Ø	L	B	g	Probe shaft
			mm					
03969277	M2 coupling thread	1	M2	0,5	15,3	7,8	0,3	Carbide
03969278	M2 coupling thread	1	M2	1	35,5	29,8	0,7	Carbide
03969279	M2 coupling thread	1	M2	2	16	8,5	0,8	Carbide
03969280	M2 coupling thread	1	M2	2	40	32	2	Carbide
03969281	M2 coupling thread	1	M2	3	22,5	–	2	Carbide

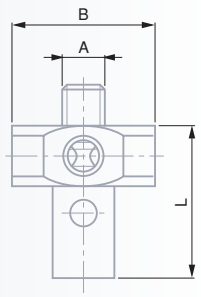
1



Cross-shaped probe styli

		Relevant drawing	A	Ø	L	B	g	Probe shaft
			mm					
03969054	M2 coupling thread, 5-way stylus	1	M2	–	7,5	7	1,1	Stainl. steel
03969046	M3 coupling thread, 5-way stylus	1	M3	–	13	10	3,7	Stainl. steel

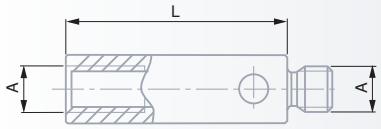
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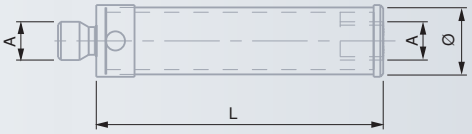
Probe extensions

	Relevant drawing	mm A	Ø	L	B	g	Probe shaft
1 M2 coupling thread							
03969231	1	M2	–	10	–	0,5	Stainl. steel
03969232	1	M2	–	20	–	1	Stainl. steel
03969233	1	M2	–	30	–	1,6	Stainl. steel
03969230	1	M2	3	5	–	–	Stainl. steel
03969234	1	M2	3	40	–	1,8	Stainl. steel
03969247	1	M2	3	50	–	1,51	Ceramic
03969246	1	M2	3	40	–	1,22	Ceramic
03969238	1	M2	3	50	–	1	Carbon
03969239	1	M2	3	70	–	1,3	Carbon
03969240	1	M2	3	90	–	1,5	Carbon
03969270	1	M2	3	40	–	0,9	Carbon
1 M3 coupling thread							
03969044	1	M3	–	10	–	0,8	Stainl. steel
03969245	1	M3	–	20	–	1,8	Stainl. steel
03969320	1	M3	–	35	–	2,9	Stainl. steel
1 M4 coupling thread							
03969401	2	M4	7	30	–	5,1	Ceramic

1



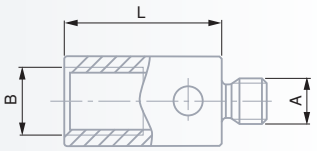
2



Adapters

		Relevant drawing	A	Ø	L	B	g	Probe shaft
03969061	M2-M3 coupling thread,	1	M2	–	7	M3	0,5	Stainl. steel
03969062	M3-M2 coupling thread	1	M3	–	5	M2	0,5	Stainl. steel
03969403	M4-M3 coupling thread	1	M4	–	9	M3	1,4	Stainl. steel

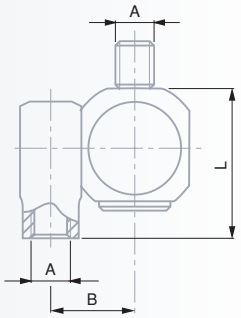
1



Articulations

		Relevant drawing	A	Ø	L	B	g	Probe shaft
03969059	M2 coupling thread	1	M2	–	8	4,5	1,7	Stainl. steel
03969060	M3 coupling thread	1	M3	–	12	6	3,8	Stainl. steel

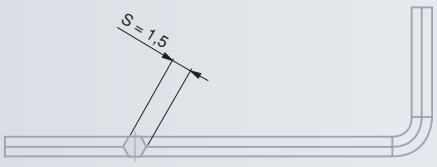
1



Additional accessories

		Relevant drawing
042086	Socket head key, 1,5 mm	1
047866	Tightening key for styli, M2-M3	2
050697	Tightening key for carbon-fibre styli	3

