

A large, stylized graphic element occupies the lower half of the page. It features a central vertical grey bar flanked by two sets of three-pointed grey triangles pointing towards each other. This central structure is surrounded by concentric grey arcs, creating a gear-like or wave-like pattern against a light beige background.

**MANUAL GAUGING**  
**REFERENCE GUIDE**

**MARPOSS**





***... A WORLD OF GAUGING  
for your quality products !***

***TESTAR, a MARPOSS division, is pleased to introduce its new catalogue of  
products to satisfy your gauging needs.***

***[www.marposs.com](http://www.marposs.com)***



TESTAR's mission is to develop and offer innovative measuring component products to the MARPOSS worldwide sales organizations, end user and gauge maker markets for the local production of high quality gauge solutions.

TESTAR is organized with a team of marketing and R&D professionals dedicated for over 30 years to developing and manufacturing successful products.



*TESTAR headquarters team*

*Show Room*





*Research & Development center*

*Production, inspection and calibration of measuring transducers*



All TESTAR products originate in the Research and Development center within World Headquarters in Italy. Here the knowledge gained from both customer applications and our own internal manufacturing operations, is the basis for developing new ideas.

TESTAR's product development process integrates Marketing, Research and Development, Engineering and Manufacturing through simultaneous engineering methodologies. As a result, new product projects include everything from production technologies to commercial strategies.

TESTAR's manufacturing area operates with the most advanced equipment to assure the quality of its products.

#### *Metrology laboratory*



All necessary calibration and component inspections are performed in a comprehensively equipped SIT accredited Metrology Laboratory (No. 84).



An advanced information system, optimized for data transmission among the various distribution centers, allows TESTAR to efficiently share information and manage real-time communication. To support our Customer's commitment to quality, TESTAR, as a Division of MARPOSS, operates under Company's certified procedures. MARPOSS has an integrated system to manage the Company quality, the environment and safety, attested by ISO 9001:2000, ISO 14001:2004 and OHSAS 18001 certifications; it has further been qualified EAQF 94 and has obtained the Q1-Award. All of the worldwide sales organizations are ISO 9001:2000 certified. These certifications represent the companies capacity to assure the quality and reliability of products and overall service. TESTAR products, sales and service support are available through 22 direct sales and service organizations, and 11 exclusive distributors.

## OEM - PRODUCTS / PRIVATE LABEL



### YOUR NAME & LOGO = YOUR PRODUCT

Testar products are also available with own brand name and logo (Private Label). Testar offer an unparalleled product range which includes not only displacement transducers, but a complete line of mechanical measuring devices that can be used to design high-quality gauging systems, and modular system components that are easily assembled to solve most requirements.

To reduce design costs a CD-Rom library of .dxf CAD files is also available.

As a complement to the measuring devices, various interface boxes and electronic display units, from simple micro-column to powerful SPC embedded gauge computer, are available.

For the most demanding applications, a Windows® based SPC software package can be used with our industrial computer or with a commercial computer. Thanks to a long lasting experience in the development of manual gauges for the workshop environment, TESTAR can offer best product quality at an optimum price-performance ratio.

## **TRANSDUCERS AND MEASUREMENT TRANSMISSIONS**

RED CROWN 2 - QUICK PROBE  
AMA - QUICK BLOCK - A 124

## **BORE GAUGES LINE**

M1 STAR MBG - i-WAVE - M1 STAR EBG  
M1 WAVE - M1 MULTI  
M1 STAR COUNTERSINK - M1 AIR

## **FORKS AND RING GAUGES**

M3 STAR - QUICK SNAP - M4 STAR - M4

## **BENCH GAUGES**

QUICK SET LINE - QUICK SET UNIVERSAL

## **INDICATORS AND ELECTRONIC DISPLAY UNITS**

TD - QUICK DIGIT - E4 - QUICK READ - E4N  
E4N WAVE - NEMO - MERLIN - MERLIN MOBILE - E9066T

## **INTERFACE BOXES FOR DATA ACQUISITION**

USB INTERFACE - EASY BOX - GAGE BOX - TCI

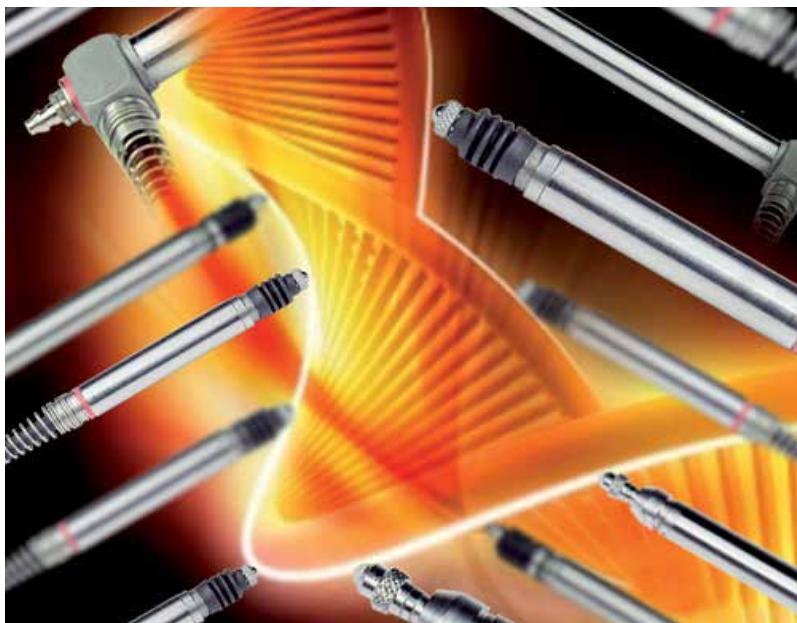
## **SOFTWARES**

QUICK SPC





# RedCrown2



## *...the new generation of pencil probes*

Evolving from our customer's latest quality requirements RedCrown2 is the new line of pencil probes developed to meet industry's global performance specifications. As a result of experience in the metrology market place & with input from measurement integrators throughout the world RedCrown2 sets the new metrological standard.

### PRODUCT FEATURES

The new precision engineered design incorporates ball cage movements, improved protection from electrical interference, by the introduction of Mu-metal shielding and added robustness throughout, all produced from a refined manufacturing process. Performance of RedCrown2 is guaranteed to give excellent accuracy under the harshest conditions where high reliability is constantly required in the manufacturing field.

The RedCrown2 line and its digitalized versions Digi Crown 2 and Red Crown 2 USB, offers a variety of measuring solutions..

The two main families, Standard (with Gaiter-IP 65) and Soft Touch (without Gaiter-IP 54), are available with the following options:

- With **HBT** and **LVDT** type transducers
- **Five standard measuring ranges:** 1mm, 2mm, 5mm, 10mm & 20mm
- **Actuation / retraction** by Spring, Pneumatic, or Vacuum methods.
- **Analogue connection:** Marposs standard connector or compatible connectors for interfacing with competitor electronics world wide.
- **Digital connection** for Marposs DigiCrown networks
- **Direct USB connector** for simple interfacing to computers
- **Cable only** allows customer to connect using their preferred type of connector
- **OEM "private label"** versions with customized body Logos, your part numbers and dedicated packaging for your product.

### QUALITY ASSURANCE

Marposs manufactures each pencil probe to strict quality standards, is certified for its integrated system of quality, environment & safety, according to international standards.

- ISO 9001(Quality Management)
- ISO 14001(Environmental Management )
- OHSAS 18001(Safety Management )

A dedicated design & production team using the latest manufacturing procedures and equipment guarantees the product meets the all the expectation of the customer for quality measuring solutions.

Red Crown2 is designed to be in compliance with the latest world standards for RoHS/WEEE.

TRANSDUCERS AND  
MEASUREMENT TRANSMISSIONS

BORE GAUGES LINE

FORKS AND RING GAUGES

BENCH GAUGES

INDICATORS AND ELECTRONIC DISPLAY UNITS

INTERFACE BOXES FOR DATA ACQUISITION

SOFTWARES

## THE PRODUCT LINE

### RedCrown<sup>2</sup>

A line of analogue pencil probes, available with  
**LVDT** and **HBT** circuitry.

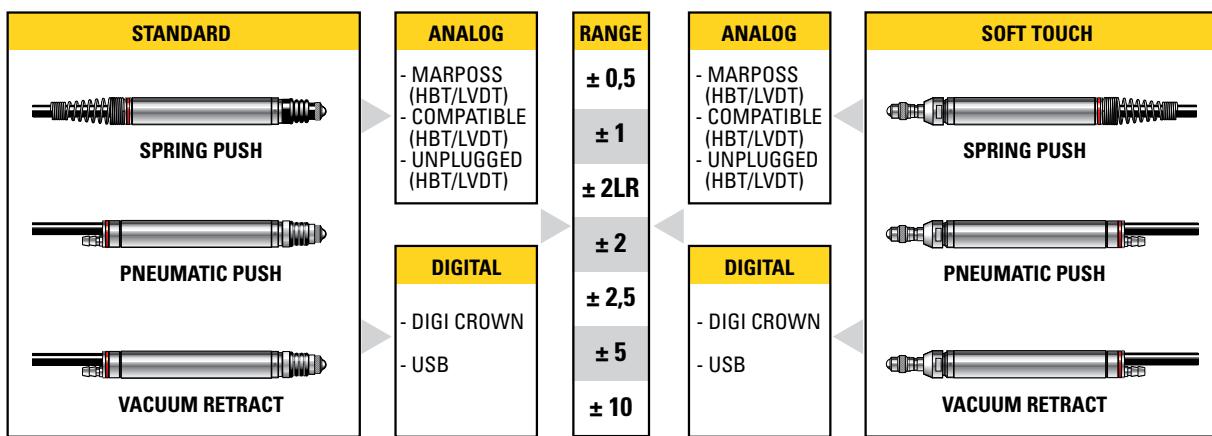
### DigiCrown<sup>2</sup>

Digitized version, with high levels of accuracy and versatility used in combination with  
**Digi Net**.

### RedCrown<sup>2</sup> USB

A probe version linearized with the USB interface integrated in the (standard USB) connector ready to be used via direct connection to any **USB** host device.





**Red Crown2** is a line of pencil probes available in STANDARD (with gaiter –IP65) or SOFT TOUCH (without gaiter –IP54) configuration, with highly precise ball cage movements and various connection options according to the conditioning and display interfaces used.

The analogue version, with LVDT or HBT transducer, allows the use of the product with standard Marposs amplifiers, or with third party amplifiers available on the market.

These probes are available both with and without connector (UNPLUGGED).

**Red Crown2 USB** is the version with USB connector, which provides high levels of measuring accuracy and is easy to use.

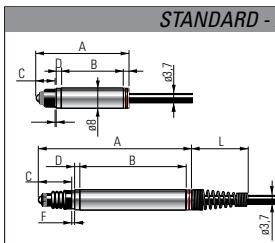
- ACCURACY. The high level of accuracy is guaranteed during the production when the compensation of the linearity and sensitivity errors are stored in each probe. Each unique unit is certified and identified by a serial number, to ensure complete traceability.
- PLUG & GAUGE. All the conditioning and interface electronics of the transducer are integrated in the USB connector, therefore no additional connecting devices are required to use the product.
- EASY TO USE. The measurement can be displayed with Marposs electronics (Nemo, Merlin, E9066) or by connecting directly with USB Host devices, where Red Crown2 USB is visible as a standard virtual COM.
- APPLICATIONS. Both static and dynamic measurements can be performed (maximum sampling frequency 1000 samples/s).
- SOFTWARE INTERFACES. For the measurement integration the Marposs software (U-Com, Easy Acquisition and QSPC) are available; alternatively a simple list of protocol commands for an easy and quick integration in other programming environments can be used.

**Digi Crown2**, digitized version, is the probe family that provides high levels of measuring accuracy combined with the Digi Net network interface.

Digi Crown2 and Digi Net together provide the following advantages:

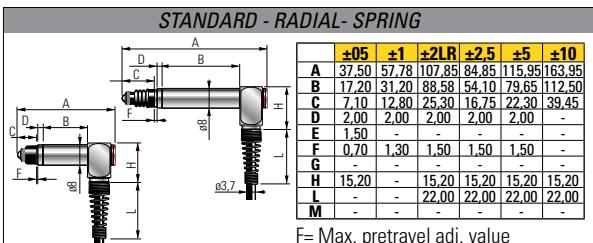
- ACCURACY. High levels of measuring accuracy is guaranteed by the linearization data stored in the memory of the connector. The Digi Net interface box is able to read the error map and perform an automatic compensation.
- PLUG & GAUGE. The memory in the connector allows any Digi Crown2 probe to be connected to the Digi Net network without requiring individual probe programming.
- FLEXIBILITY. The modularity of the system can create a network where 1 input-channel\* and 2 input-channel\* interface boxes are provided with the exact number of probes required. In a comprehensive Digi Net the Digi Crown2 can be combined with any type of incremental sensor, with analogue output sensors, and various I/O interfaces to provide a complete machine integration.
- VERSATILITY. The application can be designed by selecting the most suitable probe for the measuring task (for any measuring range the models are available with spring or pneumatic push, with axial or radial cable output and with or without gasket), and connecting it to the interface\* box.
- APPLICATIONS. Both static and synchronised dynamic measurements can be performed (maximum sampling frequency 4,000 samples/sec)
- CONNECTIVITY. The Digi Crown2 probe is designed for the Digi Net system, but it also connects to the Marposs standard line of LVDT amplifiers.

STANDARD



	<b>±05</b>	<b>±1</b>	<b>±2LR</b>	<b>±2.5</b>	<b>±4.5</b>	<b>±10</b>
<b>A</b>	36,20	50,40	106,55	83,35	14,95	162,50
<b>B</b>	24,35	41,25	75,50	60,15	86,60	120,65
<b>C</b>	7,10	12,80	25,30	16,75	22,30	39,45
<b>D</b>	2,00	2,00	2,00	2,00	2,00	2,00
<b>E</b>	2,05					-
<b>F</b>	0,70	1,30	1,50	1,50	1,50	-
<b>G</b>	-	-	-	-	-	-
<b>H</b>	-	-	-	-	-	-
<b>L</b>	-	22,00	22,00	22,00	22,00	22,00

F= Max. pretravel adj. value



	<b>+05</b>	<b>+1</b>	<b>+2LR</b>	<b>+2.5</b>	<b>+5</b>	<b>+10</b>
A	37.50	57.78	107.85	84.85	115.95	163.95
B	17.20	31.20	88.58	50.10	79.65	112.50
C	7.10	12.80	25.30	16.75	22.30	39.45
D	2.00	2.00	2.00	2.00	2.00	-
E	1.50	-	-	-	-	-
F	0.70	1.30	1.50	1.50	1.50	-
G	-	-	-	-	-	-
H	15.20	-	15.20	15.20	15.20	15.20
L	-	-	22.00	22.00	22.00	22.00

F= Max. pretravel adj. value

MECHANICAL SPECIFICATIONS		$\pm 0,5 \text{ mm}$		$\pm 1 \text{ mm}$						$\pm 2 \text{ mm LongRange}$					
Cable (A=axial - R=radial)		A	R	A	R	A	R	A	R	A	R	A	R	A	R
Movement (*)		S		S	PP	V		PV		S		PP	V		PV
Measuring range (mm)		1				2							4		
Mechanical travel (mm)		1,5				3							11		
Body Ø (mm)		8				8							8		
Spring strength (N/mm $\pm 15\%$ )		0,17		0,14		0,04		0,023			0,023		0,03		0,02
Measuring force (N $\pm 25\%$ )		1,00		0,70		0,8 $\div$ 2,5		0,70			0,70		0,7 $\div$ 2,3		0,70
PP pressure	bar					0,5 $\div$ 1							0,5 $\div$ 1		
	psi					7,5 $\div$ 14,5							7,5 $\div$ 14,5		
Vacuum retract pressure	bar							$\leq 0,6$							$\leq 0,6$
	psi							$\leq 0,9$							$\leq 0,9$
Cable length (m)		2				2							2		
Gasket	Fluoroelast.			Fluoroelastometer						Fluoroelastometer					
Repeatability ( $\mu\text{m}$ )		0,15				0,15							0,15		
Thermal drift ( $\mu\text{m}/^\circ\text{C}$ )		0,25				0,25							0,25		
Operating temperature (°C)		(-10) $\div(+65)$				(-10) $\div(+65)$							(-10) $\div(+65)$		
Storage temperature (°C)		(-20) $\div(+100)$				(-20) $\div(+100)$							(-20) $\div(+100)$		
Protection grade		IP65				IP65							IP65		
Contact type		carbide				carbide							carbide		
Contact tread		M2,5				M2,5							M2,5		

## **Red Crown 2 LVDT MARPOSS**

TRADE NAME	F05	FR05																		
ORDER CODE	3PR01L0000	3PR01L1200	3PR02L0000	3PR02L1200	3PR02L0400	3PR02L1600	3PR02L0560	3PR02L1760	F10	FR10	FPA10	FP10	FVA10	FV10	-	-	-	-	-	-
Sensitivity (mV/V/mm)	230				230															
Accuracy error ( $\mu\text{m}$ )	(**)				$\pm \text{MAX}(1+[2*K_1];7*K_1)****$												$\pm \text{MAX}(2+[2*K_1];7*K_1)****$			
Calibration spec.	3,5355V RMS with load 1M $\Omega$ /360pF/7,5kHz																3,5355V RMS with load 1M $\Omega$ /360pF/7,5kHz			

**Red Crown 2 HBT MARPOSS (for TESA compatible models please refer to dedicated section on page 6, 7, 10, 11)**

TRADE NAME		H05	HR05											
ORDER CODE		3PR01N0000	3PR01N1200		3PR02N0000	3PR02N1200	3PR02N0400	3PR02N1600	3PR02N0560	3PR02N1760		-	-	-
Sensitivity (mV/V/mm)	73.75				73.75						3PR10N0199	H21		
Accuracy error ( $\mu\text{m}$ )	(***)				$\pm \text{MAX}(1+2^* K ; 7^* K )^{***})$					3PR10N1399	HR21			
Calibration spec.					3,5355V RMS with load $2\text{K}\Omega \pm 0,1\%$ / 7,5kHz					3PR10N0559	HPA21			
										3PR10N1759	HP21			
										3PR10N0599	HVA21			
										3PR10N1799	HV21			

## **RED CROWN 2 USB**

TRADE NAME																
ORDER CODE	3PR01Y0000	U05	3PR01Y1200	UR05	3PR02Y0000	U10	3PR02Y1200	UR10	3PR02Y0400	UPA10	3PR02Y1600	UP10	3PR02Y0560	UVA10	3PR02Y1760	UV10
Accuracy error ( $\mu\text{m}$ )	$+ (0.2 + K^* 1)$								$+ (0.2 + K^* 1)$							

## Accuracy error

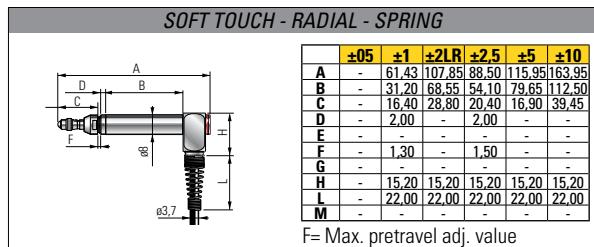
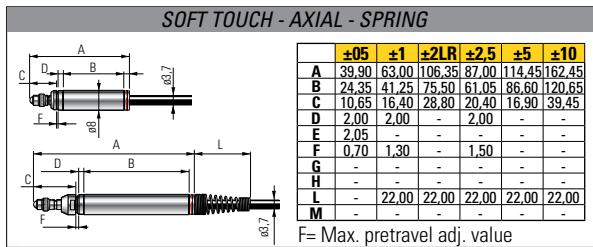
\* Movement = spring - PP = pneumatic push - V = vacuum - PV = push/vacuum - \*\* Accuracy = +/-MAX(0.5+K1|I7+K1) \*\*\* K = Reading (mm)

STANDARD - AXIAL - PNEUMATIC PUSH							STANDARD - RADIAL - PNEUMATIC PUSH							
		<b>±05</b>		<b>±1</b>		<b>±2LR</b>		<b>±2,5</b>		<b>±5</b>		<b>±10</b>		
A	-	65,98	109,69	86,65	117,75	166,75		A	-	71,75	107,85	84,85	115,95	163,95
B	-	44,55	75,50	61,05	86,60	120,65		B	-	36,10	68,55	52,60	78,15	112,50
C	-	12,80	25,30	16,75	22,30	39,45		C	-	12,80	25,30	16,75	22,30	39,45
D	-	2,00	2,00	2,00	2,00	-		D	-	2,00	2,00	2,00	2,00	-
E	-	-	-	-	-	-		E	-	1,30	1,50	1,50	1,50	-
F	-	1,30	1,50	1,50	1,50	-		F	-	1,30	1,50	1,50	1,50	-
G	-	-	-	-	-	-		G	-	7,50	7,50	7,50	7,50	7,50
H	-	-	-	-	-	-		H	-	15,20	15,20	15,20	15,20	15,20
L	-	-	22,00	-	-	-		L	-	22,00	22,00	22,00	22,00	22,00
M	-	6,00	6,00	6,00	6,00	6,00		M	-	-	-	-	-	-

