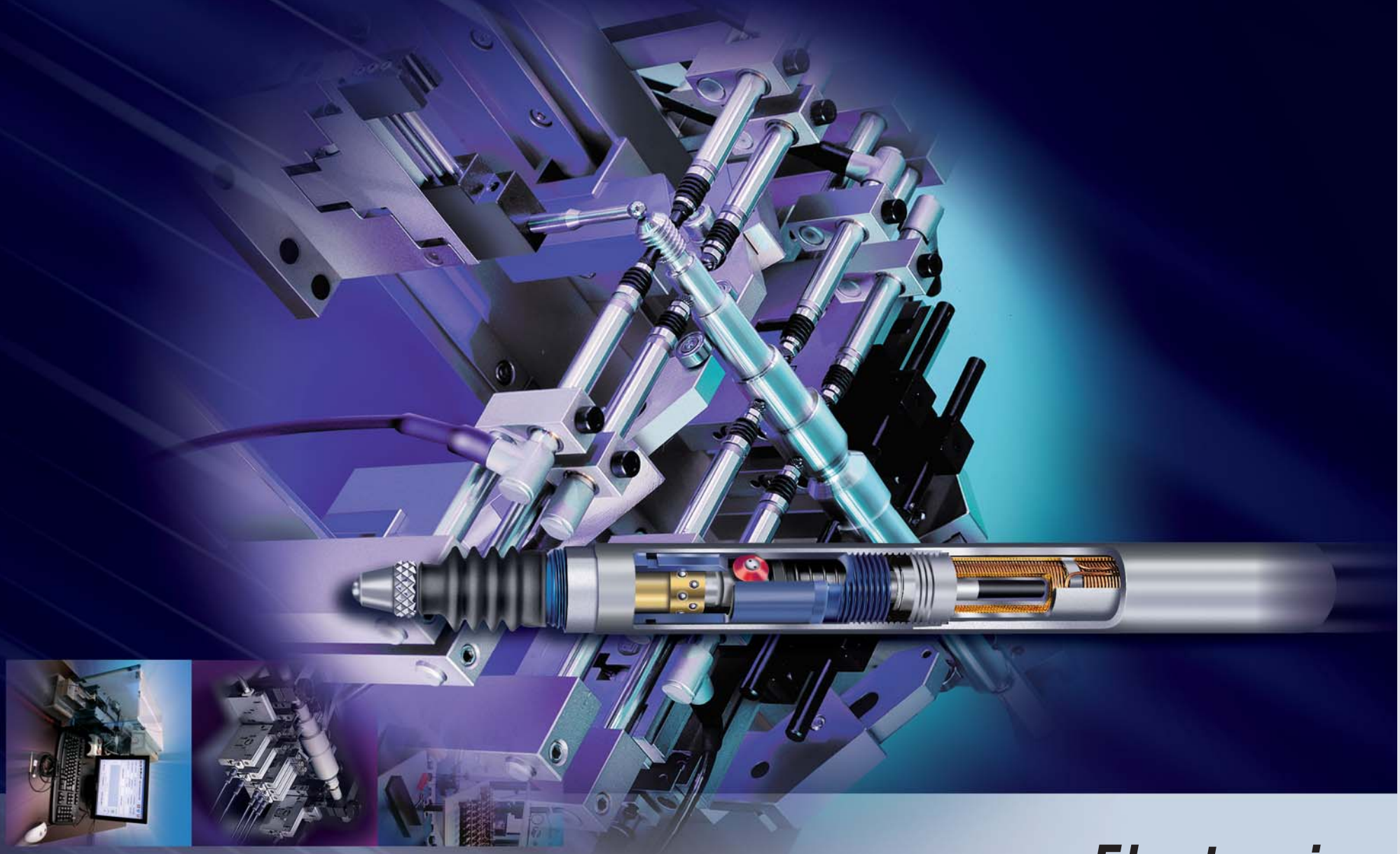


Electronic Length Measuring Equipment

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

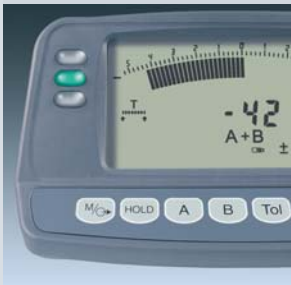
Signal processing can equally be made with positive or negative polarity signs. The use of a single probe enables single measurement of internal or external dimensions while the combination of the signals of two probes produces either a «sum measurement» or a «difference measurement».

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

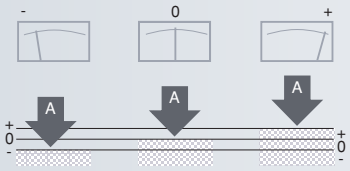
Uses limit deviations to classify the measured values while producing additional control signals usable through a remote unit.



MEASURING FUNCTIONS – OVERVIEW

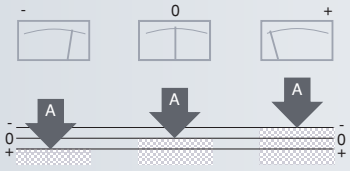
Single measurements with positive polarity sign (+A)

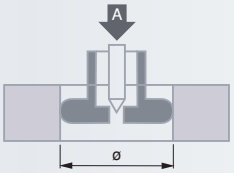
Measuring external dimensions with use of a measuring stand, snap gauge etc.



Single measurements with negative polarity sign (-A)

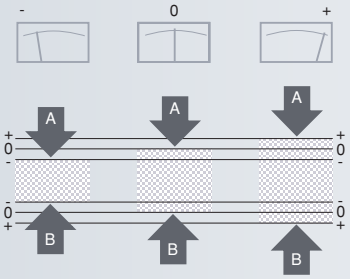
Inspecting sizes with change of the polarity sign. Display shows a low value for a small bore or a high value for a large diameter.

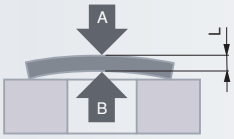




Sum measurements with positive polarity signs (+A +B)

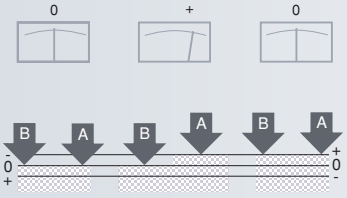
Measuring external dimensions regardless of form and position errors.

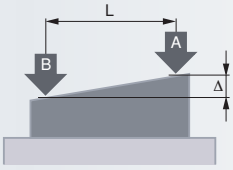




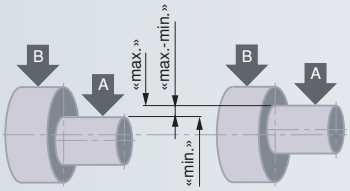
Difference measurements with opposite polarity signs (+A -B)

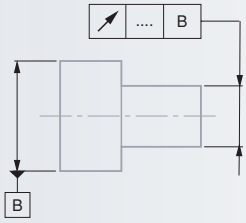
Performing step, cone and inclination measurements.

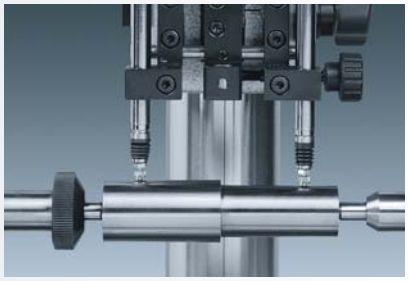


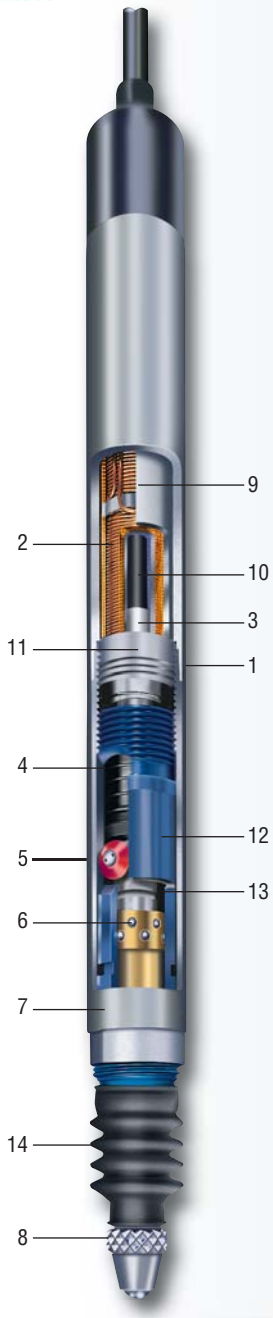


Establishing form and position errors such as runout errors with use of the memory function «max.-min.» as shown in this example.







