

Calipers



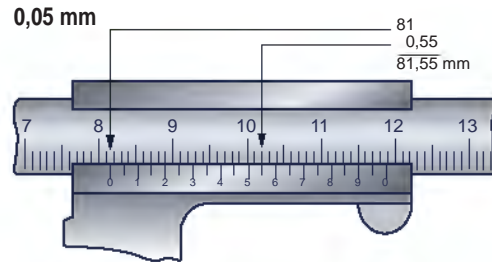
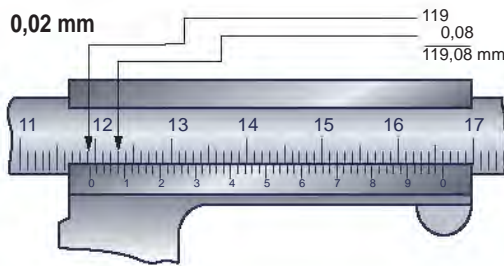
THE ESSENTIALS

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

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

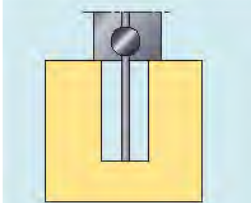
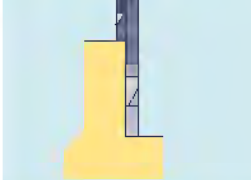
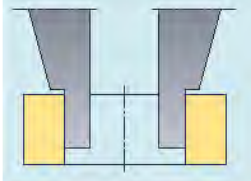
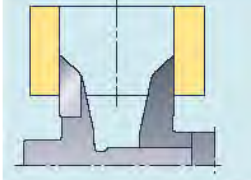
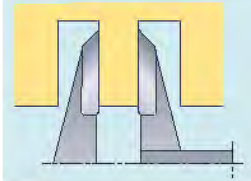
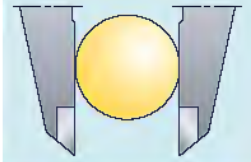
The choice of material, subjected to precisely defined heat treatment as well as a robust design result in further distinctive advantages such as wear and corrosion resistance.

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



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

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

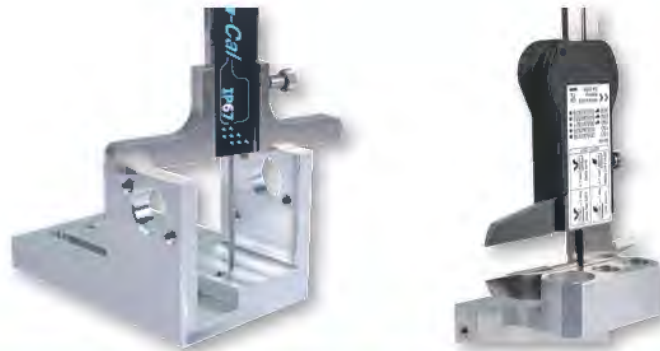
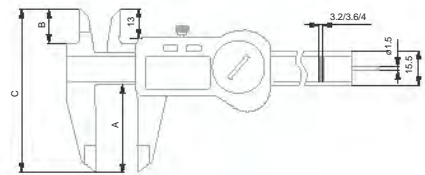


- ISO 13385-1
- 0,01 mm / 0.0005 in
- LCD, 11 mm
- Fixed zero
- mm / in conversion
- ≤ 100 mm: 20 µm
>100 mm: 30 µm
- 10 µm
- Scale with incremental divisions, inductive
- 2,5 m/s
- TLC Connectivity
- Stainless steel
- Lithium battery, 3V, CR2032
- 12.000 hours
- Standby mode after 10 minutes, instrument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

TWIN-CAL IP67

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

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



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

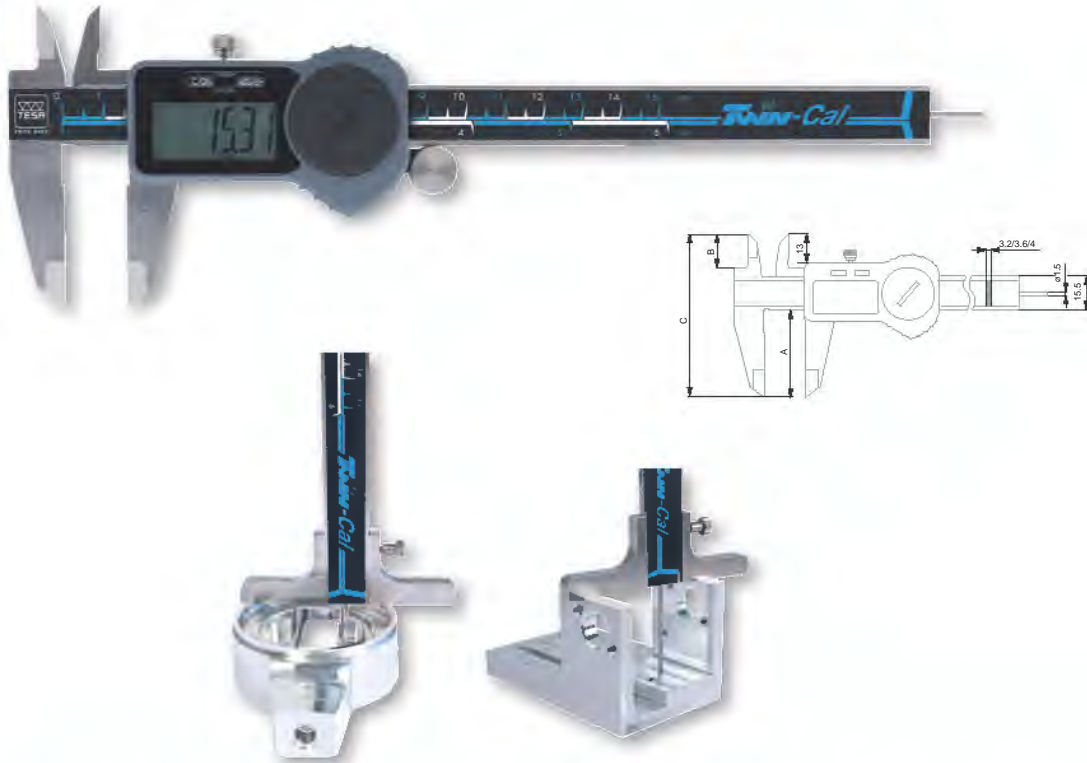
OPTIONAL ACCESSORIES:

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



TWIN-CAL IP40

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



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

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

OPTIONAL ACCESSORIES:

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

Surface Roughness Testing



TESA RUGOSURF 20

Portable roughness gauge, robust and versatile.

Well suited for production environments or inspection of inward goods.

Measures roughness parameters according to:

- ISO 4287
- JIS B0601
- DIN and ISO 12085 (MOTIF or CNOMO).

Measuring range in the Z-axis of 400 μm (6300 μin).

15 roughness parameters.

Each parameter can be activated individually or not.

Possible tolerancing of parameter values.



Scope of supply



With a measuring stand with suction base



Measurement of narrow hard to reach crevices thanks to the 100 mm probe extension



With vertical positioning support

Direct display:

- of all measured values, with tolerance levels display,
- of R roughness profile,
- the Bearing Area Curve (BAC),
- the Amplitude Distribution Curve (ADC).

2" Black&White LCD screen, high contrast for optimum visual representation.

Flexible autonomy through mains adapter or battery pack.

Storage of the measured parameters.

Multilingual menu options.

USB cable connection (optional).

Direct printing to a dot matrix printer (optional).

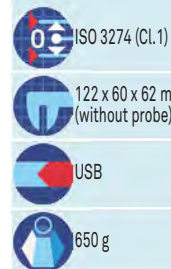
Measurement transfer, database creation and reporting available using TESA RUGOSOFT software tool (optional).

Access to narrow and hard to reach locations possible through 100 mm probe extension (optional).