F= Max. pretravel adj. value

<b>±2,5 mm</b>				<b>±5 mm</b>				<b>±10 mm</b>															
A	R	A	R	A	R	A	R	A	R	A	R	A	R										
S		PP	V		PP	V	PV	S	PP	V	PV	S	PP										
5								10				20											
6,6								11				21											
8								8				8											
0,023		0,03	0,02			0,03	0,02	0,02															
0,70		0,7 ÷ 2,3	0,70			0,70	0,7 ÷ 2,4	0,70			0,70	0,7 ÷ 2,4	0,70										
		0,5 ÷ 1					0,5 ÷ 1				0,5 ÷ 1												
		7,5 ÷ 14,5					7,5 ÷ 14,5				7,5 ÷ 14,5												
		≤0,6					≤0,6				≤0,6												
		≤0,9					≤0,9				≤0,9												
2								2				2											
Fluoroelastometer				Fluoroelastometer				Fluoroelastometer															
0,15				0,15				0,15															
0,25				0,25				0,25															
(-10) + (+65)				(-10) + (+65)				(-10) + (+65)															
(-20) + (+100)				(-20) + (+100)				(-20) + (+100)															
IP65				IP65				IP65															
carbide				carbide				carbide															
M2,5				M2,5				M2,5															
115				115				115				23											
± MAX(2,5 + [2*K]; [7*K])***				± MAX(5 + [2*K]; [7*K])***				± MAX(10 + [2*K]; [7*K])***															
3,5355V RMS with load 1MΩ//360pF/7,5kHz				3,5355V RMS with load 1MΩ//360pF/7,5kHz				3,5355V RMS with load 1MΩ//360pF/7,5kHz															
36,875				36,875				36,875															
± MAX(2,5 + [2*K]; [7*K])***				± MAX(5 + [2*K]; [7*K])***				± MAX(10 + [2*K]; [7*K])***															
3,5355V RMS with load 2KΩ±0,1%/7,5kHz				3,5355V RMS with load 2KΩ±0,1%/7,5kHz				3,5355V RMS with load 2KΩ±0,1%/7,5kHz															
3PD05L0000 D05	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD05L1200 RD25	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD05L0400 PA025	3PRO5Y0400 UPA25	3PR05N0400 HPA25	3PR05L0400 FPA25	3PD05L1600 UP25	3PRO5Y1600 HP25	3PR05N1600 FP25	3PD05L0560 VAD05	3PRO5Y0560 UVAD05	3PR05N0560 HVA25	3PR05L0560 FVA25	3PP05L1760 VD05	3PRO5Y1760 HV25	3PR05N1760 FV25	3PR05L0000 F25		
±(0,6+K*2)	±(0,6+K*2)	3PR10Y0000 U50	3PR10N0000 H50	3PR10L0000 F50	3PR10Y1200 UR50	3PR10N1200 HR50	3PR10L1200 FR50	3PD10L0400 PA050	3PRO10Y0400 UP050	3PR10N0400 HPA50	3PR10L0400 FPA50	3PD10L1600 UP050	3PRO10Y1600 HP050	3PR10N1600 FP050	3PR10L0560 UV050	3PRO10Y0560 HVA50	3PR10N0560 FVA50	3PD10L1760 VD05	3PRO10Y1760 HV50	3PR10N1760 FV50	3PR10L0000 F50		
		3PR10Y0000 U50	3PR10N0000 H50	3PR10L0000 F50	3PR10Y1200 UR50	3PR10N1200 HR50	3PR10L1200 FR50	3PD10L0400 PA050	3PRO10Y0400 UP050	3PR10N0400 HPA50	3PR10L0400 FPA50	3PD10L1600 UP050	3PRO10Y1600 HP050	3PR10N1600 FP050	3PR10L0560 UV050	3PRO10Y0560 HVA50	3PR10N0560 FVA50	3PD10L1760 VD05	3PRO10Y1760 HV50	3PR10N1760 FV50	3PR10L0000 F50		
		±(0,6+K*2)	±(0,6+K*2)	3PR10Y0000 U50	3PR10N0000 H50	3PR10L0000 F50	3PR10Y1200 UR50	3PR10N1200 HR50	3PR10L1200 FR50	3PD10L0400 PA050	3PRO10Y0400 UP050	3PR10N0400 HPA50	3PR10L0400 FPA50	3PD10L1600 UP050	3PRO10Y1600 HP050	3PR10N1600 FP050	3PR10L0560 UV050	3PRO10Y0560 HVA50	3PR10N0560 FVA50	3PD10L1760 VD05	3PRO10Y1760 HV50	3PR10N1760 FV50	3PR10L0000 F50
3PD10L0000 D10	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD10	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA10	3PRO5Y0400 UP10	3PR05N0400 HPA10	3PR05L0400 FPA10	3PD10L1600 UP10	3PRO5Y1600 HP10	3PR05N1600 FP10	3PD10L0560 VAD10	3PRO5Y0560 UVAD10	3PR05N0560 HVA10	3PR05L0560 FVA10	3PD10L1760 VD10	3PRO5Y1760 HV10	3PR05N1760 FV10	3PR10L0000 F10		
3PD10L0000 D10	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD10	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA10	3PRO5Y0400 UP10	3PR05N0400 HPA10	3PR05L0400 FPA10	3PD10L1600 UP10	3PRO5Y1600 HP10	3PR05N1600 FP10	3PD10L0560 VAD10	3PRO5Y0560 UVAD10	3PR05N0560 HVA10	3PR05L0560 FVA10	3PD10L1760 VD10	3PRO5Y1760 HV10	3PR05N1760 FV10	3PR10L0000 F10		
3PD10L0000 D20	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD20	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA20	3PRO5Y0400 UP20	3PR05N0400 HPA20	3PR05L0400 FPA20	3PD10L1600 UP20	3PRO5Y1600 HP20	3PR05N1600 FP20	3PD10L0560 VAD20	3PRO5Y0560 UVAD20	3PR05N0560 HVA20	3PR05L0560 FVA20	3PD10L1760 VD20	3PRO5Y1760 HV20	3PR05N1760 FV20	3PR10L0000 F20		
3PD10L0000 D20	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD20	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA20	3PRO5Y0400 UP20	3PR05N0400 HPA20	3PR05L0400 FPA20	3PD10L1600 UP20	3PRO5Y1600 HP20	3PR05N1600 FP20	3PD10L0560 VAD20	3PRO5Y0560 UVAD20	3PR05N0560 HVA20	3PR05L0560 FVA20	3PD10L1760 VD20	3PRO5Y1760 HV20	3PR05N1760 FV20	3PR10L0000 F20		
3PD10L0000 D20	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD20	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA20	3PRO5Y0400 UP20	3PR05N0400 HPA20	3PR05L0400 FPA20	3PD10L1600 UP20	3PRO5Y1600 HP20	3PR05N1600 FP20	3PD10L0560 VAD20	3PRO5Y0560 UVAD20	3PR05N0560 HVA20	3PR05L0560 FVA20	3PD10L1760 VD20	3PRO5Y1760 HV20	3PR05N1760 FV20	3PR10L0000 F20		
3PD10L0000 D20	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD20	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA20	3PRO5Y0400 UP20	3PR05N0400 HPA20	3PR05L0400 FPA20	3PD10L1600 UP20	3PRO5Y1600 HP20	3PR05N1600 FP20	3PD10L0560 VAD20	3PRO5Y0560 UVAD20	3PR05N0560 HVA20	3PR05L0560 FVA20	3PD10L1760 VD20	3PRO5Y1760 HV20	3PR05N1760 FV20	3PR10L0000 F20		
3PD10L0000 D20	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD20	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA20	3PRO5Y0400 UP20	3PR05N0400 HPA20	3PR05L0400 FPA20	3PD10L1600 UP20	3PRO5Y1600 HP20	3PR05N1600 FP20	3PD10L0560 VAD20	3PRO5Y0560 UVAD20	3PR05N0560 HVA20	3PR05L0560 FVA20	3PD10L1760 VD20	3PRO5Y1760 HV20	3PR05N1760 FV20	3PR10L0000 F20		
3PD10L0000 D20	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD20	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA20	3PRO5Y0400 UP20	3PR05N0400 HPA20	3PR05L0400 FPA20	3PD10L1600 UP20	3PRO5Y1600 HP20	3PR05N1600 FP20	3PD10L0560 VAD20	3PRO5Y0560 UVAD20	3PR05N0560 HVA20	3PR05L0560 FVA20	3PD10L1760 VD20	3PRO5Y1760 HV20	3PR05N1760 FV20	3PR10L0000 F20		
3PD10L0000 D20	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD20	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA20	3PRO5Y0400 UP20	3PR05N0400 HPA20	3PR05L0400 FPA20	3PD10L1600 UP20	3PRO5Y1600 HP20	3PR05N1600 FP20	3PD10L0560 VAD20	3PRO5Y0560 UVAD20	3PR05N0560 HVA20	3PR05L0560 FVA20	3PD10L1760 VD20	3PRO5Y1760 HV20	3PR05N1760 FV20	3PR10L0000 F20		
3PD10L0000 D20	3PRO5Y0000 U25	3PR05N0000 H25	3PR05L0000 F25	3PD10L1200 RD20	3PRO5Y1200 HR25	3PR05N1200 FR25	3PD10L0400 PA20	3PRO5Y0400 UP20	3PR05N0400 HPA20	3PR05L0400 FPA20	3PD10L1600 UP20	3PRO5Y1600 HP20											

## SOFT TOUCH



<b>SOFT TOUCH</b>	<b><math>\pm 0.5 \text{ mm}</math></b>		<b><math>\pm 1 \text{ mm}</math></b>				<b><math>\pm 2 \text{ mm LongRange}</math></b>					
Cable (A=axial - R=radial)	A	R	A	R	A	R	A	R	A	R	A	R
Movement (*)	S		S		PP		V		PV		S	PP
Measuring range (mm)	1			2							4	
Mechanical travel (mm)	1,5			3							11	
Body Ø (mm)	8			8							8	
Spring strength (N/mm $\pm 15\%$ )	0,070		0,06	0,045						0,016	0,010	
Total Measuring force (N $\pm 25\%$ )	0,40		0,30	0,18 $\div$ 1,23			0,09 $\div$ 1,41		0,30	0,18 $\div$ 1,23		0,09 $\div$ 1,41
PP pressure bar				0,5 $\div$ 2			0,125 $\div$ 2		0,5 $\div$ 2			0,125 $\div$ 2
psi				7,3 $\div$ 29			1,825 $\div$ 29		7,3 $\div$ 29			1,825 $\div$ 29
Vacuum retract pressure bar							$\leq 0,6$					$\leq 0,6$
psi							$\leq 0,9$					$\leq 0,9$
Cable length (m)	2			2							2	
Repeatability ( $\mu\text{m}$ )	0,15			0,15							0,15	
Thermal drift ( $\mu\text{m}/^\circ\text{C}$ )	0,25			0,25							0,25	
Operating temperature ( $^\circ\text{C}$ )	(-10) $\div$ (+65)			(-10) $\div$ (+65)							(-10) $\div$ (+65)	
Storage temperature ( $^\circ\text{C}$ )	(-20) $\div$ (+100)			(-20) $\div$ (+100)							(-20) $\div$ (+100)	
Protection grade	IP50			IP50(IP54 PP version)							IP50(IP54 PP version)	
Contact type	Nylon (PA66)			Nylon (PA66)							carbide	
Contact tread	M2,5			M2,5							M2,5	

**Red Crown 2 LVDT MARPOSS**

<b>TRADE NAME</b>	<b>ORDER CODE</b>	
	3PR01L5000	
Sensitivity (mV/V/mm)	230	
Accuracy error ( $\mu\text{m}$ )	(***)	
Calibration spec.	$\pm \text{MAX}(1+ 2^{\circ}\text{K} ; 7^{\circ}\text{K} )***$	

**Red Crown 2 HBT TESA**

<b>TRADE NAME</b>	<b>ORDER CODE</b>	
	3PR02T5000	
Sensitivity (mV/V/mm)	230	
Accuracy error ( $\mu\text{m}$ )	(***)	
Calibration spec.	3,5355V RMS with load 1MΩ // 360pF/7,5kHz	

**RED CROWN 2 USB**

<b>TRADE NAME</b>	<b>ORDER CODE</b>	
	3PR02Y5000	
Accuracy error ( $\mu\text{m}$ )	$\pm(0,2+K^*1)$	
Calibration spec.	3V RMS with load 2kΩ $\pm 0,1\%$ /13kHz	

**DIGI CROWN 2**

<b>TRADE NAME</b>	<b>ORDER CODE</b>	
	3PD01L5000	
Accuracy error ( $\mu\text{m}$ )	$\pm(0,2+K^*1)$	

\* Movement S= spring - PP= pneumatic push - V= vacuum - PV= push/vacuum - \*\* Accuracy =  $+\/-\text{MAX}(0,5+|2^{\circ}\text{K}|;|7^{\circ}\text{K}|)$  \*\*\* K= Reading (mm)

SOFT TOUCH - AXIAL - PNEUMATIC PUSH							SOFT TOUCH - RADIAL - PNEUMATIC PUSH						
A	$\pm 05$	$\pm 1$	$\pm 2LR$	$\pm 2,5$	$\pm 5$	$\pm 10$	A	$\pm 05$	$\pm 1$	$\pm 2LR$	$\pm 2,5$	$\pm 5$	$\pm 10$
A	-	69,63	109,65	90,30	117,75	165,75	A	-	66,30	107,85	88,50	115,95	163,95
B	-	44,55	75,50	61,05	86,60	120,65	B	-	36,10	68,55	52,60	78,15	112,50
C	-	16,40	28,80	20,40	16,90	39,45	C	-	16,40	28,80	20,40	16,90	39,45
D	-	2,00	-	2,00	-	-	D	-	2,00	-	2,00	-	-
E	-	-	-	-	-	-	E	-	-	-	-	-	-
F	-	1,30	-	1,50	-	-	F	-	1,30	-	1,50	-	-
G	-	-	-	-	-	-	G	-	7,50	7,50	7,50	7,50	7,50
H	-	-	-	-	-	-	H	-	15,20	15,20	15,20	15,20	15,20
L	-	-	-	-	-	-	L	-	22,00	22,00	22,00	22,00	22,00
M	-	6,00	6,00	6,00	6,00	6,00	M	-	-	-	-	-	-

F= Max. pretravel adj. value

$\pm 2,5$ mm				$\pm 5$ mm				$\pm 10$ mm					
A	R	A	R	A	R	A	R	A	R	A	R	A	R
S	PP	V	PV	S	PP	V	PV	S	PP	V	PV	S	PP
5				10				20				21	
6,6				11								8	
8				8									
0,016	0,01			0,02	0,07			0,030	0,010				
0,30	$0,18 \div 1,23$			0,30	$0,18 \div 1,23$			0,30	$0,18 \div 1,23$			0,09 $\div 1,41$	
	$0,5 \div 2$				$0,5 \div 2$				$0,5 \div 2$			$0,125 \div 2$	
	$7,3 \div 29$				$7,3 \div 29$				$7,3 \div 29$			$1,825 \div 29$	
	$\leq 0,6$								$\leq 0,6$			$\leq 0,6$	
	$\leq 0,9$								$\leq 0,9$			$\leq 0,9$	
	2				2							2	
	0,15				0,15							0,15	
	0,25				0,25							0,25	
	(-10) + (+65)				(-10) + (+65)							(-10) + (+65)	
	(-20) + (+100)				(-20) + (+100)							(-20) + (+100)	
	IP50(IP54 PP version)				IP50(IP54 PP version)							IP50(IP54 PP version)	
	Nylon (PA66)				Nylon (PA66)							Nylon (PA66)	
	M2,5				M2,5							M2,5	

115	$\pm \text{MAX}(2,5+ 2*K ; 7*K )^{***})$	115	$\pm \text{MAX}(5+ 2*K ; 7*K )^{***})$
3,5355V RMS with load $1M\Omega / 360pF / 7,5kHz$		3,5355V RMS with load $1M\Omega / 360pF / 7,5kHz$	$\pm \text{MAX}(10+ 2*K ; 7*K )^{***})$

73,75	$\pm \text{MAX}(2,5+ 2*K ; 7*K )^{***})$	29,5	$\pm \text{MAX}(5+ 2*K ; 7*K )^{***})$
3V RMS with load $2k\Omega \pm 0,1\% / 13kHz$		3V RMS with load $2k\Omega \pm 0,1\% / 13kHz$	$\pm \text{MAX}(10+ 2*K ; 7*K )^{***})$

$\pm(0,6+K^*2)$		$\pm(0,6+K^*2)$	
3V RMS with load $2k\Omega \pm 0,1\% / 13kHz$		3V RMS with load $2k\Omega \pm 0,1\% / 13kHz$	$\pm(1,2+K^*2)$

$\pm(0,6+K^*2)$		$\pm(0,6+K^*2)$	
3V RMS with load $2k\Omega \pm 0,1\% / 13kHz$		3V RMS with load $2k\Omega \pm 0,1\% / 13kHz$	$\pm(1,2+K^*2)$

3PD05L5000 D05L	3PR05Y5000 U25L	3PR05T5000 H25L	3PR05L5000 F25L
3PD05L6200 RD05L	3PR05Y6200 UR25L	3PR05T6200 HR25L	3PR05L6200 FR25L
3PD05L5400 PA05L	3PR05Y5400 UPA25L	3PR05T5400 HPA25L	3PR05L5400 FPA25L
3PD05L6600 PD05L	3PR05Y6600 UP25L	3PR05T6600 HP25L	3PR05L6600 FP25L
$\pm(0,6+K^*2)$			
3PD05L5800 PVAD05L	3PR05Y5800 UPVA25L	3PR05T5800 HPVA25L	3PR05L5800 FPVA25L
3PD05L7000 PVD05L	3PR05Y7000 UPV25L	3PR05T7000 HPV25L	3PR05L7000 FPV25L
$\pm(0,6+K^*2)$			
3PD10L5000 D10L	3PR10Y5000 U50L	3PR10T5000 H50L	3PR10L5000 F50L
3PD10L6200 RD10L	3PR10Y6200 UR50L	3PR10T6200 HR50L	3PR10L6200 FR50L
3PD10L5400 PAD10L	3PR10Y5400 UPA50L	3PR10T5400 HPA50L	3PR10L5400 FPA50L
3PD10L6600 PD10L	3PR10Y6600 UP50L	3PR10T6600 HP50L	3PR10L6600 FP50L
$\pm(0,6+K^*2)$			
3PD10L5800 PVAD10L	3PR10Y5800 UPVA50L	3PR10T5800 HPVA50L	3PR10L5800 FPVA50L
3PD10L7000 PVD10L	3PR10Y7000 UPV50L	3PR10T7000 HPV50L	3PR10L7000 FPV50L
$\pm(0,6+K^*2)$			
3PD20L5000 D20L	-	U100L	3PR20T5000 H100LL
3PD20L6200 RD20L	-	UR100L	3PR20T6200 HR100L
3PD20L5400 PA20L	-	UPA100L	3PR20T5400 HPA100L
3PD20L6600 PD20L	-	UP100L	3PR20T6600 HP100L
$\pm(0,6+K^*2)$			
3PD20L5800 PVAD20L	-	-	3PR20T5800 HPVA100L
3PD20L7000 PVD20L	-	-	3PR20T7000 FPV100L
$\pm(0,6+K^*2)$			

**UNPLUGGED**

STANDARD	$\pm 0,5 \text{ mm}$		$\pm 1 \text{ mm}$						$\pm 2 \text{ mm Long Range}$							
	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Cable (A=axial - R=radial)	S		S		PP	V	PV		S		PP	V		PV		
Movement (*)	1				2							4				
Measuring range (mm)	1,5				3							11				
Mechanical travel (mm)	8				8							8				
Body Ø (mm)																
Spring strength (N/mm $\pm 15\%$ )	0,17		0,14		0,04		0,023				0,023		0,03		0,02	
Measuring force (N $\pm 25\%$ )	1,00		0,75		0,8-2,5		0,75				0,70		0,7-2,3		0,70	
PP pressure	bar				0,5-1							0,5-1				
	psi				7,5-14,5							7,5-14,5				
Vacuum retract pressure	bar						$\leq 0,6$						$\leq 0,6$			
	psi						$\leq 0,9$						$\leq 0,9$			
Cable length (m)	3,5				3,5							3,5				
Gasket	Fluoroelast.				Fluoroelastometer							Fluoroelastometer				
Repeatability ( $\mu\text{m}$ )	0,15				0,15							0,15				
Thermal drift ( $\mu\text{m}/^\circ\text{C}$ )	0,25				0,25							0,25				
Operating temperature ( $^\circ\text{C}$ )	(-10)+(+65)				(-10)+(+65)							(-10)+(+65)				
Storage temperature ( $^\circ\text{C}$ )	(-20)+(+100)				(-20)+(+100)							(-20)+(+100)				
Protection grade	IP65				IP65							IP65				
Contact type	carbide				carbide							carbide				
Contact tread	M2,5				M2,5							M2,5				

**Red Crown 2 LVDT MARPOSS**

TRADE NAME	3PR01M0000	F05	3PR01M1200	FR05	3PR02M0000	F10	3PR02M1200	FR10	3PR02M0400	FPA10	3PR02M1600	FP10	3PR02M0500	FVA10	3PR02M1760	FV10
ORDER CODE																
Sensitivity (mV/V/mm)	233 $\pm 5\%$				233 $\pm 5\%$							233 $\pm 5\%$				
Linearity error ( $\mu\text{m}$ )	(**)				$\pm \text{MAX}(1; 5^* \text{K})^{***}$							$\pm \text{MAX}(2; 5^* \text{K})^{***}$				
Calibration spec.	3,5355V RMS with load 1M $\Omega$ /360pF/7,5kHz											3,5355V RMS with load 1M $\Omega$ /360pF/7,5kHz				

**Red Crown 2 HBT MARPOSS**

TRADE NAME	H05	HR05	H10	HR10	HPA10	3PR02Z1200	HP10	3PR02Z1600	HVA10	3PR02Z0560	3PR02Z1760	HV10	3PR10Z0199	F21	3PR10M1399	FR21
ORDER CODE																
Sensitivity (mV/V/mm)	86 $\pm 5\%$				83 $\pm 5\%$							83 $\pm 5\%$				
Linearity error ( $\mu\text{m}$ )	(**)				$\pm \text{MAX}(1; 5^* \text{K})^{***}$							$\pm \text{MAX}(2; 5^* \text{K})^{***}$				
Calibration spec.	3,5355V RMS with load 2k $\Omega \pm 0,1\%$ /7,5kHz											3,5355V RMS with load 2k $\Omega \pm 0,1\%$ /7,5kHz				

\* Movement S= spring - PP= pneumatic push - V= vacuum - PV= push/vacuum - \*\* Accuracy  $\pm 0,5 = +/-(\text{MAX}(0,5; 5^* \text{K}))$  - \*\*\* K= Reading (mm)

<b><math>\pm 2,5 \text{ mm}</math></b>								<b><math>\pm 5 \text{ mm}</math></b>								<b><math>\pm 10 \text{ mm}</math></b>																							
A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R														
S	PP	V	PV	S	PP	V	PV	S	PP	V	PV	S	PP	V	PV	S	PP	V	PV	S	PP	V	PV																
5				10				20				21				8				-																			
6,6				11				-				-				-				-																			
8				8				-				-				-				-																			
0,023	0,03	0,02	-	0,03	0,02	0,02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-															
0,70	0,7 ÷ 2,3	0,70	-	0,70	0,7 ÷ 2,4	0,70	-	0,70	-	-	-	-	-	-	-	0,70	-	-	0,70	-	-	-	-	-	-														
0,5 ÷ 1	-	-	-	0,5 ÷ 1	-	-	-	-	-	-	-	-	-	-	-	0,5 ÷ 1	-	-	-	-	-	-	-	-	-														
7,5 ÷ 14,5	-	-	-	7,5 ÷ 14,5	-	-	-	-	-	-	-	-	-	-	-	7,5 ÷ 14,5	-	-	-	-	-	-	-	-	-														
≤ 0,6	-	-	-	≤ 0,6	-	-	-	-	-	-	-	-	-	-	-	≤ 0,6	-	-	-	-	-	-	-	-	-														
≤ 0,9	-	-	-	≤ 0,9	-	-	-	-	-	-	-	-	-	-	-	≤ 0,9	-	-	-	-	-	-	-	-	-														
3,5	-	-	-	3,5	-	-	-	3,5	-	-	-	-	-	-	-	3,5	-	-	-	-	-	-	-	-	-														
Fluoroelastometer								Fluoroelastometer								Fluoroelastometer																							
0,15				0,15				0,15				0,25				0,25				-				-															
0,25				0,25				-				-				-				-				-															
(-10) + (+65)				(-10) + (+65)				(-10) + (+65)				(-10) + (+65)				(-10) + (+65)				-				-															
(-20) + (+100)				(-20) + (+100)				IP65				IP65				IP65				-				-															
carbide				carbide				M2,5				M2,5				M2,5				-				-															
117,5 ± 5%								117,5 ± 5%								23 ± 5%								-															
± MAX(2,5;  5*K )***)								± MAX(5;  5*K )***)								± MAX(10;  5*K )***)								-															
3,5355V RMS with load 1MΩ//360pF/7,5kHz								3,5355V RMS with load 1MΩ//360pF/7,5kHz								3,5355V RMS with load 1MΩ//360pF/7,5kHz								-															
80,5 ± 5%								53,5 ± 5%								37 ± 5%								-															
± MAX(2,5;  5*K )***)								± MAX(5;  5*K )***)								± MAX(10;  5*K )***)								-															
3,5355V RMS with load 2kΩ±0,1%/7,5kHz								3,5355V RMS with load 2kΩ±0,1%/7,5kHz								3,5355V RMS with load 2kΩ±0,1%/7,5kHz								-															