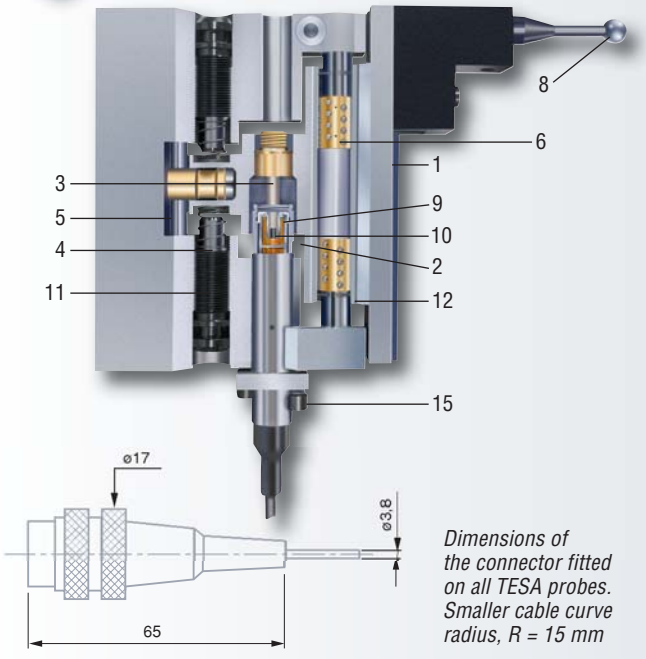


TESA Electronic Probes at the Forefront in Precision Measurement

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

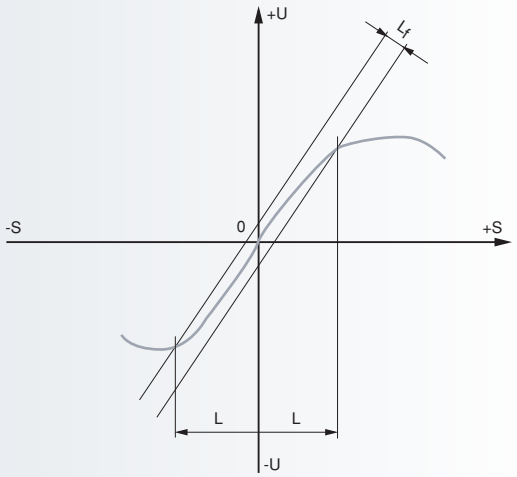
Sensitivity of standard half-bridge probes used in conjunction with TESA electronic probes

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).

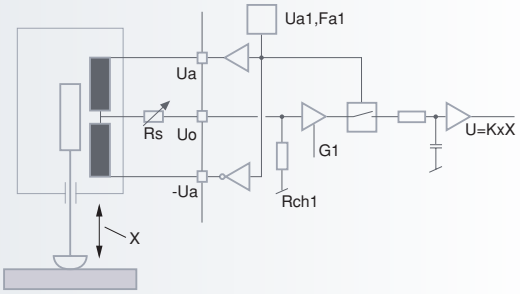


Inductive measuring
s Travel
U Output current
0 Electrical zero
L Linearity range
Lf Linearity error

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

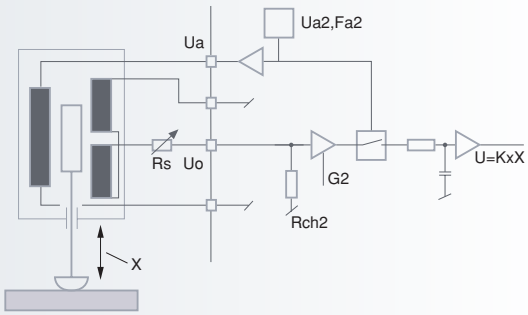
These probes have two serial coils with middle output mounted side by side, which are energized by a sinusoidal alternation at 13 kHz. Both are linked together to a Wheatstone bridge over an additional half-bridge.



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

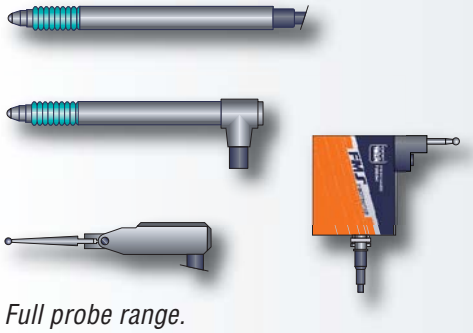


Wiring plan of LVDT probes

Compatible Probes

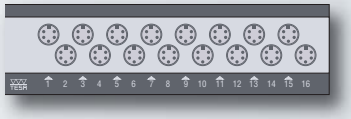
Upon request, all TESA's probes can be made available with a data output compatible with any electronic equipment from other makers.

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.

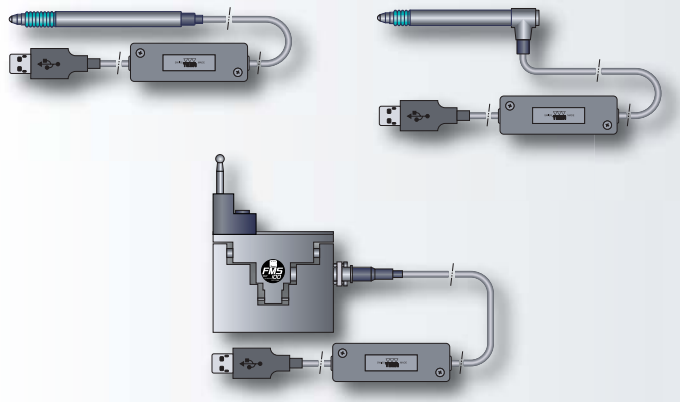
See pages O-48 to O-49.

Display unit with 2 connected probes TESATRONIC

Measurements and value display with value classification.

See pages O-42 to O-47.

TESA USB Probes

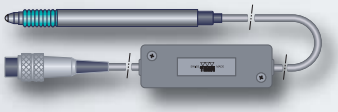


Direct connection to host computer

Easy-to-use and effective for single accurate and multi-gauging devices.

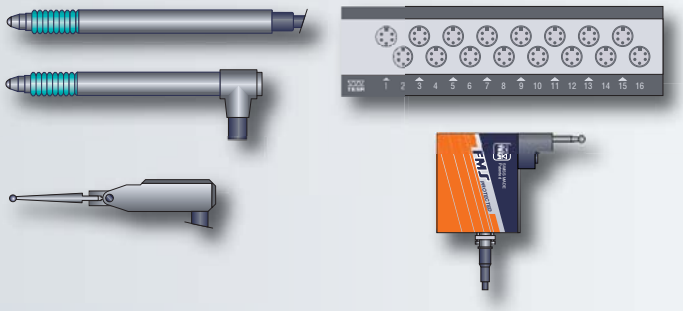
See pages O-14 to O-15.

TESA DC Probes



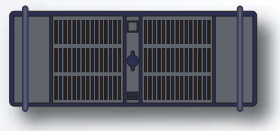
DC probes.

See page 0-16.

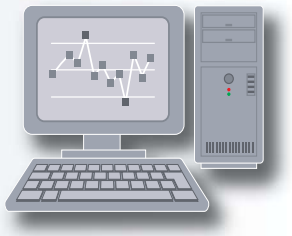


Interface boxes for TESA half-bridge probes. Analogue data output as for DC probes.

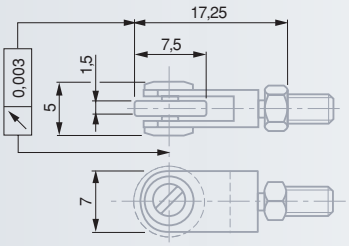
See page 0-50.

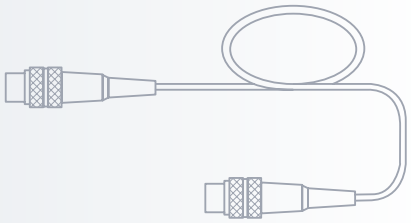


SPC or computer with analog board.



TESA Accessories





Accessories for TESA's probes.

See pages 0-34 to 0-41.

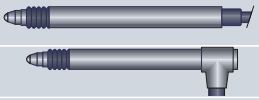
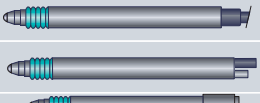
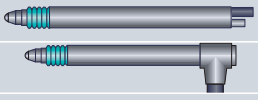
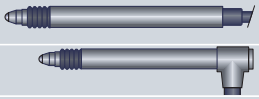
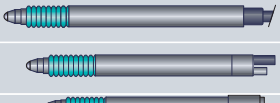
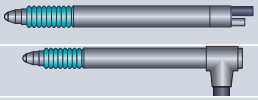
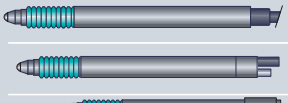
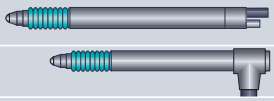
TESA Software Tools

Software tools for data capture and data analysis (settings, measurements, inspection reports).

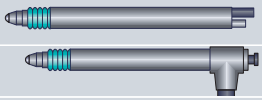
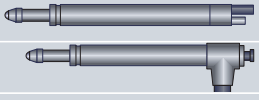
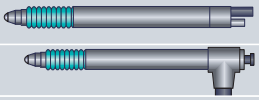
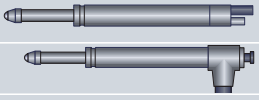
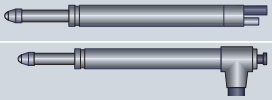
See chapter A – Connectivity

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.