Description:

1. Start / Measure
2. Probe protection
3. LCD 2" screen
4. Enter key
5. Defilement key
6. Return key / Measurement parameters
7. ON/OFF Switch
8. Batter charger connector
9. USB Connector for PC
10. Printer connector



	06930013
	TESA RUGOSURF 20 portable surface roughness tester for use in the workshop Z = ± 200 µm (± 0.0079 in) X = 16 mm (0.63 in)
	Measuring span, µm 400 µm (0.0157 in) on Z axis, 16 mm (0.63 in) on X axis
	Indication span, µm Ra = 0 ÷ 100 µm; Rt = 0,05 ÷ 400 µm
	Accuracy class in accordance with ISO 3274 Class 1
	Measuring force, N 0,75 mN in accordance with ISO 3274
	Resolution, µm 0,001 µm
	Display LCD 2" black/white (160 x 100 pixels)
	Roughness parameters DIN / ISO / JIS / ASME: Ra, Rq, Rt, Rc, RSm, R _{Pc} R _{mr} , R _z , R _{max} PP _c , P _{mr} MOTIF ISO 12085 (CNOMO): Pt, R, R _x , AR
	Graphics Bearing Area Curve (BAC), Amplitude Distribution Curve (ADC), Profile-R
	Cut-off length, mm 0,25 – 0,80 – 2,50 mm (0.010 – 0.030 – 0.100 in)
	Number of cut-off 1 to 5
	Stylus diamond tip (R = µm; angle °) R = 5 µm, 90°
	Memory capacity max 1000 measurements with parameters; max 20 measurements with profile and graphics
	Dimensions, mm 122 x 60 x 62 mm
	Degree of protection for keyboard (IP XX) IP67 (membrane keyboard)
	Digital data output (USB) USB cable connector to PC
	Weight, g 650 g
	Included in delivery RUGOSURF 20 SB10 standard skid probe Roughness standard Ra = 2,97 µm Positioning pin Ø 8 mm for use vertically Detachable probe protector Integral rechargeable battery Charger and adapter EU/US User manual Plastic carrying and storage case
	Measuring response time 1 to 10 s
	Probing speed, mm/s 1 mm/s (2 mm/s probe retract to measuring position)
	Units mm or inch
	Power supply 100 ÷ 240 VAC; 50 ÷ 60 Hz; 12 V, 400 ÷ 650 mAh



OPTIONAL ACCESSORIES:

04760099	Cable RUGOSURF 20 to PC
06960033	Printer for RUGOSURF + cables
06960034	RUGOSOFT Software + Dongle
06960035	Granite 400 x 250 mm with vertical support H150 mm, 25 kg, Grade 0 for Rugosurf 20 and 10G
06960081	Probe SB10 2µm for RUGOSURF 20 and 10G as SB10 but R = 2 µm
06960037	SB20 probe for RUGOSURF 20 et 10G for grooves of depth < 5 mm
06960038	SB30 probe for RUGOSURF 20 and 10G for small bores of Ø > 4 mm
06960039	SB40 Probe for RUGOSURF 20 and 10G V-shape for cylinders of Ø > 1 mm
06960040	SB50 probe for RUGOSURF 20 and 10G for concave surfaces and for measuring at 90° with RUGOSURF 10G
06960057	SB110 probe for RUGOSURF 20 and 10G for concave or convex surfaces, R > 5 mm
06960056	100 mm extension for probe with skid for RUGOSURF 20, 10G, 90G
06960064	Roughness standard Ra = 0,1 µm (4 µin)
06960065	Roughness standard Ra = 0,5 µm (20 µin)
06960066	Roughness standard Ra = 1,0 µm (40 µin)

STANDARD ACCESSORIES:

06960036	SB10 standard probe for RUGOSURF 20 and 10G R = 5 µm, 90°
06960041	Roughness standard Ra = 2,97 µm (117 µin)
06960045	Battery NiMH 7,2 V, 300 mAh, format PP3 for RUGOSURF 20 et 10G
057655	Vertical and adjustable positioning supports (2 parts) V-form for cylinder Ø > 100 mm for RUGOSURF 20
057941	Transport case with internal protection foam for RUGOSURF 20



RUGOSOFT Software

Software for RUGOSURF 20 and RUGOSURF 10G.

Enables the user to import stored measurement values from the device to the computer for the management of a database.

Optimal and detailed visualization of the results: parameters, profiles (R roughness and P primary profile) or a combination of both.

Calculation of roughness parameters.

Statistical analysis of a set of measurements.

Creation and storage of measuring programs (instrument parameters and parameters to be measured) in the software, which can then be loaded onto the instrument.

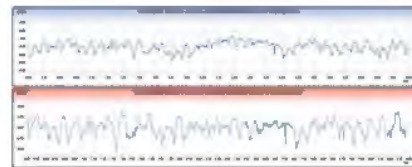
Customizable measurement report.

Output from the PC

- measuring results with measuring parameters
- profiles as coordinates
- measuring report in format: .xls .pdf .doc .rpt (Crystal Report) or also .rtf (Rich Text Format)



RUGOSOFT



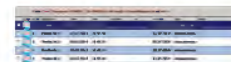
Roughness profile and primary profile



Statistics



Parameters and bearing area curve



List of measurements



Included in delivery

06960034	RUGOSOFT Software + Dongle	<ul style="list-style-type: none"> - USB protection key (dongle) - Installation CD - User instructions plus online support (included in the installation CD)
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OPTIONAL ACCESSORIES:

04760099	Cable RUGOSURF 20 to PC
06960062	Cable RUGOSURF 10G and RUGOSURF 90G to PC (connector v3)



Height Gauges



INSPECTION DURING THE COURSE OF THE MANUFACTURING PROCESS

Height gauges are single-axis handtools made to measure on a surface plate, preferably on granite. The TESA- μ HITE version being offered in this section clearly shows that combining a surface plate with any height gauge can create a complete measuring system.

Providing the necessary versatility, they are well suited for dimensional inspection directly on a machine or a group of machines, usually during the various setting and sampling operations throughout the whole manufacturing process.

They are specially made for checking parts that are difficult to machine due to their critical sizes.

TESA-HITE or TESA MICRO-HITE, whether manually operated or motor-driven, do not require any special skills. Nearly everyone working in the workshop can use them easily.



SCS Calibration Certificate

The newly implemented TESA-HITE and TESA MICRO-HITE production line now also includes its own temperature-controlled laboratory recently certified by the Swiss Accreditation Service (SCS), so that each height gauge comes with a SCS calibration certificate provided free of charge.

The negligible temperature variation along with the use of high-precision step gauges allow the lowest uncertainty of measurement to be achieved during the calibration process.

As a first step, all values needed for automatic compensation for the systematic errors of the finished height gauge through Computer Aided Accuracy (CAA) are captured.

Once conveniently calculated, each single compensation value is then stored in the tool memory so as to allow the automatic calculation of the measured values during calibration.

Finally, the relevant calibration certificate is issued based on the values obtained during a new series of measurements taken at another measuring station, also equipped with step gauges. The applied calibration procedure together with the SCS based certification ensure that every TESA height gauge is traceable to national standards.

Height Gauges – One of TESA's Strengths

TESA offers the largest range of height gauges for reliable one or two-dimensional measurements. End users can choose the most suitable model not only according to the requirements of their metrology applications, but also according to their financial resources.

This wide range goes from the simple height and scribing gauge to the motorised vertical column suitable for high-precision measurements in two coordinate directions.
















TESA-HITE Plus M 400 / 700

The added value of the motorised TESA-HITE plus M 400 / 700 is not only noticeable in their technical features, but also in their ease of use. Combine with the programming function, this solution is ideal for recurrent measurements in the shop floor environment.

Advanced functions allow for complex calculations such as those required for two-axis or perpendicularity measurement. These height gauges with outstanding features offer the most attractive price/performance relationship, making them indispensable for the workshop.