**STANDARD COMPATIBLE MODELS**

SPRING	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
<b>HBT</b>	<b>H05</b>	<b>HR05</b>	<b>H10</b>	<b>HR10</b>	<b>H21</b>	<b>HR21</b>	<b>H20</b>	<b>HR20</b>
TESA	3PR01T0000	3PR01T1200	3PR02T0000	3PR02T1200	3PR10T0199	3PR10T1399	3PR05T0199	3PR05T1399
MERCER	3PR01R0000	3PR01R1200	3PR02R0000	3PR02R1200	-	-	-	-
METEM	3PR01S0000	3PR01S1200	3PR02S0000	3PR02S1200	-	-	-	-
MAHR-FEINPRUEF	3PR01P0000	3PR01P1200	3PR02P0000	3PR02P1200	-	-	3PR05P0199	-
<b>LVDT</b>	<b>F05</b>	<b>FR05</b>	<b>F10</b>	<b>FR10</b>	<b>F21</b>	<b>FR21</b>	<b>F20</b>	<b>FR20</b>
MICROCONTROL	3PR01K0000	3PR01K1200	3PR02K0000	3PR02K1200	-	-	-	-

PNEUM. PUSH	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
<b>HBT</b>			<b>HPA10</b>	<b>HP10</b>	<b>HPA21</b>	<b>HP21</b>	<b>HPA20</b>	<b>HP20</b>
TESA	NA	NA	3PR02T0400	3PR02T1600	3PR10T0559	3PR10T1759	-	-
MERCER	NA	NA	3PR02R0400	3PR02R1600	-	-	-	-
METEM	NA	NA	3PR02S0400	3PR02S1600	-	-	-	-
MAHR-FEINPRUEF	NA	NA	3PR02P0400	3PR02P1600	-	-	-	-
<b>LVDT</b>			<b>FPA10</b>	<b>FP10</b>	<b>FPA21</b>	<b>FP21</b>	<b>FPA20</b>	<b>FP20</b>
MICROCONTROL	NA	NA	3PR02K0400	3PR02K1600	-	-	-	-

VACUUM	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
<b>HBT</b>			<b>HVA10</b>	<b>HV10</b>	<b>HVA21</b>	<b>HV21</b>	<b>HVA20</b>	<b>HV20</b>
TESA	NA	NA	3PR02T0560	3PR02T1760	3PR10T0599	3PR10T1799	-	-
MERCER	NA	NA	3PR02R0560	3PR02R1760	-	-	-	-
METEM	NA	NA	3PR02S0560	3PR02S1760	-	-	-	-
MAHR-FEINPRUEF	NA	NA	3PR02P0560	3PR02P1760	-	-	-	-
<b>LVDT</b>			<b>FVA10</b>	<b>FV10</b>	<b>FVA21</b>	<b>FV21</b>	<b>FVA20</b>	<b>FV20</b>
MICROCONTROL	NA	NA	3PR02K0560	3PR02K1760	-	-	-	-

**SOFT TOUCH COMPATIBLE MODELS**

SPRING	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
<b>HBT</b>	<b>H05L</b>	<b>HR05L</b>	<b>H10L</b>	<b>HR10L</b>	<b>H21L</b>	<b>HR21L</b>	<b>H20L</b>	<b>HR20L</b>
TESA	3PR01T5000	3PR01T6200	3PR02T5000	3PR02T6200	3PR10T5199	3PR10T6399	3PR05T5199	-
METEM	3PR01S5000	3PR01S6200	3PR02S5000	3PR02S6200	-	-	-	-
<b>LVDT</b>	<b>F05L</b>	<b>FR05L</b>	<b>F10L</b>	<b>FR10L</b>	<b>F21L</b>	<b>FR21L</b>	<b>F20L</b>	<b>FR20L</b>
MICROCONTROL	-	-	-	3PR02K6200	-	-	-	-

PNEUM. PUSH	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
<b>HBT</b>			<b>HPA10L</b>	<b>HP10L</b>	<b>HPA21L</b>	<b>HP21L</b>	<b>HPA20L</b>	<b>HP20L</b>
TESA	NA	NA	3PR02T5400	3PR02T6600	3PR10T5559	3PR10T6759	-	-
METEM	NA	NA	3PR02S5400	3PR02S6600	-	-	-	-
<b>LVDT</b>			<b>FPA10L</b>	<b>FP10L</b>	<b>FPA21L</b>	<b>FP21L</b>	<b>FPA20L</b>	<b>FP20L</b>
MICROCONTROL	NA	NA	3PR02K5400	3PR02K6600	-	-	-	-

VACUUM	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
<b>HBT</b>			<b>HVA10L</b>	<b>HV10L</b>	<b>HVA21L</b>	<b>HV21L</b>	<b>HVA20L</b>	<b>HV20L</b>
TESA	NA	NA	3PR02T5560	3PR02T6760	3PR10T5599	3PR10T6799	-	-
METEM	NA	NA	3PR02S5560	3PR02S6760	-	-	-	-
<b>LVDT</b>			<b>FVA10L</b>	<b>FV10L</b>	<b>FVA21L</b>	<b>FV21L</b>	<b>FVA20L</b>	<b>FV20L</b>
MICROCONTROL	NA	NA	3PR02K5560	3PR02K6760	-	-	-	-

<b><math>\pm 2,5 \text{ mm}</math></b>		<b><math>\pm 5 \text{ mm}</math></b>		<b><math>\pm 10 \text{ mm}</math></b>	
<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>
<b>H25</b>	<b>HR25</b>	<b>H50</b>	<b>HR50</b>	<b>H100</b>	<b>HR100</b>
3PR05T0000	3PR05T1200	3PR10T0000	3PR10T1200	3PR20T0000	3PR20T1200
3PR05R0000	3PR05R1200	3PR10R0000	3PR10R1200	3PR20R0000	3PR20R1200
3PR05S0000	3PR05S1200	3PR10S0000	3PR10S1200	3PR20S0000	3PR20S1200
3PR05P0000	3PR05P1200	3PR10P0000	3PR10P1200	3PR20P0000	3PR20P1200
<b>F25</b>	<b>FR25</b>	<b>F50</b>	<b>FR50</b>	<b>F100</b>	<b>FR100</b>
3PR05K0000	3PR05K1200	3PR10K0000	3PR10K1200	3PR20K0000	3PR20K1200

<b><math>\pm 2,5 \text{ mm}</math></b>		<b><math>\pm 5 \text{ mm}</math></b>		<b><math>\pm 10 \text{ mm}</math></b>	
<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>
<b>HPA25</b>	<b>HP25</b>	<b>HPA50</b>	<b>HP50</b>	<b>HPA100</b>	<b>HP100</b>
3PR05T0400	3PR05T1600	3PR10T0400	3PR10T1600	3PR20T0400	3PR20T1600
3PR05R0400	3PR05R1600	3PR10R0400	3PR10R1600	3PR20R0400	3PR20R1600
3PR05S0400	3PR05S1600	3PR10S0400	3PR10S1600	3PR20S0400	3PR20S1600
3PR05P0400	3PR05P1600	3PR10P0400	3PR10P1600	3PR20P0400	3PR20P1600
<b>FPA25</b>	<b>FP25</b>	<b>FPA50</b>	<b>FP50</b>	<b>FPA100</b>	<b>FP100</b>
3PR05K0400	3PR05K1600	3PR10K0400	3PR10K1600	3PR20K0400	3PR20K1600

<b><math>\pm 2,5 \text{ mm}</math></b>		<b><math>\pm 5 \text{ mm}</math></b>		<b><math>\pm 10 \text{ mm}</math></b>	
<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>
<b>HVA25</b>	<b>HV25</b>	<b>HVA50</b>	<b>HV50</b>	<b>HVA100</b>	<b>HV100</b>
3PR05T0560	3PR05T1760	3PR10T0560	3PR10T1760	3PR20T0560	3PR20T1760
3PR05R0560	3PR05R1760	3PR10R0560	3PR10R1760	3PR20R0560	3PR20R1760
3PR05S0560	3PR05S1760	3PR10S0560	3PR10S1760	3PR20S0560	3PR20S1760
3PR05P0560	3PR05P1760	3PR10P0560	3PR10P1760	3PR20P0560	3PR20P1760
<b>FVA25</b>	<b>FV25</b>	<b>FVA50</b>	<b>FV50</b>	<b>FVA100</b>	<b>FV100</b>
3PR05K0560	3PR05K1760	3PR10K0560	3PR10K1760	3PR20K0560	3PR20K1760

<b><math>\pm 2,5 \text{ mm}</math></b>		<b><math>\pm 5 \text{ mm}</math></b>		<b><math>\pm 10 \text{ mm}</math></b>	
<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>
<b>H25L</b>	<b>HR25L</b>	<b>H50L</b>	<b>HR50L</b>	<b>H100L</b>	<b>HR100L</b>
3PR05T5000	3PR05T6200	3PR10T5000	3PR10T6200	3PR20T5000	3PR20T6200
3PR05S5000	3PR05S6200	3PR10S5000	3PR10S6200	3PR20S5000	3PR20S6200
<b>F25L</b>	<b>FR25L</b>	<b>F50L</b>	<b>FR50L</b>	<b>F100L</b>	<b>FR100L</b>
3PR05K5000	3PR05K6200	3PR10K5000	3PR10K6200	3PR20K5000	3PR20K6200

<b><math>\pm 2,5 \text{ mm}</math></b>		<b><math>\pm 5 \text{ mm}</math></b>		<b><math>\pm 10 \text{ mm}</math></b>	
<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>
<b>HPA25L</b>	<b>HP25L</b>	<b>HPA50L</b>	<b>HP50L</b>	<b>HPA100L</b>	<b>HP100L</b>
3PR05T5400	3PR05T6600	3PR10T5400	3PR10T6600	3PR20T5400	3PR20T6600
3PR05S5400	3PR05S6600	3PR10S5400	3PR10S6600	3PR20S5400	3PR20S6600
<b>FPA25L</b>	<b>FP25L</b>	<b>FPA50L</b>	<b>FP50L</b>	<b>FPA100L</b>	<b>FP100L</b>
3PR05K5400	3PR05K6600	3PR10K5400	3PR10K6600	3PR20K5400	3PR20K6600

<b><math>\pm 2,5 \text{ mm}</math></b>		<b><math>\pm 5 \text{ mm}</math></b>		<b><math>\pm 10 \text{ mm}</math></b>	
<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>	<b>AX</b>	<b><math>90^\circ</math></b>
<b>HVA25L</b>	<b>HV25L</b>	<b>HVA50L</b>	<b>HV50L</b>	<b>HVA100L</b>	<b>HV100L</b>
3PR05T5560	3PR05T6760	3PR10T5560	3PR10T6760	3PR20T5560	3PR20T6760
3PR05S5560	3PR05S6760	3PR10S5560	3PR10S6760	3PR20S5560	3PR20S6760
<b>FVA25L</b>	<b>FV25L</b>	<b>FVA50L</b>	<b>FV50L</b>	<b>FVA100L</b>	<b>FV100L</b>
3PR05K5560	3PR05K6760	3PR10K5560	3PR10K6760	3PR20K5560	3PR20K6760

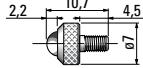
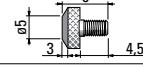
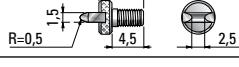
For dimensions please refer to drawings on page 4-5.

For dimensions please refer to drawings on page 6-7.

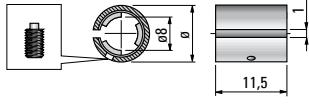
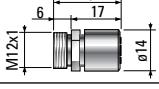
## SPRINGS

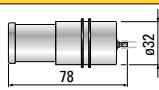
SPRING	FORCE	Measuring Range					Order code
		±0,5	±1	±2LR	±2,5	±5	
	0,4 (N)	X					1024099751
	2 (N)	X					1024099753
	2,5 (N)	X					1024099754
	1 (N)		X				1042414237
	2 (N)		X				1042414236
	2,5 (N)		X				1042414235
	1 (N)				X		1042414435
	1,6 (N)				X		1042414441
	2 (N)				X		1042414436
	2,5 (N)				X		1042414437
	1 (N)					X	1042414537
	1,6 (N)					X	1042414561
	2 (N)					X	1042414536

## ACCESSORIES

CONTACTS	DESCRIPTION	Order code
	Contact ø5 mm / M2,5	3392409910
	Flat contact M2,5	3392409912
	Cut contact M2,5	3392409914

CABLE EXTENSIONS	DESCRIPTION	Order code
	Cable extension 1 m	6735932026
	Cable extension 2 m	6735932015
	Cable extension 5 m	6735932016
	Cable extension 10 m	6735932017
	Cable extension 15 m	6735932037

CLAMPING	DESCRIPTION	Order code
	Bushing outside ø 10 mm	1019826001
	Bushing outside ø 3/8"	1019826002
	Dowel M3x10	1024099760
	Dowel 4-40 UNC x .375"	1024099761
	Tongs bushing ø 8	2042414100

OTHER ACCESSORIES	DESCRIPTION	Order code
	Vacuum pump + L = 1 m tubing	4717008002
	Pre-travel regulator wrench	1346413200

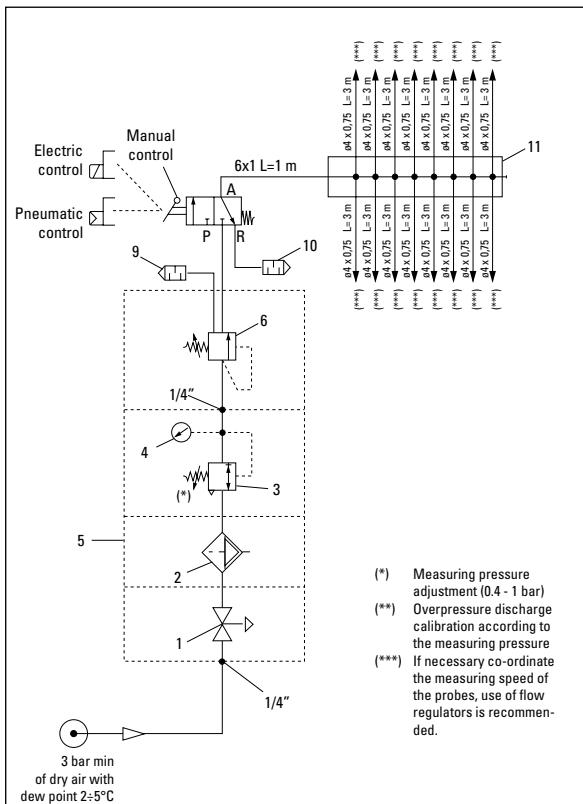
AIR ADAPTORS	DESCRIPTION	Order code
	Axial air adaptor	4430RSMV03
	Radial air adaptor	4430RSMVAB

## PNEUMATIC SYSTEM

For applications with pneumatic push and vacuum retraction probe type, the pneumatic system should be sized as shown in the below schemes.

Air supply: air must be dry and unoiled, with dew point in the range 2-5 °C and filtered to 5 µm.

PNEUMATIC SYSTEM FOR MEASURING PROBES

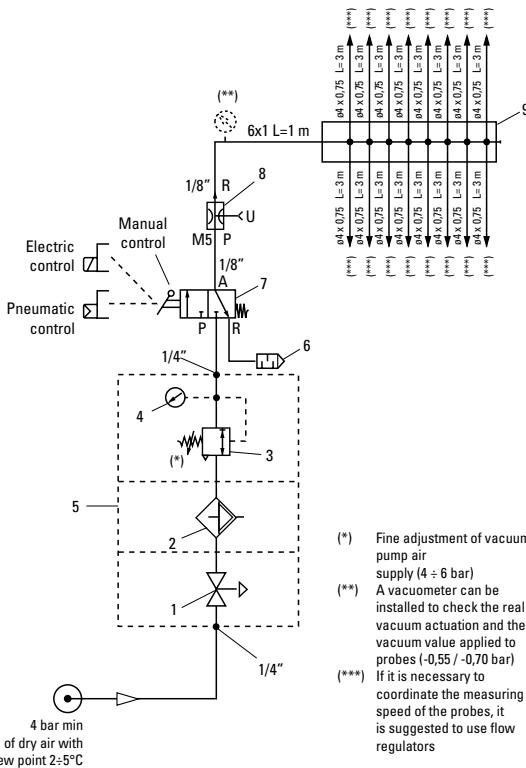


Ref	Q.ty	Description
1	1	ON-OFF valve 1/4"
2	1	Filter 5µ with semi automatic discharge
3	1	Pressure regulator
4	1	Pressure gauge ø 50 1/8" scale 0÷4 bar
5	2	Rapid terminal with bracket 72
6	1	Overpressure discharge valve
7	1	Beam 1/4"
8	1	Silencer 1/2"
9	1	Monostable lever 3-way 2-position valve
10	1	Silencer 1/8"
11	1	Distributor for max 16 probes

Application specs for pneumatic push probes:

- Standard version with gaiter: 0,4÷1 bar
- Version without gaiter: 0,5÷2 bar

PNEUMATIC LAYOUT FOR VACUUM CONTACT RETRACTION



Ref	Q.ty	Description
1	1	ON-OFF valve 1/4"
2	1	Filter 5µ with semi automatic discharge
3	1	Pressure regulator
4	1	Pressure gauge ø 50 1/8" scale 0÷4 bar
5	2	Rapid terminal with bracket 72
6	1	Silencer 1/2"
7	1	Monostable lever 3-way 2-position valve
8	1	Vacuum pump
9	1	Distributor for max 16 probes

Application specs for probes with spring push and vacuum retraction:

- Standard version with gaiter: -0,55÷ -0,7 bar
- Version without gaiter: 0,5÷2 bar

## CROSS REFERENCE TABLE: SENSORS - INTERFACE UNITS - DISPLAY UNITS

A124	D124	QUICK BLOCK	DIGI BLOCK	HAND HELD GAUGES	RED CROWN 2	DIGI CROWN 2	RED CROWN 2 USB	DEVICE NAME	#CH	ACQUISITION TIME
●		●		●	●			QUICK READ	1-2	2 ms
●		●		●	●	(*)		E4N	1÷4	2 ms
●		●		●	●	(*)		TCI1 - TCI4 - TCI8	1 4 8	2 ms
●	●	●	●	●	●	(*)		GAGE POD	16	0,25 ms
		●		●	●	(*)		EASY BOX	4	1 ms
								DIGI NET	1÷744	0,25 ms
									1÷31	0,25 ms
									1÷8	0,25 ms
									1÷744	0,25 ms
							●	RED CROWN 2 USB	1	1 ms

\* Digi Crown2 probes, can also be connected to all Marposs standard LVDT interfaces.

\*\* Red Crown2 LVDT can be connected to Digi Crown Net by dedicated programming.

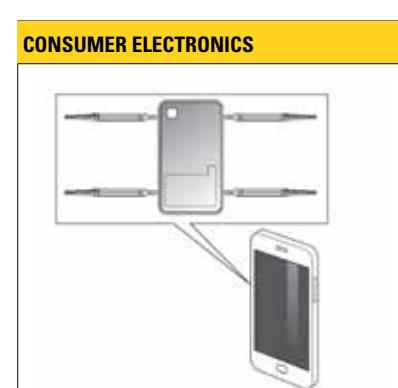
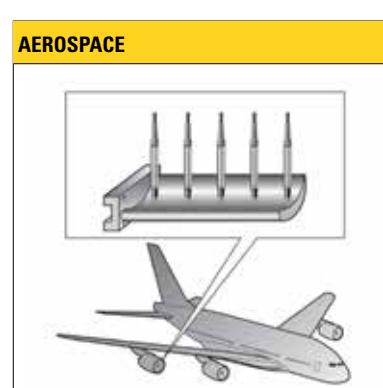
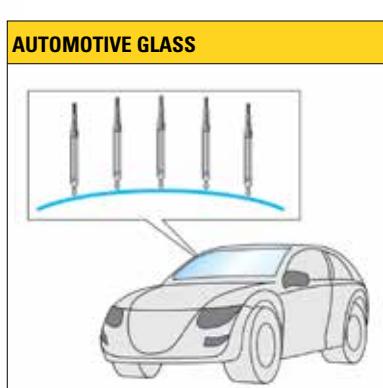
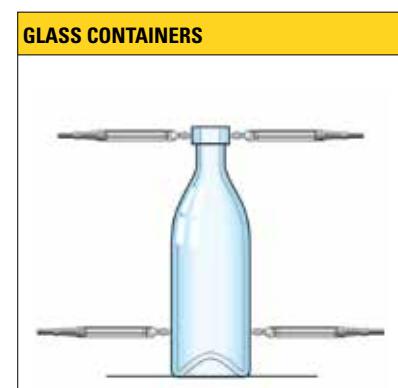
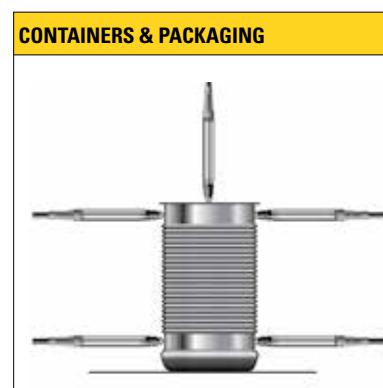
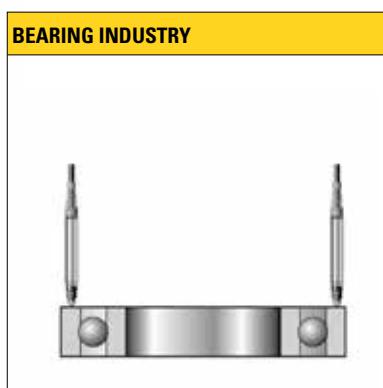
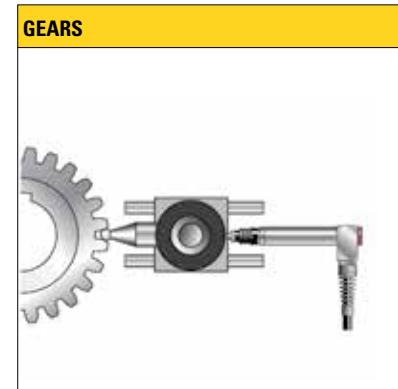
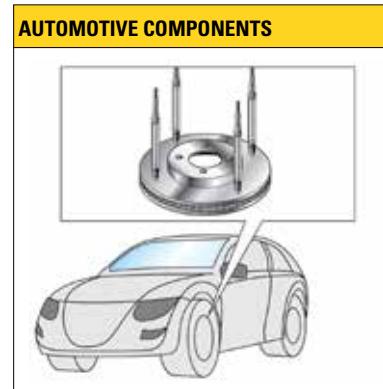


	OUTPUT TYPE	ACQUISITION SW	DISPLAY UNIT	VISUALIZATION ON
	SERIAL 232	EMBEDDED	QUICK READ	LED BARGRAPH + DIGITAL DISPLAY
	SERIAL 232 / DIGIMATIC / BCD	EMBEDDED	E4N	LED BARGRAPH + DIGITAL DISPLAY
	ANALOGUE (VOLTAGE / CURRENT)	-		PLC/CNC
	USB ETHERNET WIFI	Marposs Acq. SW (1)	E9066 INDUSTRIAL PC / COMMERCIAL PC	LCD DISPLAY
	USB	Marposs Acq. SW (1)	E9066 INDUSTRIAL PC / COMMERCIAL PC	LCD DISPLAY
	USB	EMBEDDED	MERLIN	LCD DISPLAY
	USB	EMBEDDED	NEMO	LCD DISPLAY
	USB/232/PCI CARD/ISA CARD	Marposs Acq. SW (2)	E9066 INDUSTRIAL PC / COMMERCIAL PC	LCD DISPLAY
	USB/232	EMBEDDED	MERLIN	8,4" LCD DISPLAY
	DIRECT	EMBEDDED	NEMO	5,7" LCD DISPLAY
	USB/232	MADE BY PROTOCOL COMMAND	PLC	PLC
	USB	Marposs Acq. SW (1)	NEMO/MERLIN/E9066/INDUSTRIAL PC/COMMERCIAL PC/PLC/ANY HOST USB	DEPENDING ON THE DISPLAY UNIT

(1) Please refer to the Easy Box section in Testar catalogue

(2) Please refer to the Digi Net section in Testar catalogue

## APPLICATION EXAMPLES





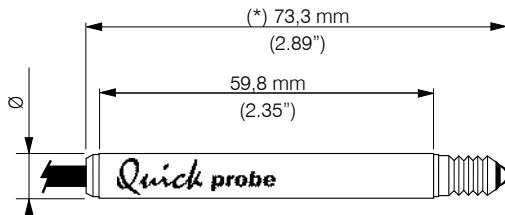
# Quick probe



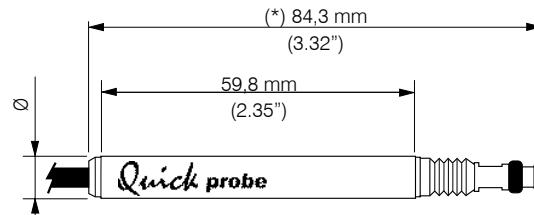
## PENCIL PROBES

- 8 models of full-bridge (LVDT) and half-bridge (HBT) probes with clamping diameter 8 mm or 3/8" and measuring range  $\pm 1$  mm (.04"), to be used especially with mechanical transmission devices such as TESTAR AMA, Quick Block and Quick Set.
- Designed to be used in the workshop as well as in the laboratory, can solve various measuring problems at a very competitive price/performance ratio.
- Available with fixed or interchangeable contact.
- IP 65 protection degree against dust and fluids.
- Compatible with any electronics already present on the market.

