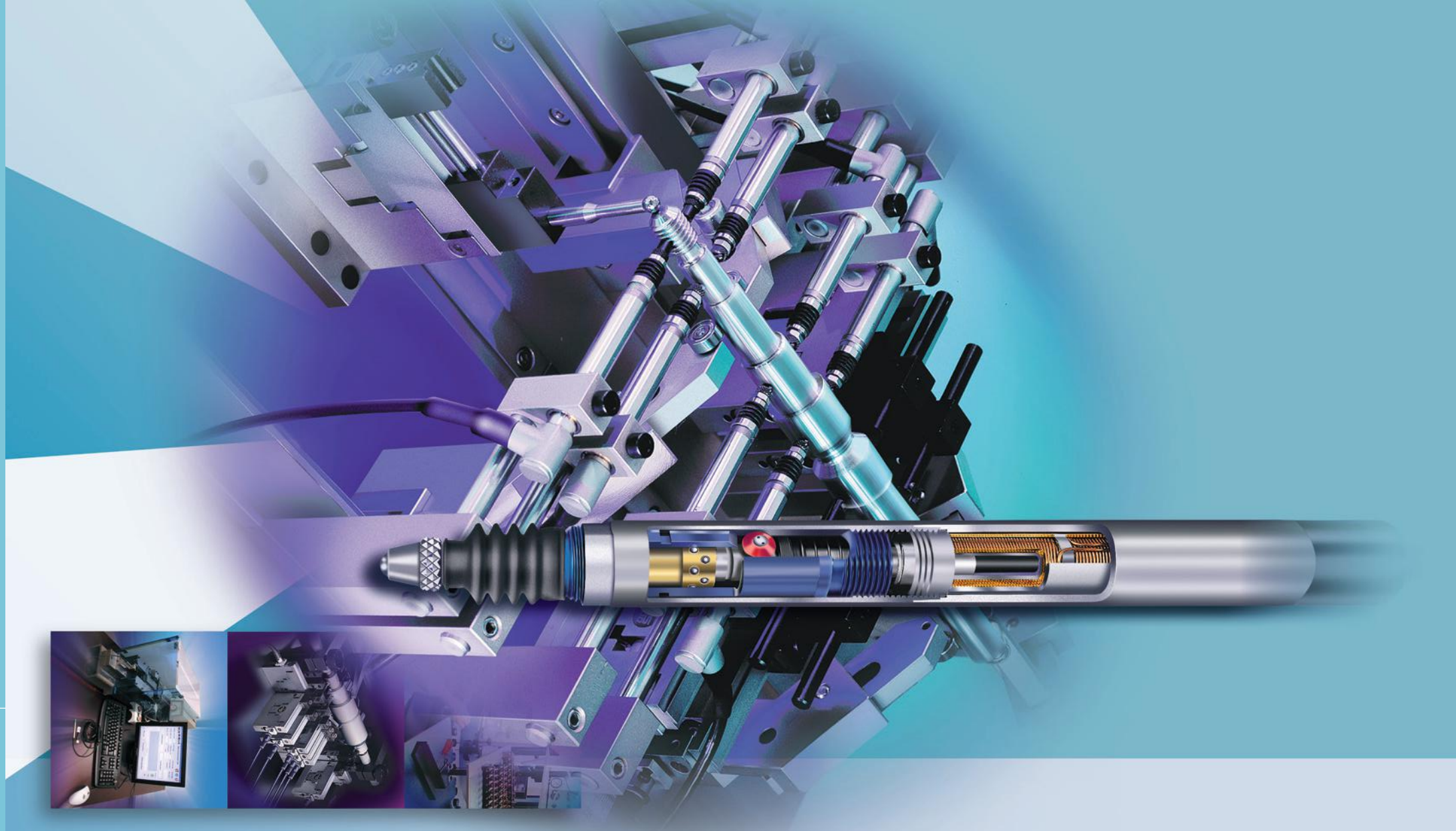
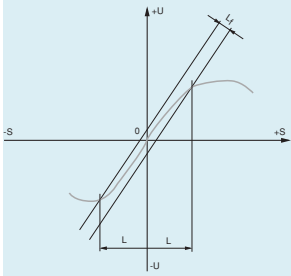


Electronic Length Measuring Equipment

TESA INDUCTIVE PROBES AND ELECTRONIC EQUIPMENT



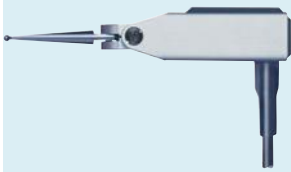
TESA probes: At the cutting edge of technology

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

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

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

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



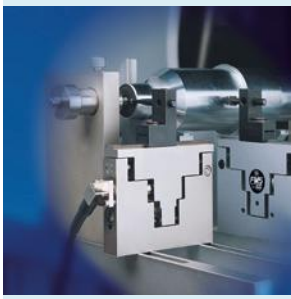
GT-31

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

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

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

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



Probe FMS

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

TT20

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

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

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

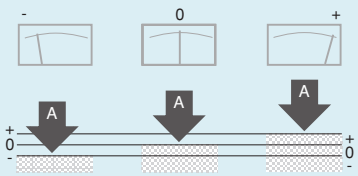
USB probe

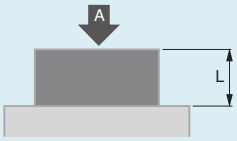
Wireless probe

Application examples of measuring functions

Single measurements with positive polarity sign (+A)

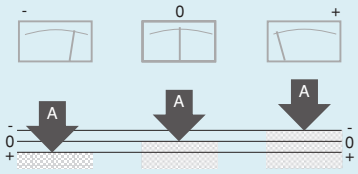
Measuring external dimensions with use of a measuring stand, snap gauge etc.

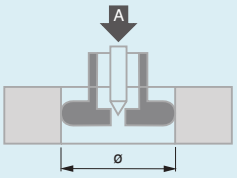




Single measurements with negative polarity sign (-A)

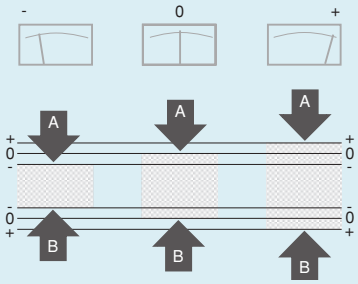
Inversion of polarity with displayed value equal to bore or diameter

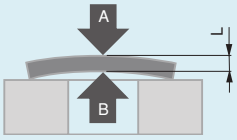




Sum measurements with positive polarity signs (+A +B)

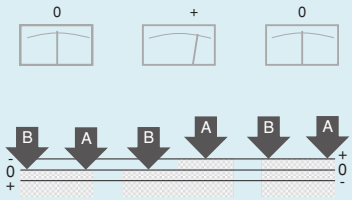
Measuring external dimensions regardless of form and position errors

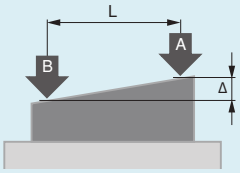




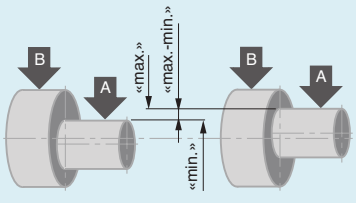
Difference measurements with opposite polarity signs (+A -B)

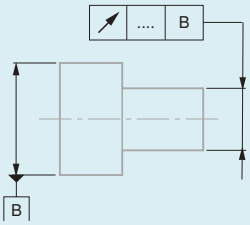
Cone, inclination and step measurements.





Establishing form and position errors with "max - min" memory function as in the example for runout errors



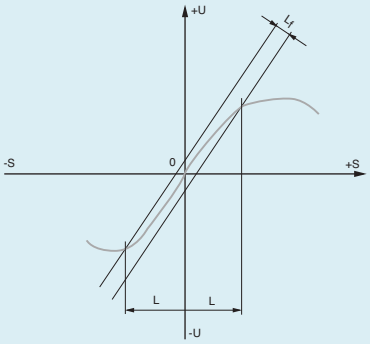


For the acquisition of measured values, TESA offers a complete family of probes and measuring instruments for the most demanding applications. The probes, supplied in standard execution, do not need any form of adaptation. They function on the inductive half-bridge principle.
The market offers other equipment using probes that partly operate on the principle of a differential transformer and these are known as LVDT (Linear Variable Differential Transformer) probes.
TESA also offers a range of probes compatible with other electronic equipment, using an adaptor and a connector depending on the origin of the equipment. A description of TESA standard half-bridge and LVDT probes is provided below.

Standard half-bridge probes for TESA equipment

OPERATING PRINCIPLE

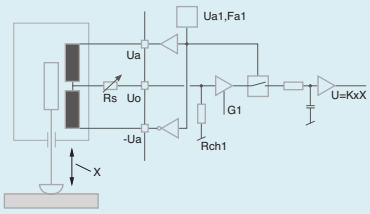
All TESA electronic probes (value sensors) work based on the inductive principle with mechanical contact of the workpiece.
They are fitted with a coil system inducing an alternating output voltage that depends on the the position of the ferro magnetic core. When symmetrically positioned – i.e. at electrical zero – no voltage is impressed.
A move of the core, which may be attached to the measuring bolt while the measurand is being taken, causes the inductance to change. This change generates a signal that is amplified and rectified before being displayed and further output. Depending on the instrument type, the analogue signal will be shown on a voltmetre or a numerical display after a digital transformation.
Unambiguous assessment of the measurand (at bolt position) to the signal (displayed value) is the main characteristic of analogue value acquisition. One of its distinct advantages lies in the value primarily displayed, which will be reproduced in the event of a power cut (switch-off or power failure).



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

TESA Standard Half-Bridge Probes for TESA Electronic Equipment

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

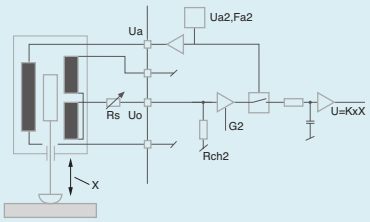


Wiring plan of half-bridge probes

TESA LVDT Probes

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

Available upon request.



Wiring plan of LVDT probes

Multiple application possibilities

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

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

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

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

Internal processing of measured values

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

Mathematical Data Processing

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

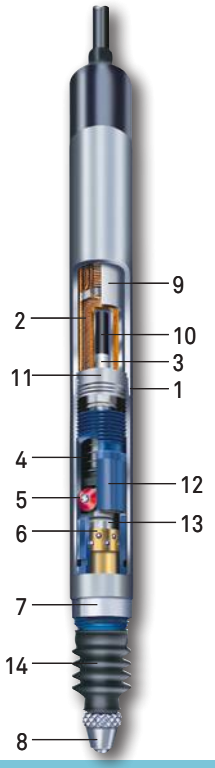
Value Storage

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

Classification of Values

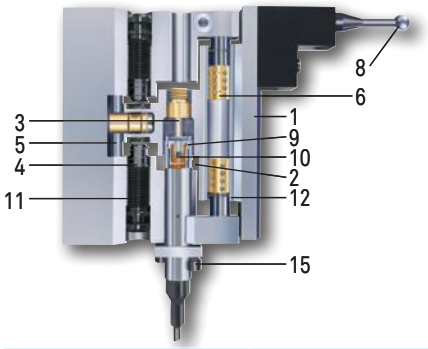
The measured values can be classified after the entering of limit deviations. In this case, the control signals can be used by an external peripheral unit.

Components of a TESA inductive probe



1 Mounting stem or probe housing
2 Coil system
3 Element mounted between the ferromagnetic core and the measuring bolt for the correction of varying coefficients of thermal expansion
4 Force compression spring
5 Anti-rotation guiding system
6 Ball cage
7 Setting element for limiting the measuring bolt travel
8 Probe insert
9 In-between tube being part of the coil system
10 Ferro-magnetic core
11 Force spring stop
12 Ball-bearing guiding tube
13 Measuring bolt
14 Sealing bellow
15 Mechanical device for zero-setting

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



Sensitivity	73,75 mV/V/mm 29,50 mV/V/mm (GT 61, GT 62) 7,375 mV/V/mm (GT 61S, GT 62S) 49,17 mV/V/mm (FMS 130, FMS 132)
All given values are valid for the following reference conditions :	
Drive voltage	3 V
Drive frequency	13 kHz
Adjustment load	2 kΩ

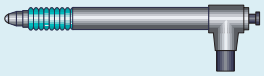
Probes with Axial Movement, Ø 8 mm

	NO	=	Measuring range, mm	Measuring bolt travel, mm	Cable output	Measuring bolt retraction	Sealing bellows
	**03210904**	GT 21	± 1 mm	4,3	Axial	Mechanical	Nitrile
	**03210924**	GT 22	± 1 mm	4,3	Radial	Mechanical / vacuum	Nitrile
	**03230057**	GTL 21	± 2 mm	4,3	Axial	Mechanical	Viton
	**03230072**	GTL 211	± 2 mm	4,3	Axial	Mechanical / vacuum	Viton
	**03230056**	GTL 22	± 2 mm	4,3	Radial	Mechanical / vacuum	Viton
	**03230027**	GT 27	± 2 mm	10,3	Axial	Mechanical	Viton
	**03230073**	GT 271	± 2 mm	10,3	Axial	Mechanical / vacuum	Viton
	**03230026**	GT 28	± 2 mm	10,3	Radial	Mechanical / vacuum	Viton
	**03230041**	GT 61	± 5 mm	10,3	Axial	Mechanical	Viton
	**03230042**	GT 62	± 5 mm	10,3	Radial	Mechanical / vacuum	Viton
	**03230036**	GT 21 HP	± 0,2 mm	4,3	Axial	Mechanical	Nitrile
	**03230021**	GT 22 HP	± 0,2 mm	4,3	Radial	Mechanical / vacuum	Nitrile

* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Nominal measuring force*, N	Moble weight, g	Mechanical limit max frequency** (Hz)	Partially removable	Répeatability, µm	Max. permissible error for deviations in linearity, µm (L in mm)	Hysteresis, µm	Protection level (IP XX), as per IEC 60529
0,63	6	60	Yes	0,01 µm	0,2 + 3 · L^3 µm	0,02	IP65
0,63	6	60	Yes	0,01 µm	0,2 + 3 · L^3 µm	0,02	IP65
0,63	6	60	Yes	0,01 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8 · L µm	0,02	IP65
0,63	6	60	Yes	0,01 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8 · L µm	0,02	IP65
0,63	6	60	Yes	0,01 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8 · L µm	0,02	IP65
0,63	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
0,63	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
0,63	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
0,90	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP65
0,90	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8 · L µm	0,05	IP65
0,63	6	60	No	0,01 µm	0,07 + 0,4 · L µm	0,01	IP64
0,63	6	60	No	0,01 µm	0,07 + 0,4 · L µm	0,01	IP64

Probes with Axial Movement, Ø 8 mm, with Activation of the Measuring Bolt by Pneumatic Pressure

	NO	=	Measuring range, mm	Measuring bolt travel, mm	Cable output	Sealing bellows
	**03230060**	GTL 212	± 1,5 mm	3,2	Axial	Viton
	**03230054**	GTL 222	± 1,5 mm	3,2	Radial	Viton
	**03230067**	GTL 212-A	± 1,5 mm	3,2	Axial	Without belllows
	**03230063**	GTL 222-A	± 1,5 mm	3,2	Radial	Without bellows
	**03230061**	GT 272	± 2 mm	10,3	Axial	Viton
	**03230053**	GT 282	± 2 mm	10,3	Radial	Viton
	**03230068**	GT 272-A	± 2 mm	10,3	Axial	Without bellows
	**03230069**	GT 282-A	± 2 mm	10,3	Radial	Without bellows
	**03230062**	GT 612	± 5 mm	10,3	Axial	Viton
	**03230055**	GT 622	± 5 mm	10,3	Radial	Viton
	**03230070**	GT 612-A	± 5 mm	10,3	Axial	Without bellows
	**03230071**	GT 622-A	± 5 mm	10,3	Radial	Without bellows

* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Measuring force, nominal*, N	Mobile weight, g	Max. mechanical frequency limit** (Hz)	Partially removable	Repeatability, µm	Max. permissible error for deviations in linearity, µm (L in mm)	Hysteresis, µm	Protection level (IP XX), as per IEC 60529
1,2	6	60	Yes	0,015 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8· L µm	0,02	IP65
1,2	6	60	Yes	0,015 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8· L µm	0,02	IP65
0,2	6	60	Yes	0,015 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8· L µm	0,02	IP50
0,2	6	60	Yes	0,015 µm	0,2 + 2,4 · L^2 µm BPX / TWIN-T10: 0,2 + 0,8· L µm	0,02	IP50
1,0	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
1,0	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP65
0,85	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP50
0,85	8	60	Yes	0,05 µm	0,2 + 3 · L^3 µm	0,05	IP50
2,0	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP65
2,0	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP65
1,0	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP50
1,0	8	60	Yes	0,05 µm	1 + 4 · L µm BPX / TWIN-T10: 0,6 + 0,8· L µm	0,05	IP50

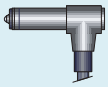
USB, DC, Wireless Probes

	NO	=	Measuring range, mm	Max. plunger travel, mm	Cable output	Bolt retraction	Sealing bellows
	**03230500**	GTL 21 W	± 2 mm	4,3	Without cable	Mechanical	Viton
	**03230502**	GT61 W	± 5 mm	10,3	Without cable	Mechanical	Viton
	03230501	GTL 212 W	± 1,5 mm	4,3	Without cable	Pressure (bolt activation), bellow spring (bolt retraction)	Viton
	03230503	GT 612 W	± 5 mm	10,3	Without cable	Pressure (bolt activation), bellow spring (bolt retraction)	Viton
	03230201	GTL 22 USB	± 2 mm	4,3	Radial	Mechanical / vacuum	Viton
	03230200	GTL 21 USB	± 2 mm	4,3	Axial	Mechanical	Viton
	03230204	GT 61 USB	± 5 mm	10,3	Axial	Mechanical	Viton
	03230205	GT 62 USB	± 5 mm	10,3	Radial	Mechanical / vacuum	Viton
	03230202	GTL 222 USB	± 1,5 mm	3,1	Radial	Pressure (bolt activation), bellow spring (bolt retraction)	Viton
	03230058	GTL 22 DC	± 2 mm	4,3	Radial	Mechanical / vacuum	Viton
	03230059	GTL 21 DC	± 2 mm	4,3	Axial	Mechanical	Viton
	03230087	GT 62 DC	± 5 mm	10,3	Radial	Mechanical / vacuum	Viton
	03230086	GT 61 DC	± 5 mm	10,3	Axial	Mechanical	Viton
	03230085	GT 44 DC	± 1 mm	2,1	Radial	Mechanical / vacuum	Viton
	03230081	GT 31 DC	± 0,3 mm	0,7	Angled	Without retraction	Without bellows

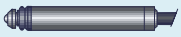
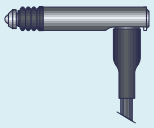
* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Nominal measuring force*, N	Mobile weight, g	Max. mechanical frequency limit**, (Hz)	Partially removable	Repeatability, µm	Maximum permissible error, µm (L in mm)	Hysteresis, µm	Level of protection (IP XX), as per IEC 60529
0,63	6	60	No	0,10 µm	0,4 + 0,8 · L µm	0,5	IP54
0,9	8	60	No	0,24 µm	0,8 + 0,8 · L µm	0,5	IP54
1,2	6	60	No	0,10 µm	0,4 + 0,8 · L µm	0,5	IP54
2,0	8	60	No	0,24 µm	0,8 + 0,8 · L µm	0,5	IP54
0,63	6	60	No	0,1 µm	0,4 + 0,8 · L µm	0,5	IP65
0,63	6	60	No	0,1 µm	0,4 + 0,8 · L µm	0,5	IP65
0,90	8	60	No	0,24 µm	0,8 + 0,8 · L µm	0,5	IP65
0,90	8	60	No	0,24 µm	0,8 + 0,8 · L µm	0,5	IP65
1,2	6	60	No	0,1 µm	0,4 + 0,8 · L µm	0,5	IP64
0,63	6	60	Yes	0,1 µm	0,2 + 3,5 · L^2 µm		IP65
0,63	6	60	Yes	0,1 µm	0,2 + 3,5 · L^2 µm		IP65
0,9	8	60	No	0,1 µm	1 + 4 · L µm		IP65
0,9	8	60	Yes	0,1 µm	1 + 4 · L µm		IP65
0,4	2	60	No	0,1 µm	0,2 + 5 · L^2 µm		IP65
0,1	12	25	No	0,1 µm	0,2 + 50 · L^2 µm		IP50

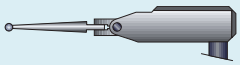
Probes with Axial Movement,Ø 8 mm

	NO		Measuring range, mm	Measuring bolt travel, mm	Cable output	Bolt retraction	Sealing bellows
	**03230001**	GT 41	± 0,3 mm	0,7	Axial	None	Nitrile
	**03230002**	GT 42	± 0,3 mm	0,7	Radial	Vacuum	Nitrile
	**03230035**	GT 43	± 1 mm	2,1	Axial	Mechanical	Viton
	**03230017**	GT 44	± 1 mm	2,1	Radial	Vacuum	Viton

Unbranded Axial Probes with Measuring Bolt Mounted on a Ball-bearing

	**96410012**	410	± 1 mm	2,5	Axial and radial	Mechanical	Nitrile
	**96160013**	160	± 1 mm	3,3	Axial	Mechanical	Viton
	**96430029**	430	± 0,5 mm	1,25	Axial	Mechanical	Nitrile
	**96441041**	451	± 0,5 mm	2,10	Radial	Mechanical	Nitrile

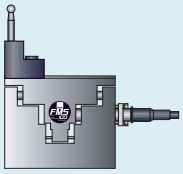
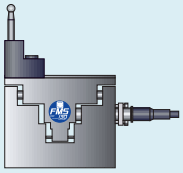
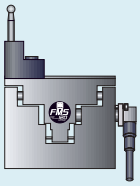
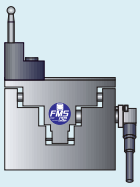
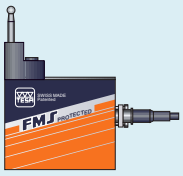
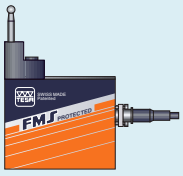
Probe with Inclinable Lever

	**03210802**	GT 31	± 0,3 mm	0,7	Angled	Without	Without bellows

* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

Nominal measuring force*, N	Mobile weight, g	Max. mechanical frequency limit**, (Hz)	Partially removable	Repeatabilty, µm	Max. permissible error for deviations in linearity, µm (L en mm)	Hysteresis, µm	Level of protection (IP XX), as per IEC 60529
0,63	2	60	No	0,01 µm	0,2 + 5· L^2 µm	0,01	IP65
0,63	2	60	No	0,01 µm	0,2 + 5· L^2 µm	0,01	IP65
0,4	2	60	No	0,1 µm	0,2 + 5· L^2 µm	0,15	IP65
0,4	2	60	No	0,1 µm	0,2 + 5· L^2 µm	0,15	IP65
0,60	3,1	60	No	0,1 µm	0,2 % (for a measuring span of ± 1 mm) µm		IP62
0,60	2,5	60	No	0,1 µm	0,2 % (for a measuring span of ± 1 mm) µm		IP62
0,75	1,9	60	No	0,2 µm	0,2 % (for a measuring span of ± 0,5 mm) µm		IP62
0,60	3,0	60	No	0,1 µm	0,2 % (for a measuring span of ± 0,5 mm) µm		IP62
0,1	12	25	No	0,1 µm	0,2 + 50 · L^2 µm	0,25	IP40

Universal FMS Probes

	NO	=	Measuring range, mm	Measuring bolt travel, mm	Cable output	Bolt retraction	Sealing bellows
	**03230019**	FMS 100	± 2 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230049**	FMS 130	± 2,9 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230028**	FMS 102	± 2 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230050**	FMS 132	± 2,9 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230037**	FMS100-P	± 2 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230051**	FMS130-P	± 2,9 mm	5,8	Parallel	Retraction by air pressure (optional)	Without bellows
	**03230038**	FMS102-P	± 2 mm	5,8	Angled	Retraction through air pressure (optional)	Without bellows
	**03230052**	FMS132-P	± 2,9 mm	5,8	Angled	Retraction through air pressure (optional)	Without bellows

* Nominal value of the measuring force at electrical zero, max. deviation ± 25 %
** For an amplitude of 10 % to the last value of the measuring range

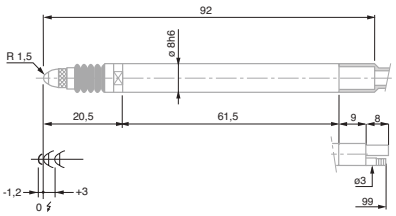
Nominal measuring force*, N	Mobile weight, g	Max. mechanical frequency limit**, Hz	Partially removable	Repeatabilty, µm	Max.permissible error for deviation in linearity, µm (L in mm)	Hysteresis, µm	Protection level (IP XX), as per IEC 60529
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP50
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP50
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP50
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP50
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP54
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP54
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP54
2	110	25	Yes	0,5 µm	$0,2 + 3 \cdot L^3$ µm	0,5	IP54

Standard Probes, ± 1 mm, 4,3 mm Travel (GT21)

Universal probes for standard and continuous use applications.

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

GT21



GT 21

NO		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03210904	**GT 21**	± 1	0,63	Mechanical	Nitrile
03210905	**GT 21**	± 1	1,00	Mechanical	Nitrile
03210906	**GT 21**	± 1	1,60	Mechanical	Nitrile
03210907	**GT 21**	± 1	2,50	Mechanical	Nitrile
03210908	**GT 21**	± 1	4,00	Mechanical	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of the lower bolt stop***, mm (factory setting)	Cable output	Data Sheet No.
GT 21	4,3	$0,2 + 3 \cdot L^3$	0,01	0,02	-2,2 to 0,1 (factory setting -1,2)	Axial	03200249

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

DIN 32876 Part 1

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

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

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

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

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

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

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

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

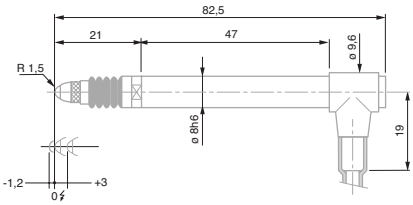
Inspection report with a declaration of conformity

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

Universal probes for common but constraining applications.

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

GT 22



GT 22

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

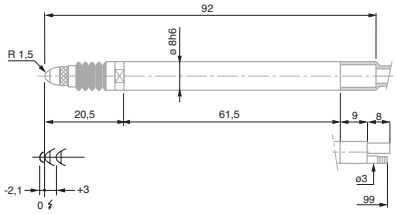
	Measuring travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of the lower bolt stop***, mm (factory setting)	Cable output	Data Sheet No.
GT 22	4,3	$0,2 + 3 \cdot L^3$	0,01	0,02	-2,2 to 0,1 (factory setting -1,2)	Radial	03200250

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

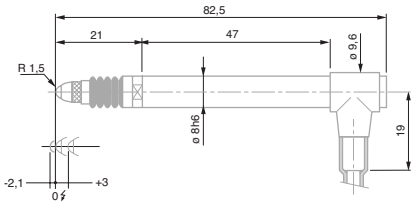
Standard Probes ± 2 mm, 4,3mm Bolt Travel, Linear Travel

Universal probes for standard and continual usage applications.

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



GTL 21
GTL 211



GTL 22

GTL 21
GTL 211

GTL 22

		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03230057	**GTL 21**	± 2	0,63	Mechanical	Viton
03230072	**GTL 211**	± 2	0,63	Mechanical / vacuum	Viton
03230056	**GTL 22**	± 2	0,63	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error for deviation in linearity, µm (L in mm)	Repeata-bilty, µm	Hysteresis, µm	Setting of measuring bolt lower stop***, mm (factory setting)	Cable output	Data Sheet No.
GTL 21	4,3	$0,2 + 2,4 \cdot L^2$ (BPX: $0,2 + 0,8 \cdot L$)	0,01	0,02	-2,2 to 0,1 (factory setting -2,1)	Axial	03200391
GTL 211	4,3	$0,2 + 2,4 \cdot L^2$ (BPX: $0,2 + 0,8 \cdot L$)	0,01	0,02	-2,2 to 0,1 (factory setting -2,1)	Axial	03200435
GTL 22	4,3	$0,2 + 2,4 \cdot L^2$ (BPX: $0,2 + 0,8 \cdot L$)	0,01	0,02	-2,2 to 0,1 (factory setting -2,1)	Radial	03200392

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

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastometer

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

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

0,2 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton bellows = high-resistance fluoroelastomer

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

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

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 8 g

Inspection report with a declaration of conformity

Standard Probes, ± 2 mm, 10,3 mm Travel, with Long Retraction Travel

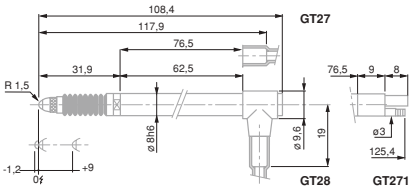
Universal inductive probes for various applications, especially for use with multi-gauging inspection fixtures.

- Long retraction travel to prevent the probe from being damaged.
- Protection level IP65 as per IEC 60529.
- Large choice of accessories: measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other suppliers also available on request.

GT 27

GT 271

GT 28



GT 27/ 28
GT 271

NO		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03230027	**GT 27**	± 2	0,63	Mechanical	Viton
03230073	**GT 271**	± 2	0,63	Mechanical / vacuum	Viton
03230026	**GT 28**	± 2	0,63	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repatability, µm	Hysteresis, µm	Setting of measuring bolt lower stop***, mm (factory setting)	Cable output	Data Sheet No.
GT 27	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	-2,2 to 0,1 (factory setting -1,2)	Axial	03200251
GT 271	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	-2,2 to 0,1 (factory setting -1,2)	Axial	03200436
GT 28	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	-2,2 to 0,1 (factory setting -1,2)	Radial	03200252

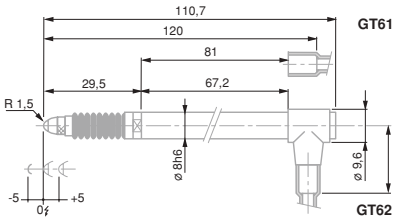
* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero

Standard Probes ± 5 mm, 10,3 mm Bolt Travel, Extended Range

- Designed for long measuring travels and low resolution of values
- Specially suited for use on multigauging inspection fixtures.
- Correction factor appplied to get the true value is 2,5x (10x for the S probe version).
- Protection level IP 65 as per IEC 60529.
- Large choice of accessories: Measuring inserts, spring sets, etc.
- LVDT probes compatible with measuring equipment from other suppliers also available on request.

GT 61

GT 62



GT 61 / GT 62

		Measuring range, mm	Nominal measuring force*, N	Measuring bolt retraction	Sealing bellows
03230041	**GT 61**	± 5	0,90	Mechanical	Viton
03230042	**GT 62**	± 5	0,90	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max.permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Measuring bolt***, mm (factory setting)	Cable output	Data Sheet No.
GT 61	10,3	1 + 4 · L (BPX: 0,2 + 0,8 · L)	0,05	0,05	Lower - 5,1 upper + 5,2 (factory setting -5)	Axial	03200294
GT 62	10,3	1 + 4 · L (BPX: 0,2 + 0,8 · L)	0,05	0,05	Lower - 5,1 upper + 5,2 (factory setting -5)	Radial	03200295

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

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton bellows = highly resistant fluoroelastomer

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

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

0,09 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 8 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

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

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

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

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

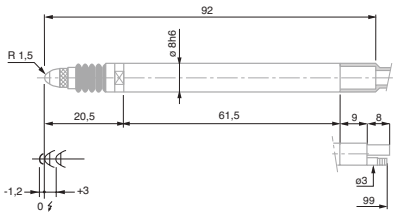
Mobile weight: 6 g

Inspection report with a declaration of conformity

GT 21 HP High Precision Probes, ± 0,2 mm, 4,3 mm Travel

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

GT 21 HP



GT 21 HP

NO		Measuring range, mm	Measuring force, nominal*, N	Bolt retraction	Sealing bellows
03230036	**GT 21 HP**	± 0,2	0,63	Mechanical	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm (factory setting)	Cable output	Data Sheet No.
GT 21 HP	4,3	07 + 0,4 · L	0,01	0,01	-2,2 to +0,1 (factory setting -1,2)	Axial	03200264

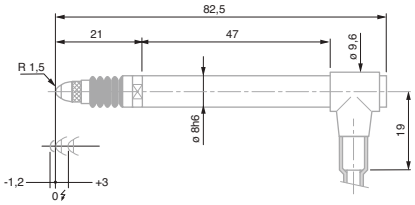
* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

GT 22 HP High Precision Probe, ± 0,2 mm, 4,3 mm Travel

Universal probe for standard and continuous use applications.