- Wide application range.
- Electronics entirely protected from the penetration of liquids and dust particles.
- Integrated air cushion, mounted control panel.
- Easy, intuitive use of the rotary power control.
- Provide all the measuring functions of a dedicated motorised column, including height, diameter, distance, parallelism, perpendicularity, straightness, angle and 2D measurement besides programming, automatic probing cycles, statistical value processing.
- TESA's patented measuring system, opto-electronic.
- Probe insert holder and inserts compatible with those of TESA MICRO-HITE.
- SCS calibration certificate attached to each height gauge.



-  Factory standard
-  Dual LC display, 128 x 63 mm in size.
 - Upper display field for length values (7 segments/sign) also with symbols for the functions.
 - Lower full dot display field for perpendicularity and straightness along with symbols for all operator-controlled function keys.
 - 7 segment display plus minus sign for the measured values
-  0,0001 mm or 0.00001 in
-  Main display with a size to 12,7 x 6,4 mm or 6,3 x 4,2 mm for auxiliary display
-  Incremental glass scale, opto-electronic data capture
-  Mm/in conversion
-  1 N
-  Air bearing for easy displacement on the granite plate.
-  Measuring head mounted on a ball-bearing. Electro-motorised head displacement at varying speeds from 7,5 up to 40 mm/s. Manual displacement: ≤ 600 mm/s. Automatic value acquisition with a constant measuring force.
-  RS232
-  Rechargeable batteries, 6V
-  ≈ 60 h, full charging takes 8 hours
-  Fixed zero

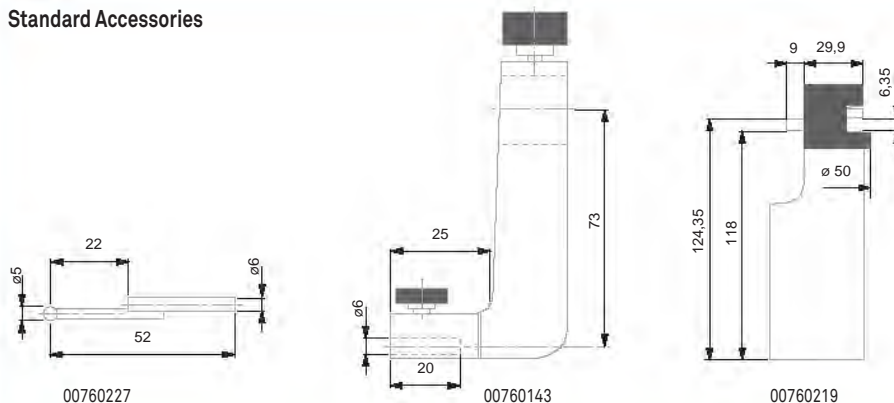
- Linear expansion
(12 ± 1,5) x 10⁻⁶ K⁻¹
- IP40, IP65 for the
electronic control
panel (IEC 60529)
- SCS calibration
certificate

00730045	TESA-HITE plus M 400	405	16
00730046	TESA-HITE plus M 700	705	27
00730057	TESA-HITE plus M 400 + printer	405	16
00730058	TESA-HITE plus M 700 + printer	705	27
CONSISTING OF:		400	700
00760143	Standard probe insert holder	●	●
00760157	Rechargeable battery, 6V	●	●
00760219	Master piece for establishing the probe constant, nominal dimension to 6,350 mm / 0.250 in	●	●
00760226	Electric pump for creating the air-cushion beneath the gauge base, already mounted	●	●
00760227	Standard probe insert with shank and 5 mm dia. ball tip in tungsten carbide	●	●
04761054	Mains adapter 100 ÷ 200 VAC / 50 ÷ 60 Hz	●	●
04761055	Cable EU for mains adapter	●	●
04761056	Cable US for mains adapter	●	●
OPTIONAL ACCESSORIES:			
04760070	RS port, used to connect a digital sensor for perpendicularity measurement		
04761052	Extension cable, Sub-D 9p/f to 9p/m, 2 m		
04761063	Sub-D 9p/m to USB cable, 2 m		
04765008	Thermal paper 57 MM		

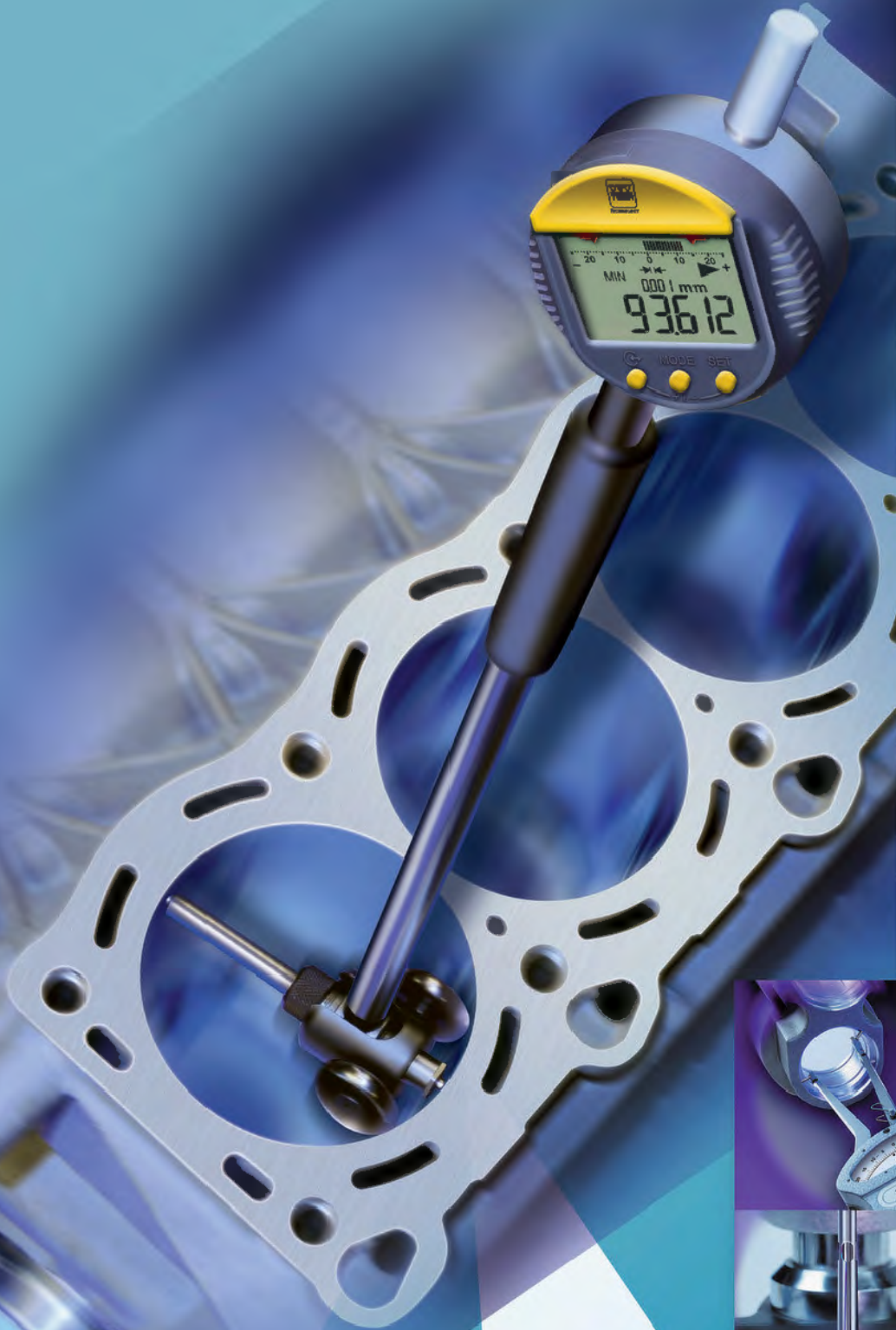
Technical Data

	Models		TESA-HITE plus M 400	TESA-HITE plus M 700
		mm	405	705
		in	16	27
	With standard accessory	mm	0 ÷ 560	0 ÷ 860
		in	0 ÷ 22	0 ÷ 33
	With probe insert holder No. 00760057	mm	0 ÷ 615	0 ÷ 915
		in	0 ÷ 24	0 ÷ 35
	With probe insert holder No. S07001622	mm	0 ÷ 785	0 ÷ 1085
		in	0 ÷ 31	0 ÷ 42
	With standard accessory	µm	(2,5 + 3 L) µm (L in m)	
		in	(0.0001 + 0.000003 L) in (L in in)	
	With standard accessory		On flat surfaces: 2 σ = < 1 µm / < 0.00005 in	
			Into bores: 2 σ = < 2 µm / < 0.0001 in	
	Frontal, mecanical	µm	8	12
		in	0.00031	0.00047
		kg	27	32