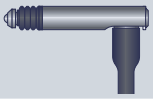
N**	Moving mass (g)	Frequency limit Hz***	Dismount-able	µm	(L in mm) µm****	°C	IEC 60529	
0,63	6	60	●	0,01	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-17
0,63	6	60	●	0,01	$0,2 + 3 \cdot L^3$	–10 ÷ 65	IP65	O-18
0,63	6	60	●	0,01	$0,2 + 2,4 \cdot L^2$	–10 ÷ 65	IP65	O-17
0,63	6	60	●	0,01	$0,2 + 2,4 \cdot L^2$	–10 ÷ 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

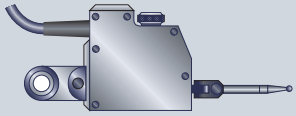
Miniature axial probes, 8 mm dia. probe housing

			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

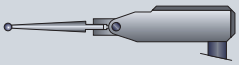
N**	Moving mass g	Frequency limit Hz***	Dismount-able	µm	(L in mm) µm****	°C	IEC 60529	
0,63	2	60	–	0,01	$0,2 + 5 \cdot L^2$	–10 ÷ 65	IP65	O-24
0,63	2	60	–	0,01	$0,2 + 5 \cdot L^2$	–10 ÷ 65	IP65	O-24
0,4	2	60	–	0,1	$0,2 + 5 \cdot L^2$	5 ÷ 65	IP65	O-24
0,4	2	60	–	0,1	$0,2 + 5 \cdot L^2$	5 ÷ 65	IP65	O-24

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

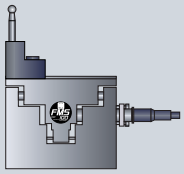
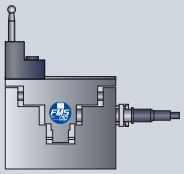
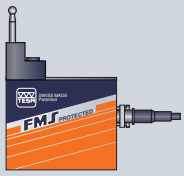
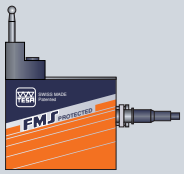
N**	Moving mass g	Frequency limit Hz***	Dismount-able	µm	%****	°C	IEC 60529	
1,8	2,5	10	–	0,5	0,3	0 ÷ 60	IP40	O-28
0,02 ÷ 0,2	10,6	10	–	0,25	0,6	0 ÷ 60	IP40	O-28

** 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

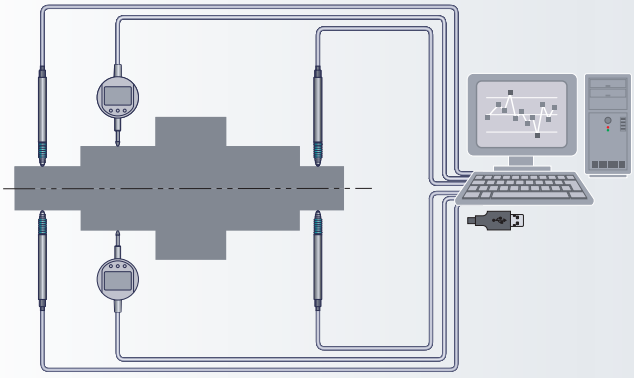
** Nominal value of the measuring force at electrical zero, max. deviation ±25%.
*** Highest mechanical frequency valid for the final value of the measuring range, amplified by 10%.
**** Linearity related max. permissible errors.

TESA PROBES WITH DIRECT USB CONNECTION

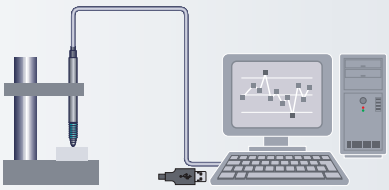
New generation of TESA's USB probes for a surprising ease of use

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

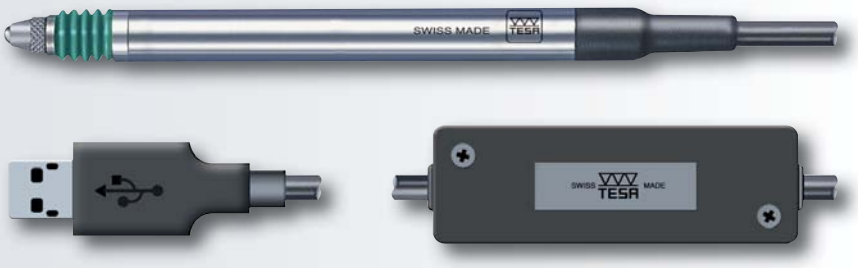
Identification number

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

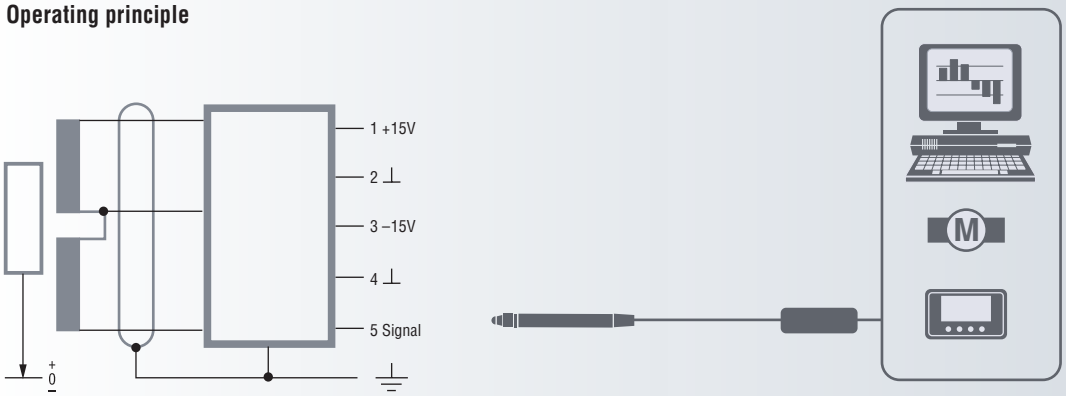
Drive voltage: ±15 V
Consumption: 15 mA
Adjustment load: > 1 kΩ
Sensitivity: see table

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

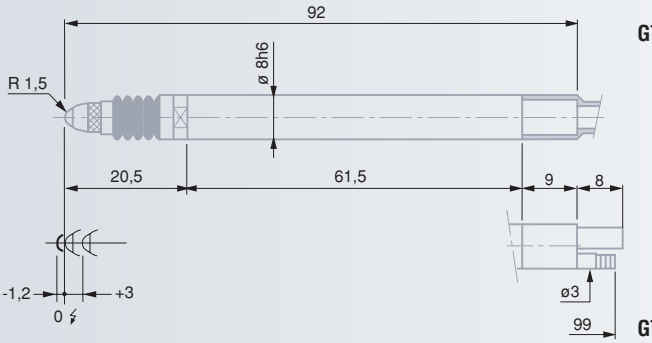
Identification number

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

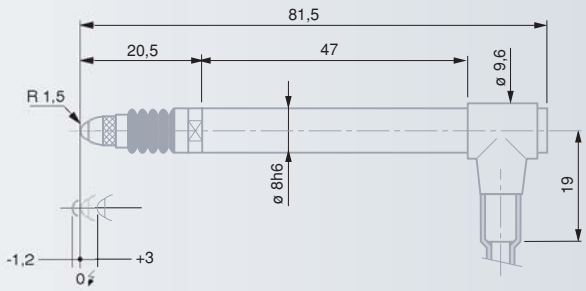
		Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellows
Standard probes					
03210924	**GT 22**	± 2	0,63	vacuum	nitrile
03210921	**GT 22**	± 2	0,16	vacuum	nitrile
03210922	**GT 22**	± 2	0,25	vacuum	nitrile
03210923	**GT 22**	± 2	0,4	vacuum	nitrile
03210925	**GT 22**	± 2	1,0	mechanical	nitrile
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.