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

GT 22 HP



GT 22 HP

		Measuring range, mm	Measuring force, nominal*, N	Bolt retraction	Sealing bellows
03230021	**GT 22 HP**	± 0,2	0,63	Mechanical / vacuum	Nitrile

	Measuring travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repatability, µm	Hystersis, µm	Setting of lower stop of the measuring bolt***, mm (factory setting)	Cable output	Data Sheet No.
GT 22 HP	4,3	0,07 + 0,4 · L	0,01	0,01	-2,2 to +0,1 (usine -1,2)	Radial	03200265

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

DIN 32876 Part 1

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

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

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

0,15 µm/°C

20 ± 0,5°C

Protection level IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellow = highly resistant fluoroelastomer

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

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

0,2 µm/°C

20 ± 0,5°C

Protection level: IP65 (IEC 60529) or IP50 for GTL 212-A and GTL 222-A

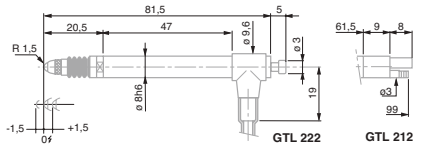
Mobile weight: 6 g

Inspection report with a declaration of conformity

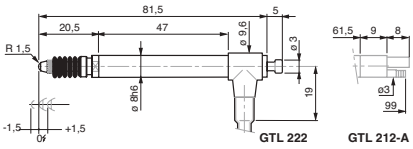
Pneumatic Probes ± 1,5 mm, 3,2 mm Bolt Travel, Linear

Probes for use with measuring fixtures or inspection machines integrating semi-automated or automated measuring routines.

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



GTL 212 / GTL 222



GTL 212-A / GTL 222-A

GTL 222

GTL 212

GTL 212-A

GTL 222-A

NO		Measuring range, mm	Measuring force, nominal*, N	Measuring bolt retraction	Sealing bellows	Nominal/ Maximal pressure, bar
03230060	**GTL 212**	± 1,5	1,2	Pressure (bolt activation), spring (bolt retraction)	Viton	0,7 / max 1,0
03230054	**GTL 222**	± 1,5	1,2	Pressure (bolt activation), spring (bolt retraction)	Viton	0,7 / max 1,0
03230067	**GTL 212-A**	± 1,5	0,2	Pressure (bolt activation), spring (bolt retraction)	Without belllows	0,25 / max 6,0
03230063	**GT 222-A**	± 1,5	0,2	Pressure (bolt activation), spring (bolt retraction)	Without bellows	0,25 / max 6,0

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Cable output	Data Sheet No.
GTL 212	3,2	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,015	0,02	Axial	03200413
GTL 222	3,2	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,015	0,02	Radial	03200393
GTL 212-A	3,2	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,015	0,02	Axial	03200430
GT 222-A	3,2	$0,2 + 2,4 \cdot L^2$ (BPX: 0,2 + 0,8· L)	0,015	0,02	Radial	03200422

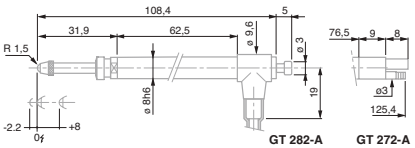
* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.

Pneumatic Probes ± 2 mm, 10,3 mm Bolt Travel, with Long Retraction Travel

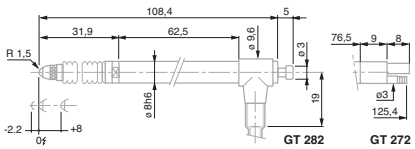
These probes are intended for use with measuring fixtures or machines integrating automated and semi-automated measuring routines.

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

GT 282-A



GT 282-A / GT 272-A



GT 282 / GT 272

GT 282

GT 272

GT 272-A

No		Measuring range, mm	Measuring force, nominal*, N	Bolt retraction	Sealing bellows	Nominal/ Maximal pressure, bar
03230061	**GT 272**	± 2	1,0	Pressure (bolt activation), spring (bolt retractiom)	Viton	1,1 / max 1,5
03230053	**GT 282**	± 2	1,0	Pressure (bolt activation), spring (bolt retraction)	Viton	1,1 / max 1,5
03230068	**GT 272-A**	± 2	0,85	Pressure (bolt activation), spring (bolt retraction)	Without bellows	1,0 / max 6,0
03230069	**GT 282-A**	± 2	0,85	Pressure (bolt activation), spring (bolt retraction)	Without bellows	1,0 / max 6,0

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repatability, µm	Hysteresis, µm	Cable output	Data Sheet No.
GT 272	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	Axial	03200414
GT 282	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	Radial	03200390
GT 272-A	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	Axial	03200431
GT 282-A	10,3	$0,2 + 3 \cdot L^3$	0,05	0,05	Radial	03200432

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

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

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

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

0,15 µm/°C

20 ± 0,5°C

Protection level: IP65 (IEC 60529), IP64 for GT 21 HP

Mobile weight: 8 g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

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

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

0,09 µm/°C

20 ± 0,5°C

Protection level: IP65 (IEC 60529),

Mobile weight: 8 g

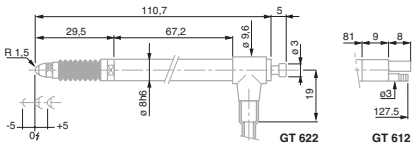
Inspection report with a declaration of conformity

Pneumatic Probes ± 5 mm, 10,3 mm Bolt Travel, Long Travel

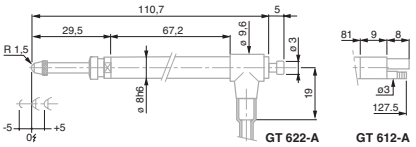
These probes are designed for use with measuring fixtures and machines with integrated automatic or semi-automatic measuring routines.

- Probes with long measuring travel and low resolution of values 8 mm dia. fixing shank.
- Suitable for multi-gauging inspection fixtures.
- Protection level IP65 ou IP50 as per IEC 60529.
- Wide range of accessories including measuring inserts, etc.
- LVDT probes compatible with measuring equipment from other suppliers available on request.

GT 622



GT 622 / GT 612



GT 622-A / GT 612-A

GT 622-A

GT 612

GT 612-A

		Measuring range, mm	Measuring force, nominal*, N	Bolt retraction	Sealing bellows	Nominal/ Maximal pressure, bar
03230062	**GT 612**	± 5	2,0	Pressure (bolt activation), spring (bolt retraction)	Viton	1,1 / max 1,5
03230055	**GT 622**	± 5	2,0	Pressure (bolt activation), spring (bolt retraction)	Viton	1,1 / max 1,5
03230070	**GT 612-A**	± 5	1,0	Pressure (bolt activation), spring (bolt retraction)	Without bellows	1,0 / max 6,0
03230071	**GT 622-A**	± 5	1,0	Pressure (bolt activation), spring (bolt retraction)	Without bellows	1,0 / max 6,0

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Cable output	Data sheet No.
GT 612	10,3	1 + 4 · L (BPX: 0,6 + 0,8· L)	0,05	0,05	Axial	03200415
GT 622	10,3	1 + 4 · L (BPX: 0,6 + 0,8· L)	0,05	0,05	Radial	03200394
GT 612-A	10,3	1 + 4 · L (BPX: 0,6 + 0,8· L)	0,05	0,05	Axial	03200433
GT 622-A	10,3	1 + 4 · L (BPX: 0,6 + 0,8· L)	0,05	0,05	Radial	03200434

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

Wireless Probe ± 2 mm

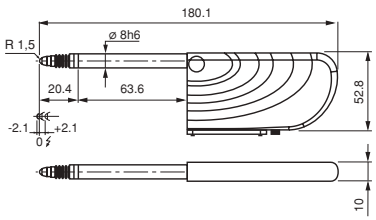
Probes developed for devices requiring a greater freedom of movement during the measurement or for parts with large dimensions.

Bidirectional and wireless communication synchronized with the TWIN-STATION Receiver.

- Resolution 0,1 µm.
- Range of 8 m, depending on environment.
- TESA wireless communication protocol independent of WiFi or Bluetooth.
- Autonomy 40 hours (rechargeable battery).
- Mounting stem Ø 8 mm with clamping possible over entire length.
- Measuring bolt mounted on ball bearing.
- Ball bearing guide separated from mounting stem in order not to negatively influence the movement of the measuring bolt in the event of improper clamping of the probe body.
- Level of protection IP54 according to IEC 60529.
- Wide range of measurement inserts.
- The TWIN-STATION (part number 05030012) manages and synchronizes up to 8 wireless probes.
- Interface Software TIS included in delivery content of the TWIN-STATION (part number 05030012): display of measured values, possibility to indicate tolerances, simple functions +A, -A, +A+B, +A-B, and export of values as a .csv file.

Note: The sales is limited to EU countries, Switzerland, USA, Canada and China.

GTL 21 W



GTL 21 W

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230500	**GTL 21 W**	± 2	0,63	Mechanical	Viton

OPTIONAL ACCESSORY:

05030012	TWIN-STATION Interface for wireless probes

	Max. plunger travel, mm	Maximum permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of the measuring bolt***, mm	Cable output	Data sheet No.
GTL 21 W	4,3	0,4 + 0,8· L	0,10	0,5	Fixed stops: lower -2,1 upper +2,1	Without cable	03200602

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

DIN 32876 Part 1

Nickel-plated housing
Stainless steel measuring bolt, hardened
Viton sealing bellows = highly resistant fluoroelastomer

Fixing body nickel Ø 8 mm
Stainless steel measuring bolt, hardened and ball bearing guided
Fixed upper and lower stops
Interchangeable inserts
M2, 5 thread
Carbide ball Ø 3 mm
Mini jack connector for charger.

Mechanical max. frequency**: 60 Hz
Power supply: 100 ÷ 240 VAC, 50 ÷ 60 Hz; 240 mAh
Rechargeable battery: 3,7 V, min. 550 mAh or 800 mAh
Frequency band: 2,4 GHz Range: 8 m, depending on environment.

Wireless transmission, TWIN-STATION Receiver (05030012)

± 0,2 µm/°C

20 ± 0,5°C

Protection level IP54 (IEC 60529)

GTL 21 W: 6g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing Stainless steel measuring bolt, hardened. Viton = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. Connector Mini-jack for charger.

Mechanical max. frequency**: 60 Hz Power supply: 100 ÷ 240 VAC, 50 ÷ 60 Hz; 240 mAh Rechargeable battery: 3,7 V, min. 550 mAh or 800 mAh Frequency band: 2,4 GHz Range: 8 m, depending on environment.

Wireless transmission, TWIN-STATION Receiver (05030012)

± 0,2 µm/°C

20 ± 0,5°C

Protection operating enevelope IP54 (IEC 60529)

GT 61 W: 8 g

Inspection report with a declaration of conformity

Wireless Probe ± 5 mm, Large Measuring Range

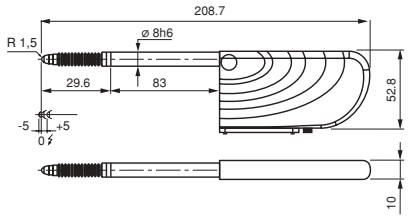
Probes developed for devices requiring a greater freedom of movement during the measurement or for parts with large dimensions.

Bidirectional and wireless communication synchronized with the TWIN-STATION Receiver.

- Resolution 0,1 µm.
- Range of 8 m, depending on environment.
- TESA wireless communication protocol independent from WiFi or Bluetooth.
- Autonomy 40 hours (rechargeable battery).
- Mounting body Ø 8 mm with possoboilty of clamping over entire length.
- Measuring bolt mounted on ball bearing.
- Separate guide bearing on the mounting body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping on the probe body.
- Level of protection IP54 according to IEC 60529.
- Wide range of measurement probes.
- The TWIN-STATION (part number 05030012) manages and synchronizes up to 8 wireless probes.
- Interface Software TIS included in supply content of the TWIN-STATION (part number 05030012): display of measured values, possibility to indicate tolerances, simple functions +A, -A, +A+B, +A-B, and export of values in a .csv file.

Note: The sales is limited to EU countries, Switzerland, USA, Canada and China.

GT 61 W



GT 61 W

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230502	**GT 61 W**	± 5	0,9	Mechanical	Viton
OPTIONAL ACCESSORY:					
05030012	TWIN-STATION Interface for wireless probes				

	Max. bolt travel, mm	Maximum permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm	Cable output	Data sheet No.
GT 61 W	10,3	0,8 + 0,8· L	0,24	0,5	Fixed stops lower -5 upper +5	Without cable	03200621

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

Wireless Pneumatic Probe ± 1,5 mm

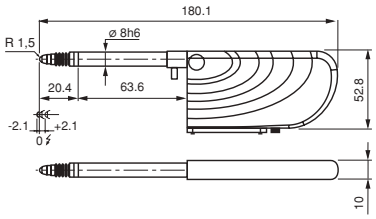
Probes developed for devices requiring a greater freedom of movement during the measurement or for parts with large dimensions.

Bidirectional and wireless communication synchronized with the TWIN-STATION Receiver.

- Resolution 0,1 µm.
- Range of 8 m, depending on environment.
- TESA wireless communication protocol independent from WiFi or Bluetooth
- Autonomy 40 hours (rechargeable battery).
- Support structure Ø 8 mm with enhanced clamping over its entire length
- Measuring rod mounted on ball bearing.
- Separate guide bearing on the holding body in order not to negatively influence the movement of the measuring rod in the event of improper clamping of the probe beads.
- Level of protection IP54 according to IEC 60529.
- Wide range of measurement probes.
- The TWIN-STATION (part number 05030012) manages and synchronizes up to 8 wireless probes.
- Interface Software TIS included in delivery content of the TWIN-STATION (art. 05030012): display of measured values, possibility to indicate tolerances, simple functions +A, -A, +A+B, +A-B, and export of values in a .csv file.

Note: The sales is limited to EU countries, Switzerland, USA, Canada and China.

GTL 212 W



GTL 212 W

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Nominal/maximal pressure, bar
03230501	**GTL 212**	± 1,5	1,2	Pressure (bolt activation), spring (bolt retraction)	Viton	0,7 / max. 1,0

OPTIONAL ACCESSORY:

05030012	TWIN-STATION Interface for wireless probes

	Max. measuring bolt travel, mm	Maximum permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of the measuring bolt***, mm	Cable output	Data sheet No.
GTL 212 W	4,3	0,4 + 0,8· L	0,10	0,5	Fixed stops: lower -2,1 upper +2,1	Without cable	03200620

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

DIN 32876 Part 1

Nickel-plated housing
Stainless steel measuring bolt, hardened
Viton sealing bellows = highly resistance fluoroelastomer

Fixing body nickel Ø 8 mm
Stainless steel measuring bolt, hardened and ball bearing guided
Fixed upper and lower stops
Probe interchangeable
M2,5 thread
Carbide ball Ø 3 mm
Mini jack connector for charger.

Mechanical max. frequency**: 60 Hz
Power supply: 100 ÷ 240 VAC, 50 ÷ 60 Hz; 240 mAh
Rechargeable battery: 3,7 V, min. 550 mAh or 800 mAh
Frequency band: 2,4 GHz Range: 8 m, depending on environment.

Wireless transmission, TWIN-STATION Receiver (05030012)

± 0,2 µm/°C

20 ± 0,5°C

Protection IP54 (IEC 60529)

GTL 212 W: 6g

Inspection report with a declaration of conformity

DIN 32876 Part 1

Nickel-plated housing
Stainless steel measuring bolt, hardened
Viton sealing bellows = highly resistance fluoroelastomer

Fixing body nickel Ø 8 mm
Stainless steel measuring bolt, hardened and ball bearing guided
Fixed upper and lower stops
Probe interchangeable
M2, 5 thread
Carbide ball Ø 3 mm
Mini jack connector for charger

Mechanical max. frequency**: 60 Hz
Power supply: 100 ÷ 240 VAC, 50 ÷ 60 Hz; 240 mAh
Rechargeable battery: 3,7 V, min. 550 mAh or 800 mAh
Frequency band: 2,4 GHz Range: 8 m, depending on environment.