QUICK PROBE WITH FIXED CONTACT



QUICK PROBE WITH INTERCHANGEABLE CONTACT



(\*) Dimensions referred to the electrical zero

TRANSDUCERS AND  
MEASUREMENT TRANSMISSIONS

BORE GAUGES LINE

FORKS AND RING GAUGES

BENCH GAUGES

INDICATORS AND ELECTRONIC  
DISPLAY UNITS

INTERFACE BOXES  
FOR DATA ACQUISITION

SOFTWARES

## TECHNICAL SPECIFICATIONS / ORDER CODES

### Mechanical specifications

	MODEL			
	SF100 LVDT	SH100 HBT	SF101 LVDT	SH101 HBT
	WITH FIXED CONTACT		WITH INTERCHANGEABLE CONTACT	
MEASURING RANGE		± 1 mm (.04")		
MAX. OVERTRAVEL		1.5 - 2.5 mm (.06" - .10")		
PRETRAVEL		1.2 - 1.5 mm (.05" - .06")		
LINEARITY ERROR		≤ 5 µm (0.25%)		
REPEATABILITY		≤ 0.1 µm		
THERMAL DRIFT		≤ 0.25 µm/°C		
TEMPERATURE RANGE		-10°C/ +65°C		
MEASURING FORCE		0.8 N ± 25%		
GUIDE		Bushing		
CABLE LENGTH		2 m		
STANDARD CONNECTOR		Lumberg SV 50/6 (DIN 45322)		
PROTECTION LEVEL		IP65		
OPTIONAL CONTACTS	Not applicable		Available (see Red Crown section)	

### Full-bridge (LVDT) electrical specifications

Trade name	SF100	SH100	SF101
Calibration frequency (KHz)		7,5	
Calibrated at		3,5V RMS with load 1 MOhm/360pF	
Max. current (mA RMS)		12	
I/O phase shift		≤ 10°	
Sensitivity (mV/V/mm)		230 ± 1%	
Cable outlet	axial	ø 8 mm	ø 3/8"
<b>Order Code</b>		3424011000	3424011050
		3424011500	3424011550

### Half-bridge (HBT) electrical specifications

Trade name	SF100	SH100	SH101
Calibration frequency (KHz)		7,5	
Calibrated at		3,5V RMS with load 2 KOhm ± 0,1%	
Max. current (mA RMS)		10	
I/O phase shift		≤ 10°	
Sensitivity (mV/V/mm)		73,75 ± 1%	
Cable outlet	axial	ø 8 mm	ø 3/8"
<b>Order Code</b>		3424014000	3424014050
		3424014500	3424014550

### Half-bridge (HBT) electrical specifications of the version compatible with amplifiers of TESA

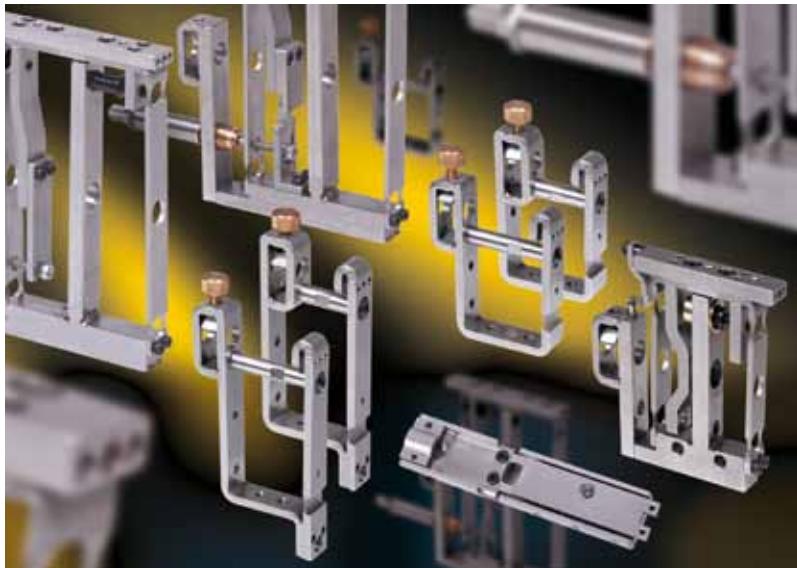
Trade name	SF100	SH100	SH101
Calibration frequency (KHz)		13	
Calibrated at		3V RMS with load 2 KOhm ± 0,1%	
Max. current (mA RMS)		7	
I/O phase shift		≤ 3°	
Sensitivity (mV/V/mm)		73,75 ± 1%	
Cable outlet	axial	ø 8 mm	ø 3/8"
<b>Order Code</b>		3424014600	3424014700

DESCRIPTION	ORDER CODE
QUICK PROBE SF/SH USER MANUAL	D4340012X1 (*)

(\*) X = I (Italian); G (English); D (German); E (Spanish); F (French)



# AMA



## ADVANCED MEASURING ARMSET

AMA™ is a line of mechanical measuring devices developed to satisfy the requirements of the gauging market. Based on their versatility, fixture makers, gauge makers and engineering sources will produce the right solution for their applications, such as: inside and outside diameters, TIR, distances, pneumatic retraction and self-centering

measuring units.

The main feature of the product line is universal applicability and this is achieved by:

- 15 different designs
- 8 mm and 3/8" clamping diameter
- high precision and reliability
- compact design (12 mm thickness)
- variety of mounting options
- wide range of contact offsets

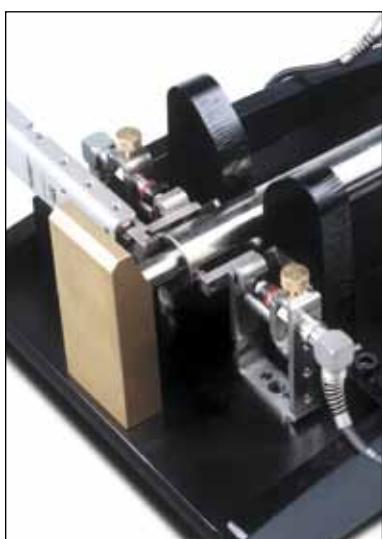
This product, manufactured of non-magnetic stainless steel, was developed as a result of TESTAR's long standing experience in the gauging field.

**AMA™ will protect and extend the working life of gauging solutions.**

They can be used with any pencil probe transducers, as well as mechanical and digital indicators. Pneumatic actuation, available on some models, allows contact retraction to eliminate interference with the workpiece during manual and automatic part loading and unloading.

A CD ROM disk, containing the .dxf drawing files of the AMA components, makes designing high quality applications an easy task, even for the beginner.

Offered by a world-wide market leader, the **AMA™ is a new and economical way of designing high quality solutions using Off The Shelf modular gauging components.**



TRANSDUCERS AND  
MEASUREMENT TRANSMISSIONS



BORE GAUGES LINE

FORKS AND RING GAUGES

BENCH GAUGES

INDICATORS AND ELECTRONIC  
DISPLAY UNITS

INTERFACE BOXES  
FOR DATA ACQUISITION

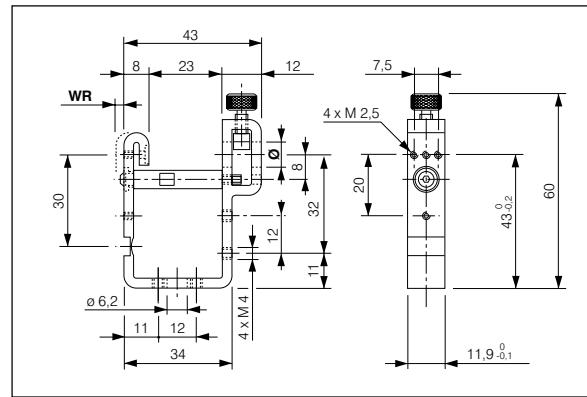
SOFTWARES

## TB - TRANSMISSION BASIC DEVICE

### TB10

Working Range (**WR**) 1.0 mm

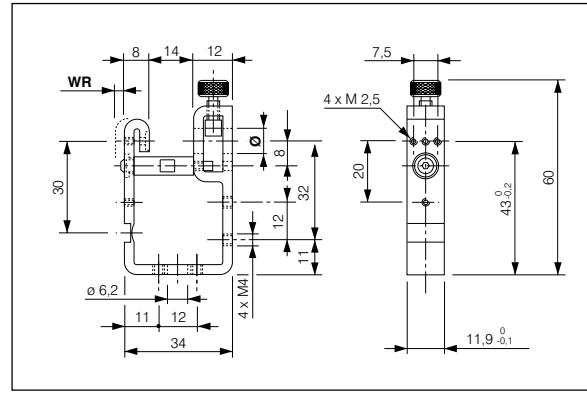
MODEL	ORDER CODE
Ø 8 mm	2927364005
Ø 3/8"	2927364035



### TB10C

Working Range (**WR**) 1.0 mm

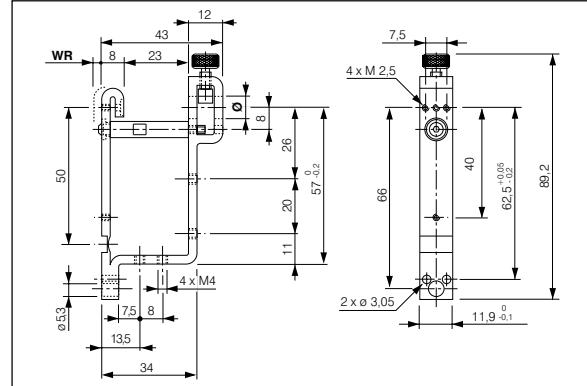
MODEL	ORDER CODE
Ø 8 mm	2927364006
Ø 3/8"	2927364036



### TB16

Working Range (**WR**) 1.6 mm

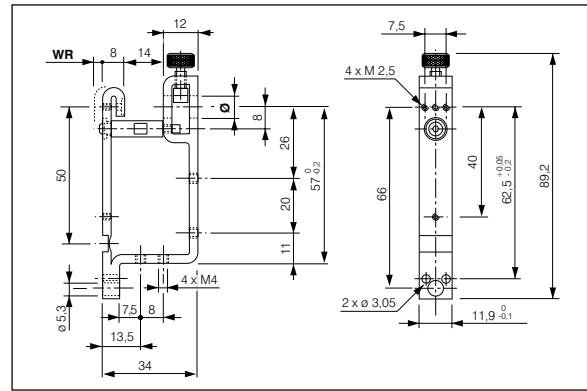
MODEL	ORDER CODE
Ø 8 mm	2927364003
Ø 3/8"	2927364033



### TB16C

Working Range (**WR**) 1.6 mm

MODEL	ORDER CODE
Ø 8 mm	2927364004
Ø 3/8"	2927364034

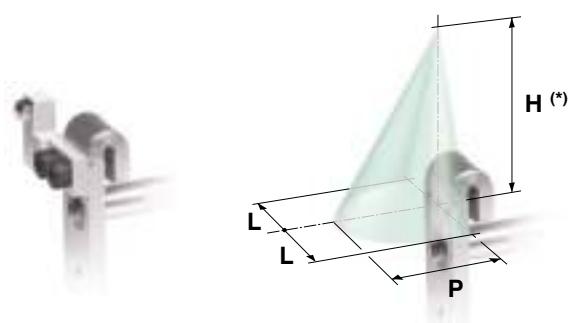


For Ø 3/8" models: M2.5 → 4-48 UNF

## CONTACT OFF-SET APPLICATION LIMITS

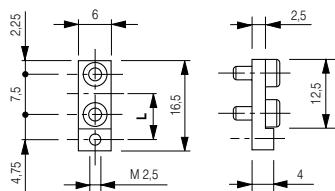
MODEL	H (*) (mm)	L (mm)	P (mm)
TB10	30	14	20
TB10C	30	14	20
TB16	50	14	20
TB16C	50	14	20

(\*) With a vertical off-set the Arm Ratio changes:  
mod. TB10 [30 / (30 + h)] mod. TB16 [50 / (50 + h)] with h = 0 ÷ H



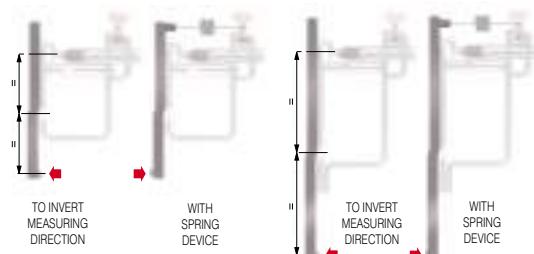
## ACCESSORIES

### OFF-SET ARMSET (ARM RATIO 1:1)



MODEL	OFF-SET L (mm)	ORDER CODE
TB10	M 2,5	2924017150
TB10C		2924017151
TB16	4-48 UNF	2924017152
TB16C		2924017153

### STRAIGHT ARMSET (ARM RATIO 1:1)



MODEL	ORDER CODE
TB10	8 mm
TB10C	3/8"
TB16	8 mm
TB16C	3/8"

### SPRING DEVICE

MODEL	ORDER CODE
TB10 - TB16	2027364001
TB10C - TB16C	2027364002

### ALTERNATIVE CLAMPING DEVICE

(alternative to standard clamping)

ORDER CODE
2027364000

## APPLICATION EXAMPLES

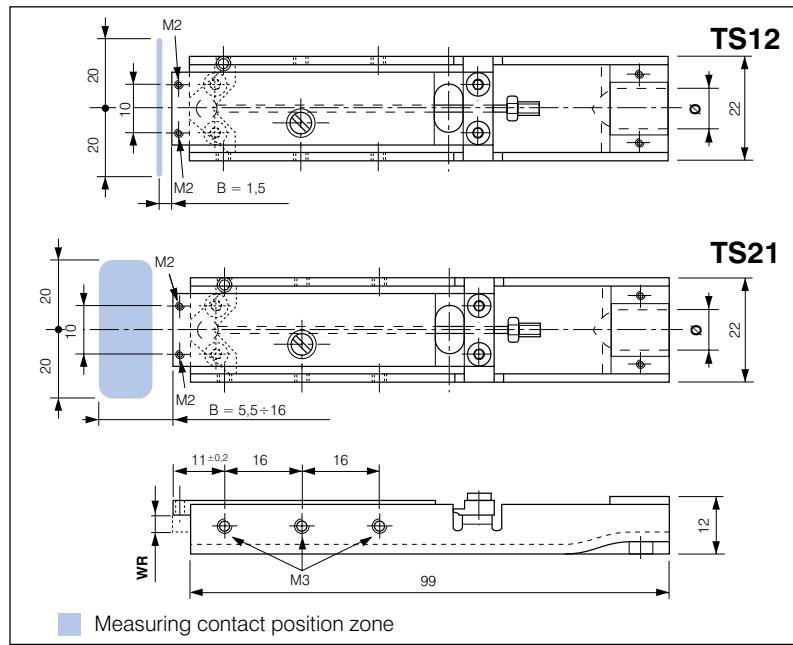


# TS - TRANSMISSION SHOULDER DEVICE

## TS12 - TS21

Working Range (WR) 1.0 mm

MODEL	$\varnothing$	ORDER CODE
TS12	8 mm	2927364100
	3/8"	2927364130
TS21	8 mm	2927364101
	3/8"	2927364131



## TECHNICAL DATA

MOD.	WORKING RANGE (WR) (mm)	ARM RATIO (AR)	REPEAT. (2.77 σ)	SENSIT. (max err. %)
TS12	1,2	1	<0,5µm	± 2
TS21	1,8 ÷ 2,1 0,02857 · B + 1,643	1,5 ÷ 1,75 0,0238 · B + 1,37		

## APPLICATION EXAMPLES



Note: with Red Crown probes featuring ± 0,5 mm range the contact extension must be mounted (with M 2,5 thread code 1024017105 or 1024017106; with 4-48 UNF thread code 1024017115 or 1024017116).

## ACCESSORIES

CONTACT FOR TS12 (AR 1:1)	CONTACT FOR TS12 (AR 1:1)	ARMSET FOR GROOVES FOR TS21 (AR 1:1.75)
 <b>ORDER CODE</b> 3292736401	 <b>R</b> <b>ORDER CODE</b> 5    3292736405 20    3292736410	 <b>ORDER CODE</b> 3292736415
 <b>WORKPIECE LOADING DIRECTION</b>		
SIDE COVER		INTERFACE BLOCK FOR QUICK SET SUPPORT BRACKET
 <b>ORDER CODE</b> 2927364145		 <b>ORDER CODE</b> 2927364150

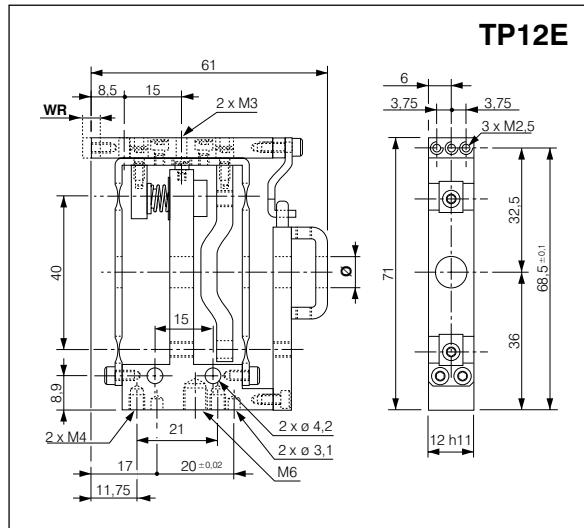


## TP - TRANSMISSION PARALLELOGRAM DEVICE

**WORKING RANGE (WR) 1.2 mm**

**TP12E** (EXTERNAL CHECKS)

MODEL	ORDER CODE
ø 8 mm	2924051200
ø 3/8"	2924051202



**TP12I** (INTERNAL CHECKS)

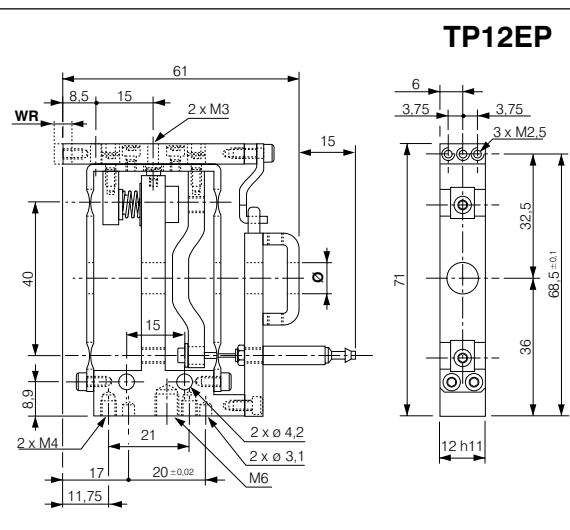
MODEL	ORDER CODE
ø 8 mm	2924051201
ø 3/8"	2924051203



**TP12EP**

(EXTERNAL CHECKS  
WITH PNEUMATIC RETRACTION)

MODEL	ORDER CODE
ø 8 mm	3024051204
ø 3/8"	3024051206



**TP12IP**

(INTERNAL CHECKS  
WITH PNEUMATIC RETRACTION)

MODEL	ORDER CODE
ø 8 mm	3024051205
ø 3/8"	3024051207



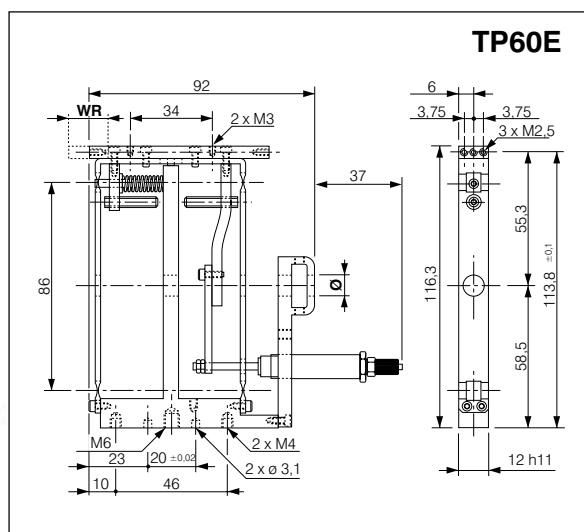
**WORKING RANGE (WR) 6.0 mm**



**TP60E**

(EXTERNAL CHECKS  
WITH PNEUMATIC RETRACTION)