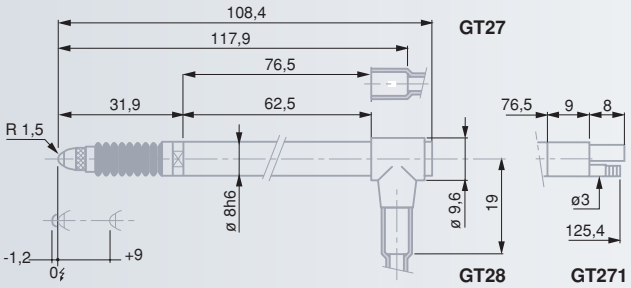
GT 27 probes with axial cable exit

		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

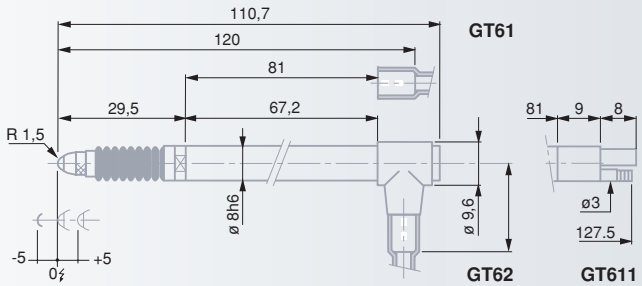
GT 62

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

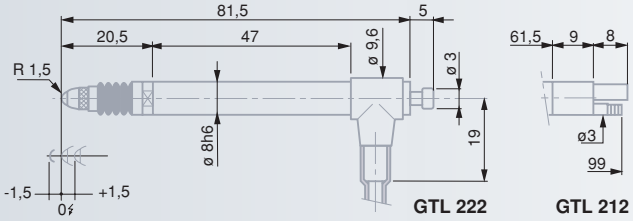
* Nominal value at electrical zero, max. ± 25%. Valid for upright assembly position, with downward oriented measuring bolt, as well as in static measuring

▼ Downward movement of the measuring bolt activated by pneumatic pressure.

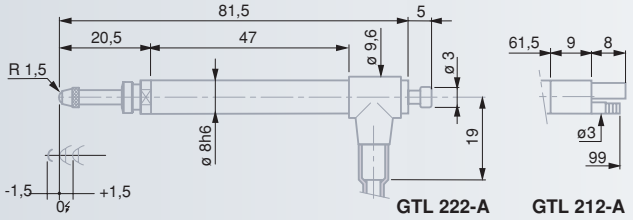
▲ Upward movement of the measuring bolt activated under the spring force only.

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

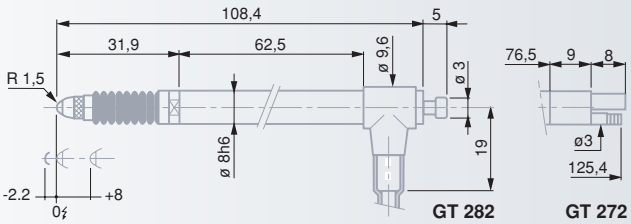
		Measuring range (mm)	Upper travel (mm)*	N**	Measuring bolt activation	Sealing below
Standard probes						
03230061	**GT 272**	± 2	8,1	1,0	▼ ▲	Viton
03230068	**GT 272-A**	± 2	8,1	0,85	▼ ▲	none

GT 282 probes with radial cable exit

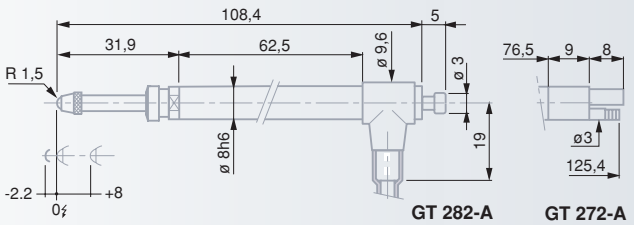
		Measuring range (mm)	Upper travel (mm)*	N**	Measuring bolt activation	Sealing below
Standard probes						
03230053	**GT 282**	± 2	8,1	1,0	▼ ▲	Viton
03230069	**GT 282-A**	± 2	8,1	0,85	▼ ▲	none

* 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

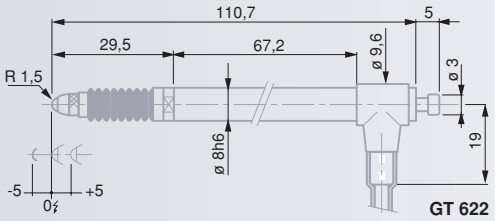
GT 622 probes with radial cable exit

		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

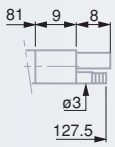
* Nominal value at electrical zero, max. ± 25%. Valid in upright assembly position with downward oriented measuring bolt, as well as in static measuring.

▼ Downward movement of the measuring bolt activated by pneumatic pressure.

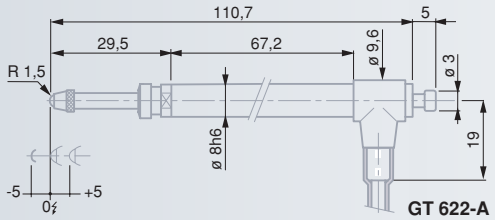
▲ Upward movement of the measuring bolt activated under the spring force only.



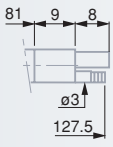
GT 622



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

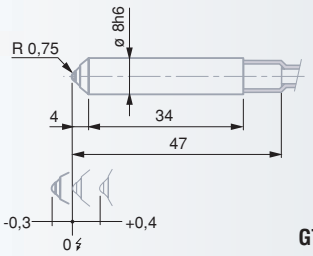
GT 42

GT 44

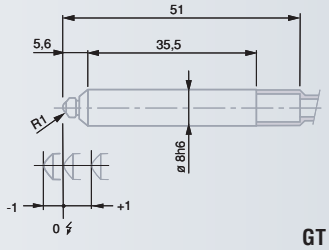
GT 42 and GT 44 probes with radial cable exit

		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

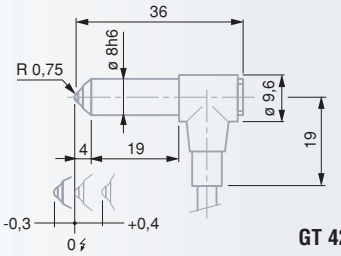
* Nominal value at electrical zero, max. ±25%. Valid in upright assembly position with downward oriented measuring bolt, as well as in static measuring.



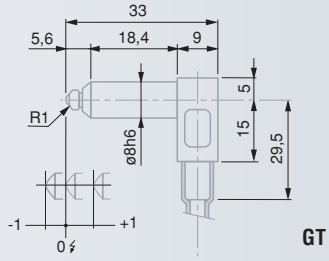
GT 41



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)

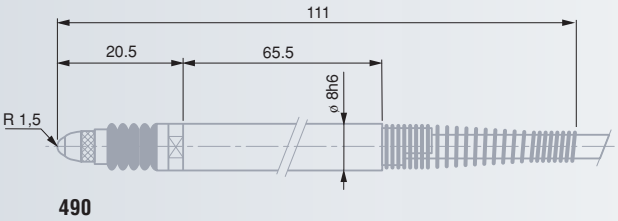
Shipping packaging

Identification number

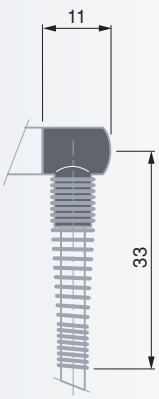
	Measuring range (mm)	N*	Measuring bolt retraction	Sealing bellow
*Probe series 490 with axial/radial** cable exit*				
03230490	± 1,5	0,63	mechanical	Viton

* 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

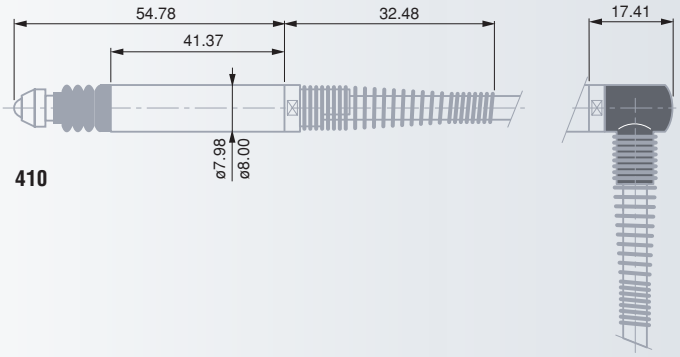
Universal probes for common but constraining applications.

- 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

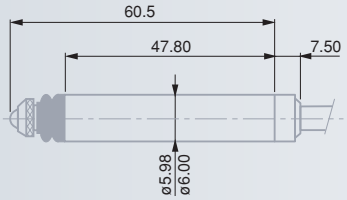
Their compact size and robust construction make them the ideal probes for a frequent use.

- 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.

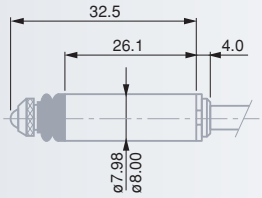
Other probes compatible with measuring equipment from other makers also available on request.

	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

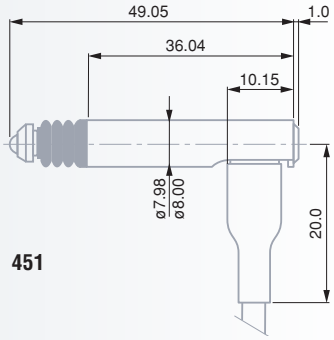
* Nominal value at electrical zero; max. deviation ± 0,15 N. Valid in upright assembly position with downward oriented measuring bolt, as well as in static measuring.