Wireless transmission, TWIN-STATION Receiver (05030012)

± 0,2 µm/°C

20 ± 0,5°C

Protection level IP54 (IEC 60529)

GT 612 W: 8 g

Inspection report with a declaration of conformity

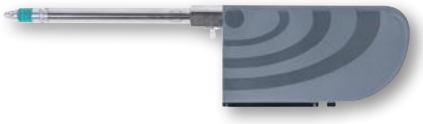
Wireless Pneumatic Probe ± 5 mm, Large Measuring Range

Probes developed for devices requiring a greater freedom of movement during the measurement or for pieces with large dimensions.

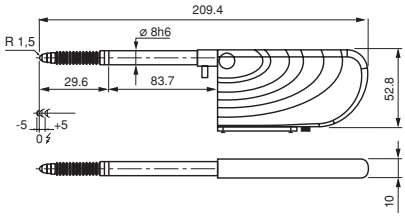
Bidirectional and wireless communication synchronized with the TWIN-STATION Receiver.

- Resolution 0,1 µm.
- Range of 8 m, depending on environment.
- TESA wireless communication protocol independent from WiFi or Bluetooth.
- Autonomy 40 hours (rechargeable battery).
- Mounting body Ø 8 mm with enhanced clamping over its entire length.
- Measuring bolt mounted on ball bearing.
- Separate guide bearing on the holding body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping on the probe body.
- Level of protection IP54 according to IEC 60529.
- Wide range of measurement probes.
- The TWIN-STATION (part number 05030012) manages and synchronizes up to 8 wireless probes.
- Interface Software TIS included in delivery content of the TWIN-STATION (art. 05030012): display of measured values, possibility to indicate tolerances, simple functions +A, -A, +A+B, +A-B, and export of values in a .csv file.

Note: The sales is limited to EU countries, Switzerland, USA, Canada and China.



GT 612 W



GT 612 W

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Nominal/maximal pressure, bar
03230503	**GT 612 W**	± 5	2,0	Pressure (bolt activation), spring (bolt retraction)	Viton	1,1 / max. 1,5

OPTIONAL ACCESSORY:

05030012	TWIN-STATION Interface for wireless probes

	Max. bolt travel, mm	Maximum permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm	Cable output	Data sheet No.
GT 612 W	10,3	0,8 + 0,8· L	0,24	0,5	Fixed stops: lower -5 upper +5	Without cable	03200622

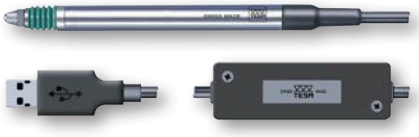
* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

USB Probes ± 2 mm, 4,3 mm Range

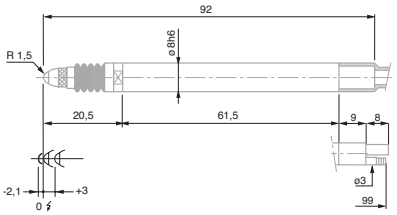
Universal probes for applications aided by a USB connection.

- Probe mounting body Ø 8 mm with enhanced clamping over its entire length.
- Measuring bolt mounted on ball bearing.
- Separate guide bearing on the mounting body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping of the probe beads.
- Level of protection IP65 according to IEC 60529.
- Wide range of measurement inserts.
- TSIP software interface included in supply 1 to 4 USB probes display. Possibility of indicating tolerances and simple functions + A,-A, + A + B + AB.
- To manage more than 4 probes USB, use the DATA-DIRECT (part number 04981001) or STAT-EXPRESS software (part number 04981002), available as an option.

TSIP Software

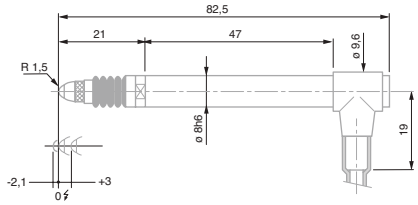


GTL 21 USB



GTL 21 USB

GTL 22 USB



GTL 22 USB

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

Fixing body Ø 8 mm. Measuring bolt guided on ball bearing. Fixed upper and lower stops. Interchangeable inserts. M 2,5 thread. Carbide ball Ø 3 mm. Cable length: 2,9 m. USB Type A plug connector

Max. mechanical frequency** 60 Hz. Consumption: 70 mAh, 5V Normal measuring interval = 80ms (optimal accuracy) Minimal measuring interval = 20ms (most rapid transfer of data) Stabilisation time after switching power on = 12 min.

0,2 µm/°C

20 ± 0,5°C

IP65 (IEC 60529)

Mobile weight: 6 g

Inspection report with a declaration of conformity

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230200	**GTL21 USB**	± 2	0,63	Mechanical	Viton
03230201	**GTL 22 USB**	± 2	0,63	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt*** mm	Cable output	Data sheet No.
GTL21 USB	4,3	0,4 + 0,8· L	0,1	0,5	Fixed stops: lower -2,0 upper +2,0	Axial	03200587
GTL 22 USB	4,3	0,4 + 0,8· L	0,1	0,5	Fixed stops: lower -2,0 upper +2,0	Radial	03200588

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

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt on ball bearing guide. Fixed lower and upper stops. Interchangeable measuring insert. Thread M2,5. Carbide ball Ø 3 mm Cable length: 2,9 m USB type A connector

Max. mechanical frequency** 60 Hz. Consumption: 70 mAh, 5V Normal measuring interval = 80ms (optimal accuracy) Minimal measuring interval = 20ms (most rapid transfer of data) Stabilisation time after switching power on = 12 min. Remark: Compressed air supply must be generated through a filter and precision regulator. The air should have a humidity of < 60 % and be filtered to < 0,5 µm.

0,2 µm/°C

20 ± 0,5°C

IP65 (IEC 60529) or IP50 for GTL 222-A

Mobile weight: 6 g

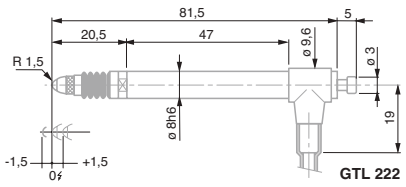
Inspection report with a declaration of conformity

USB Pneumatic Probes ± 1,5 mm, 3,1 mm Bolt Travel

Universal probes for applications facilitated by a USB connection

- Mounting body Ø 8 mm with possibility of clamping over its entire length.
- Measuring rod mounted on ball bearing.
- Separate guide bearing on the holding body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping of the probe beads.
- Level of of protection IP65 or IP50 according to IEC 60529.
- Wide range of measurement inserts.
- TSIP software interface included in supply: display 1 to 4 USB probes. Possibility of indicating tolerances and simple functions + A,-A, + A + B + AB.
- To manage more than 4 probes USB, use the DATA-DIRECT (part number 04981001) or STAT-EXPRESS software (part number 04981002), available as an option.

GTL 222 USB



GTL 222 USB

TSIP Software

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Nominal/ Maximal Pressure, bar
03230202	**GTL222 USB**	± 1,5	1,2	Pressure (bolt activation), spring (bolt retraction)	Viton	0,7 / max 1,0

	Measuring bolt travel, mm	Max. permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Cable output	Data sheet No.
GTL222 USB	3,1	0,4 + 0,8· L	0,1	0,5	Radial	03200589

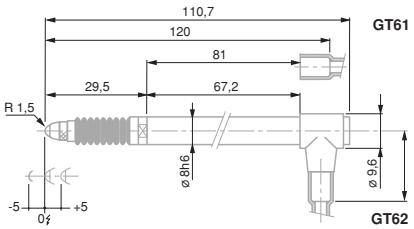
* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.

USB Probes ± 5 mm, 10,3 mm Bolt Travel, Extended Measuring Range

USB universal probes for applications facilitated by a USB connection.

- Probes designed for long measuring travel and low resolution measurement values.
- Probe mounting body Ø 8 mm with possibility of clamping over its entire length.
- Measuring bolt mounted on ball bearing.
- Separate guide bearing on the holding body in order not to negatively influence the movement of the measuring bolt in the event of improper clamping of the probe beads.
- Level of protection IP65 according to IEC 60529.
- Wide range of measurement inserts.
- TSIP software interface included in supply 1 to 4 USB probes display. Possibility of indicating tolerances, simple functions + A,-A, + A + B + AB.
- To manage more than 4 USB probes, use the DATA-DIRECT (part number 04981001) or STAT-EXPRESS software (part number 04981002), available as an option.

GT 61 USB



GT 61 USB / GT 62 USB

TSIP Software

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Viton sealing bellows = highly resistant fluoroelastomer

Fixing shank Ø 8 mm. Measuring bolt guided on ball-bearing. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable inserts. M2,5 thread. Carbide ball tip Ø 3 mm. Cable length 2,9 m. USB type A connector. 5-pin DIN 45322 connector.

Max. mechanical frequency 60 Hz
Power consumption: 70 mAh
Normal measurement interval = 80ms (maximum accuracy)
Minimum measurement interval = 20ms (fastest transfer data).
Stabilisation time after power on = 12 min

0,09 µm/°C

20 ± 0,5°C

IP65 (IEC 60529)

Mobile weight: 8 g

Inspection report with a declaration of conformity

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230204	**GT61 USB**	± 5	0,90	Mechanical	Viton
03230205	**GT62 USB**	± 5	0,90	Mechanical / vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error, µm (L in mm)	Repeatability, µm	Hysteresis, µm	Settings of lower stop of bolt***, mm	Cable output	Data sheet No.
GT61 USB	10,3	0,8 + 0,8· L	0,24	0,5	Fixed stops: lower -5,0 upper +5,0	Axial	03200591
GT62 USB	10,3	0,8 + 0,8· L	0,24	0,5	Fixed stops: lower -5,0 upper +5,0	Radial	03200592

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

DIN 32876 Part 1

See standard probes technical data

Cable length: 2 m. DIN 45322 plug connector, 5 poles. Use to connect to a device with an analogue input. For more information, refer to technical data for standard probes

Supply voltage: ±15 V
Consumption: 15 mA
Adjustable load: > 1 kΩ. Can be used in any position. Special versions on request: Sensitivity: 2 V/mm, 5 V/mm, 10 V/mm output: 0 V to +10 V (max +10 V)

See standard probes technical data

See standard probes technical data

See standard probes technical data

See standard probes technical data

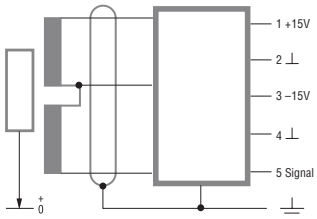
See standard probes technical data

DC Probes ± 2 mm (Output Signal in V)

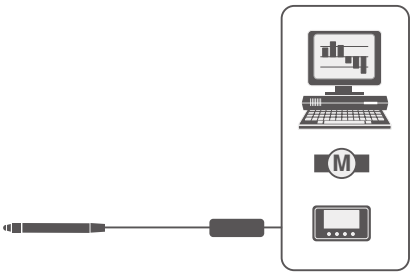
Probe provided with an electronic box which converts the signal to obtain an output DC voltage

Typically used for direct connection to a computer unit or interface equipped with an analogue input

GTL 21 DC



DIN 5 pin connection schematic



Connection of DC probe to a computer, an interface or a tracker

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Output voltage, V	Sensitivity, V/mm
03230059	**GTL 21 DC**	± 2	0,63	Mechanical	Viton	± 2	1
03230058	**GTL 22 DC**	± 2	0,63	Mechanical / vacuum	Viton	± 2	1

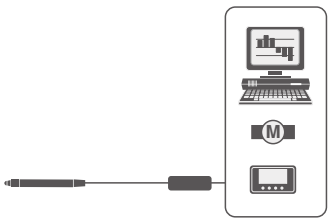
	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Data sheet No.
GTL 21 DC	4,3	$0,2 + 3,5 \cdot L^2$	0,1	03200396
GTL 22 DC	4,3	$0,2 + 3,5 \cdot L^2$	0,1	03200397

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

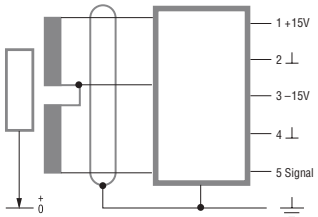
DC Probes ± 5 mm (Output Signal in V), with Extended Measuring Range

Probe provided with an electronic box which converts the signal to obtain an output DC voltage

Typically used for direct connection to a computer unit or an interface equipped with an analogue input



Connection of DC probe to a computer, an interface or a plotter



DIN 5 pin connector schematic

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Output voltage, V	Sensitivity, V/mm
03230086	**GT 61 DC**	± 5	0,9	Mechanical	Viton	± 5	1
03230087	**GT 62 DC**	± 5	0,9	Mechanical / vacuum	Viton	± 5	1

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Data sheet No.
GT 61 DC	10,3	1 + 4· L	0,1	03200519
GT 62 DC	10,3	1 + 4· L	0,1	03200520

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

DIN 32876 Part 1

See standard probes technical data

Cable length: 2 m. DIN 45322 plug connector, 5 poles. Use to connect to a device with an analogue input. For more information, refer to technical data on standard probes

Supply voltage: ± 15 V
Consumption: 15 mA
Adjustment load: > 1 kΩ
Can be used in any position. Special versions on request.
Sensivity: 2 V/mm, 5 V/mm, 10 V/mm
Output: 0 V to +10 V (max +10 V).

See standard probes technical data
See standard probes technical data
See standard probes technical data
See standard probes technical data
See standard probes technical data

DIN 32876 Part 1

See standard probes technical data

Cable length: 2 m. DIN 45322 plug connector, 5 poles. Use to connect to a device with an analog input. For more information, refer to technical data for standard probes

Drive voltage: ± 15 V Consumption: 15 mA Adjustment load: > 1 kΩ. Can be used in any position. Special versions on request. Sensivity: 2 V/mm, 5 V/mm, 10 V/mm Output: 0 V à +10 V (max +10 V)

See standard probes technical data

See standard probes technical data

See standard probes technical data

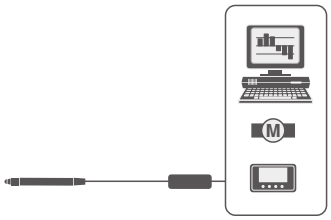
See standard probes technical data

See standard probes technical data

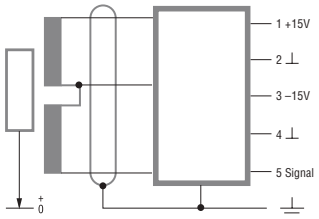
DC Miniature Probes ± 1 mm (Output Signal in V)

Probe provided with an electronic box which converts the signal to obtain an output DC voltage

Typically used for direct connection to a computer unit or an interface equipped with an analogue input



Connection of a DC probe to a computer, an interface or a plotter



DIN 5 pin connection schematic

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Output voltage, V	Sensitivity, V/mm
03230085	**GT 44 DC**	± 1	0,4	Mechanical / vacuum	Viton	± 1	1

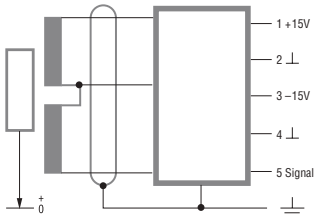
	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L en mm)	Repeatability, µm	Data sheet No.
GT 44 DC	2,1	$0,2 + 5 \cdot L^3$	0,1	03200518

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

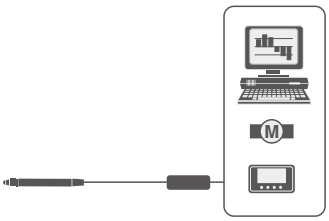
DC Miniature Probes ± 0,3 mm (Output Signal in V)

Probe provided with an electronic box which converts the signal to obtain an output DC voltage

Typically used for direct connection to a computer unit or an interface equipped with an analogue input



DIN 5 pin schematic


Connection of DC probe to a computer or an interface or a plotter

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows	Output voltage, V	Sensitivity, V/mm
03230081	**GT31 DC**	± 0,3	0,1	Without retraction	Without bellows	± 0,3	1

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatabailty, µm	Data sheet No.
GT31 DC	0,7	$0,2 + 50 \cdot L^2$	0,1	03200484

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

DIN 32876 Part 1

See standard probes technical data

Cable length: 2 m. DIN 45322 plug connector, 5 poles. Use to connect to a device with an analog input. For more information, refer technical data on standard probes

Drive voltage: ± 15 V
Consumption: 15 mA
Adjustment load: > 1 kΩ. Can be used in any measuring position. Special versions on request.
Sensivity: 2 V/mm, 5 V/mm, 10 V/mm
Output: 0 V to +10 V (max +10 V)

See standard probes technical data
See standard probes technical data
See standard probes technical data
See standard probes technical data
See standard probes technical data

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Sealing bellows: Nitrile = resistant elastomer. Viton = highly resistant fluoroelastomer.