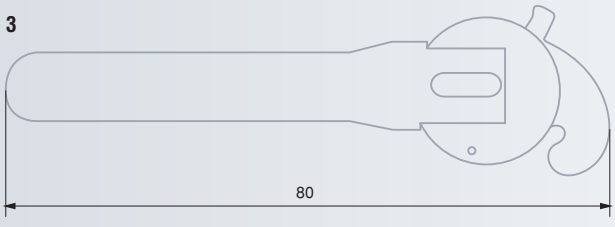
1



2



3



Styli Kits

Nº		Probe Styli Kit 8 – M2 03969086	Probe Styli Kit 3 – M2 03969063	Probe Styli Kit 1 – M2 03969075
042086	Socket head key, 1,5 mm	–	1	–
047866	Tightening key for probe styli	2	2	2
049652	Tightening key	2	–	–
050697	Tightening key	2	–	–
03969044	M3 probe extension, L = 10 mm	–	–	–
03969045	M3 probe extension, L= 20 mm	–	–	–
03969046	5-way cross-shaped stylus, M3	–	–	–
03969047	Fixed probe, 6,35 mm dia.	–	–	–
03969054	5-way cross-shaped stylus, M2	1	–	1
03969081	5-way star probe stylus, M2	–	–	1
03969082	5-way star probe stylus, M2	1	1	–
03969059	Articulation, M2	–	1	–
03969065	M8 probe extension, L = 50 mm	–	–	–
03969066	M8 probe extension, L=100 mm	–	–	–
03969067	M8 probe extension, L = 200 mm	–	–	–
03969078	Storage case for accessories	–	1	1
03969079	Storage case for accessories	–	–	–
03969085	Storage case for accessories	1	–	–
03969201	M2 probe stylus with a ruby ball tip, 1 mm dia.	–	1	2
03969202	M2 probe stylus with a ruby ball tip, 2 mm dia.	1	1	4
03969203	M2 probe stylus with a ruby ball tip, 3 mm dia.	–	1	2
03969204	M2 probe stylus with a ruby ball tip, 4 mm dia.	1	–	1
03969206	M2 probe stylus with a ruby ball tip, 6 mm dia.	–	–	1
03969212	M2 probe stylus with a ruby ball tip, 2 mm dia.	2	1	2
03969213	M2 probe stylus with a ruby ball tip, 3 mm dia.	2	1	2
03969214	M2 probe stylus with a ruby ball tip, 4 mm dia.	–	–	1
03969221	M2 carbide probe stylus with a ruby ball tip, 1 mm dia.	1	–	–
03969230	M2 probe extension, L = 5 mm	–	–	2
03969231	M2 probe extension, L = 10 mm	1	2	2
03969232	M2 probe extension, L = 20 mm	1	–	2
03969233	M2 probe extension, L = 30 mm	–	–	2
03969241	M2 probe stylus with a probe disc, 6 mm dia., L = 10 mm	–	1	–
03969242	M2 probe stylus with a probe disc, 18 mm dia., L = 7,55 mm	–	–	1
03969253	Cylindrical probe stylus	–	–	1
03969260	M2 carbon probe stylus with a ruby ball tip L = 50 mm	1	–	–
03969270	M2 carbon probe extension L = 40 mm	1	–	–
03969302	M3 probe stylus with a ruby ball tip, 2 mm dia.	–	–	–
03969303	M3 probe stylus with a ruby ball tip, 2 mm dia.	–	–	–
03969304	M3 probe stylus with a ruby ball tip, 2 mm dia.	–	–	–

Probe Styli Kit 7 – M2 03969076	Probe Extension Kit 03969077	Probe Accessory Kit TESASTAR 03969040	Probe Accessory Kit TESASTAR 03969101	Probe Styli Kit – M2 TESASTAR-m 03969087	Probe Styli Kit – M3 03969102
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03969076

TRADEMARKS REGISTERED IN SWITZERLAND AND OTHER COUNTRIES

- TESA
- TESA fig.
- CAPA µ SYSTEM fig.
- CARY
- COMPAC
- COMPAC fig.
- COMPAC GENEVE fig.
- COMPACLOG
- DIAMASTER
- DIGICO
- DIGIT-CAL
- DIGITMASTER
- ETALON fig.
- ETALON SWITZERLAND fig.
- IMICRO
- INOTEST
- INTERAPID
- INTERAPID fig.
- ISOMASTER
- JUNIOR fig.
- MAGNA µ SYSTEM fig.
- MESOBOR
- MICRO-HITE
- MICROMASTER
- µHITE fig.
- POPCAL
- ROCH FRANCE fig.
- RUGOSURF fig.
- SHOP-CAL
- STANDARD GAGE fig.
- TESA DUOTAST
- TESA EAGLE fig.
- TESA-HITE
- TESA MEMO-HITE
- TESA MICRO-HITE
- TESA MULTI-GAGE
- TESA-REFLEX
- TESA STAT
- TESA SWISS SET
- TESA SWISSCAL
- TESA SWISSDIAL
- TESA SWISSLINE
- TESA SWISSTAST
- TESA-CAL
- TESADIA
- TESADIGIT
- TESAMASTER
- TESA-µHITE fig.
- TESANORM fig.
- TESASCAN
- TESA-SCOPE
- TESASET
- TESASTAR
- TESASTAR fig.
- TESA-SWISSMASTER fig.
- TESATAST
- TESATEST
- TESATRONIC
- TESATRONIC MULTILINE
- TESA-VISIO
- TRI-O-BOR
- TRIOMATIC
- UNIMASTER
- UNITEST
- UNITEST fig.
- VALIDATOR fig.
- VERIBOR

TRADEMARKS REGISTERED IN VARIOUS COUNTRIES

- ALESOMETRE
- ALESOTEST
- DURA-CAL
- ETALON
- JUNIOR
- MERCER
- MICROMASTER
- ROCTEST
- TESA DIGITMASTER

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TESA TECHNOLOGY

- TESA Design SWISS MADE
- TESA Design – Product from the European Community
- TESA Design – Product produced outside Europe
- Product from the European Community
- Product produced outside Europe
- 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
- Number of scale divisions
- Scale spacing
- 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
- Units of measurement
- Metric/inch 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
- Blocking of display
- Locking of display
- Digital interface
- Analogue interface
- Control functions
- 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
- Page
- Centred lug back
- Centred revolution counter
- Reverse numbering or +left
- Dial locking knob
- TESA
- MERCER
- ETALON
- ROCH
- COMPAC
- HEXAGON