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

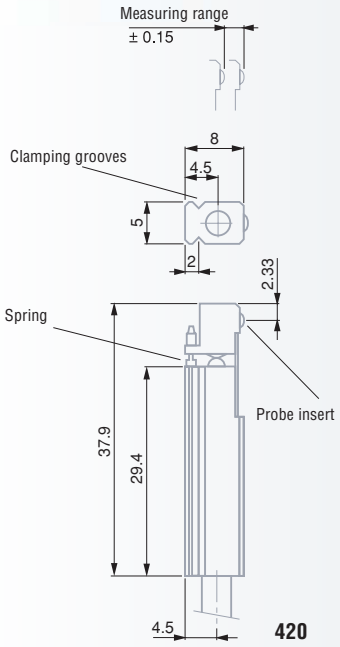
Probe series 420

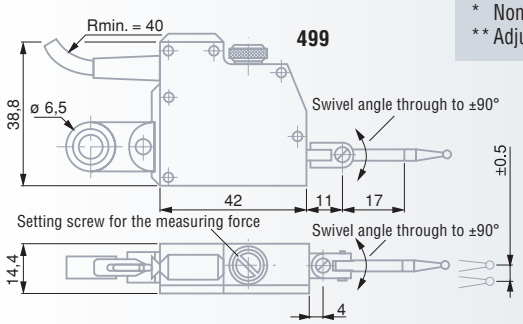
- Very short body that can be recessed into a fixture or a plug gauge.
- Probe insert mounted on leaf springs.

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.





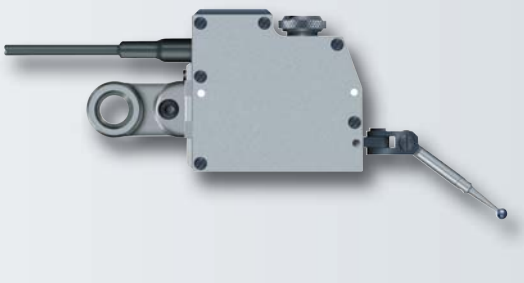
No		Measuring range (mm)	N*
Series 420 – Miniature lever probes			
96420004		± 0,15	1,8 ± 0,4
Series 499 – Lever probes with parallel guiding			
96499007		± 0,5	0,02 ÷ 0,2**

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

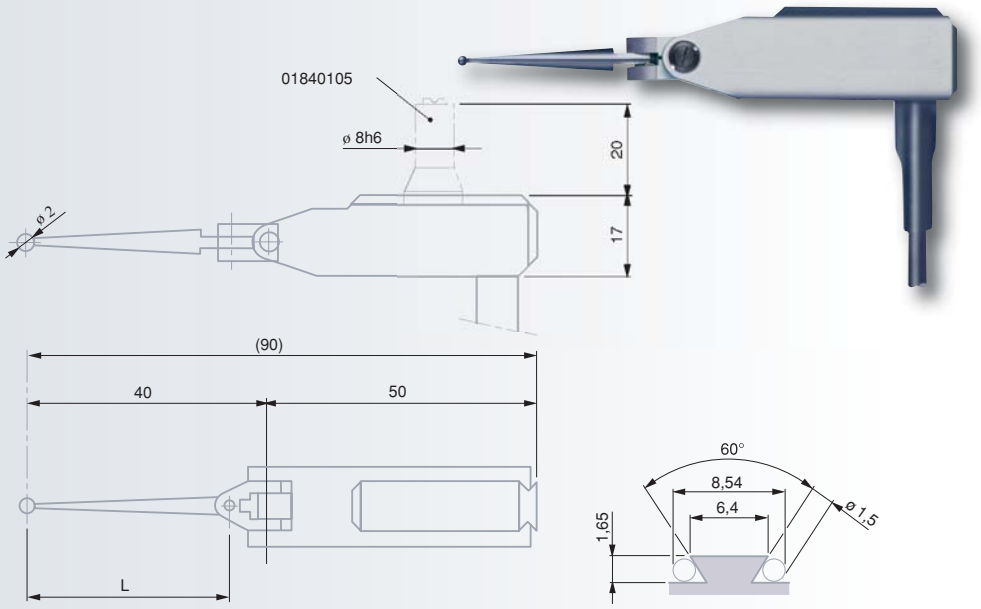
TESA GT 31 Lever Probes

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.

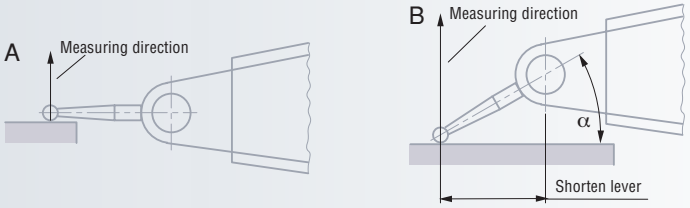
№		Measuring range (mm)	N*
03210802	**GT 31**	± 0,3	**0,1** (standard)
03210801	**GT 31**	± 0,3	**0,02**
03210803	**GT 31**	± 0,3	**0,2**

* 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)

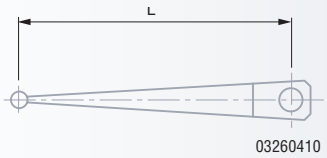
Equipped with a 2 mm dia. probe insert (No. 03260410) plus a 8 mm dia. fixing shaft No. 01840105.

Shipping packaging

Identification number

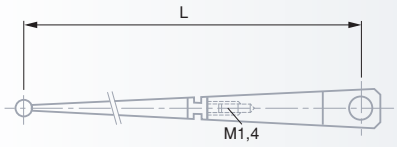
Declaration of conformity

Accessories for TESA Probes GT 31

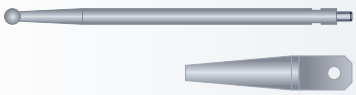


03260410


03260410



03590003


03590007

Probe inserts

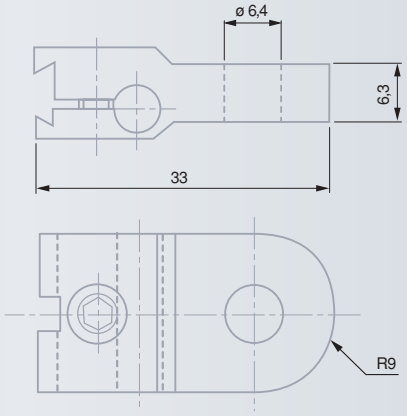
	Ball tip mm	Lever – amplification	Length L in mm
Standard probes with a one-piece shaft			
03260402	1	1 : 1	32
03260410	2	1 : 1	32
03260403	3	1 : 1	32
Special probes with a two-piece shaft			
03590002	1	1 : 1	32
03590003	2	1 : 1	32
03590004	3	1 : 1	32
03590005	4	1 : 1	32
03590006	1	1 : 2	72
03590007	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.

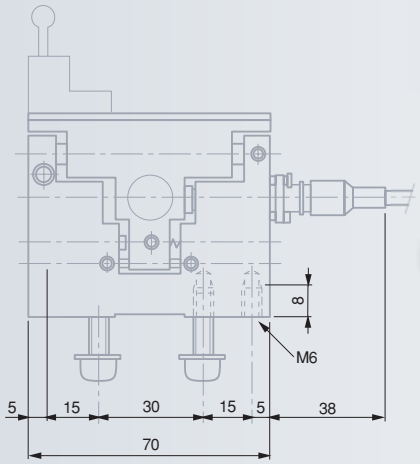
- Long-life probes featuring a small-size, rugged design.
- Modular construction to eliminate the need for many assembly components.
- Ball-bearing probe displacement.
- Direction of the probing force and probe retraction depending on used accessory.
- Wide variety of measuring inserts and supports for 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.



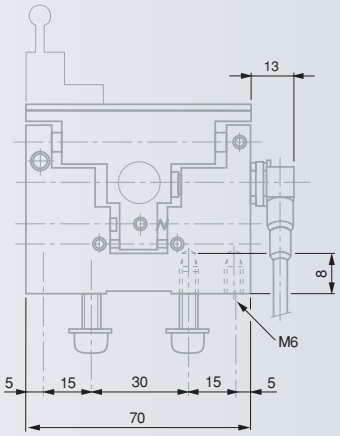
	Mechanical stop** lower mm	upper mm	mm	µm	µm	µm***	Technical data sheets
FMS 100	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200253
FMS 100-P	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200283
FMS 130	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200342
FMS 130-P	–2,9	2,9	5,8	0,5	0,5	0,2 + 3 · L³	03200344

** 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

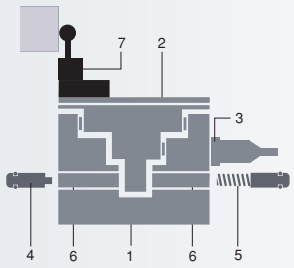
Configuration and Use of TESA FMS Probes

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.

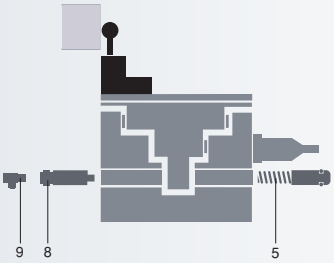


1 *Fixed probe body*
2 *Moving probe body*
3 *Measuring element with fine adjust*
4 *Adjustable stop*
5 *Spring set for the measuring force*
6 *Mounting bores*
7 *Holder for the probe insert*

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.