Standard Accessories



Comparative Measurement



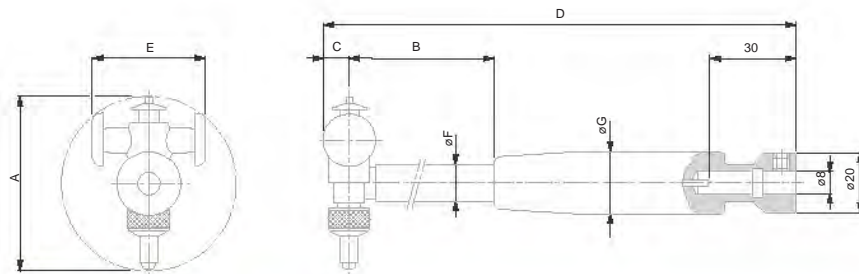
TESA VERIBOR



- Only VERIBOR without dial gauge: $2 \mu\text{m}$
- Only VERIBOR without dial gauge: $\pm 2s = 0,5 \mu\text{m}$
- Measuring bolts and anvils fitted with carbide ball tips
- Mounting for sensor with stem $\varnothing 8 \text{ h6 mm}$
- Set including 1 single TESA VERIBOR.
1 set of interchangeable fixed inserts covering the whole application range.

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

Sets supplied without dial gauges, electronic probes or indicators



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

Special Versions

Available on request :

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

ACCESSORIES FOR TESA VERIBOR

Set of Extensions

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

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



Depth Extensions

To be mounted on the body of VERIBOR $\varnothing \geq 25 \leq 550$ mm for large measuring depths (dimension B in the technical drawing of the VERIBOR).

No	=	mm
05760029	Extension	1000
05760027	Extension	500



Dial Gauge Protection Guard

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

No	=	mm
05760013	Protection guard	\varnothing 58



Dial gauges – Electronic and Analogue



EASY-TO-USE AND VERSATILE

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

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

CHOICE OF DIAL GAUGE OR ELECTRONIC INDICATOR


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

STANDARDS AND DEFINITIONS

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

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

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

 Total permissible error in 1 measuring direction over the entire measuring range
within the partial measuring range


in the 2 measuring directions

 Repeatability limit

 Max. hysteresis

Mechanical dial gauges.

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

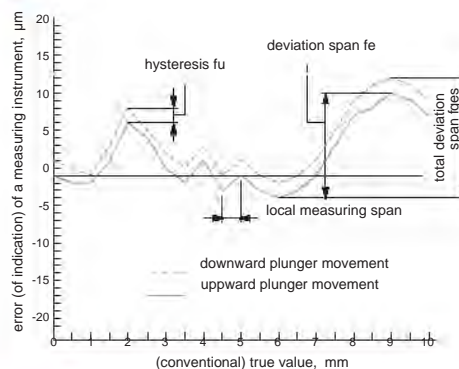
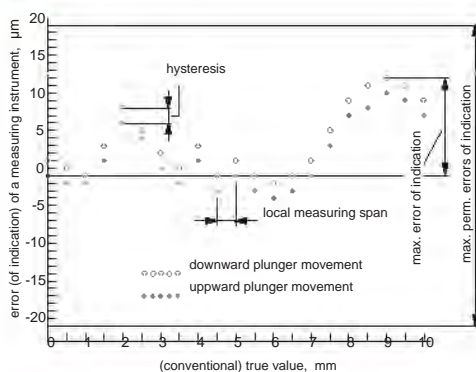
 Deviation span (error of indication within the measuring range)

Deviation span (error of indication) within the partial measuring range

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

 Repeatability limit (reliability) of indication

 Hysteresis of indication



TESA DIGICO 705

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

- Same functions as DIGICO 600.



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

01930258	DIGICO 705 MI	12,5	0.5	0,001	0.00005	4	2	150

Accessories for TESA DIGICO 200 – 700



01962002		External power supply
01961000		Lithium battery, 3V, CR2032
04761054		Battery charger 100 ÷ 200 VAC / 50 ÷ 60 Hz, 6,6 Vdc, 750 mAh supplied without power cable
04761055		Cable EU for charger 0471054
04761056		Power cable US for charger 0471054