MODEL	ORDER CODE
ø 8 mm	2924051400
ø 3/8"	2924051430



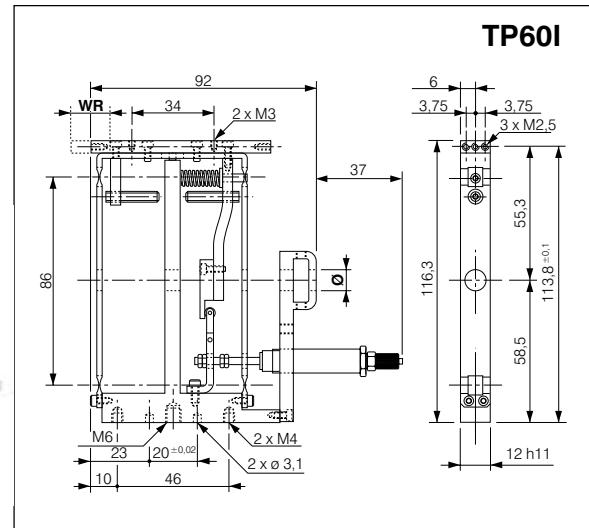
For ø 3/8" models: M2,5 → 4-48 UNF

- BORE GAUGES LINE
- FORKS AND RING GAUGES
- BENCH GAUGES
- INDICATORS AND ELECTRONIC DISPLAY UNITS
- INTERFACE BOXES FOR DATA ACQUISITION
- SOFTWARES

## TP60I

(INTERNAL CHECKS WITH PNEUMATIC RETRACTION)

MODEL	ORDER CODE
Ø 8 mm	2924051401
Ø 3/8"	2924051431



For Ø 3/8" models: M2,5 → 4-48 UNF

## WORKING RANGE (WR) 2.4 mm

## TP12SE

(ELEMENT FOR SELF-CENTERING GROUP FOR EXTERNAL CHECKS)

MODEL	ORDER CODE
Ø 8 mm	2924051208
Ø 3/8"	2924051209



SELF-CENTERING GROUP FOR EXTERNAL Ø 20 mm OBTAINED WITH:

- TP12SE (Q.ty 2)
- Slide (Q.ty 2)
- Self-centering kit (Q.ty 1)
- 30 mm extention (Q.ty 1)

## WORKING RANGE (WR) 12.0 mm

## TP60SE

(ELEMENT FOR SELF-CENTERING GROUP FOR EXTERNAL CHECKS WITH PNEUMATIC RETRACTION)

MODELLO	ORDER CODE
Ø 8 mm	2924051409
Ø 3/8"	2924051407



SELF-CENTERING GROUP FOR EXTERNAL Ø 75 mm OBTAINED WITH:

- TP60SE (Q.ty 2)
- Slide (Q.ty 2)
- Self-centering kit (Q.ty 1)
- 70 mm extention (Q.ty 1)

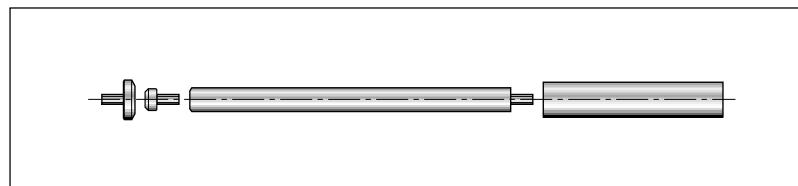
## TP60SI

(ELEMENT FOR SELF-CENTERING GROUP FOR INTERNAL CHECKS WITH PNEUMATIC RETRACTION)

MODELLO	ORDER CODE
Ø 8 mm	2924051406
Ø 3/8"	2924051408

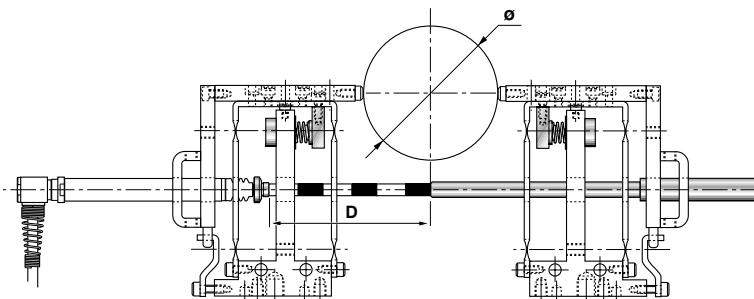
## SELF-CENTERING KIT

MODEL	$\varnothing$	ORDER CODE
TP12	8 mm	2924051210
	3/8"	2924051213
TP60	8 mm	2924051410
	3/8"	2924051413



## EXTENSIONS (D)

D	ORDER CODE
10 mm	1024017105
15 mm	1024017106
20 mm	1024017107
25 mm	1024017108
30 mm	1024017109
70 mm	1019750093
80 mm	1019750122



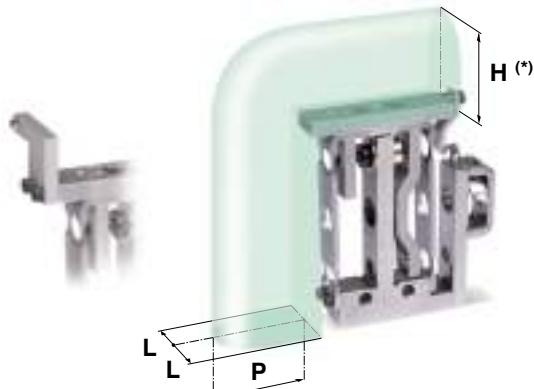
TP12	$\varnothing$ (mm)	0-3	3-8	8-13	13-18	18-23	23-28	28-33	33-38	38-43	43-48	48-53	53-58
	D (mm)	10	15	20	25	30	35	40	45	50	55	60	65
TP60	$\varnothing$ (mm)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-	-
	D (mm)	-	10	20	30	40	50	60	70	80	90	-	-

D should be obtained with the lowest number of extensions

## CONTACTS OFF-SET APPLICATION LIMITS/ MEASURING PERFORMANCES

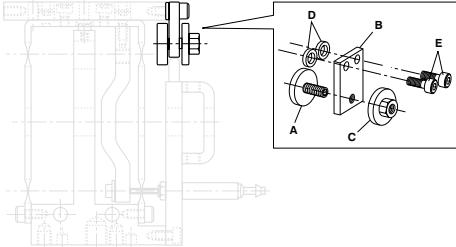
MODEL	H (*) (mm)	L (mm)	P (mm)	REPEAT. 2,77σ (μm)	SENSIT. (max err. %)
TP12	40	14	40	<0,2	± 1,5
TP60	90	14	50	<0,3	± 1,5

(\*) The Arm Ratio is 1:1 for any contact position.



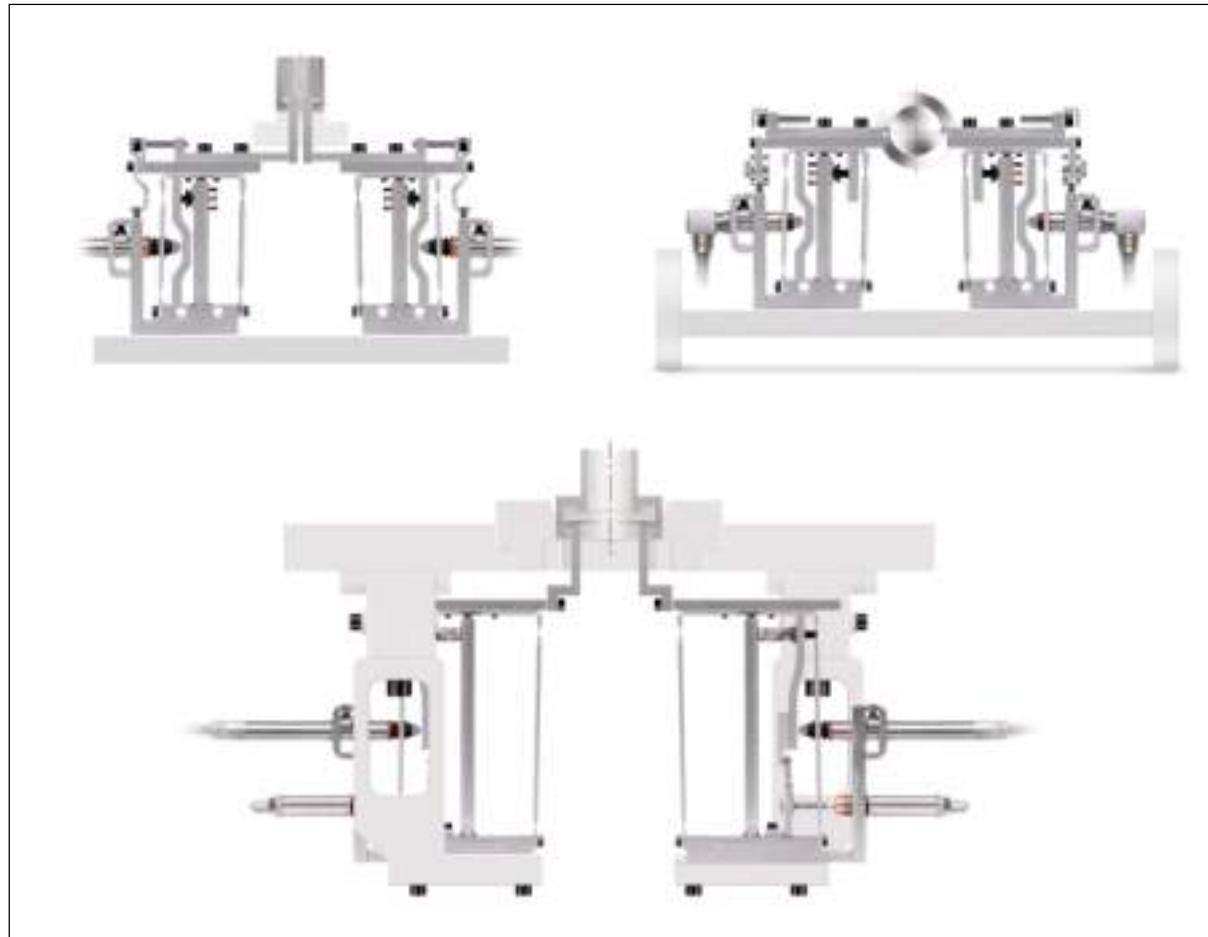
## ACCESSORIES

DESCRIZIONE	MODEL	H (*) MAX (mm)	S	ORDER CODE	RETOOLING RANGE 0 ÷ 15 mm	
SLIDE	TP12	M 2,5	20	4	2924051211	
			40	6	2924051219	
	4-48 UNF	20	4	2924051212		
			6	2924051220		
	TP60	M 2,5	90	6	2924051405	
			90	6	2924051435	
ARMSET	TP12	M 2,5	(B = 30 mm)	3192405120		
		4-48 UNF		3192405123		
	TP60	M 2,5	(B = 60 mm)	3192405140		
		4-48 UNF		3192405143		
OFF-SET ARMSET	M 2,5	(A = 8,5 mm)	2924017150			
		(A = 10 mm)	2924017151			
	4-48 UNF	(A = 8,5 mm)	2924017152			
		(A = 10 mm)	2924017153			

DESCRIPTION	MODEL	ORDER CODE	
<b>PRETRAVEL/ OVERTRAVEL LIMITER</b>	TP12 (any model)	2924051260	

Note: It must always be used when TP12 is equipped with Red Crown F05/H05 probes having a measuring range of  $\pm 0,5$  mm.

## APPLICATION EXAMPLES



## DOCUMENTATION

DESCRIPTION	ORDER CODE
Support CD Rom - with .DXF drawings collection	CD-020.02



# Quick block



TRANSDUCERS AND  
MEASUREMENT TRANSMISSIONS



*...the complete  
range of measuring  
armsets with  
parallel guide*

Quick Block is a universal measuring element, equipped with high precision linear guides, for checking internal and external diameters and distances.

The product family has been enhanced with the 10 mm range version to meet the most demanding customers' application requirements.

## PRODUCT FEATURES

- The product, IP65 certified, is available in two versions:
  - With built-in full-bridge (LVDT) or half-bridge (HBT) transducer featuring  $\pm 1$  mm ( $\pm 0.04"$ ) and  $\pm 5$  mm ( $\pm 0.2"$ ) measuring range, compatible with any third party electronic amplifiers;
  - as simple mechanical transmission featuring  $\pm 3$  mm ( $\pm 0.12"$ ) and  $\pm 5$  mm ( $\pm 0.2"$ ) measuring range, to be used with linear probes having clamping diameter 8mm or 3/8", such as Red Crown and Quick Digit.
- The built-in transducer model is also available in digitized version, to be connected to Marposs DigiCrown network, and in USB version for direct connection to electronic display units and industrial/commercial pc.
- Each version can be equipped with pneumatic actuation to facilitate part loading/unloading in the measuring station. A wide range of spring, measuring arms and contacts is also available, allowing to reach any measuring position keeping the arm ratio unchanged.
- Its measurement axis can be oriented in any spatial direction, while the contacts support has a retooling range of 20 mm.
- The  $\pm 5$  mm version features a 5 mm diameter double guide and a ball cage anti-rotation system providing a repeatability range (max-min) lower than 0,5  $\mu$ m with direct contact. This version can be supplied with axial or radial cable outlet for transducer and pneumatic cylinder.
- Particularly suitable as a Quick Set component for Post-Process applications with robot part loading and unloading. By means of specific interfaces it can be assembled on two different support brackets to measure diameters up to 40 mm and 90mm respectively.
- A special version with dovetail compatible with TESA supports and contacts is also available.



Connectors



Quick Block used as Quick Set component

BORE GAUGES LINE

FORKS AND RING GAUGES

BENCH GAUGES

INDICATORS AND ELECTRONIC  
DISPLAY UNITS

INTERFACE BOXES  
FOR DATA ACQUISITION

SOFTWARES

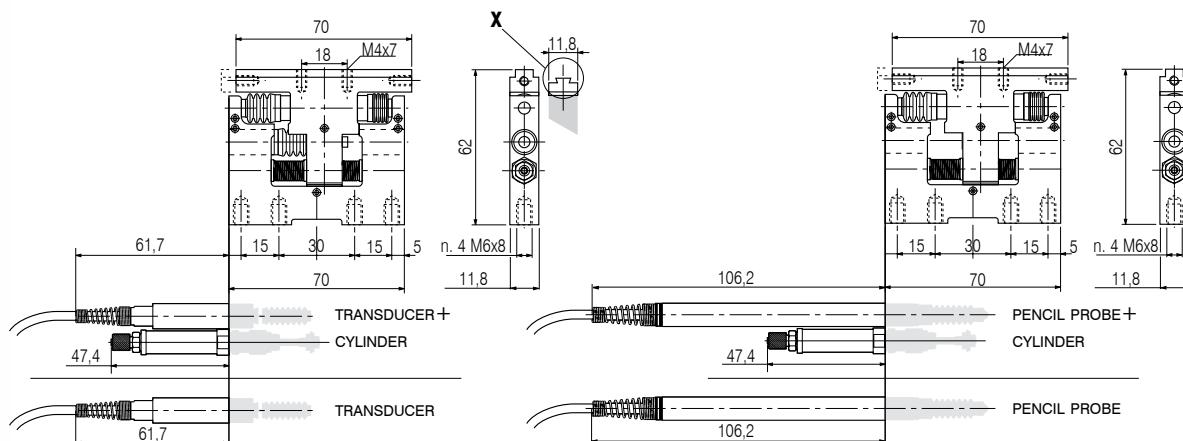
# TECHNICAL SPECIFICATIONS

Total stroke	mm	6				10,6							
Measuring range	mm	2				10							
Transducer		LVDT		HBT Std. Marposs		HBT Std. TESA		LVDT					
Pretravel	mm	1,1 ÷ 1,2				5,1 ÷ 5,2							
Contact support fixing system		Square guide		Dovetail		Square guide							
Guiding system		Ball cage				Ball cage							
Antirotation system		Allen screw				Ball cage							
Repeatability	µm	<0,5				<0,5							
Tip Force	N	1 ( $\pm 20\%$ ) with std. spring				1,7 ( $\pm 20\%$ ) with std. spring							
Thermal drift	µm/°C	<0,25				<0,25							
Actuation*		S	PA	S	PA	S	PA PR	S	PA PR				
Cable outlet**		A	A	A	A	A	A R	A R	A R				
Operating pressure	bar	3 ÷ 6				3 ÷ 6							
Total weight	g (N)	<260 (<2,548)				<260 (<2,548)							
Mobile parts weight	g (N)	100 (0,98)				110 (1,078)							
Operating temperature	°C	-10/65				-10/+65							
Protection degree	guides	IP65				IP40	IP65	IP40	IP65				
	transducer	IP65				IP65							
Cable lenght	m	2				2							
Connector		Lumberg SV50/6				Lumberg SV50/6							
Sensitivity	mV/V/mm	230		73,75		115		29,5					
Accuracy	µm	$\pm \text{MAX}(1 +  10 \cdot K ;  15 \cdot K )^{***}$				$\pm \text{MAX}(5 +  3 \cdot K ;  8 \cdot K )^{***}$							
Calibration specs.		3,5V RMS @7,5kHz with load 1MΩ/360pF	3,5V RMS @7,5kHz with load 2KΩ±0,1%	3V RMS with load 2MΩ±0,1%/ 13KHz		3,5V RMS @7,5kHz with load 1MΩ//360pF	3,5V RMS @7,5kHz with load 2KΩ±0,1%						
Code number		3419883300	3419883305	3419883350	3419883355	3419883360	3419883365	34198833800	34198833801				
		34198833805	34198833806	34198833810	34198833811	34198833815	34198833816	34198833850	34198833851				
		34198833855	34198833856	34198833860	34198833861	34198833865	34198833866						

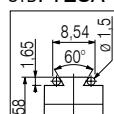
\*S=spring; PA=pneumatic cylinder with axial inlet; PR=pneumatic cylinder with radial inlet; \*\*A=axial; R=radial; \*\*\* K = reading value (mm)

**QBH100 - QBF100 Std Marposs -  
QBH100 Std Tesa**

**QB 600**



X=QBH100  
STD. TESA

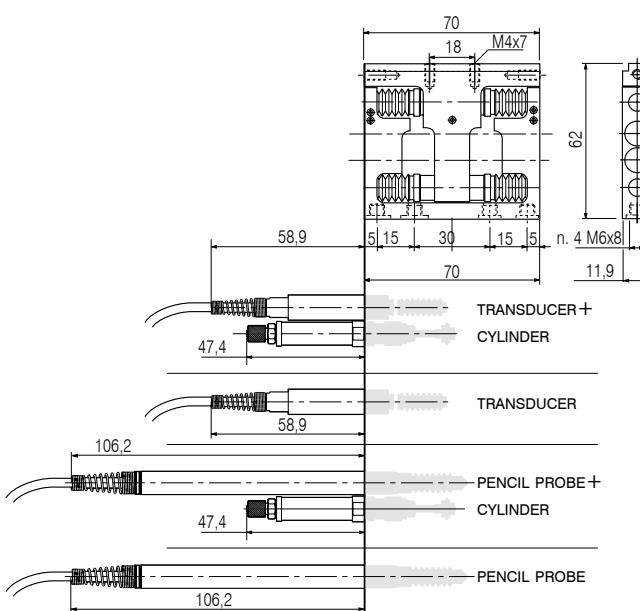


# Dimension valid for Red Crown 2,  
different size according to pencil probe

	10,6												10,6				6													
	10												10				depends on the probe													
HBT Std. TESA	DIGITIZED						USB						TRANSMISSION ONLY																	
	5,1 ÷ 5,2												depends on the probe																	
	Square guide												Square guide																	
	Ball cage												Ball cage																	
	Ball cage												Ball cage				Allen screw													
	<0,5												<0,5																	
	1,7 ( $\pm 20\%$ ) with std. spring												1,7 ( $\pm 20\%$ ) without pencil probe																	
	<0,25												<0,25																	
S	PA	PR	S	PA	PR	S	PA	PR	S	PA	PR	S	PA	PR	S	PA	PR	S	PA	PR										
A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	S	PA	PR										
	3 ÷ 6												3 ÷ 6																	
	<260 (<2,548)												<260 (<2,548)																	
	110 (1,078)												100 (0,98)				95 (0,931)													
	-10/+65												-10/+65																	
IP40	IP65		IP40		IP65		IP40		IP65		IP40		IP65		IP65		IP65		IP65											
	2												depends on the probe																	
Lumberg SV50/6			Lumberg 0332/06										Standard USB																	
29,5			-										-																	
$\pm \text{MAX}(5 +  3 \cdot K ;  8 \cdot K )***$			$\pm(1,2 + K \cdot 2)***$										$\pm(1,2 + K \cdot 2)***$																	
3V RMS @13kHz with load			-										-																	
$2K\Omega \pm 0,1\%$																														
3419883900	3419883901	3419883905	3419883906	3419883907	3419883910	3419883911	3419883915	3419883916	3419883917	34198839175	34198839176	34198839177	34198839178	34198839179	34198839180	34198839181	34198839185	34198839186	34198839187	34198839188	34198839189									
34198839171	34198839172	34198839173	34198839174	34198839175	34198839176	34198839177	34198839178	34198839179	34198839180	34198839181	34198839182	34198839183	34198839184	34198839185	34198839186	34198839187	34198839188	34198839189	34198839190	34198839191	34198839192									

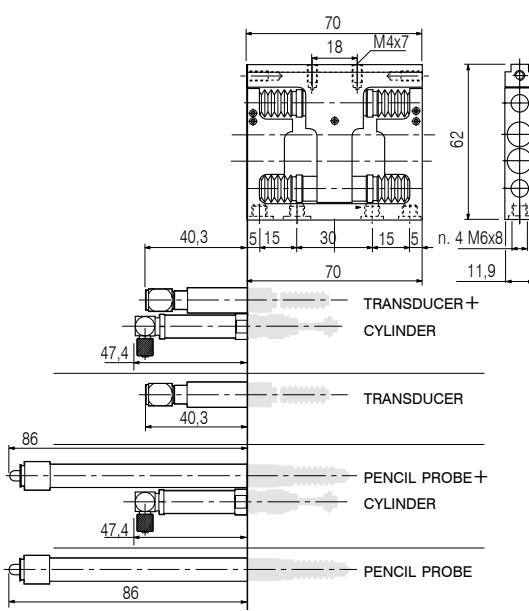
**QB1000 • QBH1000 Std. Marposs -  
QBH1000 Std. Tesa - QBF1000 - DB1000 - UB1000**