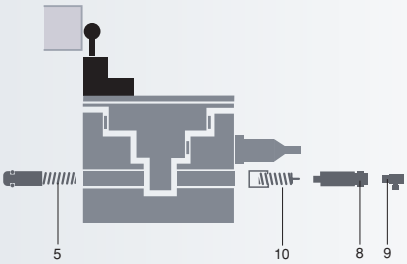
5 *Spring set for the measuring force*
8 *Pneumatic jack, No. 03260440*
9 *Connector (No. 024388, page O-41)*

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).

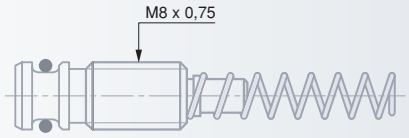


5 *Spring set for the measuring force*
8 *Pneumatic jack, No. 03260440*
9 *Connector (No. 024388, page O-41)*
10 *Auxiliary spring-loaded element, No. 03260445*

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

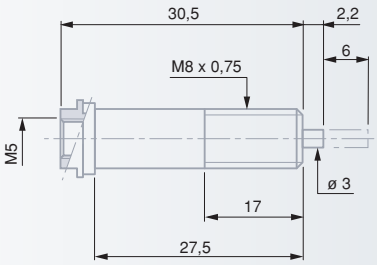
✓

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

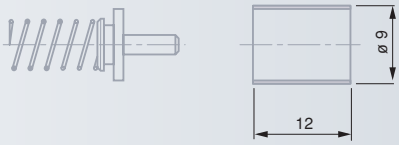
03260440	**Pneumatic jack** Operates the mobile probe body. Force under a pressure of 4 bars = 11 N Examples B and C Item 8



Auxiliary spring-loaded element

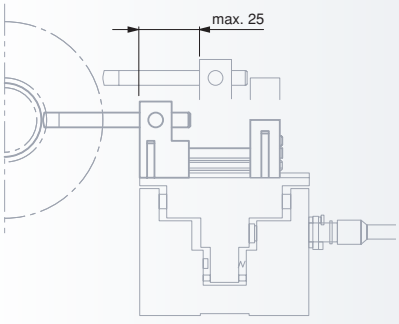
Example C
Item 10

	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



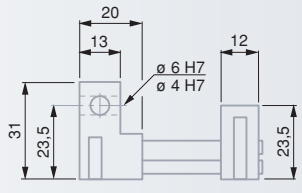
Probe Insert Holder with Fine Adjustment

Helps you to set the probe – Setting and locking screws remain accessible even when several probes are mounted side by side.

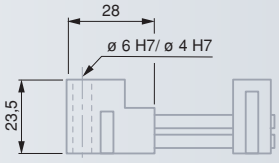


Mounting bores for probe inserts

	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

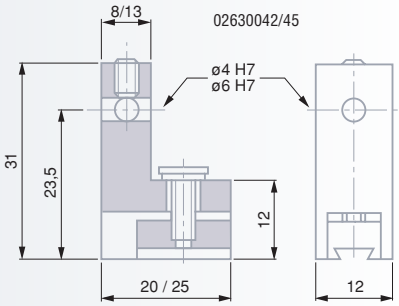
Shipping packaging

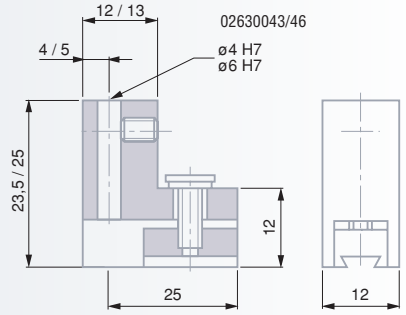
Shipping packaging

Fixed probe insert holder

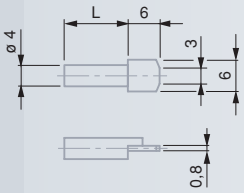
Mounting bores for probe inserts

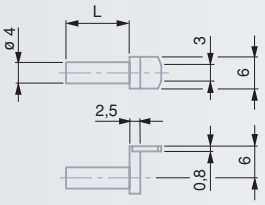
	mm	Number	Position
02630042	4	2	horizontal
02630043	4	1	vertical
02630045	6	2	horizontal
02630046	6	1	vertical

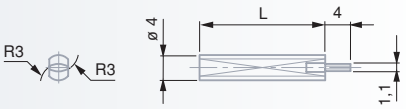




Probe inserts with a 4 mm diameter mounting shaft







Centred probe inserts with a flat, right-angle measuring face

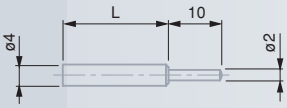
		L mm
02660066	Carbide	12
02660068	Carbide	25

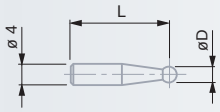
Off-centre probe inserts with a flat, right-angle measuring face

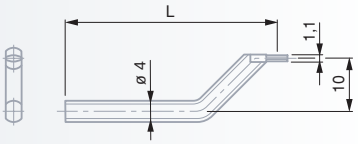
		L mm
02660067	Carbide	12
02660069	Carbide	25

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

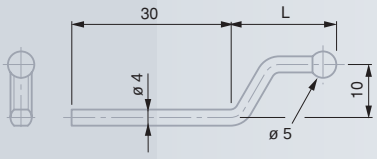
		L mm
02660073	Carbide	20
02660074	Carbide	40
02660075	Carbide	60

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

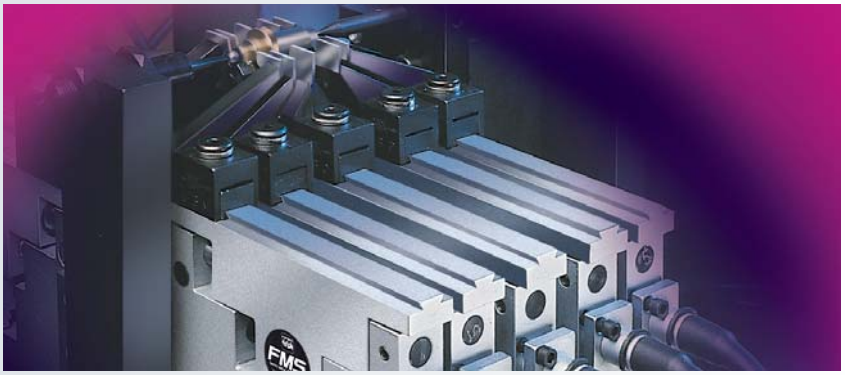
Off-centre probe inserts with 2 cylindrical measuring faces

		L mm
02660082	Carbide	40
02660083	Carbide	60



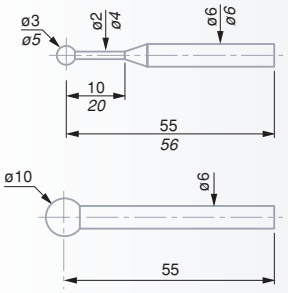
Off-centre probe inserts with a tungsten carbide ball tip

	mm	L mm
02660084	5	20
02660085	5	33
02660086	5	48



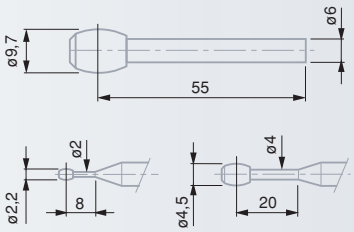
Probe inserts with a 6 mm diameter mounting shaft

Shipping packaging



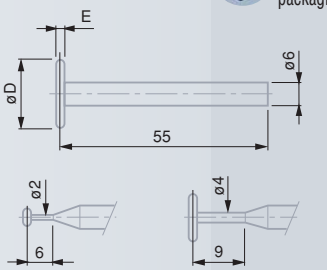
Probe inserts with a carbide ball tip

№	⌀ mm
00760058	3
00760059	5
00760060	10



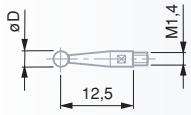
Probe inserts with a barrel-shaped measuring face for cylindrical bores. Also serve for determining the position of internal threads.

№	⌀ mm	For threads
00760066	2,2	M3 ÷ M16
00760067	4,5	M6 ÷ M48
00760068	9,7	M12 ÷ M150



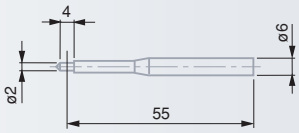
Probe inserts with a tungsten carbide disc for grooves, nuts, centering shoulders etc.

№	⌀ mm	E mm
00760074	4,5	1
00760075	14	2
00760076	19	3



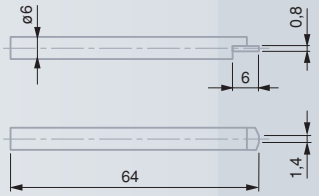
TESATAST probe inserts with a tungsten carbide ball tip. M1,4 mounting thread.