Fixing shank Ø 8 mm. Ball-bearing measuring bolt. Both lower and upper stops are fixed. Interchangeable insert. M2,5 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

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

0,1 µm/°C

20 ± 0,5°C

Level of protection: IP65 (IEC 60529)

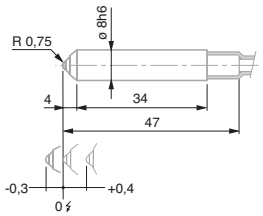
Mobile weight: 2 g

Inspection report with a declaration of conformity

GT 41 / GT 42 Miniature Probes, ± 0,3 mm, 0,7 mm Bolt Travel

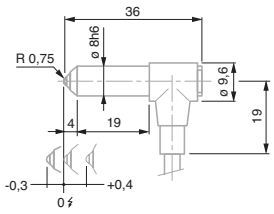
Compact probes for use in small spaces – Designed to be mounted on a measuring head for the inspection of bores and similar features.

GT 41



GT 41

GT 42



GT 42

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230001	**GT 41**	± 0,3	0,63	None	Nitrile
03230002	**GT 42**	± 0,3	0,63	Vacuum	Nitrile

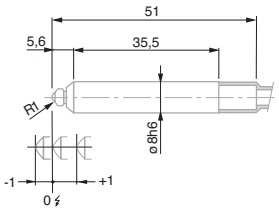
	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L en mm)	Repeatabilty, µm	Hysteresis, µm	Setting of lower stop of meauring bolt***, mm	Cable output	Data sheet No.
GT 41	0,7	$0,2 + 5 \cdot L^2$	0,01	0,01	Fixed stops: lower -0,3 upper +0,4	Axial	03200258
GT 42	0,7	$0,2 + 5 \cdot L^2$	0,01	0,01	Fixed stops: lower -0,3 upper +0,4	Radial	03200259

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

GT 43 / GT 44 Miniature Probes ± 1,0 mm, 2,1 mm Bolt Travel

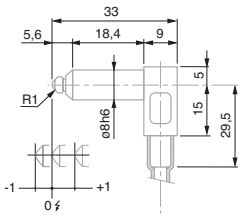
Compact probes for use in small spaces – Designed to be mounted on a measuring head for the inspection of bores and similar features.

GT 43



GT 43

GT 44



GT 44

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Sealing bellows: Nitrile = resistant elastomer. Viton = highly resistant fluoroelastomer.

Fixing shank Ø 8 mm. Ball-bearing measuring bolt. Both lower and upper stops are fixed. Interchangeable insert. M2 thread. Carbide ball tip Ø 3 mm. 2 m long cable. 5-pin DIN 45322 connector.

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

0,1 µm/°C

20 ± 0,5°C

Level of protection: IP65 (IEC 60529)

Mobile weight: 2 g

Inspection report with a declaration of conformity

		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230035	**GT 43**	± 1	0,4	Mechanical	Viton
03230017	**GT44**	± 1	0,4	Vacuum	Viton

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L en mm)	Repeatabilty, µm	Hysteresis, µm	Setting of lower stop of bolt***, mm	Cable output	Data sheet No.
GT 43	2,1	$0,2 + 5 \cdot L^2$	0,1	0,15	Fixed stops: lower -1,05 upper +1,05	Axial	03200260
GT44	2,1	$0,2 + 5 \cdot L^2$	0,1	0,15	Fixed stops: lower -1,05 upper +1,05	Radial	03200261

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

DIN 32876 Part 1

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

Fixing shank Ø 8 mm. Ball-bearing measuring bolt. Distance from electrical zero of both stops is either adjustable (downward) or depending on the position of the lower stop (upward). Interchangeable measuring insert with a 3 mm dia. tungsten carbide ball tip plus M2,5 thread. 2 m long cable. DIN 45322 5-pin connector.

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

0,025 µm/°C

20 ± 0,5°C

IP65 (IEC 60529)

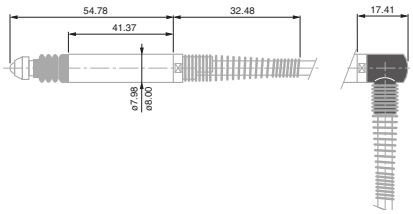
Mobile weight: 3,1 g

Probes, Unbranded Execution, Series 410 ± 1 mm, 2,5 mm Range, Short Body

Universal probes for common but constraining applications.

- 8 mm diameter probe body that can be clamped over its entire length.
- Ball bearing measuring bolt.
- Hardened steel body, hard-chrome plated.
- Degree of protection to IP62.
- Flexible axial cable exit fitted with a steel spring to prevent the cable from breaking.
- Other probes compatible with measuring equipment from other makers also available on request.

410



410 and accessory with radial cable exit (delivered with probe)

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
96410012	**410**	± 1	0,60	Mechanical	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L en mm)	Repeatabilty, µm	Setting of lower stop of the measuring bolt***, mm (factory setting)	Cable output	Data sheet No.
410	2,5	0,2 % (for a measuring span of ± 1 mm)	0,1	Adjustable from -1,2 to 0 (factory setting -1,08)	Axial and radial	F96410012

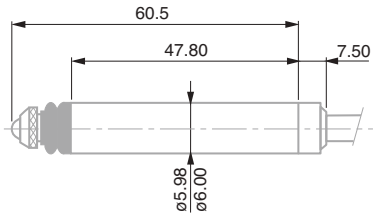
* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

Probes, Unbranded Execution, Series 160 ± 1 mm, 3,3 mm Bolt Travel, Short Body, Ø 6 mm

Compact size and robust construction makes these probes ideal for continuous use.

- Probe body Ø 6 mm.
- Clamping possible over entire length.
- Measuring bolt guided on ball bearing.
- Hard-chrome plated probe body, hardened steel.
- Protection level: IP62 as per IEC 60529.
- Executions compatible with measuring equipment from other suppliers available on request.

160



160

NO	=	Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
96160013	**160**	± 1	0,60	Mechanical	Viton

=	Measuring bolt travel, mm	Max. permissible error for deviation in linearity, µm (L in mm)	Repeatability, µm	Setting of lower stop of measuring bolt***, mm (factory setting)	Cable output	Data sheet No.
160	3,3	0,2 % (for a measuring span of ± 1 mm)	0,1	Adjustable from -1,2 to 0 (factory setting -1,08)	Axial	F96160013

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

DIN 32876 Part 1

Nickel-plated housing. Stainless steel measuring bolt, hardened. Sealing bellows: Viton = highly resistant fluoroelastomer.

Probe body Ø 6 mm. Measuring bolt guided on ball bearing.Distance between the lower stop and electrical zero adjustable. Interchangeable measuring insert. Thread M2. Carbide ball tip Ø 3 mm. 2 m long cable. DIN 45322 5-pin connector.

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

0,025 µm/°C

20 ± 0,5°C

Protection level: IP62 (IEC 60529)

Mobile weight: 2,5 g

DIN 32876 Part 1

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

Probe body Ø 8 mm. Measuring bolt guided on ball bearing.. Adjustable distance between lower bolt and electrical zero. Interchangeable measuring insert. Thread M2,5. Carbide ball tip Ø 3 mm. Cable length: 2 m DIN 45322 5-pin connector.

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

0,025 µm/°C

20 ± 0,5°C

Level of protection: IP65 (IEC 60529)

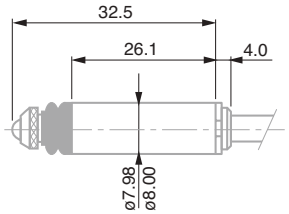
Mobile weight: 1,9 g (Series 439) Mobile weight: 3,0 g (Series 451)

Probes, Unbranded Execution, Series 430 and 451, ± 0,5 mm, 1,25 et 2,10 mm Measuring Bolt Travel, Miniature

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

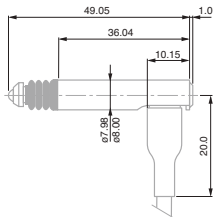
- Probe body Ø 8 mm.
- Clamping possible over its entire length.
- Measuring bolt on ball bearing guide.
- Hard chrome-plated probe body, hardened steel.
- Level of protection: IP62 as per IEC 60529.
- Probes compatible with measuring equipment from other suppliers also available on request.

430



430

451



451

NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
96430029	**430**	± 0,5	0,75	Mechanical	Nitrile
96441041	**451**	± 0,5	0,60	Mechanical	Nitrile

	Measuring bolt travel, mm	Max. permissible error for deviations in linearity, µm (L in mm)	Repeatability, µm	Setting of lower stop of measuring bolt***, mm (factory setting)	Cable output	Data sheet Nb
430	1,25	0,2 % (for a measuring span of ± 0,5 mm)	0,2	Adjustable from -0,7 to 0 (factory setting -0,58)	Axial	F96430029
451	2,10	0,2 % (for a measuring span of ± 0,5 mm)	0,1	Fixed stops (factory setting: -0,58)	Radial	F96441041

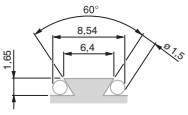
* Electrical zero (N) ± 25 % deviation limit. Valid in vertical mounting position, measuring bolt lowered and in static measuring.
** For an amplitude of 10 % to the last value of the measuring range.
*** Distance from electrical zero.

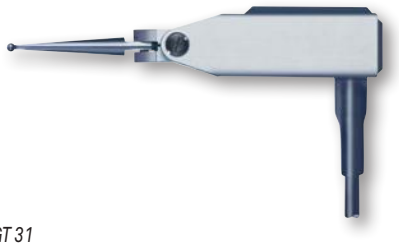
GT31 Lever Probes ± 0,3 mm, 0,3 mm Measuring Travel, Inclinable Lever

GT 31 with lever in perpendicular position

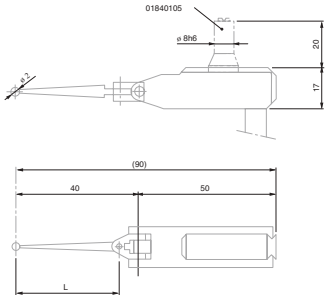
Well suited for use where probes with axial movement measuring bolts are inconvenient for measurements.

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

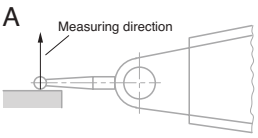




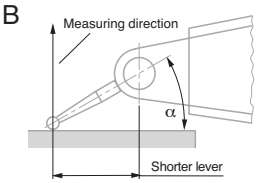
GT 31



GT 31 side view and top view



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



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

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

		Measuring range, mm	Nominal measuring force*, N	Lever retraction	Sealing bellows
03210802	**GT 31**	± 0,3	0,1	Without	Without bellows
03210801	**GT 31**	± 0,3	0,02	Without	Without bellows
03210803	**GT 31**	± 0,3	0,2	Without	Without bellows

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

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

DIN 32876 Part 1

All-metal housing, matt-chromium finish

2 dovetail attachments for clamping. Both lower and upper stops are fixed. Stainless steel measuring stem. Interchangeable measuring inserts. Carbide ball tip Ø 2 mm. Cable length: 2 m. DIN 45322, 5 pin connector. Other measuring inserts available as optional accessories..

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 25 Hz.

20 ± 0,5°C

Protection level: IP40 (IEC 60529)

Mobile weight: 12 g

DIN 32876 Part 1

Hardened steel probe body, nickel-plated

Linear guidance on ball bearing. 4 M6 mounting threads. Fixed mechanical stops. Interchangeable inserts. Dovetail.clamp for mounting holder. Cable length: 2 m. 5-pin connector DIN 45322.

Supply frequency: 13 kHz (± 5 %) Max. mechanical frequency**: 25 Hz.

-0,14 µm/°C

20 ± 0,5°C

IP50 (IEC 60529)

Mobile weight: 110 g

Inspection report with a declaration of conformity

Application: Minimal space usage with FMS units placed side by side

Application: small component measuring thanks to offset inserts

Probes with Parallel Guidance, ± 2 mm or ± 2,9 mm, 5,8 mm Measuring Travel

Modular construction enables the combination of elements, for example, such as springs, pneumatic cylinders and stops.

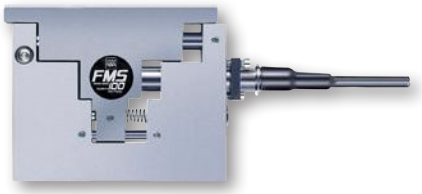
These universal probes are suited for multigauging fixtures as well as machines equipped with integrated inspection routines.

Versatility of applications:

- Probe can be used in any position for measuring.
- Measuring direction is adjustable.
- Retraction of the measuring insert is adjustable.
- Measuring force is adjustable depending on the accessory used.
- Possibility of using off-centre measuring inserts.

Unique design:

- Compact assembly noted for its robustness.
- Ball bearing guided movement.
- Wide variety of measuring inserts, holders and other accessories for measuring applications.
- LVDT execution versions compatible with melectronic equipment from other suppliers available on request.



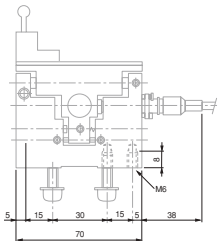
FMS 100

FMS 102

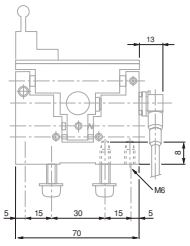
NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230019	**FMS 100**	± 2	2	Retraction by air pressure (optional)	Without bellows
03230049	**FMS 130**	± 2,9	2	Retraction by air pressure (optional)	Without bellows
03230028	**FMS 102**	± 2	2	Retraction by air pressure (optional)	Without bellows
03230050	**FMS 132**	± 2,9	2	Retraction by air pressure (optional)	Without bellows

	Measuring bolt travel, mm	Max.permissible error for deviation in linearity, µm (L in mm)	Repeatabilty, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm	Cable output	Data sheet No.
FMS 100	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200253
FMS 130	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200342
FMS 102	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200254
FMS 132	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 lower +2,9	Parallel	03200343

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



FMS 100



FMS 102

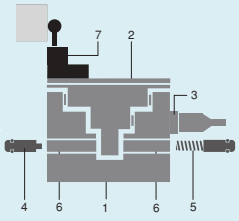
Configuration and Application of TESA FMS Probes

Shown below are the different possibilities for the activation and retraction of the probe insert during measurement cycles.

APPLICATION EXAMPLE A

- Activation of the probe insert in the direction of the part to be inspected using the measuring force produced by the spring set.
- Without retraction of the insert.

Result A
During the placing of a new part to be measured, the measuring insert remains in its contact position thanks to the measuring force produced by the spring set.

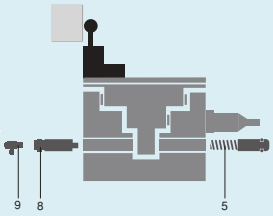


1 Static probe body
2 Mobile probe body
3 Measuring element with fine adjust
4 Adjustable stop
5 Spring set for producing measuring force
6 M6 mounting thread
7 Holder

APPLICATION EXAMPLE B

- Activation of the probe insert in the direction of the part to be measured using the measuring force of the spring set.
- Retraction of the insert by pneumatic pressure through a pneumatic connection.

Result B
During the placing of a new part to be measured, the measuring insert is retracted through activation of pressure via the pneumatic actuator.



5 Spring set for producing measuring force
8 Pneumatique actuator (Part No. 03260440)
9 Connector (Part No. 024388))

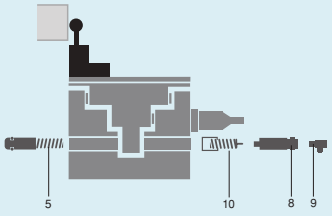
APPLICATION EXAMPLE C

- Activation of the probe insert in the direction of the part to be inspected by pneumatic pressure and the measuring force of the spring set.
- Retraction of the insert by disabling the pneumatic pressure.