**AXIAL TRANSDUCER/CYLINDER CABLE OUTLET**



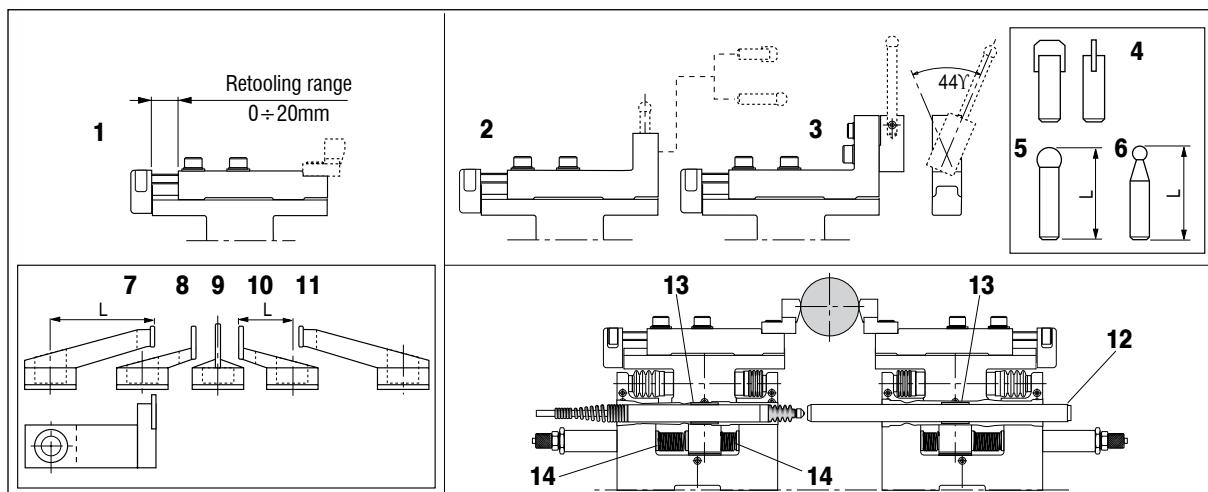
**QB1000 • QBH1000 Std. Marposs -  
QBH1000 Std. Tesa - QBF1000 - DB1000 - UB1000**

**RADIAL TRANSDUCER/CYLINDER CABLE OUTLET**



# Dimension valid for Red Crown 2,  
different size according to pencil probe

## ACCESSORIES



REF.	DESCRIPTION	ORDER CODE
1	Support for off-set cut contact 7, 8, 9, 10, 11 M4 thread [retooling range 0-20 mm (0-.79")]	2019883060
2	Support for simple cut contact 4 or spherical contact 5, 6 [retooling range 0-20 mm (0-.79")]	2019883050
3	Contacts support with side rotation 0-20 mm(0-.79")]	2019883550
4	Simple cut contact	3391988325
5	Spherical contact L 20mm, Diameter 5 mm	3391988301
6	Spherical contact L 40mm, Diameter 5 mm	3391988302
	Spherical contact L 60mm, Diameter 5 mm	3391988303
7	Spherical contact L 20mm, Diameter 3 mm	3391988310
8	Spherical contact L 40mm, Diameter 3 mm	3391988311
9	Spherical contact L 60mm, Diameter 3 mm	3391988312
10	Left off-set cut contact L = 24 mm	3391988336
11	Left off-set cut contact L = 12 mm	3391988335
12	Off-set cut contact	3391988330
13	Right off-set cut contact L = 12 mm	3391988337
	Right off-set cut contact L = 24 mm	3391988338
14	Mechanical reference shaft (external dia. 8 mm, L = 120 mm)	1119883071
	Adapting bushing for pencil probes diameter 8 mm	*
	Adapting bushing for pencil probes dia. 3/8"	*
	Spring 0,6 N (Blue)	1019826001
	Spring 1 N (Inox)	1019883035
	Spring 1,7 N (Black)	1019883030
	Spring 2 N (Green)	1019883034
	Spring 2,6 N (Red)	1019883031
	Spring 4 N (Yellow)	1019883032
	Spring 4 N (Yellow)	1019883036
Extension cables and user manuals	Extension cable LVDT/HBT L = 2 m	6735932015
	Extension cable LVDT/HBT L = 5 m	6735932016
	Extension cable LVDT/HBT L = 10 m	6735932017
	User manual QBF/QBH100	** D4340013X1
	User manual QB600	** D4340014X1
	User manual QBF/QBH/DB/UB/Q1000	** D4340064XF
Quick Set	Support bracket L = 200 mm for diameters up to 40 mm, with interface for two Quick Block	3024017100
	Support bracket L = 250 mm for diameters up to 90 mm (without interface for Quick Block)	3024018100
	Mounting interface for one Quick Block for support bracket L = 250 mm	2924018110

\* To be always used with QB600 and QB1000, to fix the pencil probe or the mechanical reference shaft

\*\* X = I (Italian); U (English); D (German); F (French); E (Spanish)



# A124



## MINIATURE MEASURING CELL

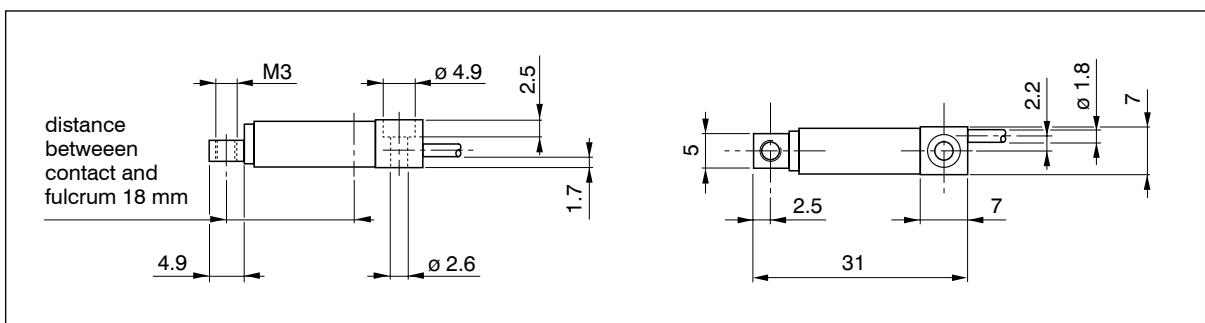
The A124 miniature measuring cell has been developed to satisfy the increasing demand for a compact and easy to use measuring component. Thanks to its small dimensions A124 can be applied in simple as well as multidimensional measuring applications. Compact dimensions, ease of use and universal applicability make TESTAR A124 the first choice for gauging designers.

## APPLICATION ADVANTAGES

1. The 7 x 7 x 31 mm compact dimensions allow solving measuring tasks for limited space applications in place of pencil probes and transmission devices.
2. Despite these small dimensions A124 is provided with a replaceable contact, a feature normally available only in larger measuring devices. Therefore contact replacement would no longer require disassembly of the com-
3. The simple design and the reduced number of components make A124 a product that is:
  - easy to install
  - reliable and robust
  - maintenance free (IP67)
  - shop floor proof
4. The universal applicability is determined by the possibility of using the A124 in virtually any measuring task still maintaining great accuracy and reliability. In addition the A124 electrical characteristics allow connection to TESTAR or MARPOSS measuring amplifiers as well as electronics made by TESA. Therefore A124 does not require any special proprietary interface box or amplifier card thus reducing the cost of the application. Based on the experience gained on Red Crown pencil probes compatible line, TESTAR has a development program to extend A124 electrical compatibility to other electronics.

**TESTAR A124 the cost effective way of designing your compact gauging application.**

## DIMENSIONS (mm)



## TECHNICAL SPECIFICATIONS AND APPLICATION MODES

### Mechanical specifications

MEASURING RANGE	$\pm 200 \mu\text{m}$
PRE-TRAVEL AT ELECTRICAL ZERO	$270 \pm 30 \mu\text{m}$
OVERTRAVEL FROM ELECTRICAL ZERO	$290 \pm 40 \mu\text{m}$
TIFF FORCE AT ELECTRICAL ZERO	$0.9 \pm 0.2 \text{ N}$
REPEATABILITY ( $\sigma \times 2,77$ )	$\leq 0.1 \mu\text{m}$
DEGREE OF PROTECTION CEI/IEC 529	IP67
STANDARD CONTACT ( $R = 1.5 \text{ mm}$ )	M3
LINEARITY ERROR	$\leq 3 \mu\text{m}$
THERMAL DRIFT AT ZERO	$\leq 0.3 \mu\text{m}/^\circ\text{C}$
OPERATING TEMPERATURE	$+5 / +40 ^\circ\text{C}$
STANDARD CONNECTOR	Lumberg SV50/6
CABLE LENGTH	3 m

Below electrical specifications refer to A124 with contact and arm ratio 1:1

### Full-bridge (LVDT) electrical specifications

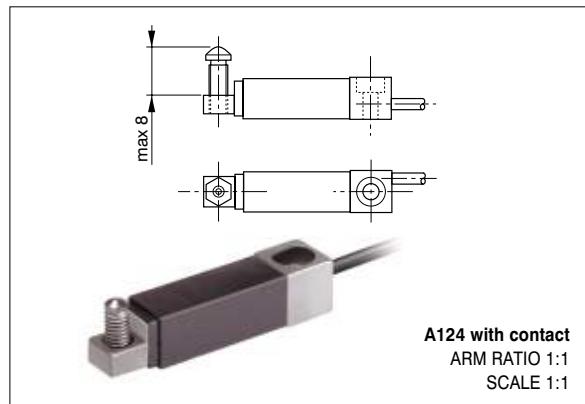
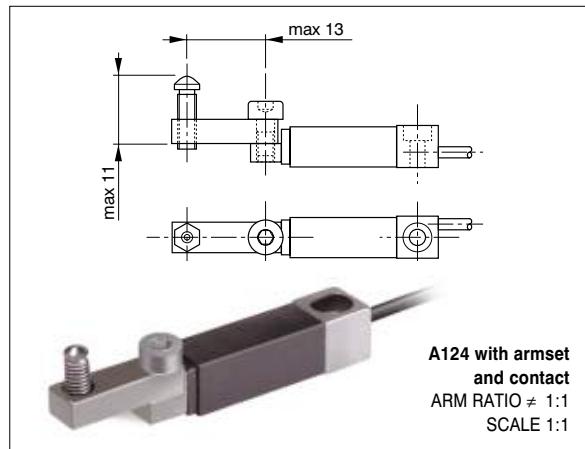
TYPE OF TRANSDUCER	LVDT compatible with TESTAR / MARPOSS amplifiers
CALIBRATION FREQUENCY	7,5 KHz
CALIBRATED AT	3,5 V RMS with load 1 MOhm/360 pF
MAX. CURRENT	5 mA / V
I/O PHASE SHIFT	$\leq 8^\circ$
SENSITIVITY	230 mV/V/mm $\pm 1\%$
ORDER CODE	3419886153

### Half-bridge (HBT) electrical specifications

TYPE OF TRANSDUCER	HBT compatible with TESTAR / MARPOSS amplifiers
CALIBRATION FREQUENCY	7,5 KHz
CALIBRATED AT	3,5 V RMS with load 2 KOhm $\pm 0,1\%$
MAX. CURRENT	4 mA / V
I/O PHASE SHIFT	$\leq 10^\circ$
SENSITIVITY	73,75 mV/V/mm $\pm 1\%$
ORDER CODE	3419886154

### Half-bridge (HBT) electrical specifications of the version compatible with amplifiers of TESA

TYPE OF TRANSDUCER	HBT compatible with amplifiers of TESA
CALIBRATION FREQUENCY	13 KHz
CALIBRATED AT	3 V RMS with load 2 KOhm $\pm 0,1\%$
MAX. CURRENT	2,5 mA / V
I/O PHASE SHIFT	$\leq 8^\circ$
SENSITIVITY	73,75 mV/V/mm $\pm 1\%$
ORDER CODE	3419886155



Application example

## ACCESSORIES

ACCESSORIES	DESCRIPTION	ORDER CODE
	Carbide contact $R=1,5 \text{ mm}$ ; $L=12 \text{ mm}$	1408612020
	Diamond contact $R=1,5 \text{ mm}$ ; $L=12 \text{ mm}$	1408612035
	Carbide contact $R=3,5 \text{ mm}$ ; $L=12 \text{ mm}$	3321120230
	Diamond contact $R=3,5 \text{ mm}$ ; $L=12 \text{ mm}$	3360120230
	Carbide contact $R=10 \text{ mm}$ ; $L=12 \text{ mm}$	3323120230
	Diamond contact $R=10 \text{ mm}$ ; $L=12 \text{ mm}$	3362120230
	Contact wrench (2,5 mm)	1300538000
	Contact wrench (4 mm)	1300540000
	Wrench for diameter set-up	1320893000
	Standard armset $L=8 \text{ mm}$	3191988600



# M1 Star

Mechanical Bore Gauge



## MAIN FEATURES

- Measurable diameters: 3 to 300 mm (0.12"-11.81"). Special versions available for bigger diameters.
- With an extensive range of accessories, it is possible to measure at depths of more than 500 mm and measure bores that are perpendicular to the axis of insertion.
- The durable measuring transmission system is capable of more than 10.000.000 measuring cycles.
- Metrological performances guaranteed for all measurable diameters.
- The mechanical transmission measuring system can be interfaced with any pencil probe, dial or digital indicator.
- The linear designed mechanical transmission system has an extensive range of accuracy and only one master is needed for zero setting.
- Compatible with the bore gauge accessories of the main competitors.
- Competitive price.
- Fast delivery times.

## MECHANICAL BORE GAGE

The M1 Star™ MBG (Mechanical Bore Gauge) is the ideal manual instrument for precision measuring of inside diameter, ovality and cylindricity.

It can be totally retooled or repaired by simply replacing the nosepiece and contacts.

A mechanical positioning system automatically ensures alignment between the nosepiece and the

contacts.

The Mechanical Bore Gauge is accurate, robust, reliable and easy to use.

Maintenance free construction requires only periodic cleaning of the precision mechanism.

A wide range of modular components makes it possible to configure the bore gauge to meet all your measuring needs.

## TECHNICAL SPECIFICATIONS

DESCRIPTION	WORKING RANGE							
<b>STANDARD MEASURING RANGE FOR TYPE B AND T (mm)</b>	<b>Ø 3 - 4,5</b>	<b>Ø 4,5 - 5,5</b>	<b>Ø 5,5 - 26</b>				<b>Ø 26 - 300</b>	
	0,055	0,070	0,120				0,150	
<b>EXTENDED MEASURING RANGE FOR TYPE B AND T (mm) (*)</b>	<b>Ø 3 - 4,5</b>	<b>Ø 4,5 - 5,5</b>	<b>Ø 5,5 - 7,5</b>	<b>Ø 7,5 - 15</b>	<b>Ø 15 - 26</b>	<b>Ø 26 - 38</b>	<b>Ø 38 - 100</b>	<b>Ø 100 - 150</b>
	-	-	-	0,120 - 0,170	0,120 - 0,200	0,150 - 0,200	0,150 - 0,400	0,150 - 0,350
<b>STANDARD MEASURING RANGE FOR TYPE SB AND BC (mm)</b>	<b>Ø 3 - 4,5</b>	<b>Ø 4,5 - 5,5</b>	<b>Ø 5,5 - 26</b>				<b>Ø 26 - 60</b>	<b>Ø 60 - 150</b>
	0,055	0,070	0,120				0,150	0,120
<b>REPEATABILITY (2,77 σ) (µm)</b>	≤ 1							

(\*) By unscrewing the contacts fastened to the measuring armset by means of a screw with Heli-Coil, the measuring ranges can be extended up to the values indicated in the table.



# M1 STAR - MBG      MECHANICAL BORE GAUGE

The advantage of the M1 Star™ MBG is the durable mechanical measurement-transmission principle which ensures excellent metrological performances. Retoolability and interchangeability with an extensive range of accessories, make the MBG universally applicable.

**1 PLUG HEAD:** formed by the nosepiece, the measuring armset and the contacts, it is the measuring element of the bore gauge. It can be interchanged by simply unscrewing it from the handle. The MBG plug head is available in four versions differing from each other in "C" distance between the contact axis and the top of the nosepiece.

See pages 4-7.

**1a CAP:** stainless steel disk protecting the internal mechanical elements from accidental damages.

**1b NOSEPIECE:** made of tempered stainless steel, it is the guiding element that ensures the measurement results are not affected by the operator's manual skill.

**1c MEASURING CONTACTS:** standard contacts are made of tungsten carbide and, in relation to the diameter range, come in two different radii that must be chosen on the basis of the bore surface roughness:

R1: standard radius for  $Ra \leq 2 \mu\text{m}$  /  $Rz < 6,3$ .

R2: bigger radius for  $Ra \geq 2 \mu\text{m}$  /  $Rz > 6,3$ .

Diamond or DLC-coated contacts are also available. Diamond contacts are suggested for soft aluminum or highly wearing applications; DLC-coated ones (3000 HV) for aluminum and relevant alloys.

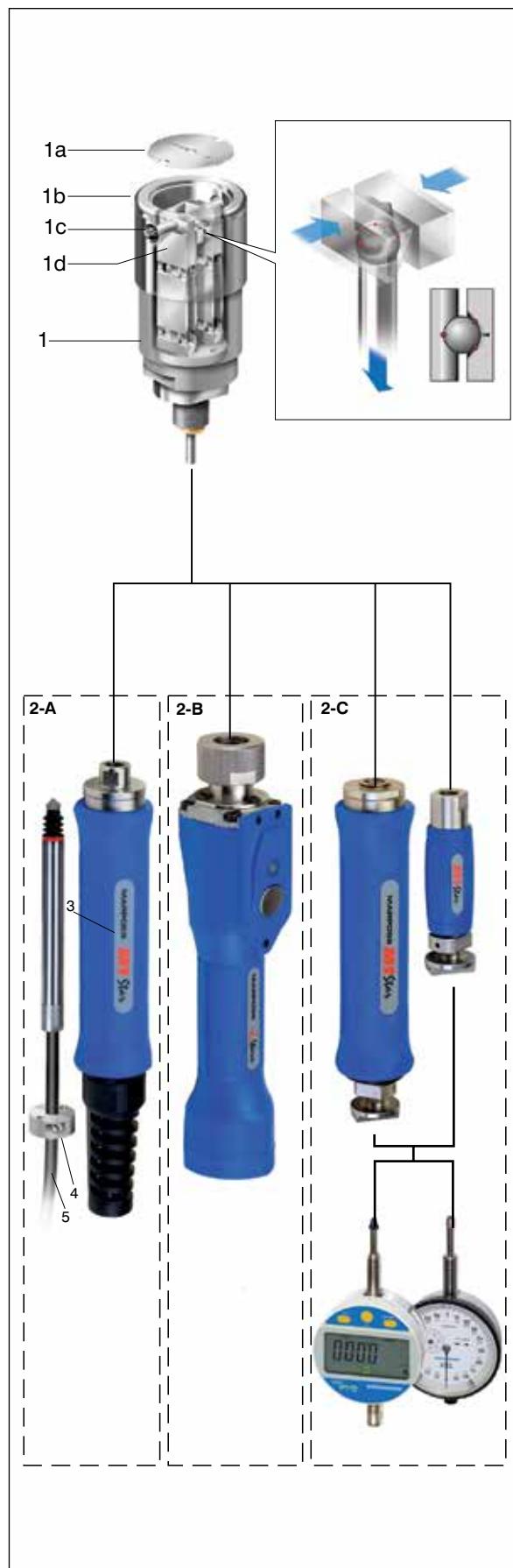
**1d MEASURING ARMSET:** it is made by either 2 or 4 fulcrum elements, depending on the diameter range. The measurement is transferred to the display device by a transfer rod with spherical head that slides on a cradle formed by a V-shaped guide and an inclined plane.

**2 HANDLE:** used to hold the plug gauge it has been specifically designed for best handling. It can be a pencil probe holder (in electro-mechanical applications - 2-A) or an i-Wave handle with wireless transmission (2-B), or an indicator holder (for digital or dial indicators - 2-C). The latter can be selected in a suitable size: standard or mini.

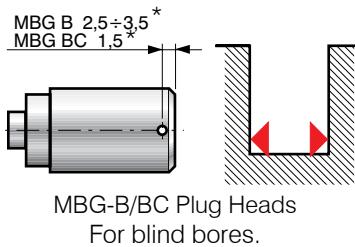
**3 NUMBER PLATE:** it can be marked with the bore gauge size or any other information required by the customer.

**4 CABLE GUIDE and CLAMP:** they are present in the pencil probe holder and prevent damages of the cable due to tearing, pulling or bending at cable exit.

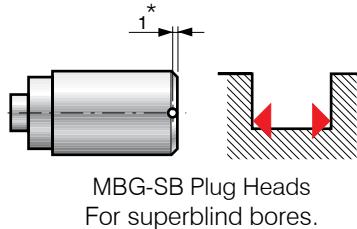
**5 CABLE:** it is a special reinforced cable ( $\varnothing 4,7 \text{ mm}$ ) specifically developed for use in manual gauges, which considerably reduces the risk of damage and unintended torsion.



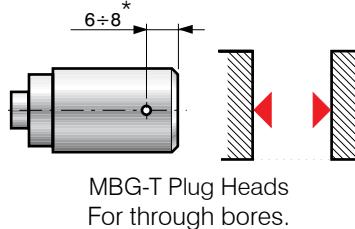
## M1 STAR - STANDARD VERSIONS



MBG-B/BC Plug Heads  
For blind bores.



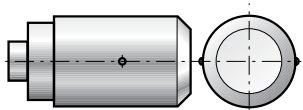
MBG-SB Plug Heads  
For superblind bores.



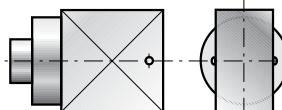
MBG-T Plug Heads  
For through bores.

## M1 STAR - DEDICATED SOLUTIONS (EXAMPLES)

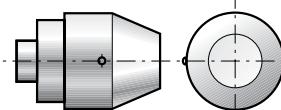
Dedicated Solutions complete the standard product line, and provide solutions for measuring conditions outside the capabilities of Standard Bore Gauges. A wide range of special measuring solutions are available, for your applications, with our series of dedicated plug-heads (on request). Please enclose a workpiece drawing with your enquiry.



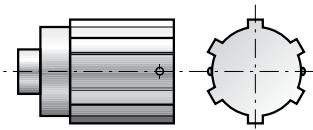
WITH LONG NOSEPIECE  
Guides the plug head when measuring discontinuous/interrupted deep bores.  
Example: cylinder block.



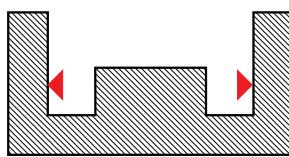
FOR PARALLEL WALLED BORES  
To be used for gap measurements.  
Example: keyways or splines



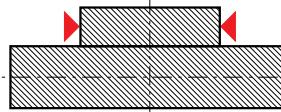
WITH PILOT CONE  
For CNC automatic applications the cone helps the entry of the nosepiece into the workpiece, reducing the possibility of accidental damages.



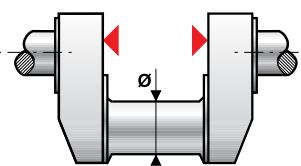
WITH CARBIDE BAR INSERTS  
The carbide bars will increase the life of the gauge, reducing the wear on the nosepiece and preventing jamming caused by the presence of metal cinders swarf or debris.



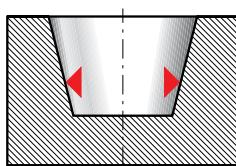
BORES WITH CENTRAL HUB  
For the measuring of internal diameters where there is a central hub projection.  
Example: automatic transmission components.



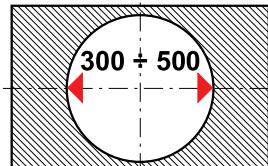
OUTSIDE DIAMETER  
For the measuring of the ending section of flywheel shafts, or the short outside diameters often found on transmission & pump components and end caps on electric motors etc.



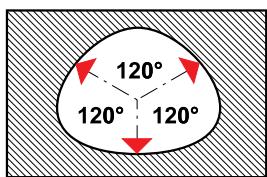
"V"-SHAPED PLUG HEAD  
Designed for the measurement of straight sided gaps in crankshafts or similar components.