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

Dial Ø 58 mm – Reading 0,001 mm
Precision dial gauges



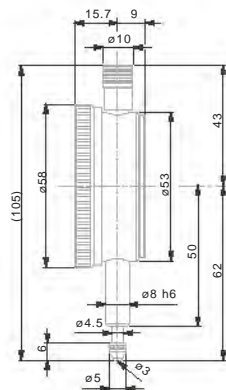
01412511



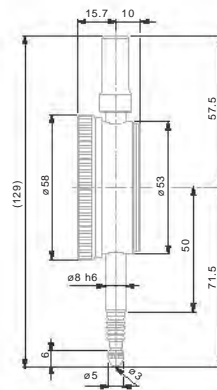
556



01412611



567



556E

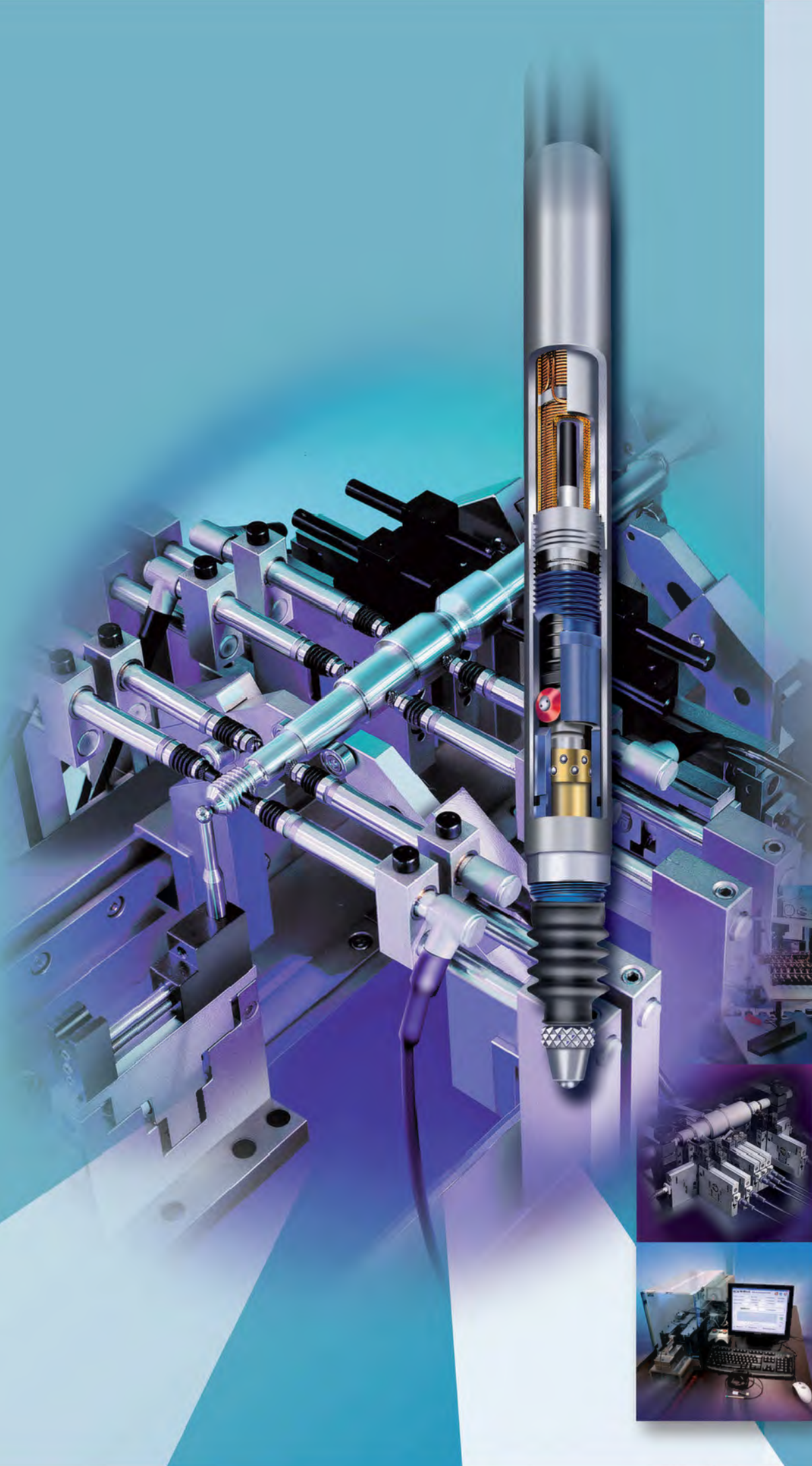
- EN ISO 463
Factory standard
- Rotating dial
- Full-metal dial casing. Mounting shank and plunger in hardened stainless steel
- Effective anti-shock in the 2 directions
- Adjustable tolerance markers. Thread M2,5 for measuring insert
- Measuring insert with 3 mm Ø ball tip, already mounted
- Inspection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

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

Permissible limits of a metrological characteristic (MPE/MPL)

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

Electronic Length Measuring Equipment



TESA INDUCTIVE PROBES AND ELECTRONIC EQUIPMENT

TESA probes: At the cutting edge of technology

TESA develops, manufactures and remains a leader in the inductive probe sector with an experience of more than 40 years. It offers a complete and unique line of probes designed to meet the requirements of varied as well as demanding applications.

Dimensional inspection of medium and large batches of parts in multigauging fixtures represents a major application area where measuring speed coupled with a high level of accuracy is needed.

High precision inductive probes (type GTL-21 HP) are, for example, also suited for the measurement of gauge blocks. The display resolution can reach a digital step of 0,01 μm !

On request, TESA probes can be supplied in versions compatible with the electronic equipment of other suppliers.

Typical qualities of TESA inductive probes : excellent repeatability, durability and longevity

All TESA inductive axial movement are mounted on a ball bearing with the exception of miniature models.

The ball bearing guidance system is insensitive to any radial force exerted on the probe housing. An anti-rotation guiding system ensures perfect movement of the mechanical guide.

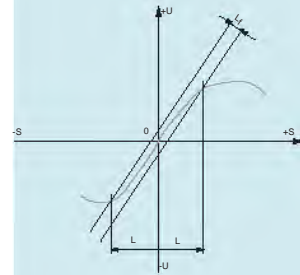
The axial probe guide system is effectively protected against penetration of liquids (oils) or solids (dust) by sealing bellows of high elastic quality. Under normal conditions, the standard nitrile elastomer bellows provide sufficient protection against oils and solvents. For applications where the probes remain in prolonged contact with coolants or lubricants and aggressive chemicals, Viton bellows are recommended. Viton is a fluorelastomer resistant to the heat of oils and aggressive chemicals.

The retraction (lifting) of the measuring bolt rod can be made by the suction of air (vacuum) accumulated within the probe thanks to the airtightness provided by the sealing bellows. This method of working principle does not use any mechanical device ensures the operation of the guidance system in an optimal manner. Similarly, the probe can be moved into its measuring position by a pneumatic activation (pressure), depending on the probe model.

Inserts (measuring inserts) can be replaced or exchanged. A wide choice of geometrical forms and sizes are available

The measuring force can be adjusted by changing the spring, depending on the probe model.

The probes integrate an electronic amplifier of the signal without relying on any mechanical conversion device. Thus, these probes are distinguished by their high repeatability and very low hysteresis errors.



GT-31



Probe FMS



TT20



USB probe



Wireless probe



For the acquisition of measured values, TESA offers a complete family of probes and measuring instruments for the most demanding applications. The probes, supplied in standard execution, do not need any form of adaptation. They function on the inductive half-bridge principle.

The market offers other equipment using probes that partly operate on the principle of a differential transformer and these are known as LVDT (Linear Variable Differential Transformer) probes.

TESA also offers a range of probes compatible with other electronic equipment, using an adaptor and a connector depending on the origin of the equipment. A description of TESA standard half-bridge and LVDT probes is provided below.

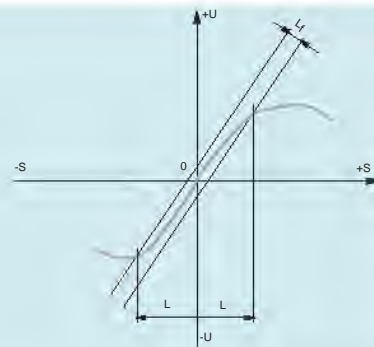
Standard half-bridge probes for TESA equipment

OPERATING PRINCIPLE

All TESA electronic probes (value sensors) work based on the inductive principle with mechanical contact of the workpiece.

They are fitted with a coil system inducing an alternating output voltage that depends on the the position of the ferro magnetic core. When symmetrically positioned – i.e. at electrical zero – no voltage is impressed. A move of the core, which may be attached to the measuring bolt while the measurand is being taken, causes the inductance to change. This change generates a signal that is amplified and rectified before being displayed and further output. Depending on the instrument type, the analogue signal will be shown on a voltmètre or a numerical display after a digital transformation.

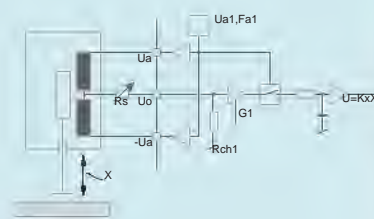
Unambiguous assessment of the measurand (at bolt position) to the signal (displayed value) is the main characteristic of analogue value acquisition. One of its distinct advantages lies in the value primarily displayed, which will be reproduced in the event of a power cut (switch-off or power failure).



Inductive measuring
 S: Travel
 U: Output current
 0: Electrical zero
 L: Linearity range
 Lf: Linearity error

TESA Standard Half-Bridge Probes for TESA Electronic Equipment

These probes have two serial coils with middle output mounted side by side, which are energized by a sinusoidal alternation signal at 13 kHz. Both are linked together to a Wheatstone bridge over an additional half-bridge.

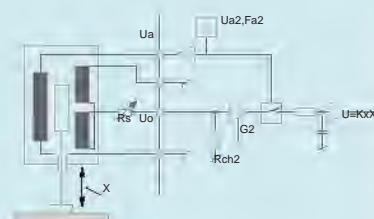


Wiring plan of half-bridge probes

TESA LVDT Probes

These probes are based on a Linear Variable Differential Transformer (LVDT). They have three coils, i.e. one primary coil being energized by a sinusoidal alternation at 5 kHz, and two secondary coils connected in opposite phase, which generate the output current proportional to the measuring travel.

Available upon request.