ATTENTION !
The force of the spring set (5) must be equal to that of the auxiliary spring element (10).

Result C
During the placing of a new part to be measured, the measuring insert is automatically retracted due to the disabling of the pneumatic pressure. which guarantees about security during the measuring cycle.

This configuration is typically preferred when there is lack of space for connecting a pneumatic actuator (left side of example B).



5 Spring set for producing measuring force
8 Pneumatic actuator (Part No. 03260440)
9 Connector (Part No. 024388)
10 Auxiliary spring element (Part No. 03260445)

DIN 32876 Part 1

Hardened steel probe body, nickel-plated

Linear guidance on ball bearing. 4 M6 mounting threads.. Fixed mechanical stops. Interchangeable inserts. Holder with dovetail clamping. Cable length: 2 m. 5-pin connector DIN 45322.

Supply frequency: 13 kHz (± 5 %). Max. mechanical frequency**: 25 Hz.

-0,14 µm/°C

20 ± 0,5°C

IP54 (IEC 60529)

Mobile weight: 110 g

Inspection report with a declaration of conformity

Application: mesurement with a protected FMS

FMS 102-P

FMS 100-P

Probes with Parallel Guidance, ± 2 mm or ± 2,9 mm, 5,8 mm Measuring Travel – Protected Version

– FMS 100-P, 102 -P, 130-P, 132-P provide dust protection of the 2 side faces.

Modular concept for combining elements, for example, such as springs, pneumatic actuators and stops.

These universal probes are suitable for mutigauging inspection fixtures as well as machines with integrated automated inspection routines.

Versatility of applications:

– Probe can be used in any position for measuring
– Measuring direction can be changed
– Retraction of the measuring insert is adjustable
– Measuring force is adjustable, depending on the accessory used
– Possibility of using off-centre measuring inserts

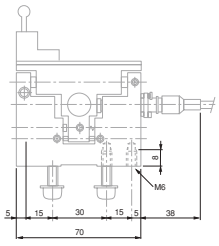
Unique design:

– Compact assembly noted for its robustness
– Ball bearing guided movement
– Wide variety of measuring inserts, holders and other accessories for
– measuring applications
– LVDT execution versions compatible with melectronic equipment from other suppliers available on request.

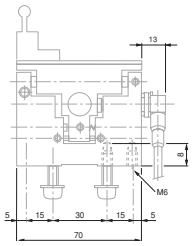
NO		Measuring range, mm	Nominal measuring force*, N	Bolt retraction	Sealing bellows
03230037	FMS100-P	± 2	2	Retraction by air pressure (optional)	Without bellows
03230051	FMS130-P	± 2,9	2	Retraction by air pressure (optional)	Without bellows
03230038	FMS102-P	± 2	2	Retraction through air pressure (optional)	Without bellows
03230052	FMS132-P	± 2,9	2	Retraction through air pressure (optional)	Without bellows

	Measuring bolt travel, mm	Max. permissible errors for deviations in linearity, µm (L en mm)	Repeatability, µm	Hysteresis, µm	Setting of lower stop of measuring bolt***, mm	Cable output	Data sheet No.
FMS100-P	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200283
FMS130-P	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Parallel	03200344
FMS102-P	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Angled	03200289
FMS132-P	5,8	$0,2 + 3 \cdot L^3$	0,5	0,5	Fixed stops: lower -2,9 upper +2,9	Angled	03200345

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



FMS 100-P



FMS 102-P

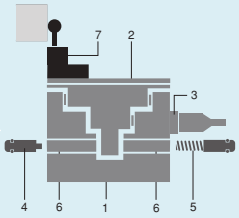
Configuration and Application of TESA FMS Probes

Shown below are the different possibilities for the activation and retraction of the probe insert during measurement cycles.

APPLICATION EXAMPLE A

- Activation of the probe insert in the direction of the part to be inspected using the measuring force produced by the spring set.
- Without retraction of the insert.

Result A
During the placing of a new part to be measured, the measuring insert remains in its contact position thanks to the measuring force produced by the spring set.

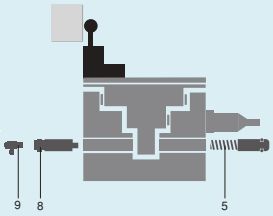


1 Static probe body
2 Mobile probe body
3 Measuring element with fine adjust
4 Adjustable stop
5 Spring set for producing measuring force
6 M6 mounting thread
7 Holder

APPLICATION EXAMPLE B

- Activation of the probe insert in the direction of the part to be measured using the measuring force of the spring set.
- Retraction of the insert by pneumatic pressure through a pneumatic connection.

Result B
During the placing of a new part to be measured, the measuring insert is retracted through activation of pressure via the pneumatic actuator.



5 Spring set for producing measuring force
8 Pneumatique actuator (Part No. 03260440)
9 Connector (Part No. 024388))

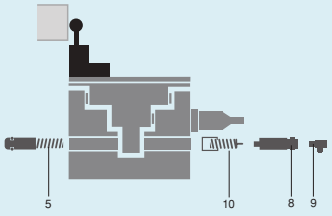
APPLICATION EXAMPLE C

- Activation of the probe insert in the direction of the part to be inspected by pneumatic pressure and the measuring force of the spring set.
- Retraction of the insert by disabling the pneumatic pressure.

ATTENTION !
The force of the spring set (5) must be equal to that of the auxiliary spring element (10).

Result C
During the placing of a new part to be measured, the measuring insert is automatically retracted due to the disabling of the pneumatic pressure. which guarantees about security during the measuring cycle.

This configuration is typically preferred when there is lack of space for connecting a pneumatic actuator (left side of example B).



5 Spring set for producing measuring force
8 Pneumatic actuator (Part No. 03260440)
9 Connector (Part No. 024388)
10 Auxiliary spring element (Part No. 03260445)

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

10 x 5 mm

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

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

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift and signal amplification: ≤ 0.005 %/° C. Display frequency limit with respect to input signal: 10 Hz

IP63 (IEC 60529)

2004/ 108/EC
EN 61326-1
annex A

RS232 via TLC connector

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

LCD display size: 70 x 62 mm

500 g (including batteries)

5 decades plus minus sign

± 1 digital step

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

TESATRONIC TWIN-T10 probe display unit

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

Other features:

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

TWIN-T10

No	Designation	Number of probe inputs	Automatic conversion of range	Analogue scale zoom x5	Memory function for values MAX, MIN, MAX-MIN
04430013	TESATRONIC TWIN-T10	1	●	●	●

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

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

DIN 32876 Part 1

110 mm scale length

6-decade display plus minus sign

12,5 x 6,6 mm

126 x 62 mm LCD display, with 50 scale divisions

Value limit for a temperature of 20°C and a relative humidity of ≤ 50 %
TT20:
Analogue display: 2%
Digital display 0,3 %
Digital output: 0,3 %
TT60:
Analog display: 2 %
Digital display: 0,3 %
Analogue output: 0,3%
Digital output: 0,3%

± 1 numerical interval

255 x 235 x 120 mm (W x D x H)

Resistant plastic material

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

TESATRONIC TT20 and TT60 Probe Display Units

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

TESATRONIC TT20

Combined digital and analogue indication

2 probe inputs for single measurements, sum and difference measurements

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

TESATRONIC TT60

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

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

TT60

TT20

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

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

DELIVERED WITH THE FOLLOWING ACCESSORIES:	
04761054	Battery charger 100 ÷ 200 VAC 50 ÷ 60 Hz, 6,6 V DC, 750 mAh supplied without power cable
04761055	Mains cable EU for charger 0471054

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

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

RS232 opto-coupled output

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

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

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

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

1,1 kg

DIN 32876 Part 1

110 mm scale length

6-decade display plus minus sign

12,5 x 6,6 mm

126 x 62 mm LCD display, with 50 scale divisions

Limit value for a temperature of 20°C and a relative humidity of ≤ 50 %:
Analog display: 2 %
Digital display: 0,15 %
Analog output: 0,3 %
Digital output: 0,15 %

± 1 digital interval

255 x 235 x 120 mm (W x D x H)

Resistant plastic

TESATRONIC TT 80 and TT 90 Probe Display Units

High resolution display units

Combined analogue/digital display

Two probe inputs for single, sum and difference measurements.

In addition to TESATRONIC TT60 funczions, TT 80 has the following additional functions:

- 9 measuring ranges with digital steps of 0,01 µm or 0.000001 in.
- Memorisation of extreme values "max.", "min.", "max. minus min." as well as the mean of the two values "max." and "min.".
- Dynamic measurement with acquisition of more than 10 single values per second.
- Classification of measured values with a contact relay providing output signals for 5, 10, 20 or 40 acceptable classes.
- Analogue output for external processing of signals.

In addition to TESATRONIC TT60 functions, TT 90 has the following additional functions:

- 9 measuring ranges with digital step of 0,01 µm or 0.000001 in.
- Memorisation of extreme values "max.", "min.", "max. minus min." plus the mean of both values "max." and "min.".
- Dynamic measurement with acquisition of more than 10 single values per second.
- Classification of measured values with output signals through contact relay for 5, 10, 20 or 40 acceptable classes.
- Analogue output for external signal processing.
- Output for bolt retraction control.
- Selection of stabilisation time for measuring cycles.
- RS digital output for values to the micron.

TT 90

TT 80

Application: TT 80 with a SIP (Société genevoise d'instruments de physique) high precision measuring bench

NO		Measuring range zoom x5	Memory
04430011	**TESATRONIC TT80 High precision electronic display**	–	●
04430012	**TESATRONIC TT90 High precision electronic display**	–	●

	Number of probes inputs	Automatic conversion of range
TESATRONIC TT80 High precision electronic display	2	●
TESATRONIC TT90 high precision electronic display	2	●

DELIVERED WITH THE FOLLOWING ACCESSORIES:	
04761054	Battery charger 100 ÷ 200 VAC / 50 ÷ 60 Hz, 6,6 V DC, 750 mAh, supplied without power cable
04761055	Mains cable EU for charger 0471054

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

For a temperature of 20°C and a relative humidity of ≤ 50 %: Response time analogue, digital and LED displays classification: ≤ 100 ms. Holding of digital display: 100 ms. Response time of the analogue output signal in relation to analogue display: ≤ 30 ms.

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift and signal amplification: ≤ 0,005 %/°C. No drift of stored values. Frequency limit for all displays frequency, analog output and memory in relation to input signal: 10 Hz

RS232 opto-coupled output

Voltage range of ± 2 V to ± 10 V. Output current: ≤ 2 mA. Load adjustment: ≥ 5 kΩ. Background noise (probe to 0 electric) ≤ 1 mV. Reference potential: analog ground 0 V

6,5 Vdc up to 7,3 V DC. Consumption: 2 W. Monitored voltage fluctuation. Supply voltage for probe: 3 V

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

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

1,1 kg

DIN 32876 Part 1

Length: 100 mm

Limit value for a temperature of 20°C and a relative humidity of ≤ 50 %: Analog Display: 1,5 % Analog output: 0,3 %

Display: negligible. Classification signals: 5 %

258 x 190 x 158 mm (W x D x H)

Die-cast aluminum case, designed for the workshop

For a temperature of 20°C and a relative humidity of ≤ 50 %: Response time of the analogue display: ≤ 1 ms. Response time of the analogue output signal from the analog display: 20 ms. Response time for classification signals: 10 ms.

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift: ≤ ± 0,005 % /°C. No drift of stored values. Frequency limit for analogue display: 1 Hz. Frequency limit for analogue output: 50 Hz. Frequency limit for classification: 30 Hz

TESATRONIC TTA20 Probe Display Unit

Compact design with analogue indication and value classification of measured values.

Aluminium housing, designed for shop floor applications, user-friendly.

- Easy-to-read analogue display with mirror strip in order to avoid parallax error.
- 6 measuring ranges.
- Metric/Inch conversion.
- Zero setting potentiometer for display.
- 2 probe inputs for single, sum or difference measurements.
- 1 auxiliary signal input, e.g. for all correction values.
- Colour LEDs of green for "Good", yellow for "Rework" and red for "Scrap".
- Potentiometer for setting limit tolerances.
- Polarity reverse switch for classification signals (internal or external dimensions).
- Switch for locking or unlocking a displayed value.
- Analogue output for a display unit or external recording.

TTA20

		Number of measuring ranges Min range / Max range max (µm)	Measuring range zoom x5	Memory	Power supply
04430003	**TTA20**	6 / min ± 3 max ± 1000	–	–	Network

DELIVERED WITH THE FOLLOWING ACCESSORIES:	
03160015	Mains cable CH 2 m
03160016	Mains cable, EU, 2 m
03160017	Mains cable without plug, 2 m for TTA20

OPTIONAL ACCESSORY:	
04460004	Connector 15 pins for analogue output and classification signal of TTA20

µm	µm	*in*	*in*
± 1000	50	*± 0.1*	*0.005*
± 300	10	*± 0.03*	*0.001*
± 100	5	*± 0.01*	*0.0005*
± 30	1	*± 0.003*	*0.0001*
± 10	0,5	*± 0.001*	*0.00005*
± 3	0,1	*± 0.0003*	*0.00001*

Number of probe inputs	Automatic conversion of range
2	–

Accessories for TESATRONIC TT Units

04761055

047610556

04761054

03160017

03160015

03160016

NO	
04761054	Battery charger 100 ÷ 200 VAC 50 ÷ 60 Hz, 6,6 V DC, 750 mAh supplied without power cable
04761055	Mains cable EU for charger 0471054
04761056	Mains cable US for charger 0471054
03160015	Mains cable CH, 2 m for TTA20
03160016	Mains cable EU, 2 m for TTA20
03160017	Mains cable without plug, 2 m for TTA20
04460004	Connector 15 pins for analogue output and classification signal of TTA20

Voltage: ± 1 V. Output current ≤ 3 mA. Adjustment load ≥ 2 kΩ. Residual ripple (at electrical zero): ≤ 1 mV. Reference potential: analogue ground 0 V

Supply voltage 230 or 115 V -10 % to +20 %, 50-60 Hz. Virtual power: 20 VA. Supply voltage for probe: 1,5 Vrms -10 % to +5 %. Frequency: 13 kHz ± 0,5 %.

Level of protection: IP40 (IEC 60529)

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

3,4 kg

±2 mm, ±5 mm

0,1 µm

Field error indication (pictogram / text) to a temperature of 20°C and a relative humidity of ≤ 50 %: Digital output: ± (0,05 + 0,15 % of range)

55 x 172 x 155 mm (H x W x D)

Housing in aluminium

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift: ≤ ± 0,05 %/°C. Sensitivity drift: ≤ ± 0,05 %/°C. Acquisition time: 10 ms (between two consecutive measurements) 1 ms (timing window) time data transfer of digital serial output (USB): depends on the operating system of the computer.

USB port (USB Hub) Communication: USB 2.0, 3 external ports (≤ 100 mAh)

Supply voltage of the charger: 115 to 230 Vrms, charger frequency 50 ÷ 60 -10 to +15 % Hz

IP40 (IEC 60529) (DIN 40050)

IEC/EN 61326-1 U.S. 47 CFR part 15, subpart B, Class B digital device

1 kg (BPX) 0,85 kg (TWIN-STATION)

Power supply 100 ÷ 240 V, 50 ÷ 60 Hz (04761054) EU Cable, CH (04761055) U.S. Cable (04761056)

ELECTRONIC INTERFACE UNITS

Electronic interfaces to manage, synchronize inductive probes and allow data transfer to a computer or an automatic inspection machine.

TESA Probe Interface Boxes - BPX Series

Modular system available in 2 versions (BPX and TWIN-STATION) for the conversion of measured signals to digital values and transmission of these values to a computer. These units are key components for multigauging inspection fixtures for centralised process control systems.

Signal inputs – 1 to 4 TESA standard half-bridge probes.

Signal output – digital, RS232 through USB port.