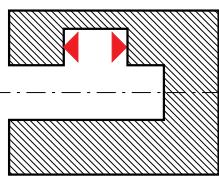
CONE SHAPED PLUG HEAD  
For tapered bores.  
Example: front or rear knuckles.



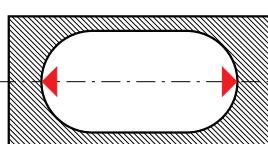
MACRO-LITE  
Particularly light and easy to be used for diameters up to 500 mm.  
Example: large pipes, oil & gas industries.



3 POINTS MEASURING  
For shape and roundness checking.  
Example: tri-lobed or irregular shaped bores.



RIGHT ANGLE PLUG HEAD  
For measuring bores with perpendicular axis to the direction of gage insertion, or for limited space applications.  
Example: differential carrier.



oval-shaped PLUG HEAD  
Designed for measuring oval bores or inter-connecting bores.  
Example: lobe pump designs in fuel and oil pumps.

# DIMENSIONAL SPECIFICATIONS OF STANDARD VERSIONS

TRANSDUCERS AND  
MEASUREMENT TRANSMISSIONS



FORKS AND RING GAUGES

BENCH GAUGES

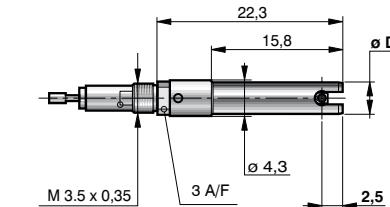
INDICATORS AND ELECTRONIC  
DISPLAY UNITS

INTERFACE BOXES  
FOR DATA ACQUISITION

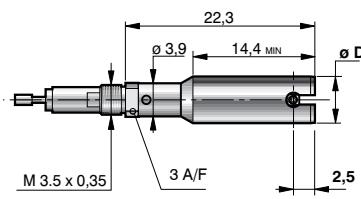
SOFTWARES

**$\varnothing_{min} * 3 \text{ to } < 4$**

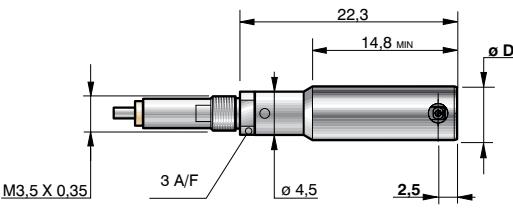
## PLUG HEAD MBG-B



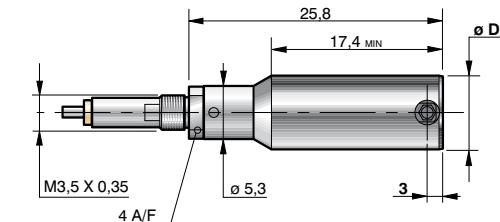
**$\varnothing_{min} * 4 \text{ to } < 4,5$**



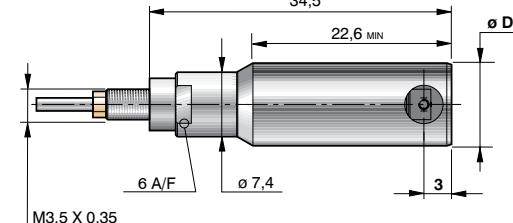
**$\varnothing_{min} * 4,5 \text{ to } < 5,5$**



**$\varnothing_{min} * 5,5 \text{ to } < 7,5$**

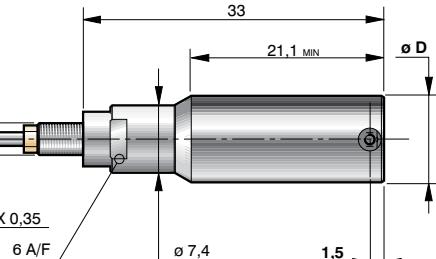
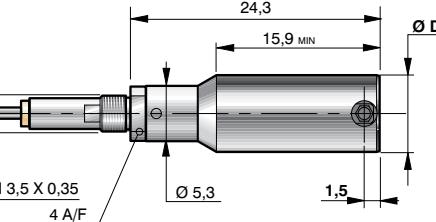
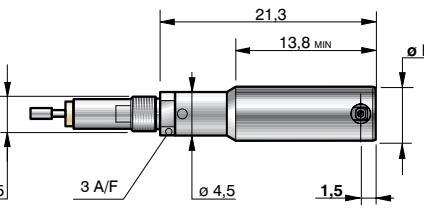
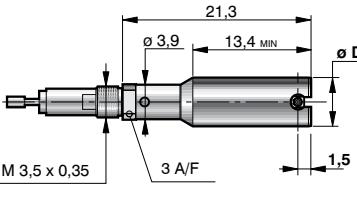
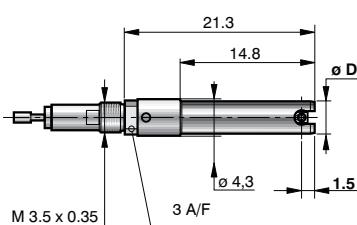


**$\varnothing_{min} * 7,5 \text{ to } < 9,5$**



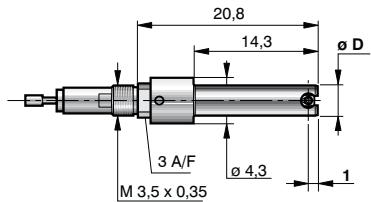
\* Ømin = minimum bore diameter

## PLUG HEAD MBG-BC

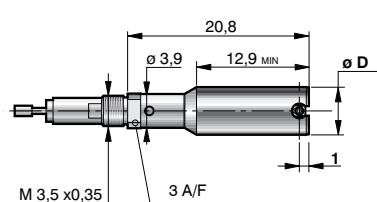


$\varnothing D$	CARBIDE OR DLC - COATED		DIAMOND	
	R1	R2	R1	R2
	3 ÷ < 5,5	0,25	0,75	-
5,5 ÷ < 7,5	0,5	1	-	-
7,5 ÷ < 9,5	1,5	2,5	0,75	-

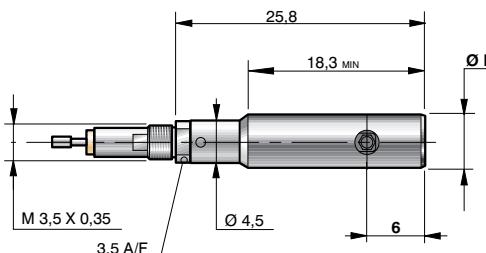
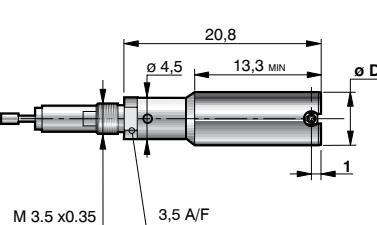
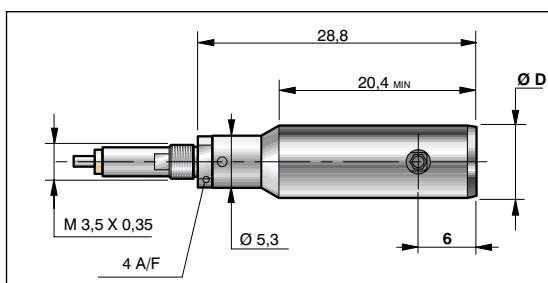
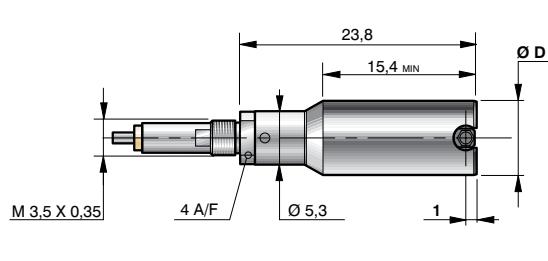
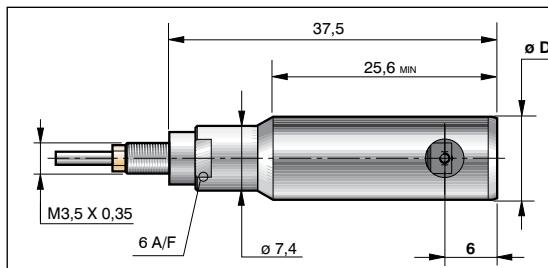
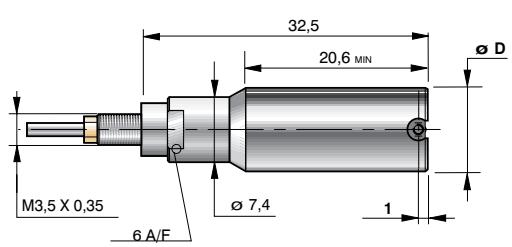
$\varnothing D$	CARBIDE OR DLC - COATED		DIAMOND	
	R1	R2	R1	R2
	3 ÷ < 5,5	0,25	0,75	-
5,5 ÷ < 7,5	0,5	1	-	-
7,5 ÷ < 9,5	1,5	2,5	-	-

**PLUG HEAD MBG-SB****PLUG HEAD MBG-T**

N.A.

 **$\varnothing \text{min} * 3 \text{ to } < 4,5$** 

N.A.

 **$\varnothing \text{min} * 4 \text{ to } < 4,5$**  **$\varnothing \text{min} * 5,5 \text{ to } < 7,5$**  **$\varnothing \text{min} * 7,5 \text{ to } < 9,5$** 

\* Ømin = minimum bore diameter

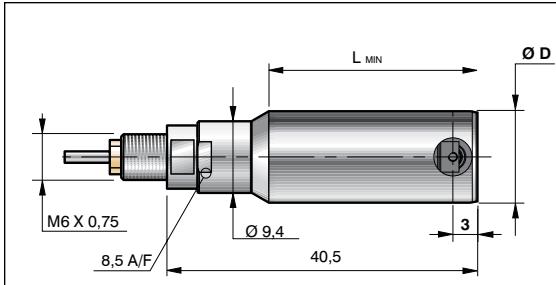
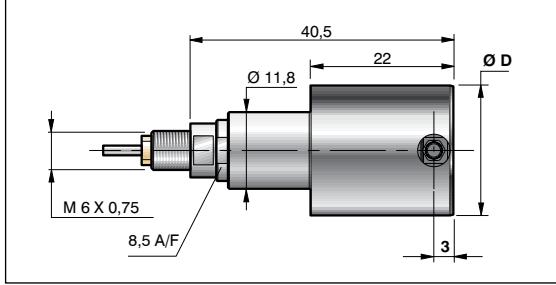
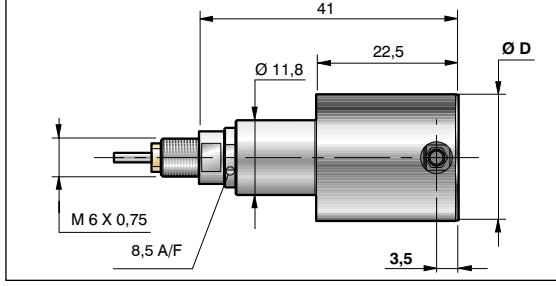
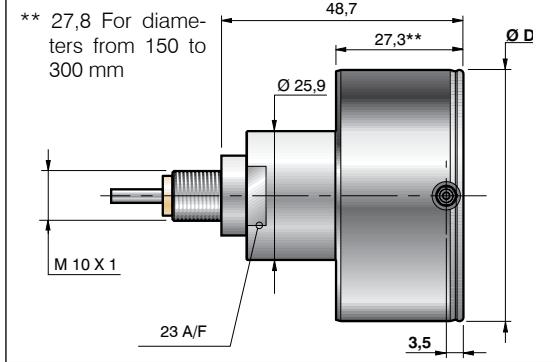
## MEASURING CONTACTS FOR PLUG HEADS TYPE SB

<b>Ø D</b>	CARBIDE OR DLC - COATED		DIAMOND	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
3 ÷ <5,5	0,25	0,75	-	-
5,5 ÷ <7,5	0,5	1	-	-
7,5 ÷ <9,5	1,5	2,5	-	-

## MEASURING CONTACTS FOR PLUG HEADS TYPE T

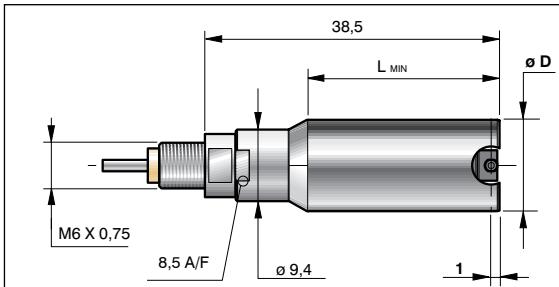
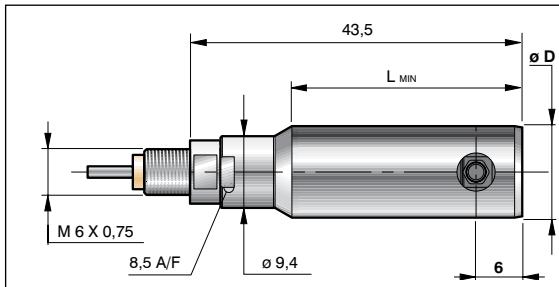
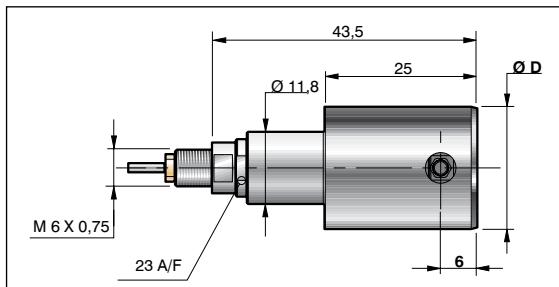
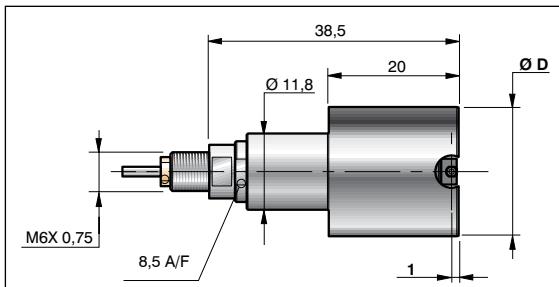
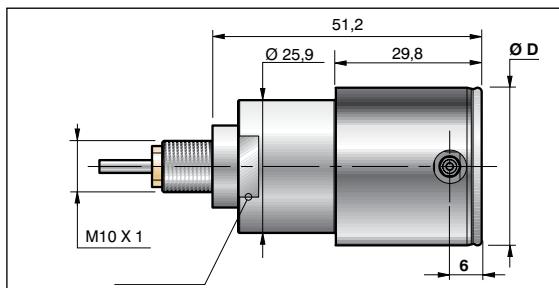
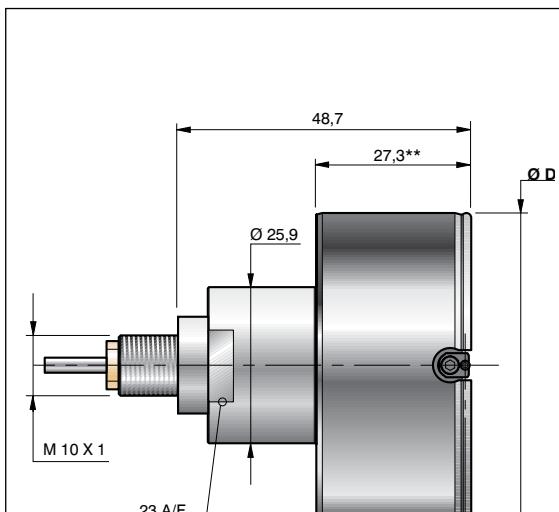
<b>Ø D</b>	CARBIDE OR DLC - COATED		DIAMOND	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
4,5 ÷ <5,5	0,25	0,75	-	-
5,5 ÷ <7,5	0,5	1	-	-
7,5 ÷ <9,5	1,5	2,5	0,75	-

# DIMENSIONAL SPECIFICATIONS OF STANDARD VERSIONS

PLUG HEAD MBG-B		PLUG HEAD MBG-BC	
<b><math>\varnothing_{min} * 9,5 \text{ to } &lt; 15</math></b>			N.A.
<b><math>\varnothing_{min} * 15 \text{ to } &lt; 20</math></b>			N.A.
<b><math>\varnothing_{min} * 20 \text{ to } &lt; 26</math></b>			
<b><math>\varnothing_{min} * 26 \text{ to } &lt; 300</math></b>			N.A.

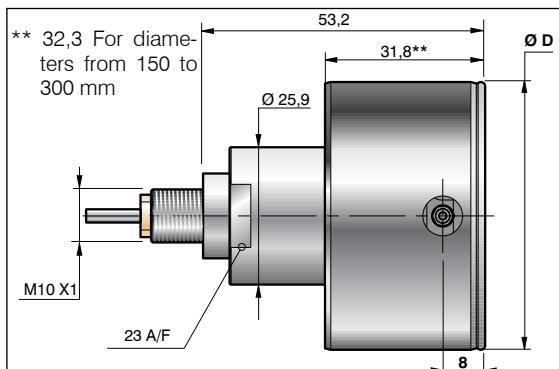
\* Ømin = minimum bore diameter

MEASURING CONTACTS FOR PLUG HEADS TYPE B				
$\varnothing D$	CARBIDE OR DLC - COATED		DIAMOND	
	R1	R2	R1	R2
9,5 ÷ <15	2	3,5	0,75	-
15 ÷ <16	2	5	0,75	-
16 ÷ <20	2	5	2	-
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <300	4	10	4	10

**PLUG HEAD MBG-SB****PLUG HEAD MBG-T** **$\varnothing_{min} * 9,5 \text{ to } < 15$**  **$\varnothing_{min} * 15 \text{ to } < 26$**  **$\varnothing_{min} * 26 \text{ to } < 40$** 

\*\* 27,8 For diameters from 150 to 300 mm

\* Ømin = minimum bore diameter

 **$\varnothing_{min} * 40 \text{ to } < 300$** 

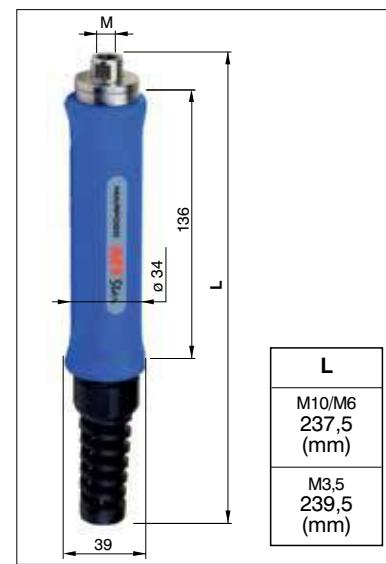
MEASURING CONTACTS FOR PLUG HEADS TYPE SB				
<b>Ø D</b>	CARBIDE OR DLC - COATED		DIAMOND	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
9,5 ÷ <15	2	3,5	-	-
15 ÷ <26	2	5	-	-
-	-	-	-	-
26 ÷ <300	4	10	-	-

MEASURING CONTACTS FOR PLUG HEADS TYPE T				
<b>Ø D</b>	CARBIDE OR DLC - COATED		DIAMANT	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
9,5 ÷ <15	2	3,5	0,75	-
15 ÷ <16	2	5	0,75	-
16 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	5
32 ÷ <300	4	10	4	10

# STANDARD HANDLES

## PENCIL PROBE HANDLES

Thread M	Type	ORDER CODE
M3,5	Without Pencil Probe - 8 mm h6 Clamping Diameter	2TPL300000
	With RedCrown LVDT $\pm 1$ mm, cable length L=2 m, Lumberg SV50/6 connector	2TPL3F2000
	With RedCrown HBT $\pm 1$ mm, cable length L=2 m, Lumberg SV50/6 connector	2TPL3H2000
M6	Without Pencil Probe - 8 mm h6 Clamping Diameter	2TPL600000
	With RedCrown LVDT $\pm 1$ mm, cable length L=2 m, Lumberg SV50/6 connector	2TPL6F2000
	With RedCrown HBT $\pm 1$ mm, cable length L=2 m, Lumberg SV50/6 connector	2TPL6H2000
M10	Without Pencil Probe - 8 mm h6 Clamping Diameter	2TPLA00000
	With RedCrown LVDT $\pm 1$ mm, cable length L=2 m, Lumberg SV50/6 connector	2TPLAF2000
	With RedCrown HBT $\pm 1$ mm, cable length L=2 m, Lumberg SV50/6 connector	2TPLAH2000

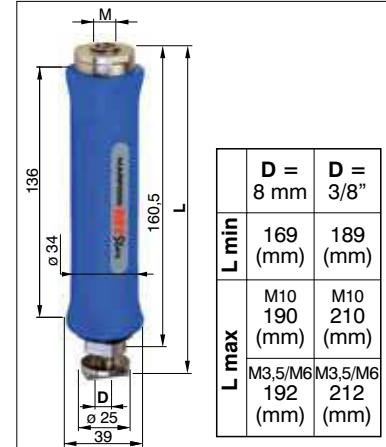


A full range of pencil probe handles is available on request, such as for example:

- handle with 3/8" clamping diameter
- RedCrown probe with cable length L=4 m or 5 m
- RedCrown probe with Lumberg S3
- RedCrown unplugged probe compatible to amplifiers of other manufacturers (Air-Gage, Hommel/Etamic, Mahr Federal, Metrel, Metem, Mercer, Mitutoyo, Tesa, etc

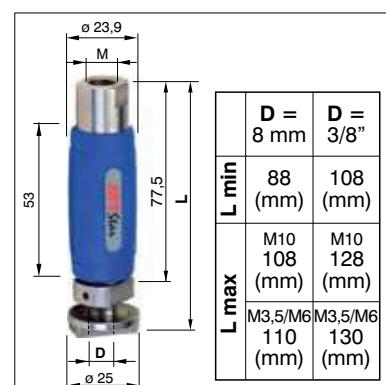
## INDICATOR HANDLE

Thread M	CLAMPING DIAMETER	ORDER CODE
M3,5	8 mm h6	2TCL3S0000
	3/8"	2TCL4S0000
M6	8 mm h6	2TCL6S0000
	3/8"	2TCL7S0000
M10	8 mm h6	2TCLAS0000
	3/8"	2TCLBS0000



## MINI INDICATOR HANDLE

Thread M	CLAMPING DIAMETER	ORDER CODE
M3,5	8 mm h6	2TCS3S0000
	3/8"	2TCS4S0000
M6	8 mm h6	2TCS6S0000
	3/8"	2TCS7S0000
M10	8 mm h6	2TCSAS0000
	3/8"	2TCSBS0000



## HOOKS

Hooks to hang up the M1 Star MBG bore gauges are available in two styles, for all handle types as shown (see the figures).

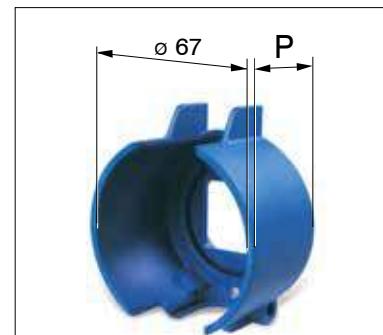
DESCRIPTION	ORDER CODE
Eye hook for pencil probe handle	1T0JHS0810
T-shaped hook for pencil probe handle	1T0JHS0811
Eye hook for indicator handle	1T0JHS0812



## INDICATOR PROTECTIVE SHELLS

Protective shells guarantee the indicator from accidental damages caused by dropping or side impact, etc.