Wiring plan of LVDT probes

Multiple application possibilities

TESA probes have been designed for applications for use with instruments for internal and external measurements, measuring supports or special measuring systems. For such applications, different probe executions can be supplied such as probes with an axial measuring bolt or parallel guides, refer also to angle lever probes. In addition, there are also special executions developed for multi-gauging inspection fixtures or 'in-process' inspection stations, which enable an economy in the number of components needed. Apart from a few exceptions, the measuring operations executed are always comparative measurements with reference to a standard such as a gauge block, a setting ring or any other component that can be used as a master.

The measurements are extremely accurate. Bias error influence is negligible compared to the budget for measuring uncertainty given the fact that the comparison is being established between two almost practically equal values

Random errors also lose their influence in a procedure where the display setting is made under the same conditions as the subsequent probing measurements

TESA measuring instruments are equipped with an analogue and/or digital display, depending on the model.

Internal processing of measured values

Depending on the application, the electrical signals are processed in different ways within the instrument.

Mathematical Data Processing

The signals can be processed with positive polarity sign as well as negative polarity sign. The use of a single probe enables single measurement of internal or external dimensions while the combination of the signals of two probes produces either a "sum measurement" or a "difference measurement".

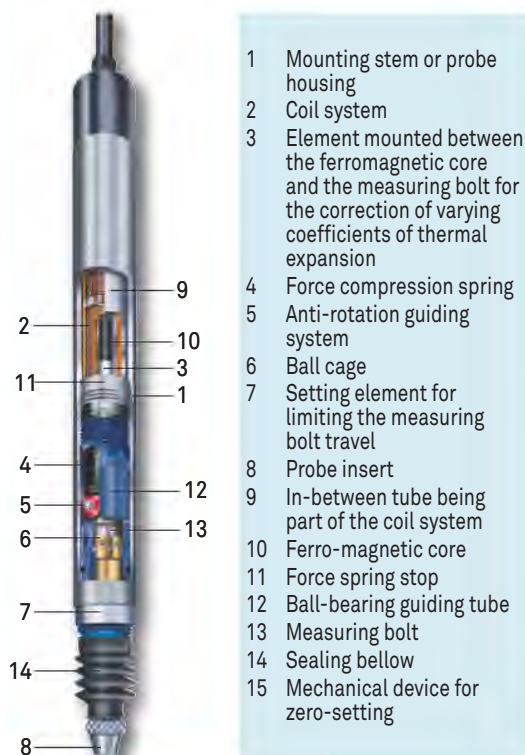
Value Storage

The storage of measured values in the memory ensures the reliability of dynamic measuring cycles. The characteristic values are the two minimum and maximum values or the difference between the smallest and largest value acquired while measuring form or position errors.

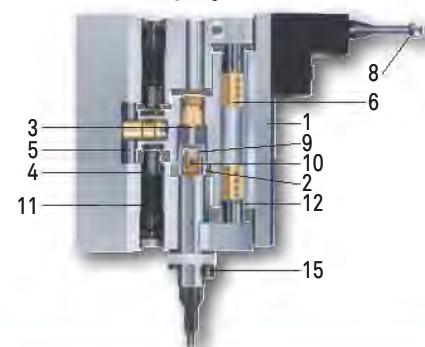
Classification of Values

The measured values can be classified after the entering of limit deviations. In this case, the control signals can be used by an external peripheral unit.

Components of a TESA inductive probe



Sensitivity of TESA half-bridge probes for TESA electronic interfaces and electronic displays



Sensitivity	73,75 mV/V/mm
	29,50 mV/V/mm (GT 61, GT 62)
	7,375 mV/V/mm (GT 61S, GT 62S)
	49,17 mV/V/mm (FMS 130, FMS 132)

All given values are valid for the following reference conditions :

Drive voltage	3 V
Drive frequency	13 kHz
Adjustment load	2 k Ω



Standard Probes, ± 1 mm, 4,3 mm Travel (GT22)

Universal probes for common but constraining applications.

- 8 mm diameter probe housing. Can be clamped over its entire length.
- Measuring bolt mounted on a ball bearing.
- Both the probe housing and ball-bearing guide are separate from one another, so that the measuring bolt moves easily even if the probe is not clamped appropriately.
- Degree of protection IP65 according to IEC 60529.
- Wide range of accessories including measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other makers available on request.



GT 22

GT 22

No	=	Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03210924	GT 22	± 1	0,63	Mechanical / vacuum	Nitrile
03210921	GT 22	± 1	0,16	Mechanical / vacuum	Nitrile
03210922	GT 22	± 1	0,25	Mechanical / vacuum	Nitrile
03210923	GT 22	± 1	0,40	Mechanical / vacuum	Nitrile
03210925	GT 22	± 1	1,00	Mechanical	Nitrile
03210926	GT 22	± 1	1,60	Mechanical	Nitrile
03210927	GT 22	± 1	2,50	Mechanical	Nitrile
03210928	GT 22	± 1	4,00	Mechanical	Nitrile

=	Measuring travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of the lower bolt stop***, mm (factory setting)	Cable output	Data Sheet No.
GT 22	4,3	0,2 + 3 · L ³	0,01	0,02	-2,2 to 0,1 (factory setting -1,2)	Radial	03200250

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.

** For an amplitude of 10 % to the last value of the measuring range.

*** Distance from electrical zero.

N DIN 32876 Part 1

☆ Nickel-plated housing. Stainless steel measuring bolt, hardened. Nitrile sealing bellows = resistant elastomer

A Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

☆ Supply frequency: 13 kHz (± 5 %). Max mechanical frequency** 60 Hz.

☆ 0,15 µm/°C

☆ 20 ± 0,5°C

☆ Protection level IP65 (IEC 60529)

☆ Mobile weight: 6 g

☆ Inspection report with a declaration of conformity



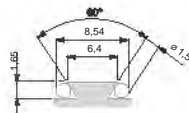
GT31 Lever Probes ± 0,3 mm, 0,3 mm Measuring Travel, Inclinable Lever



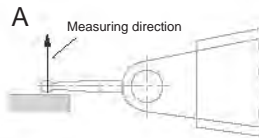
GT 31 with lever in perpendicular position

Well suited for use where probes with axial movement measuring bolts are inconvenient for measurements.

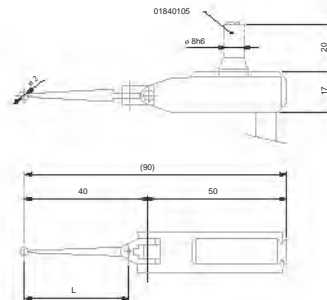
- Inclinable lever for measuring in two directions.
- Balanced lever system on ball-bearing.
- Interchangeable measuring insert, with carbide ball tip, inclinable through to 180°.
- Automatic reversal of the probing direction while the indication remains unchanged.
- Protected against shocks by 2 safety clutches.
- One-piece housing provided with 2 dovetails.
- Level of protection: IP40 as per IEC 60529.



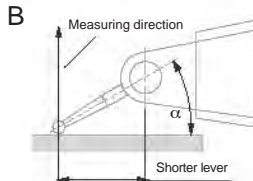
GT 31



GT 31
Figure A - the leverage matches 1:1, no correction of the measured value needed



GT 31 side view and top view



GT 31
Figure B - the leverage is no longer 1:1, correction of the measured value is needed.

Note
(Fig. A) With the insert lying parallel to the workpiece surface, the leverage matches 1:1. Therefore, no correction of the measured values is needed.
(Fig. B, angle α) Any other position will change the effective lever length, so that read values must be corrected. In this connection, please consult the instruction manual.