- Direct connection to the computer's USB port.
- Stand Alone operating mode: program routine via the computer, enabling the BPX box to execute a simple measuring function with classification signal relay via connector Sub-D 15P.
- Optimal adaptation for various measuring applications, for example, connection of 16 probes thanks to serial USB connections on 4 BPX boxes.
- Increased functional reliability and high precision.
- Increased immunity to negative environmental effects, whether of electrical origin or provoked by liquid and solid contaminants.
- BPX is compatible and can be used with TWIN-STATION.
- TIS interface software is included in the BPX (part number 05030012) for display of measured values. Possibility of indicating tolerance values, and simple functions +A, -A, +A+B, +A-B, export of values to a .csv file.

BPX Front

BPX Rear

TIS software included in the BPX supply

NO	Number of probe inputs	Number of I / O (In / Out) controllers	Connector
05030010	4	1 / 3	Sub-D 15 p/f (for In/ Out signals)

TWIN-STATION Receiver for TESA Wireless Probes

Modular system available in 2 executions (TWIN-STATION and BPX) for the conversion of inductive probe signals into digital values for transmission to a computer.

These units are important components for measuring fixtures requiring freedom of movement without any constraints and without any cables, a wireless transmission

Signal inputs – 1 to 8 TESA half-bridge wireless probes*

Signal outputs – digital, RS232 through USB port

- Direct connection to the USB port of the computer.
- Perfect fit for your metrology applications through the connection of up to 16 wireless probes by means of serial USB to 2 TWIN-STATION units.
- Great functional reliability and high accuracy.
- TWIN-STATION is compatible and can be used with BPX.
- TIS interface software TIS included in supply of TWIN-STATION (part no. 05030012): display of measured values. Possibility of indicating tolerances, simple functions +A, -A , +A+B, +AB , and export of values to a .Csv file.

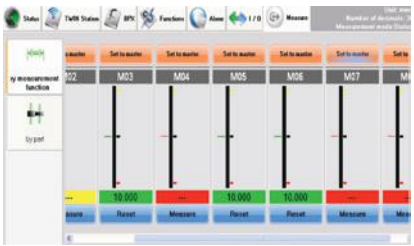
Note: The sale of TWIN-STATION is limited to EU countries, Switzerland, USA and Canada.

* The sale of wireless probes is limited to EU countries, Switzerland, USA, Canada and China.

GTL 21 W wireless probe with VERIBOR (optional)

TWIN-STATION, front

TWIN-STATION, rear



TIS Software, inclued in the TWIN-STATION supply

± 2 mm, ± 5 mm

0,1 µm

For a temperature of 20°C and a relative humidity of ≤ 50 %: Digital output: ± (0,05 + 0,15 % of measuring range)

55 x 172 x 155 mm (H x W x D)

Housing case in aluminium

For a temperature of 20°C and a relative humidity of ≤ 50 %: Zero drift: ≤ ± 0,05 %/°C. Sensitivity drift: ≤ ± 0,05 %/°C. Acquisition time: 20 ms (between two consecutive measurements) 2 ms (timing window) Time for data transfer from digital serial output (USB): depends on the operating system of the computer

Power supply via USB cable connection
– directly to PC (USB port)
– to a USB-connected hub
– to a BPX probe interface (05030010)

IP40 (IEC 60529) (DIN 40050)

IEC/EN 61326-1 U.S. 47 CFR part 15, subpart B, Class B digital device

0,85 kg

USB cable, 1,80 m

No	Number of wireless probes per TWIN-STATION	Power supply	Weight, kg
05030012	1-8	Power supply via: – USB port of PC – USB-connected hub – BPX	0,85

± 0,5 % with reference to the measuring span

± 10 to ± 15 V DC, 60 mA

≤ ±100 ppm/°C, stability at zero = ≤ ±0,2 µm/°C

IP50 (IEC 60529)

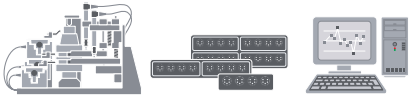
TESA Probe Interface Boxes with Analogue Output – Series M4P-2

Signal inputs – TESA standard execution probes (Half-bridge)

Signal outputs – analogue (in ± V/mm)

- Connection of up to 32 TESA standard half-bridge probes.
- Connection possible to a PC through the A/D transducer.

Rack with 3 M4P-2 interfaces



Multi-gauging fixture with 1, 2 or 4 M4P-2 interfaces

NO		Sensivity (mV / V /mm)	Number of probe inputs	Dimensions (mm)	Analogue outputs	Weight (kg)
S48001721	M4P-2 interface 4 probe inputs with demodulator and analogue output in V/mm	73,75	4, including a demodulator	36 x 100 x 120	± 1 V/mm, ± 2,5 V/mm, ± 5 V/mm, ± 10V/mm	0,6
S48001722	R2M-1 rack for 2x M4P-2	–	8 (with 2x M4P-2)	55 x 212 x 144	–	0,9
S48001723	R4M-1 rack for 4x M4P-2	–	16 (with 4x M4P-2)	160 x 212 x 144	–	1,2
S48001724	Supply module MA4-2, 230V	–	Voltage: 230 ±10 % Vac, 50 Hz	85 x 222 x 146	Output voltage: ± 15V for 32 probes	1,1
S48001731	Power supply MA4-2, 110 V	–	Voltage: 110 ±10 % Vac, 60 Hz	85 x 222 x 146	Output voltage: ± 15V for 32 probes	1,1

Accessories for M4P-2 probe interface

NO	
S48001725	M4P-2 connecting cable to PC, 2m DB-37 pins m/f

Adaptor Cable: DIN 5p Connector to USB Type A Connector

Allows for quick and easy connection of any TESA standard half bridge probe to a PC USB port.

Signal inputs – TESA standard probes (Half-bridge)
Signal outputs – digital RS 323 through USB port

		Measuring range, mm	Deviation span of indication	Zero drift
03260500	Cable adapter DIN 5p for USB. enables connection of TESA probes sensivity 73,75 mV/V/ mm directly to a USB port	± 2 mm	0,3 % ± 0,1 µm	± 0,01 %/°C
03260501	Cable adapter DIN 5p for USB. enables connection of TESA probes sensivity 29,50 mV/V/ mm directly to a USB port	± 5 mm	0,3 % ± 0,1 µm	± 0,01 %/°C

Cable adapter: DIN 5-pin connector to USB connector type A

DIN 32876 Part 1

0.1 µm

2 V effectively
13 kHz ± 0,5 %

At 20°C and relative humidity ≤ 50 %: error of 'indication = 0,3 % ± 0,1 µm zero drift ± 0,01 %/°C V. Standard refresh speed = 80 ms. Maximum refresh speed = 42 ms. Distance between the stops and the electrical zero cannot be adjusted. Length of cable: 1,2 m. Note: the total error should take into account the error of the probe and the error of the adapter.

USB 2.0 RS232, virtual COM port

20 ± 0,5°C

IP51 (IEC 60529)

Input impedance 970 ± 50Ω (13 kHz) or 2150 ± 50Ω (standard 0 µm) Phase (13 kHz): 71 ± 2°. Input resistance: 100 ± 5Ω. Output impedance at 13 kHz: 1000 ± 2Ω. Phase (13 kHz): 0,2° Dummy probe (half-bridge), sensivity 73,75 mV/V/m. Suitable for instruments with following features: Frequency: 13 ± 0,65 kHz, Voltage: 3 ± 0,015 Veff (2 symetrical voltages of 1,5 Veff) Input and output impedance: ≤ 0,2Ω et 2000Ω, respectively

Calibration: 40 % to 60 %. Operating: 20 % to 80 %. Storage: 5 % to 95 %. Without condensation.

IP40 (IEC 60529)

Inspection report

Ø 18 mm, length 118 mm

≈ 45 g

20 ± 0,5°C, stabilisation time = 8 h

± 3 ppm/°C. Ageing: ± 30 ppm/a

Calibration Standards – Dummy Probes

Calibration standards – also known as "dummy probes" – are resistance dividers. Each calibration standard simulates a given length dimension with high accuracy.

Each calibration standard has 2 values (positive and negative). The values indicated below are the nominal values.

These products are calibrated and supplied with an inspection report that shows the values (actual values) measured during calibration and the related measuring uncertainty.

The calibration standards are connected to the instrument in place of regular probes. For the calibration and all required setting operations of the instrument, certain criteria and conditions need to be respected.Consult the user manual or get in touch with our specialists for further information.

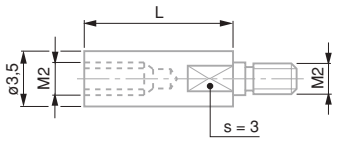
Set of 3 calibration standards (S41077249)

NO		Value of the calibration standard (microns)
S41078077	Dummy probe	± 0
S41078079	Dummy probe	± 3
S41078228	Dummy probe	± 100
S41078230	Dummy probe	± 190
S41078087	Dummy probe	± 300
S41078332	Dummy probe	± 500
S41078751	Dummy probe	± 1000
S41078752	Dummy probe	± 1900
S41077249	Set of 3 dummy probes	± 0 / ± 100 / ± 1000
S41078654	Set of 2 dummy probes	± 190 / ± 1900

INSERTS FOR AXIAL PROBES, WITH M2 THREAD

Extensions for Inserts with M2 Thread

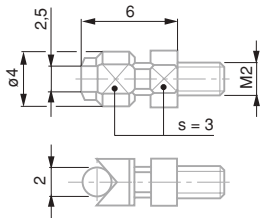
NO	L, mm
03540505	10
03540506	15



03540505, 03540506

Measuring Insert with Cylindrical Measuring Face, Lock Nut for Radial Alignment, M2 Thread

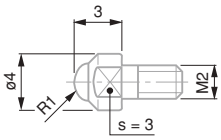
NO		L, mm
03510503	Carbide	6



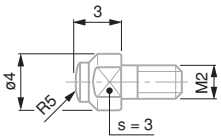
03510503

Hemispherical Measuring Inserts, M2 Thread

NO	R, mm	Material	L, mm
03510204	R 1	Carbide	3
03510103	R 5	Carbide	3



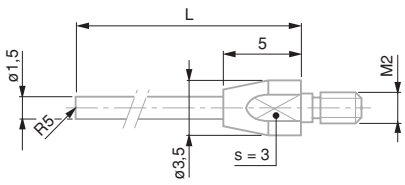
03510204



03510103

Spherical Measuring Inserts, R = 5 mm, M2 Thread

NO		L, mm
03510202	Carbide	16
03510203	Carbide	26

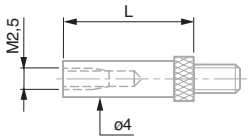


03510202, 03510203

INSERTS FOR AXIAL PROBES, WITH M2,5 THREAD

Extensions for Measuring Inserts, Ø 4 mm, 10 – 40 mm

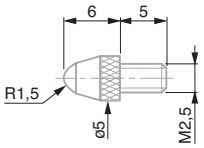
NO	L, mm
03540501	10
03540502	15
03540503	20
03540504	40



03540501 to 03540504

Standard Spherical Measuring Inserts, R = 1,5 mm, L = 6 mm

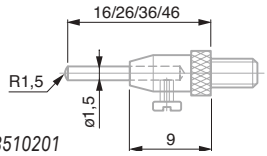
NO	=		L, mm
03510001	L=6 mm	Steel	6
03510002	L=6 mm	Carbide	6
03560001	L=6 mm	Sapphire	6



03510001, 03510002, 03560001

Spherical Measuring Insert with 4 Interchangeable Pins, R = 1,5 mm, Length 16-46 mm

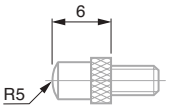
NO		L, mm
03510201	Steel	16, 26, 36, 46



03510201

Spherical Measuring Inserts, R = 5 mm, L = 6 mm

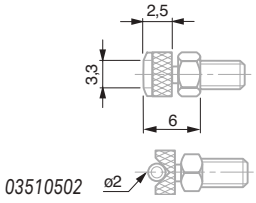
NO		L, mm
03510101	Steel	6
03510102	Carbide	6



03510101, 03510102

Insert with Cylindrical Measuring Face, Counter Nut for Radial Alignment

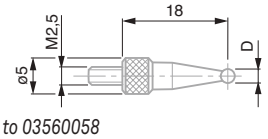
NO		L, mm
03510502	Carbide	6



03510502

Spherical Measuring Inserts, R 1 – 8 mm, L > 18mm

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

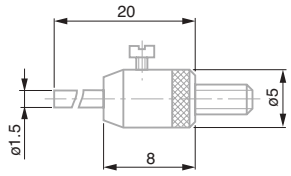


03560051 to 03560058

INSERTS FOR AXIAL PROBES, WITH M2,5 THREAD

Inserts with a Flat Measuring Face Ø 1,5 mm, Interchangeable Pin, Steel or Carbide

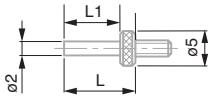
NO	Ø		L, mm
03560008	1,5	Steel	20
03560009	1,5	Carbide	20



03560008, 03560009

Inserts with Flat Measuring Face, Ø 2 mm, Steel

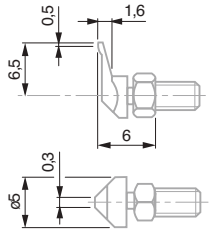
NO	Ø	L, mm	L1, mm
03560026	2	5	2,8
03560027	2	10	7,8
03560028	2	15	12,8
03560029	2	20	17,8



03560026 to 03560029

Insert with Offset (6,5 mm) Measuring Contact Point, Lock Nut for Radial Alignment

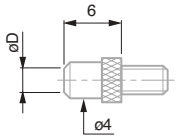
NO		L (offset), mm
03510401	Steel	6,5



03510401

Inserts with a Flat Measuring Face, Ø 2,5 – 3,4 mm

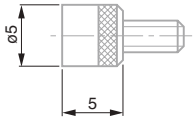
NO	Ø		L, mm
03510801	2,5	Steel	6
03510802	2,5	Carbide	6
03560022	3,4	Steel	8
03560023	3,4	Carbide	8



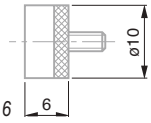
03510801, 03510802, 03560022, 03560023

Inserts with Flat Measuring Face, Ø 5 – 10 – 20 mm

NO	Ø		L, mm
03560012	5	Steel	5
03560013	5	Carbide	5
03560014	10	Steel	6
03560015	10	Carbide	6
03560016	20	Steel	3,6



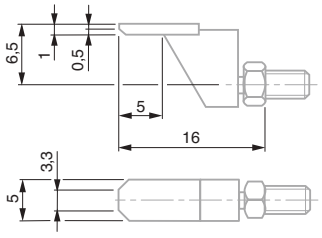
03560012, 03560013



03560016

Insert with Off-centre (6,5 mm) Narrow Face, Lock Nut for Radial Alignment

NO		B (measuring face contact), mm
03510602	Carbide	0,5

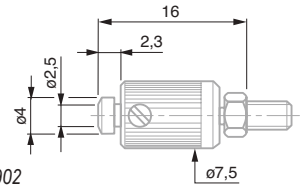


03510602

INSERTS FOR AXIAL PROBES, WITH M2,5 THREAD

Insert with a Flat Measuring Face, Ø 2,5 mm, Adjustable Parallelism, Counter-nut for Radial Alignment

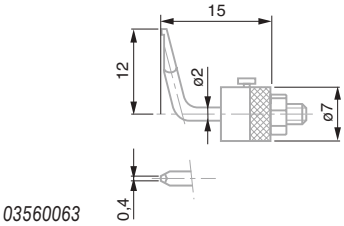
NO	Ø		
03510902	2,5	Carbide	16



03510902

Insert with Offset (12 mm) Contact Point, Lock Nut for Radial Alignment

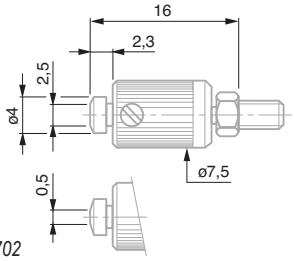
NO			
			L (offset), mm
03560063	Steel		12



03560063

Insert with Narrow Measuring Face, Adjustable Parallelism, Counter-nut for Radial Alignment

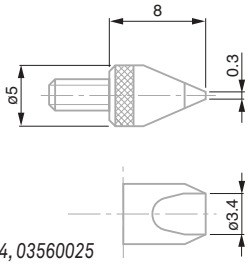
NO			
			B, mm
03510702	Carbide		0,5



03510702

Inserts with Blade-shaped Measuring Face, Lock Nut for Radial Alignment

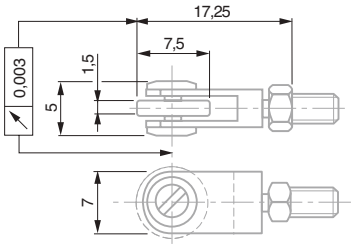
NO				
			L, mm	B (measuring face), mm
03560024	Steel		8	0,3
03560025	Carbide		8	0,3



03560024, 03560025

Measuring Inserts with Ball-bearing Rollers, Lock Nut for Radial Alignment

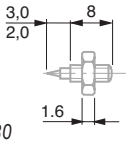
NO			
	Roller shape		L, mm
03560010	Cylindrical	Steel	17,25
03560011	Domed	Steel	17,25



03560010, 03560011

Insert with Needle Contact Point

NO
03560030



03560030

SPRING SETS, BELLOWS, CLAMPING ELEMENTS, MANUAL RETRACTION FOR AXIAL PROBES

Spring Sets for Axial Probes

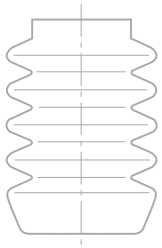
All values given in the table for the measuring force equal nominal values at electrical zero; max. deviation ± 25 %. Valid for upright assembly position with downward oriented measuring bolt, and used in static measurement.