№	⌀ D mm	L mm
01860201	1	12,53
01860202	2	12,53
01860203	3	12,53
01860307	Wrench	



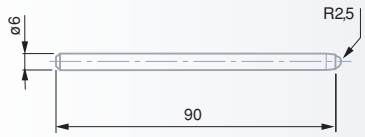
Probe insert with small cylindrical measuring face

№		⌀ mm
00760082	Carbide	2



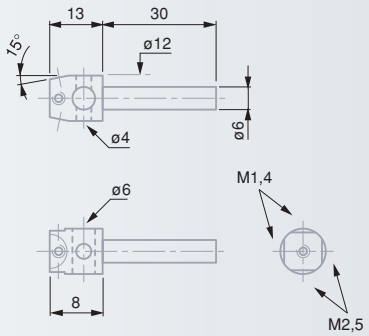
Centred probe insert with a small flat, right angle measuring face

№		mm
S26074380	Carbide	64



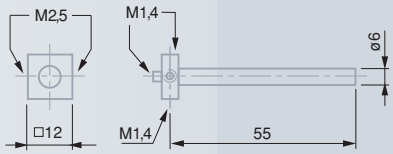
Probe inserts with one flat and one spherical measuring faces

№		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

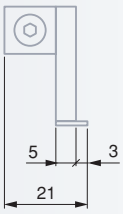


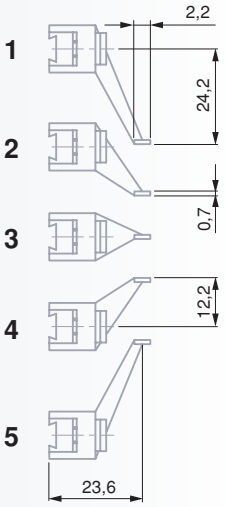
Universal probe insert holder with 2 mounting threads

№	
00760096	M1,4; M2,5

Shipping packaging

Probe inserts with offset measuring face





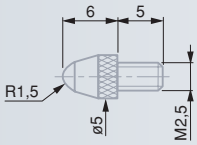
Probe inserts with a flat, right-angle measuring face in tungsten carbide, whether centred or offset

	As shown opposite
02630047	1
02630048	2
02630049	3
02630050	4
02630051	5

Shipping packaging

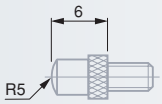
Measuring Inserts for Axial Probes, Dial Gauges and the Like

Models with a M2,5 mounting thread



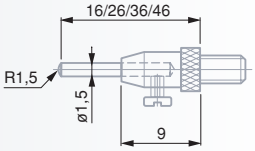
Standard probe inserts with a ball tip

		L mm
03510001	Steel	6
03510002	Carbide	6



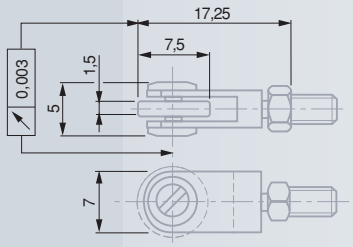
Probe inserts with a spherical measuring face

		R mm
03510101	Steel	5
03510102	Carbide	5



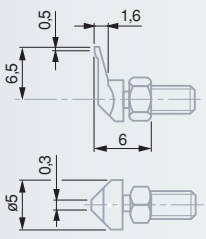
Probe insert with 4 interchangeable steel pins. Spherical face, R = 1,5 mm

		L mm
03510201	Steel	16, 26, 36, 46



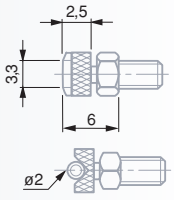
Probe inserts with a ball-bearing steel roller.
Counternut for radial alignment.

		Shape
03560010	Steel	cylindrical
03560011	Steel	domed



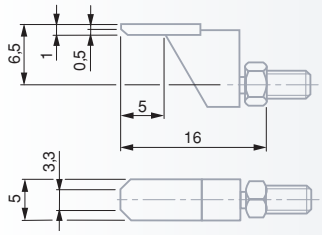
Off-centre probe insert (A) with pointed measuring face.
Counternut for radial alignment.

		A mm
03510401	Steel	6,5



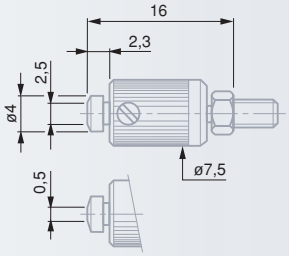
Probe insert with cylindrical measuring face. Counternut for radial alignment.

03510502	Carbide



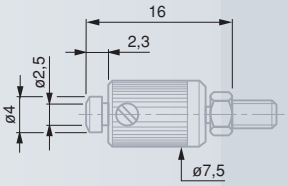
Offset probe insert with a narrow measuring face. Counternut for radial alignment.

		B mm
03510602	Carbide	0,5



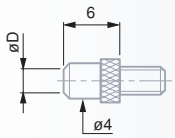
Probe insert with a narrow measuring face, parallel adjustable. Counternut for radial alignment.

		B mm
03510702	Carbide	0,5



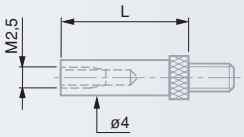
Probe insert with a flat measuring face, parallel adjustable. Counternut for radial alignment.

		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

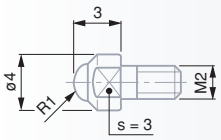


Extensions for probe inserts

	L mm
03540501	10
03540502	15
03540503	20
03540504	40

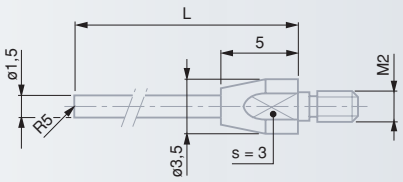
Additional probe inserts as well as extensions with M2,5 coupling thread as listed on the pages F-42 to F-44.

Probe Inserts with a M2 Coupling Thread for GT 43 and GT 44 Miniature Probes as well as Probes with Short Body, Series 160



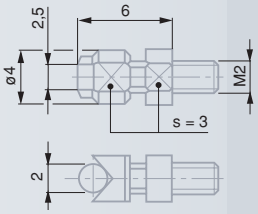
Probe inserts with spherical measuring face. Also with a M2 thread.

		mm
03510204	Carbide	R 1
03510103	Carbide	R 5



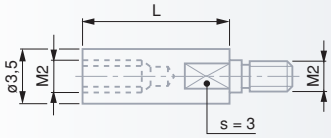
Probe inserts with a spherical measuring face (R5). Also with a M2 thread.

		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.

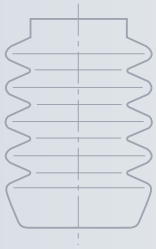
Plastic sleeve marked with force related data

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

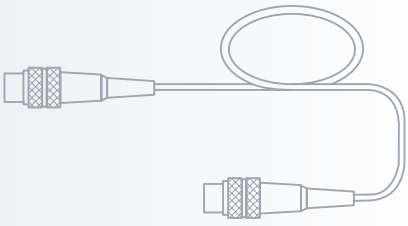
Complete set with safety ring and washer

№		№	
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

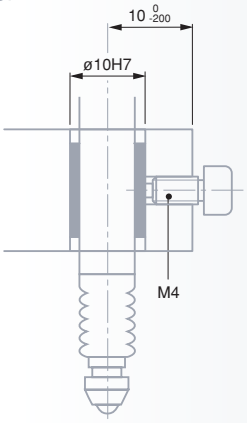
Other cable lengths available on request

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.

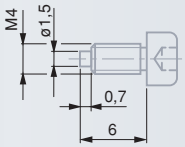
All dimensions shown in the drawing must be respected

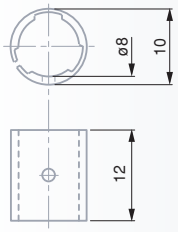
Shipping packaging



VKD clamp screw

№	⌀
02611013	M4



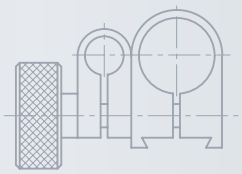


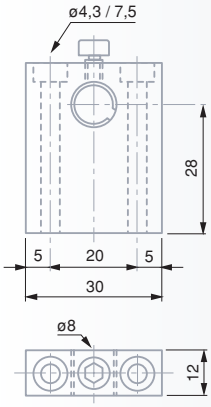
VKE clamp

№	⌀ 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

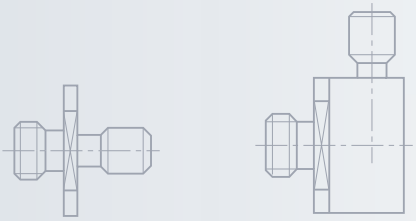
For lifting up to 20 measuring bolts simultaneously with a measuring force up to 0,63 N

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.