No		Measuring range, mm	Nominal measuring force*, N	Lever retraction	Sealing bellows
03210802	GT 31	± 0,3	0,1	Without	Without bellows
03210801	GT 31	± 0,3	0,02	Without	Without bellows
03210803	GT 31	± 0,3	0,2	Without	Without bellows

	Measuring lever travel, mm	Max. permissible error for deviations in linearity, μm (L in mm)	Repeatability, μm	Hysteresis, μm	Setting of lower stop of the measuring insert***, mm	Cable output	Data sheet No.
GT 31	0,7	$0,2 + 50 \cdot L^2$	0,1	0,25	Fixed lower and upper stops	Angled	03200266

* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

- DIN 32876 Part 1
- All-metal housing, matt-chromium finish
- 2 dovetail attachments for clamping. Both lower and upper stops are fixed. Stainless steel measuring stem. Interchangeable measuring inserts. Carbide ball tip $\varnothing 2$ mm. Cable length: 2 m. DIN 45322, 5 pin connector. Other measuring inserts available as optional accessories..
- Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 25 Hz.
- $20 \pm 0,5^\circ\text{C}$
- Protection level: IP40 (IEC 60529)
- Mobile weight: 12 g

N ROHS 2 according to 2011/65/EU
REACH according to EC 1907/2006
WEEE according to 2002/96/EC

8 10 x 5 mm

8 For a temperature of 20°C and a relative humidity of ≤ 50 %:
Analogue and digital response time: ≤ 100 ms. Holding of digital display: ≥ 100 ms.

= Supply: 4 batteries AA 1,5 V, type LRC 6.
Power consumption: ≈ 7 mW/3,5 V.
Probe supply voltage: 0,7 V.
Supply frequency: 13 ± 0,65 kHz

***** For a temperature of 20°C and a relative humidity of ≤ 50 %:
Zero drift and signal amplification: ≤ 0,005 %/°C.
Display frequency limit with respect to input signal: 10 Hz

IP63 (IEC 60529)

CE 2004/108/EC
EN 61326-1
annex A

RS232 via TLC connector

100 x 170 x 38 mm
(W x D x H)

LCD display size:
70 x 62 mm

500 g
(including batteries)

5 decades plus minus sign

± 1 digital step

Value limit for a temperature of 20°C and a relative humidity of ≤ 50 %:
Analogue display: 1 %
Digital display: 1 %

TESATRONIC TWIN-T10 probe display unit

- Portable display TESATRONIC TWIN-T10 for TESA inductive probe.
- Autonomous instrument used during assembly, on an inspection workstation of a production line, for final inspection or directly on a machine on the shop floor.
- Frequently used with a GT 31 lever probe for geometry measurements: form tolerances (straightness, flatness etc.) or orientation tolerances (parallelism, perpendicularity, etc.).
- Function TOL for measurements with tolerances.
- Memory function for values MAX, MIN or MAX-MIN for dynamic measurements.
- Function for zero-setting of the display, for easy comparative measurements with a reference part.
- Special ZOOM mode for a more detailed visualization of the analogue scale. This mode simplifies the alignment and fine adjustment during assembly.

Other features:

- 4 or 7 measuring ranges from ± 5 µm to ± 5 mm, or switchable automatically depending on the measured value.
- Access to functions by direct keys.
- Millimetre/inch conversion.
- 1 probe signal input.
- Power supply by standard AA batteries.
- RS232 digital output (TLC connector).



TWIN-T10



Designation



Number of probe inputs



Automatic conversion of range



Analogue scale zoom x5



Memory function for values MAX, MIN, MAX-MIN

04430013

TESATRONIC TWIN-T10 1





Run-out measurement with TWIN-T10 and GT 31 lever probe

STANDARD ACCESSORIES:

03210802	GT31 lever probe, $\pm 0,3$ mm, $F = 0,10$ N, standard version
04768000	Hand switch for manually triggering data transfer. Jack plug connector, 1,8 m - TESA SPC PRINTER printer - TESATRONIC TT display units
04768001	Foot switch for triggering data transfer. Jack plug, 1,8 m - TESA SPC PRINTER printer - TESATRONIC (TT) display units
04760181	TESA TLC-USB CABLE for instruments with a TLC connector
04760182	TLC-DIGIMATIC CABLE for instruments with a TLC connector
04760180	TESA TLC-TWIN wireless transceiver. Compatible with any instrument equipped with a TLC connector (TESA Link Connector)
05030012	TWIN-STATION Receiver for wireless TLC-TWIN transceiver
04981001	DATA-DIRECT software and dongle
04981002	STAT-EXPRESS Software and dongle
01460008	Back with central lug
01460009	Back with offset lug

- DIN 32876 Part 1
- 110 mm scale length
- 6-decade display plus minus sign
- 12,5 x 6,6 mm
- 126 x 62 mm LCD display, with 50 scale divisions
- Value limit for a temperature of 20°C and a relative humidity of ≤ 50 %
 TT20:
 Analogue display: 2%
 Digital display 0,3 %
 Digital output: 0,3 %
 TT60:
 Analog display: 2 %
 Digital display: 0,3 %
 Analogue output: 0,3%
 Digital output: 0,3%
- ± 1 numerical interval
- 255 x 235 x 120 mm (W x D x H)
- Resistant plastic material
- For a temperature of 20°C and a relative humidity of ≤ 50 %:
 TT20:
 Response time of analogue, digital and LED classification displays: ≤ 80 ms.
 Maintenance of digital display: 80 ms.
 TT60:
 Response time of analogue, digital and LED classification displays: ≤ 80 ms.
 Holding of digital display: 80 ms.
 Response time of the analogue output signal in relation to analogue display: ≤ 30 ms.

TESATRONIC TT20 and TT60 Probe Display Units

- Functional reliability.
- User-friendly.
- Essential for inspection in production or metrology laboratory.

TESATRONIC TT20

Combined digital and analogue indication

2 probe inputs for single measurements, sum and difference measurements

- Large LC display for comfortable and error-free reading.
- Pseudo-analogue bargraph indication for a better repeatability and negligible hysteresis.
- Choice between pointer or bargraph indication.
- LCD display for all functions.
- 7 measuring ranges, switchable manually or automatically according to the measured value.
- Direct conversion from metric to inch units.
- Touch button for the indication setting of of each measuring channel.
- Keys for introducing limit values.
- Classification of values (3 classes) and display through colour LEDs with signal outputs.
- Locking of displayed values for step by step measurement routines.
- Automatic recognition of the type of connected TESA probe with adaptation of the measurement signals to the value of output connected (valid only for TESA probes produced from 1997 onwards).
- Opto-coupled RS232 output, bidirectional.
- Power supply through mains adapter.

TESATRONIC TT60

Same features as TESATRONIC TT20, but with following added functions:

- Memory for retaining extreme values "max.", "min.", "max.-min." along with mean value obtained from "max." minus "min.".
- Dynamic measurement with acquisition of >100 single values.
- Value classification with output signals through contact relay for 5, 10, 20 or 40 acceptable classes.
- Analogue output for exterior processing of signals.





TT60



TT20

No	=	Measuring range zoom x5	Memory
04430009	TESATRONIC TT20 Display unit for 1 or 2 inductive probes	–	–
04430010	TESATRONIC TT60 Display unit for 1 or 2 inductive probes	–	●




		
	Number of probe inputs	Automatic switching of range
TESATRONIC TT60 Display unit for 1 or 2 inductive probes		●
TESATRONIC TT20 Display unit for 1 or 2 inductive probes		●


DELIVERED WITH THE FOLLOWING ACCESSORIES:


- 04761054** Battery charger 100 ÷ 200 VAC
50 ÷ 60 Hz, 6,6 V DC, 750 mAh
supplied without power cable
- 04761055** Mains cable EU
for charger 0471054


OPTIONAL ACCESSORIES:

- 04768000** Hand switch for manually triggering data transfer. Jack plug connector, 1,8 m
 - TESA SPC PRINTER printer
 - TESATRONIC TT display units
- 04768001** Foot switch for triggering data transfer. Jack plug, 1,8 m
 - TESA SPC PRINTER printer
 - TESATRONIC (TT) display units
- 04761062** Opto-USB cable, Duplex, 2m
Bidirectional communication
- 04761049** Opto-RS cable, Duplex, 2m
Bidirectional communication

 For a temperature of 20°C and a relative humidity of ≤ 50 %:
 TT20:
 Response time of analogue, digital and LED classification displays: ≤ 80 ms.
 Maintenance of digital display: 80 ms.
 TT60:
 Response time of analogue, digital and LED classification displays: ≤ 80 ms.
 Holding of digital display: 80 ms.
 Response time of the analogue output signal in relation to analogue display: ≤ 30 ms.