No		Measuring force (N)
03260419	Spring sets for GT22	0,16
03260420	Spring sets for GT22	0,25
03260457	Spring sets for GT21/22	0,63
03260422	Spring sets for GT21/22	1,0
03260423	Spring sets for GT21/22	1,6
03260424	Spring sets for GT21/22	2,5

Bellows for Axial Probes

Nitrile: resistant synthetic sealing for normal use. Viton: high-resistance synthetic sealing. Used in conditions where probes are permanently exposed to coolants and lubricants.

No		
03260468	For 4,3 mm bolt travel GT 21, 22, GTL 21, 211, 22	Nitrile
03260470	For 4,3 mm bolt travel GT 21, 22, GTL 21, 211, 22	Viton
03260489	For pressure probe 4,3 mm bolt travel GTL 212, 222	Viton
03260491	For 10,3 mm bolt travel GT 27, 271, 28, 61, 611, 62	Viton
03260490	For pressure probe 10,3 mm bolt travel GT 272, 282, 612, 622	Viton

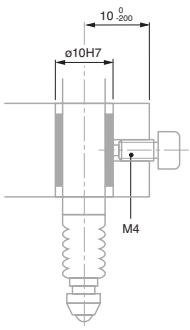


Protection bellow

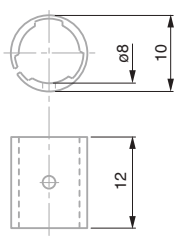
Clamping Elements for Axial Probes

Elements with 3 clamping faces – Prevents any deformation of the measuring bolt guiding system, thus preserving all the metrological properties of the probe.

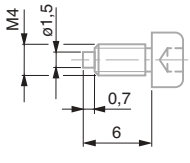
No		Ø	A mm
02611013	VKD clamping screw		M4
02611014	VKE clamping sleeve	Ø 8 mm	
01860401	Y61 fixing clamp	Ø 5,6 mm and Ø 9,5 with dovetail	
02660048	VDE 28 probe holder	Ø 8 mm	



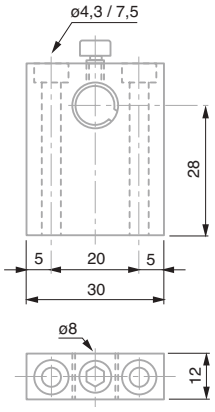
Fixing clamp for axial probe



VKE – clamping sleeve



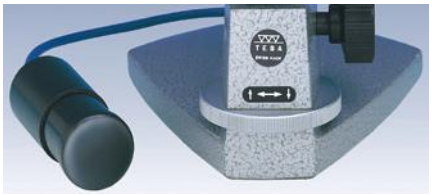
VKD – clamping screw



VDE – clamping élément with sleeve and clamping screw

Manual Measuring Bolt Retraction for Axial Probes

NO		
03540104	TB 11 retraction device components	Consisting of: – 1 Washer TB102 (03540102) – 1 Lifting Lever TB101 (03540101)
03260401	Manual pneumatic retraction device.	Suitable for GT 22, 271, 28, 42, 44, 611, 62 – GTL211, 22 probes Consisting of: – 1 hand-operated vacuum pump – 1 tube of 1m, Ø 4,7 mm (ref. 03540405)
03540405	TB311 flexible tube	

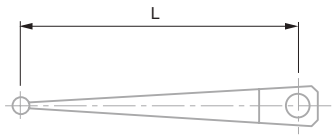


Stainless steel measuring insert, carbide ball tip

ACCESSORIES FOR GT 31 LEVER PROBES

Probe Inserts for GT 31 Lever Probes

NO	Ø	Lever – amplification	L, mm	A
03260402	1	1 : 1	32	One-piece shaft
03260410	2	1 : 1	32	One-piece shaft
03260403	3	1 : 1	32	One-piece shaft
03590002	1	1 : 1	32	Two-piece shaft
03590003	2	1 : 1	32	Two-piece shaft
03590004	3	1 : 1	32	Two-piece shaft
03590005	4	1 : 1	32	Two-piece shaft

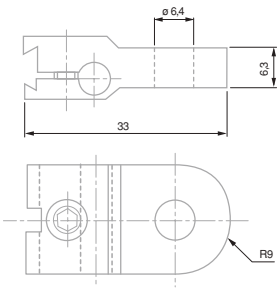


03260410

03260410

Fixing Bracket for TESA GT 31 Lever Probe

NO	
03240100	Fixing bracket with dovetail clamp or cylindrical bore for GT31 probe

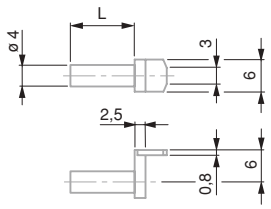


03240100

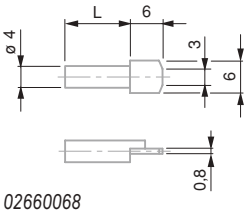
INSERTS WITH Ø 4 MM MOUNTING SHAFT, FOR FMS PROBES

Probe Inserts with a Flat Rectangular Face, Ø 4 mm Mounting Shaft for FMS Probes

NO		L, mm
02660066	Carbide	12
02660068	Carbide	25
02660067	Carbide	12
02660069	Carbide	25



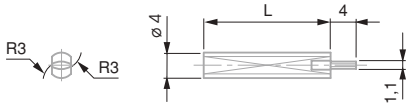
02660067, 02660069



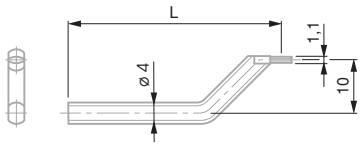
02660066, 02660068

Probe with 2 Cylindrical Measuring Faces with Ø 4 mm Mounting Shaft, for FMS Probes

NO		L, mm
02660070	Carbide	20
02660071	Carbide	40
02660072	Carbide	60
02660082	Carbide	40
02660083	Carbide	60



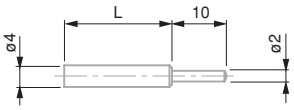
02660070, 02660071, 02660072



02660082, 02660083

Insert with Ø = 2 mm Diameter Contact Pin, Hemispherical Face with Ø 4 mm Diameter Mounting Shaft for FMS Probes

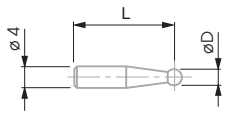
NO		L, mm
02660074	Carbide	40



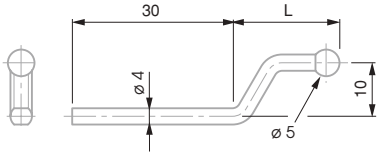
02660074

Probe with Ball Tip Ø 4 mm for FMS Probes

NO	Ø		L, mm
02660076	3	Carbide	20
02660077	3	Carbide	40
02660078	3	Carbide	60
02660079	5	Carbide	20
02660080	5	Carbide	40
02660081	5	Carbide	60
02660084	5	Carbide	20
02660085	5	Carbide	33



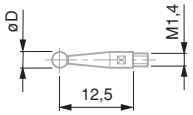
02660076 to 02660081



02660084, 02660085

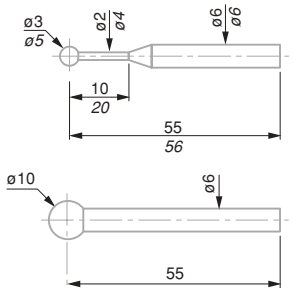
INSERTS WITH Ø 6 MM MOUNTING SHAFT, FOR FMS PROBES

Inserts with Ball Tip, Ø 6 mm Mounting Shaft, for FMS Probes



01860201, 01860202, 01860203

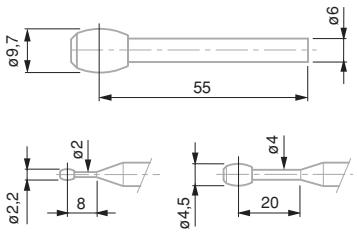
NO	Ø		L, mm
00760058	3	Carbide	55
00760059	5	Carbide	56
00760060	10	Carbide	55
01860201	1	Carbide	12,53
01860202	2	Carbide	12,53
01860203	3	Carbide	12,53
01860307	Wrench	–	–



00760058, 00760059, 00760060

Barrel Shaped Inserts for Bores, Ø 6 mm Mounting Shaft, for FMS Probes

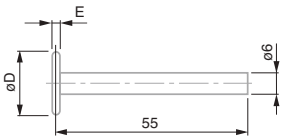
NO	Ø		Thread
00760066	2,2	Carbide	M3 to M16
00760067	4,5	Carbide	M6 to M48
00760068	9,7	Carbide	M12 to M150



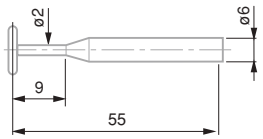
00760066, 00760067, 00760068

Disc Inserts for Grooves, Ø 6 mm Mounting Shaft, for FMS Probe

NO	Ø		Disc thickness, mm
00760074	4,5	Carbide	1
00760075	14	Carbide	2
00760076	19	Carbide	3



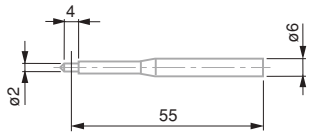
00760075/ 00760076



00760074

Special Inserts, Ø 6 mm Mounting Shaft, for FMS Probes

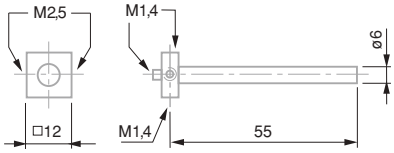
NO	Ø		L, mm
00760082	2	Carbide	55



00760082

Universal Probe Holder with Ø 6 mm Mounting Shaft, for FMS Probes

NO		L, mm
00760096	M1,4 and M2,5 threads	55



00760096

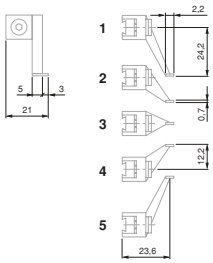
SPRINGS, PNEUMATIC ACTUATORS, HOLDERS, OFF-SET INSERTS, FOR FMS PROBE

Rectangular flat measuring face

Carbide

Inserts with Offset Measuring Faces, for FMS Probes

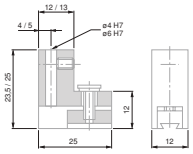
NO		Drawing
02630047	VBM offset insert	1
02630048	VBN offset insert	2
02630049	VBO offset insert	3
02630050	VBP offset insert	4
02630051	VBQ offset insert	5



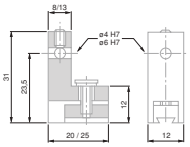
Inserts with offset faces for FMS probes

Fixed Holder, for FMS Probe

NO		Ø	A Number	A Position
02630042	VBH fixed holder	4	2	Horizontal
02630043	VBJ fixed holder	4	1	Vertical
02630045	VBK fixed holder	6	2	Horizontal
02630046	VBL fixed holder	6	1	Vertical



03230043
03230046



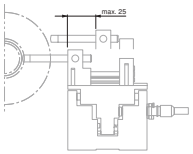
02630042
02630045

Holder with Fine Adjustment for FMS Probe

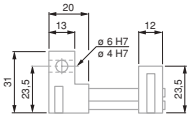
Helps greatly for setting a FMS probe.

Setting and locking screws remain accessible even when several probes are mounted side by side.

NO	mm	Ø	A Number	A Position
02630053	25	4	2	Horizontal
02630055	25	4	1	Vertical
02630052	25	6	2	Horizontal
02630054	25	6	1	Vertical



02630053

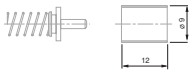


02630052
02630053

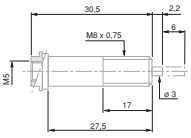
Auxiliary Springs and Pneumatic Retraction Jack, for FMS Probe

All values given in the table for the measuring force equal nominal values at electrical zero; max. deviation ± 25 %. Valid for probing movements executed horizontally as well as in static measuring.

NO		N
03260440	Pneumatic jack	11 (for 4 bars)
03260441	Spring element	0,4
03260442	Spring element	0,63
03260443	Spring element	1,0
03260444	Spring element	1,6
03260445	Spring element	2,0
03260446	Spring element	2,5
03260447	Spring element	4,0



Auxiliary sping element for FMS probe

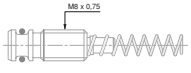


Pneumatic cylinder (jack) for FMS probe

Spring Set with Specific Measuring Force, for FMS Probe

All values given in the table for the measuring force equal nominal values at electrical zero; max. deviation ± 25 %. Valid for probing movements executed horizontally as well as in static measuring mode

NO		Meauring force, N
03260448	Spring set red	0,4
03260449	Spring set yellow	0,63
03260450	Spring set green	1,0
03260451	Spring set blue	1,6
03260452	Spring set brown	2,5
03260453	Spring set black	4,0



Spring set for measuring force for FMS probe

230 V 50 Hz

Maximum 20 probes type GT 22, GT 42 and GT 44, maximum force 0,63 N. Maximum 10 probes type GT 28 and GT 62, Maximum force 0,63 N.

Electro-pneumatic Pump for Measuring Bolt Retraction

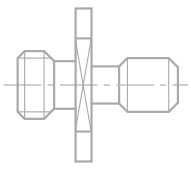
Electro-pneumatic vacuum pump, controlled by external switch (03260433): requires an automatic external command (e.g. instrument display).

NO			
03260432	Electro-pneumatic vacuum pump with activation by connected foot switch	Electro-pneumatic vacuum pump. For the simultaneous retraction of a maximum number of 20 measuring bolts with a force up to 0,63 N	Activation by connected foot switch
03260433	Electro-pneumatic vacuum pump with activation by external control	Electro-pneumatic vacuum pump. For the simultaneous retraction of a maximum number of 20 measuring bolts with a force up to 0,63 N	Activation by external control

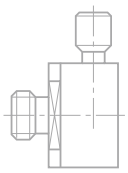
Electro-pneumatic vacuum pump

Connectors for Electro-pneumatic Pump for Measuring Bolt Retraction

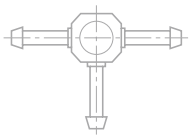
NO	
03540403	T-connector for tube Ø 4,7 / Ø 2 mm (03540405)
03560000	Straight connector, M4 thread for tube Ø 4,7 / Ø 2 mm (03540405)
03560002	Angled connector, M4 thread for tube Ø 4,7 / Ø 2 mm (03540405)



Straight connectors



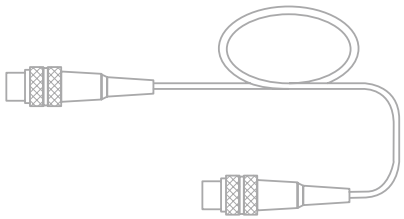
Angled connector



T-connector

Extension Cable for Probes, Lengths = 1 – 20m

It is recommended to calibrate equipment (probe + extension) connected together to ensure the highest accuracy.



Cable extensions for TESA probes
DIN 453225, 5 pin connector

No	Length, m (feet)
03240201	1 m (3 ft)
03240202	2 m (6 ft)
03240203	3 m (9 ft)
03240205	5 m (16 ft)
03240210	10 m (32 ft)
03240215	15 m (49 ft)
03240220	20 m (65 ft)