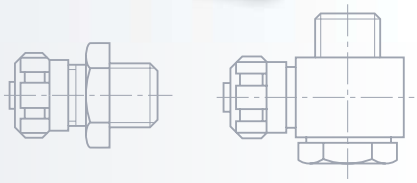
03260486	Controlled electrically through a TESA's electronic unit or manually



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)

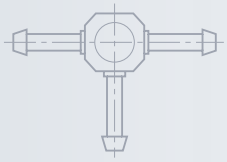
	Connector type
03560000	straight
03560002	angled



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*

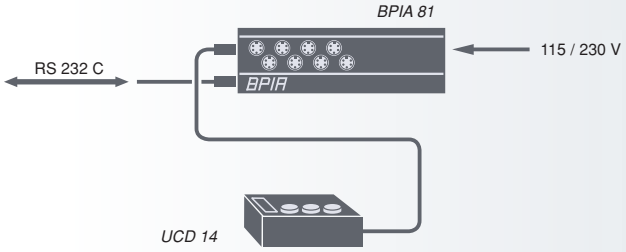
TESA Probe Interface Boxes

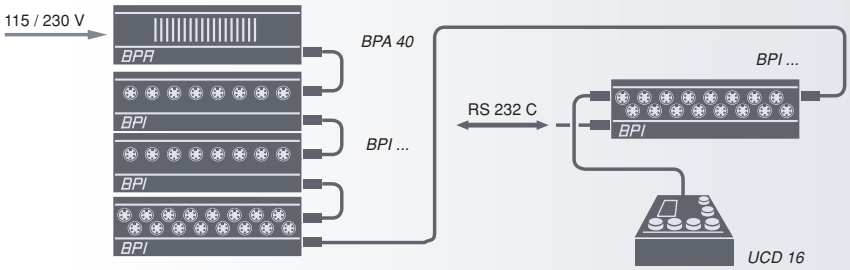
Modular system that consists of three basic models acting as probe interfaces for the preparation and further transmission of the measurement signals to a computer, whether in their digital or analogue form – All models are key components for multigauging fixtures applied in centralised process control.

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%.

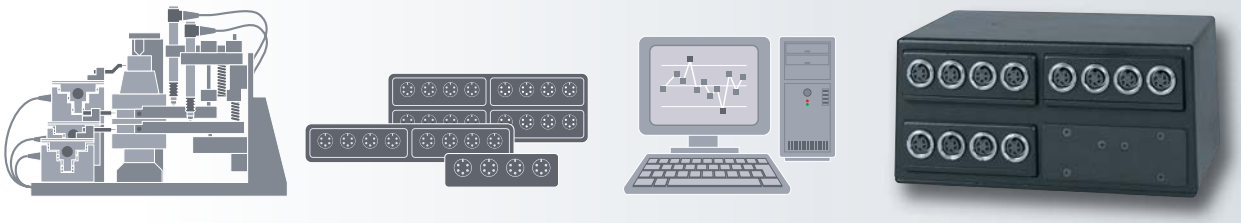
Note: Total deviation must include that of both the standard probe and adapter.

✓
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.

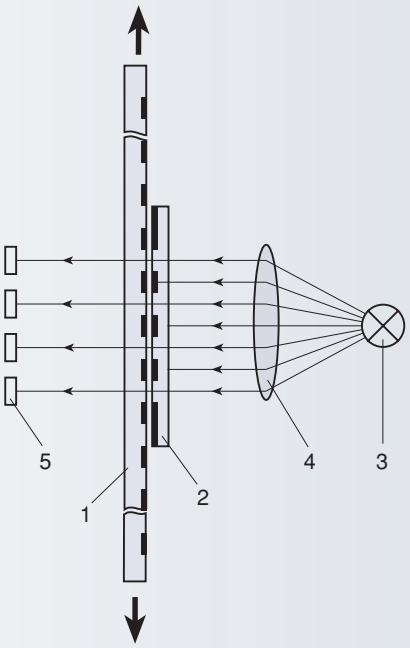
Their connection to the instrument replaces that of a regular probe.
Calibration and setting operations, if needed, are subject to a number of criteria that must be respected.
For a further information with regard to this, refer to the instruction manual or ask for our specialists.

The way they work

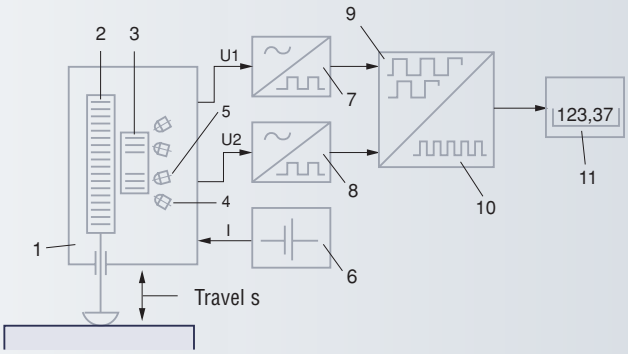
All electronic length measuring systems shown in this part of our catalogue work on the basis of value sensors in the form of digital probes with axial displacement. These probes generate the digital capture of measured physical quantities (i.e. measurands), which are changing as the incremental linear 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.

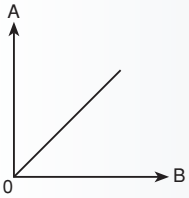
As the gratings of both the scale and reticule are moved in relation to one another, the opaque divisions on the scanning reticle are covered alternately by the lines and blanks on the linear scale, which serves as material measure. This provides a bright/dark information, which is then converted into 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.

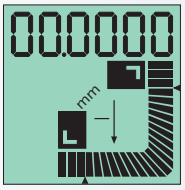
TESA TG - C10 Computing Counter

№	
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*.

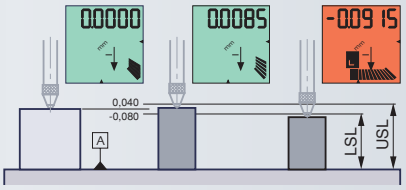
Each unit is supplied with the following accessories:

04761054	1 mains adapter 100 to 240 Vac, 50 to 60 Hz, 6,6 Vdc, 750 mA
04761055	1 EU adapter cable

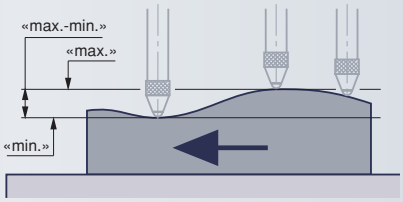
* Compatible with equivalent HEIDENHAIN probes with same connector shape and signal.

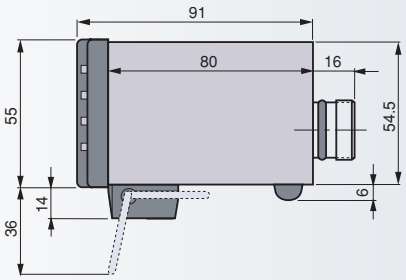


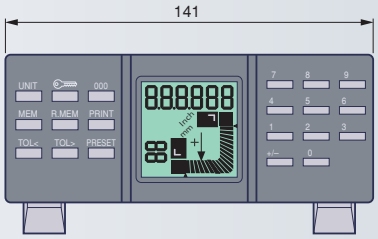
Input of the lower and upper specification limits (LSL and USL)



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

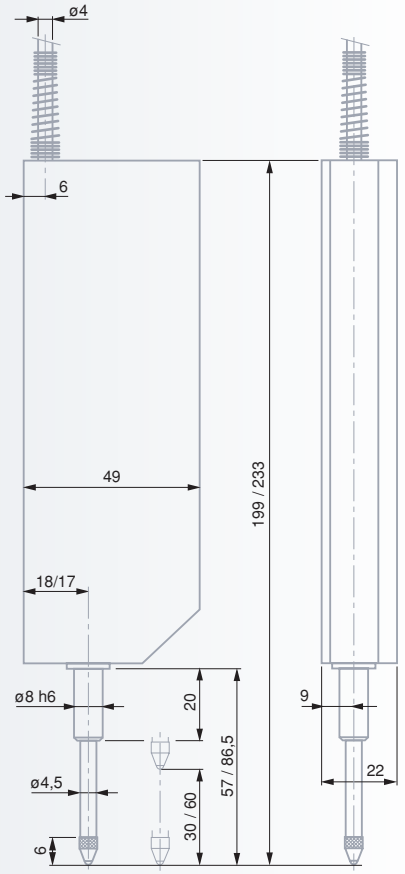
Inspection report

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

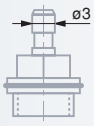
* Applicable with the probe used in vertical position with downward oriented measuring bolt, as well as in static measuring.

** TG 60 cannot be used with compressed air.

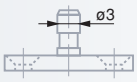


Optional accessories

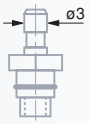
	Connectors for lifting the measuring bolt by vacuum
01960009	Suitable for TESA TG 30 (No. 04630006)
01960008	Suitable for TESA TG 60 (No. 04630007)
	Connector for lifting the measuring bolt by air pressure
01960010	Suitable for TESA TG 30 (No. 04630006)



01960009



01960008



01960010