 RS232 opto-coupled output

 TT60: Voltage Range: ± 2 V to ± 10 V. Output current: ≤ 2 mA. Load adjustment: ≥ 5 kΩ. Background noise (probe at electrical zero) ≤ 1 mV. Reference potential: ground 0 V.

 Supply: 6,5 V DC up to 7,3 V DC. Supply frequency: 13 ± 0,65 kHz. Power consumption: 2 W. Monitored voltage variations. Probe supply voltage: 3 V.

 Protection of frontal face: IP54 (IEC 60529, DIN 40 050)

 IEC/EN 61326-1
USA: CFR47, Part 15, Subpart B, Class B, Digital Device

 1,1 kg





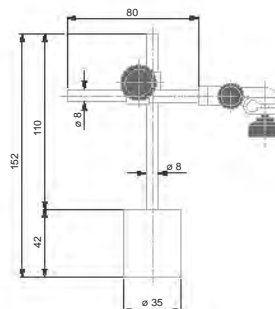
Measuring Supports and Auxiliary Equipment



SMALL MAGNETIC SUPPORTS

Ideal for lever type dial test indicators, and dial gauges up to 40 mm diameter
- With 2 articulation joints and fine adjustment.

Small magnetic support UJ 15



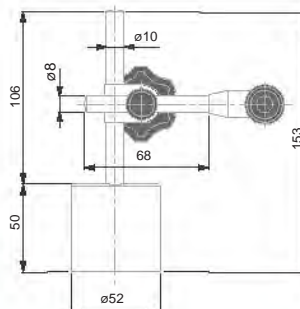
01639007 + 01640501
with dial test indicator

- Holding force on a flat surface: ≈ 220 N
- Rounded base with permanent magnet
- 0,47 kg
- Supplied without measuring instrument



01639007 Magnetic support INTERAPID UJ15, dovetail clamp and $\varnothing 8$ mm cylindrical clamping

Small magnetic support UJ 15G



01639016 UJ Magnetic support

- Holding force on a flat surface: ≥ 350 N
- Rounded base with permanent magnet
- 0,93 kg
- Supplied without measuring instrument

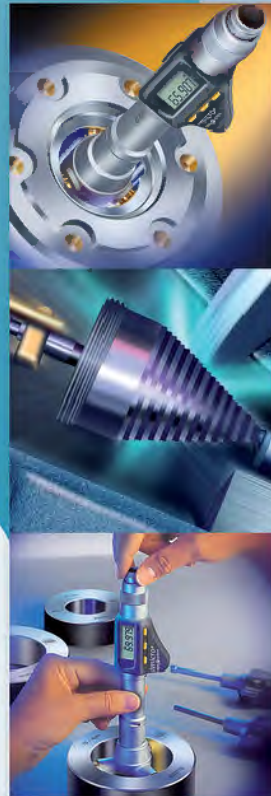
Accessories for Small Magnetic Stands



01640501 Steel base plate for UJ15 or UJ15G that become movable

- 50 x 80 x 20 mm
- 0,60 kg

Internal Measurement

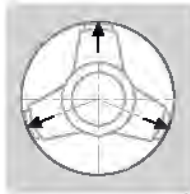


THE CHALLENGES OF INTERNAL MEASUREMENT

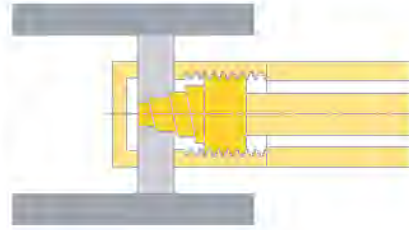
Bore measurement is more difficult than external measurement of components. Apart from the very tight tolerances specified, all measuring elements having a direct influence on the uncertainty of measurement must be designed in such a way that they can fit into the bore to be checked.

3-LINE CONTACT OFFERS A TRUE ADVANTAGE

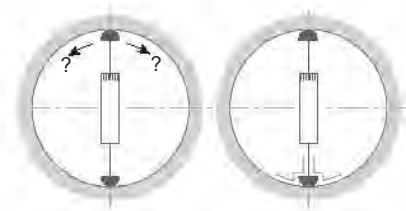
The near perfect auto-centering and auto alignment provided by TESA IMICRO, TESA TRI-O-BOR, ALESOMETER and ETALON INTALOMETER make bore measurement reliable, without the need for an operator to estimate.



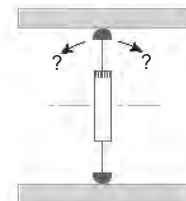
The three measuring bolts are spaced 120° apart, thus providing optimum self-centring.



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



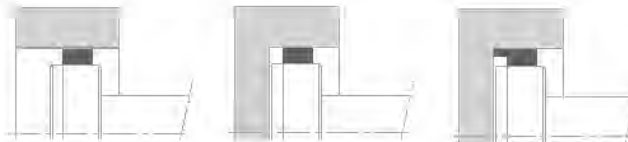
2-point contact measuring instruments are not self-centring. To enable bore measurements, the use of auxiliary means are required.



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

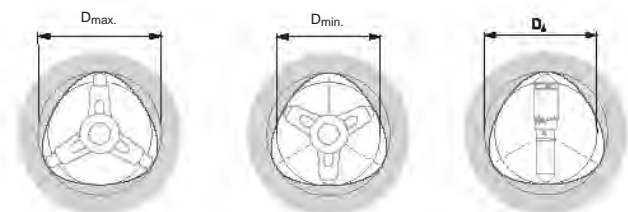
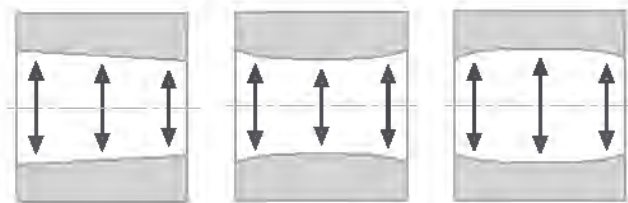
A SINGLE TOOL CAN REPLACE HUNDREDS OF PLUG GAUGES

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



ESTABLISHING FORM ERRORS

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



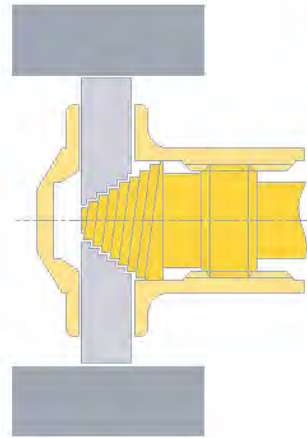
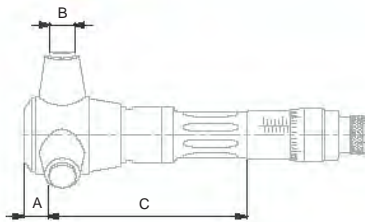
N DIN 863 T4
(Style C1)
NFE 11-099



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

Inspection report with a declaration of conformity

TESA IMICRO with Analogue Indication – Metric

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



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

TESA IMICRO with Analogue Indication – Full Metric Sets



DIN 863 T4
(Style C1)
NFE 11-099

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

Inspection report
with a declaration
of conformity



mm

Isolated
instruments

mm

Setting
rings

mm

Extensions

A mm

COMPOSITION OF THE SETS:

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