DESCRIPTION	DEPTH (P)	ORDER CODE
Protective shell for mechanical Indicator	39 mm	2T0DIPS001
Protective shell for digital Indicator	52 mm	2T0DIPS000



## PROTECTIVE DOME FOR QUICK-DIGIT

DESCRIPTION	ORDER CODE
Protective dome for the upper lifting rod of Quick Digit indicator	2T0DIC000



## STANDS

Used on the bench, these stands position the gauge in a vertical or horizontal attitude, allowing the workpiece to be referenced or located on the plug.

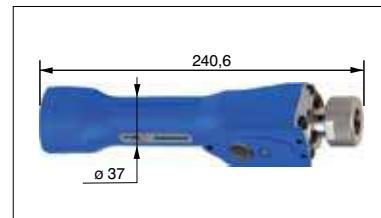
DESCRIPTION	ORDER CODE
Adjustable base for MBG	2TS0000001
Standard base for MBG	2TS0000002



## HANDLES WITH WIRELESS TRANSMISSION

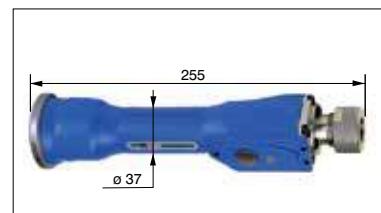
### i-WAVE HANDLE WITH ALKALINE BATTERIES

DESCRIPTION	ORDER CODE
i-Wave handle with alkaline batteries (one adapter for plug heads with M6 and M10 thread is included in the supply)	3TJ0SFB000



### i-WAVE HANDLE WITH LI-ION BATTERIES

DESCRIPTION	ORDER CODE
i-Wave handle with Li-Ion inductive batteries (one adapter for plug heads with M6 and M10 thread is included in the supply)	3TJ0SFI000



### "CLIP ON" MANUAL CHARGER

DESCRIPTION	ORDER CODE
"Clip On" manual charger for i-Wave handle with Li-Ion batteries (the power supply unit is included in the supply)	2T0IRMS000



### STAND CHARGER WITH PLUG SUPPORT

DESCRIPTION	ORDER CODE
Stand with battery charger for i-Wave handle with Li-Ion batteries	2T0IRBS001
Power supply unit for one stand with battery charger	2T0IRCS000
Power supply unit and junction box for up to four stands with charger	2T0IRSS004



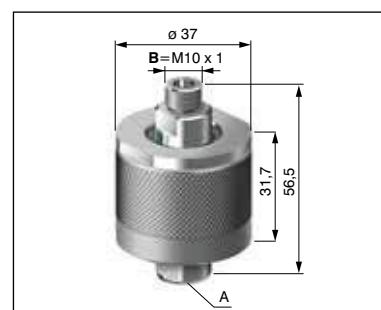
## OTHER ACCESSORIES

### ROTARY SPACERS

The rotary spacers make it possible to have the indicator dial always facing the operator, even during dynamic measurements.

PLUG GAUGE THREAD A <sup>(1)</sup>	ORDER CODE
M6X0,75	2TR060S000
M10X1	2TR100S000

(1)NOTE: Thread **A**: plug gauge-side thread - Thread **B**: handle-side thread

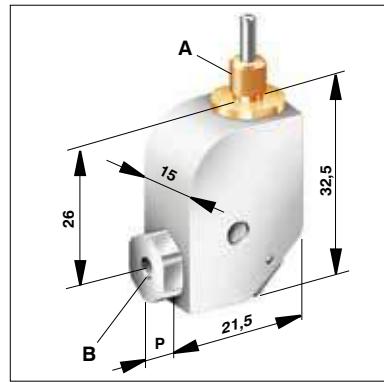


## ANGLE ADAPTORS

The angle adaptors are needed when space is limited and the position of the bore is a 90° to the direction of insertion.

THREAD B <sup>(1)</sup>	THREAD A <sup>(1)</sup>	P (mm)	ORDER CODE
M3,5 X 0,35	M6 X 0,75	3,7	2TAS630000
M6 X 0,75		4,2	2TAS660000
M10 X 1		13,1	2TAS6A0000
M3,5 X 0,35	M10 X 1	3,7	2TASA30000
M6 X 0,75		4,2	2TASA60000
M10 X 1		13,1	2TASAA0000

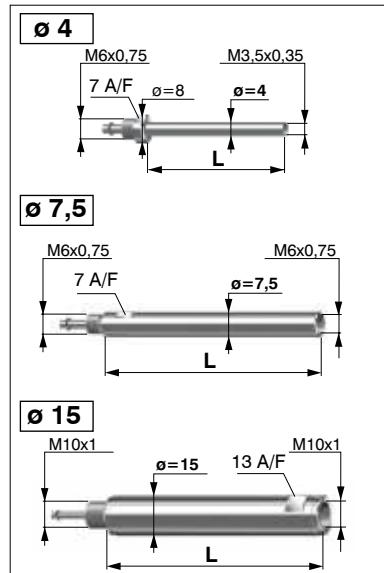
(1)NOTE: Thread **A**: handle-side thread - Thread **B**: plug gauge-side thread



## DEPTH EXTENSIONS

The extensions make it possible to reach the deeper measuring positions, when inserted between the plug head and the handle:

LENGTH	ORDER CODE		
	Ø 4 (mm)	Ø 7,5 (mm)	Ø 15 (mm)
20	2TXMS40020	2TXMS70020	-
30	2TXMS40030	2TXMS70030	-
40	2TXMS40040	2TXMS70040	-
50	2TXMS40050	2TXMS70050	2TXMSF0050
65	2TXMS40065	2TXMS70065	2TXMSF0065
80	2TXMS40080	2TXMS70080	2TXMSF0080
100	2TXMS40100	2TXMS70100	2TXMSF0100
125	2TXMS40125	2TXMS70125	2TXMSF0125
250	-	2TXMS70250	2TXMSF0250
500	-	-	2TXMSF0500



## SPECIAL DEPTH EXTENSIONS

For special applications and used where the extension diameter must not exceed the plug head size:

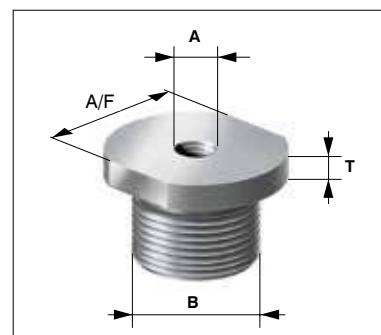
Ø (mm)	L (mm)	ORDER CODE	
3,8	20	2TXMS30020	
	65	2TXMS30065	
4,8	65	2TXMS50065	
	80	2TXMS50080	
5,3	65	2TXMS60065	
	80	2TXMS60080	
8	65	2TXMS80065	
	80	2TXMS80080	
	100	2TXMS80100	
	125	2TXMS80125	

## THREAD ADAPTORS

Thread adaptors improve applications capability and interchangeability of the accessories.

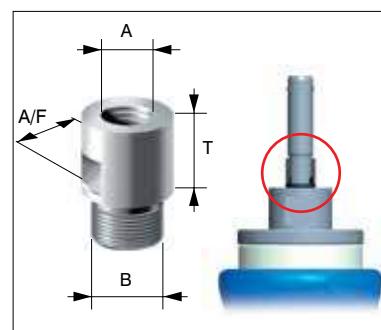
### Standard thread adaptors:

RANGE	THREAD A <sup>(1)</sup>	THREAD B <sup>(1)</sup>	A/F	T (mm)	ORDER CODE
3 - 9,5	M3,5X0,35	M6X0,75	7	1	1TA0350600
3 - 9,5	M3,5X0,35	M10X1	13	2	1TA0351000
9,5 - 26	M6X0,75	M10X1	13	2	1TA0601000



### Protective thread adaptors (for plug heads with M3,5x0,35 thread)

RANGE	THREAD A <sup>(1)</sup>	THREAD B <sup>(1)</sup>	A/F	T (mm)	ORDER CODE
3 - 4	M3,5X0,35	M6X0,75	6	6	1TAP350600
4 - 4,5			6	6	1TAP350601
4,5 - 5,5			6	6	1TAP350602
5,5 - 7,5			6	6	1TAP350603
7,5 - 9,5			9	9	1TAP350604



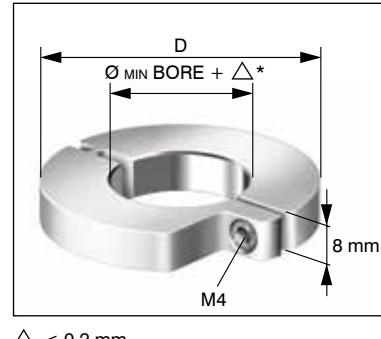
(1)NOTE: Thread **A**: plug head-side thread - Thread **B**: handle-side thread - The dimension **T** is designed according to the required measuring depth.

## DEPTH STOPS

The depth stops are used to accurately define the position of the measuring section and can be placed at a specific position on either the nosepiece or depth extension.

### DEPTH STOPS FOR NOSEPIECE

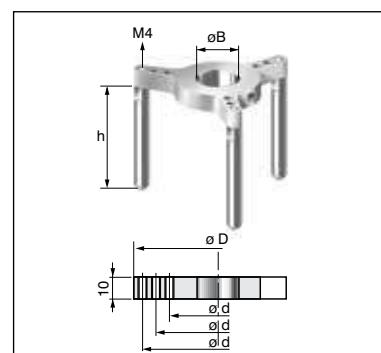
ø min Bore (mm) (inch)	ø D (mm) (inch)	ø min Bore (mm) (inch)	ø D (mm) (inch)
8 < 11 (0.3150" < 0.4331")	33 (1.29")	40 < 45 (1.5748" < 1.7716")	71 (2.79")
11 < 15 (0.4331" < 0.5905")	37 (1.45")	45 < 50 (1.7716" < 1.9685")	76 (2.99")
15 < 20 (0.5905" < 0.7874")	42 (1.77")	50 < 60 (1.9685" < 2.3622")	86 (3.38")
20 < 25 (0.7874" < 0.9842")	51 (2.00")	60 < 70 (2.3622" < 2.7559")	96 (3.77")
25 < 30 (0.9842" < 1.1811")	56 (2.20")	70 < 80 (2.7559" < 3.1496")	106 (4.17")
30 < 35 (1.1811" < 1.378")	61 (2.40")	80 < 90 (3.1496" < 3.5433")	116 (4.56")
35 < 40 (1.378" < 1.5748")	66 (2.59")	90 ≤ 100 (3.5433" ≤ 3.937")	126 (4.96")



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### DEPTH STOPS FOR EXTENSION

Ø B (mm)	Ø D (mm)	h (mm)	ø d (mm)				ORDER CODE
4	32	32,8	26				2TDEM040A0
7,5	42	34,8	36				2TDEM075A0
15	45	45	38				2TDEM150A0
			44	56	68		2TDEM150B0
			79	91	103		2TDEM150C0
			117	129	141	153	2TDEM150D0
			177	189	201	213	2TDEM150E0





iWave



#### WIRELESS INTERFACE HANDLE

I-Wave™ is an innovative interface handle featuring *Bluetooth®* transmission technology, which allows mechanical gauges to be interfaced wireless to various

electronic displays.

Any mechanical gauge head with M10, M6 or M3,5 thread can be mounted very quickly by means of an adapter. By simply pressing the button on top of the handle, the measured value is displayed in real time on the electronic unit.

#### MAIN CHARACTERISTICS

- The robust and reliable Star-Lock system allows gauge head changeover in just few seconds, without need of any tool.
- Wireless offers following advantages: No cable entanglement or breaks, ergonomic operations, measuring directly at the machine.
- The i-Wave handle contains the *Bluetooth®* transmitter and power supply batteries. It is available with standard "C" alkaline or Li-Ion inductive rechargeable batteries, allowing approx. 220 or 40 hours continuous working time respectively.
- The i-Wave guarantees excellent repeatability of 1 micron or .000040 inch.
- Thanks to IP67 protection rating it can be used even in severe shop floor environments.
- The measurement value is transmitted at a distance of up to 10m to the associated electronic display unit. This is done even in the manufacturing environment in a safe and reliable way.

### ELECTRONIC INTERFACES

The i-Wave communicates wirelessly to *Bluetooth®* enabled MARPOSS electronic displays and measurement units, such as: Merlin, Merlin Mobile, E9066 and E4N Wave. Communication software, developed by MARPOSS, is also available to allow connection of the i-Wave to commercial computers.



The *Bluetooth®* word mark and logos are owned by the *Bluetooth®* SIG Inc. and any use of such marks by Marposs is under license. Other trademarks and trade names are those of their respective owners.

## TECHNICAL SPECIFICATION OF THE i-WAVE HANDLE

BATTERIES		PROTECT. DEGREE	COMMUNIC. DISTANCE	WEIGHT
TYPE	MIN. DURATION			
Alkaline Type "C"	220 hours*	IP67	Bluetooth® Class 2 (10m)	540g
Inductive Li-Ion**	40 hours*			

\* The duration of the batteries can be further increased up to several months in normal operating conditions by means of the programmable auto-shutdown option (Power Safe mode).

\*\*For a full charge of the battery 5 to 6 hours are required. 2 hours are enough to reach 80% of the full charge.

	DESCRIPTION	ORDER CODE
	i-Wave Handle with alkaline batteries (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	3TJ0SFB000
	i-Wave Handle with Li-Ion inductive batteries (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	3TJ0SFI000
	"Clip On" manual charger for i-Wave handle with Li-Ion batteries (the power supply unit is included in the supply)	2T0IRMS000
	Stand with battery charger for i-Wave handle with Li-Ion batteries	2T0IRBS001
	Power supply unit for one stand with battery charger	2T0IRCS000
	Power supply unit and junction box for up to four stands with charger	2T0IRSS004

(\*) Adapters for gauge heads with thread M3,5 or from other manufacturers are available on request.

## BATTERY CHARGER APPLICATION EXAMPLES



"Clip on" charger



Charging station



**M1 Star**  
Electronic Bore Gauge



## ELECTRONIC BORE GAUGE

M1 Star is an innovative line of manual gauges for measuring the diameters of bores.

Thanks to the application experience Marposs gained through the M1 Electron, a product that boasts an extremely extensive diffusion, with more than 100,000 units present in all sorts of industrial environments, the M1 Star EBG (Electronic Bore Gauge) is the ideal manual electronic gauge for measuring the diameter, ovality and cylindricity of bores, wherever a high-precision performance is required.

## MAIN CHARACTERISTICS

### • Application range

Diameters from 3 to 375 mm, with a measurement section depth up to 500 mm.

### • Accuracy

Marposs' completely friction-free measurement reading system ensures repeatability within 0.5 microns, constant over the entire application range. Each plug is delivered with a certificate of individual testing of the product.

### • Electrical compatibility

The EBG plug heads are available with Marposs standard

LVDT or HBT transducer. The compatibility to third party electronic units is obtained by means of special cables.

### • Versatility of application

The connection between plug head and cable is made with a connector allowing quick replacement of the plug head itself. The extensive linearity range of the transducers used in the M1 Star EBG requires only one zero-setting ring.

### • Sturdiness and resistance to environmental factors

The M1 Star EBG has been designed to be used in the harshest production environments. Guaranteed IP67 protection (waterproof, dirt and dust sealed) with excellent resistance to impacts and accidental falls, plus replaceable tear resistant cable make the EBG sturdy and reliable, thus reducing maintenance costs and down times to a minimum.

### • Supply conditions

The most advanced engineering and production processes allow Marposs to offer the EBG with extremely competitive pricing and fast delivery times. The M1 Star EBG is also available for customized OEM supplies.

## TECHNICAL SPECIFICATIONS

DESCRIPTION	WORKING RANGE					
STANDARD MEASURING RANGE FOR TYPE B AND T (mm)	<b>Ø 3 - 8</b>		<b>Ø 8 - 13</b>	<b>Ø 13 - 26</b>	<b>Ø 26 - 50</b>	<b>Ø 50 - 150</b>
	0,050		0,060	0,060	0,070	0,070
EXTENDED MEASURING RANGE FOR TYPE B AND T (mm)	<b>Ø 3 - 6</b>	<b>Ø 6 - 8</b>	<b>Ø 8 - 13</b>	<b>Ø 13 - 26</b>	<b>Ø 26 - 38</b>	<b>Ø 38 - 150</b>
	0,050 - 0,070	0,050 - 0,100	0,060 - 0,150	0,060 - 0,200	0,070 - 0,200	0,070 - 0,350
STANDARD MEASURING RANGE FOR TYPE SB (mm)				<b>Ø 13 - 26</b>	<b>Ø 26 - 50</b>	<b>Ø 50 - 150</b>
				0,060	0,070	0,070
REPEATABILITY (2,77 σ) (µm)	<b>≤ 0,5</b>					
THERMAL DRIFT (µm/°C)	<b>≤ 0,3</b>					

THE WORKING RANGE CAN BE FURTHER EXTENDED, ON REQUEST, THROUGH A DEDICATED DESIGN OF THE BORE GAUGE



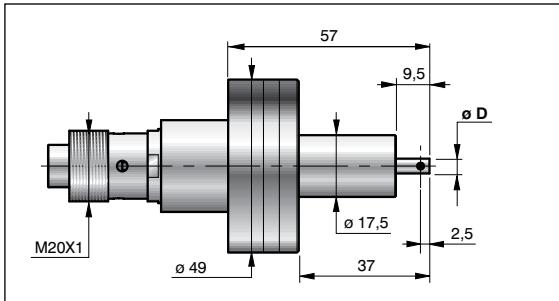
## M1 STAR EBG ELECTRONIC BORE GAUGE

- 1 NOSEPIECE:** it is the guiding element ensuring that operator's ability does not affect the measurement result.
- 2 MEASURING CONTACTS:** they are available in various radii and materials (carbide, diamond and DLC), depending on the type of part to be measured.
- 3 MEASURING ARMSET:** this element is composed, depending on the measuring range, of two or four fingers with a fulcrum. The built-in LVDT or HBT transducer is extremely precise, reliable and durable (IP67 waterproof, frictionless) and mechanically transduces the acquired measurement into an electrical signal proportional to the movement.
- 4 SIGNAL-PROCESSING ELECTRONIC UNIT:** the embedded electronic circuit allows to perform a fine adjustment of the sensitivity and is totally protected (IP67 protection degree).
- 5 CONNECTOR:** it connects the plug head to the cable, making retooling a simple operation and reducing the cost for repairs.
- 6 HANDLE:** The ergonomic design and the antislip surface allow a safe handling of the bore gauge. Under the product label a plate is available, on which any information required by the customer can be marked.
- 7 CABLE EXTENSION:** It is a special reinforced cable ( $\varnothing$  4,7 mm) specifically developed for use in manual gauges, with considerably reduces the risk of damage and unintended torsion. It complies with EMC Standards for manual gauges.
- 8 CONNECTION TO ELECTRONIC DISPLAY UNIT:** for connection to electronic display units the EBG is supplied with a Lumberg type SV50/6 or S3. Extensions with dedicated connectors can be supplied, making it possible to achieve compatibility with many of the electronic display units available on the market.

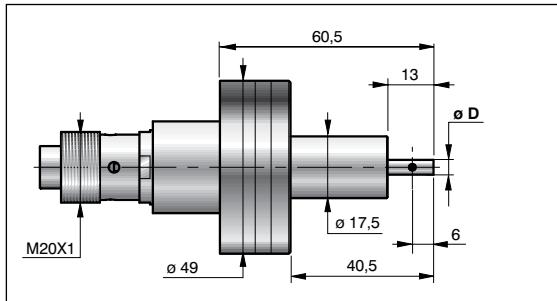


# DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES

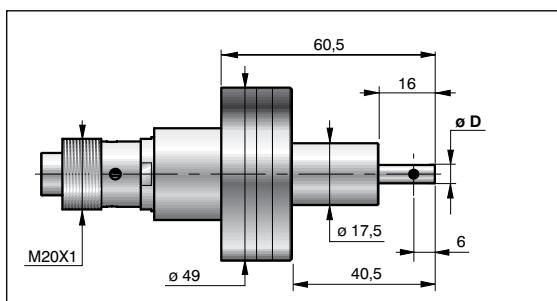
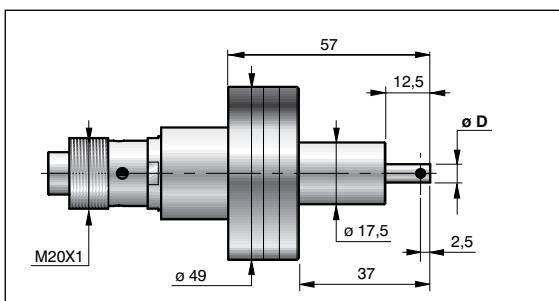
**PLUG HEAD EBG-B**



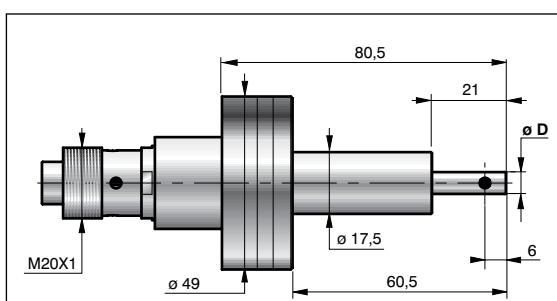
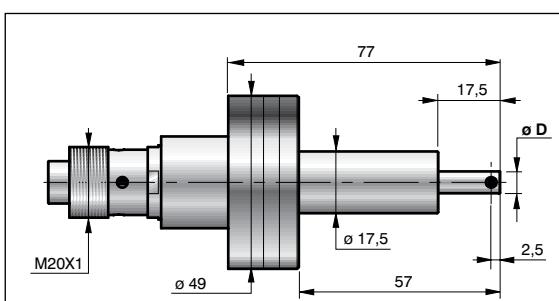
**PLUG HEAD EBG-T**



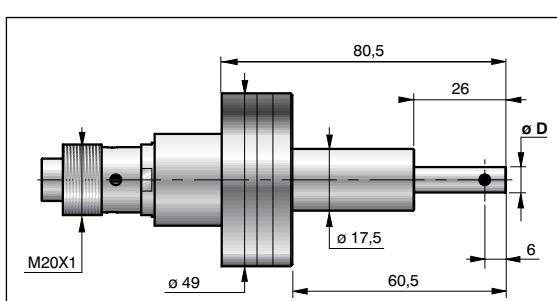
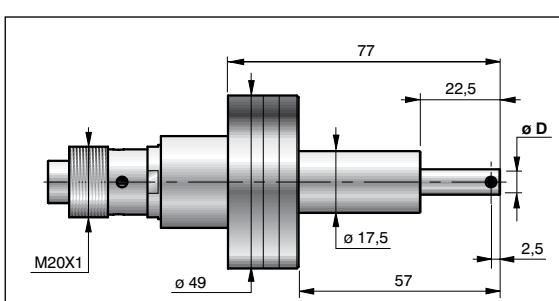
$\varnothing_{min} * 3 \div < 4$



$\varnothing_{min} * 4 \div < 5$



$\varnothing_{min} * 5 \div < 6$



$\varnothing_{min} * 6 \div < 7$

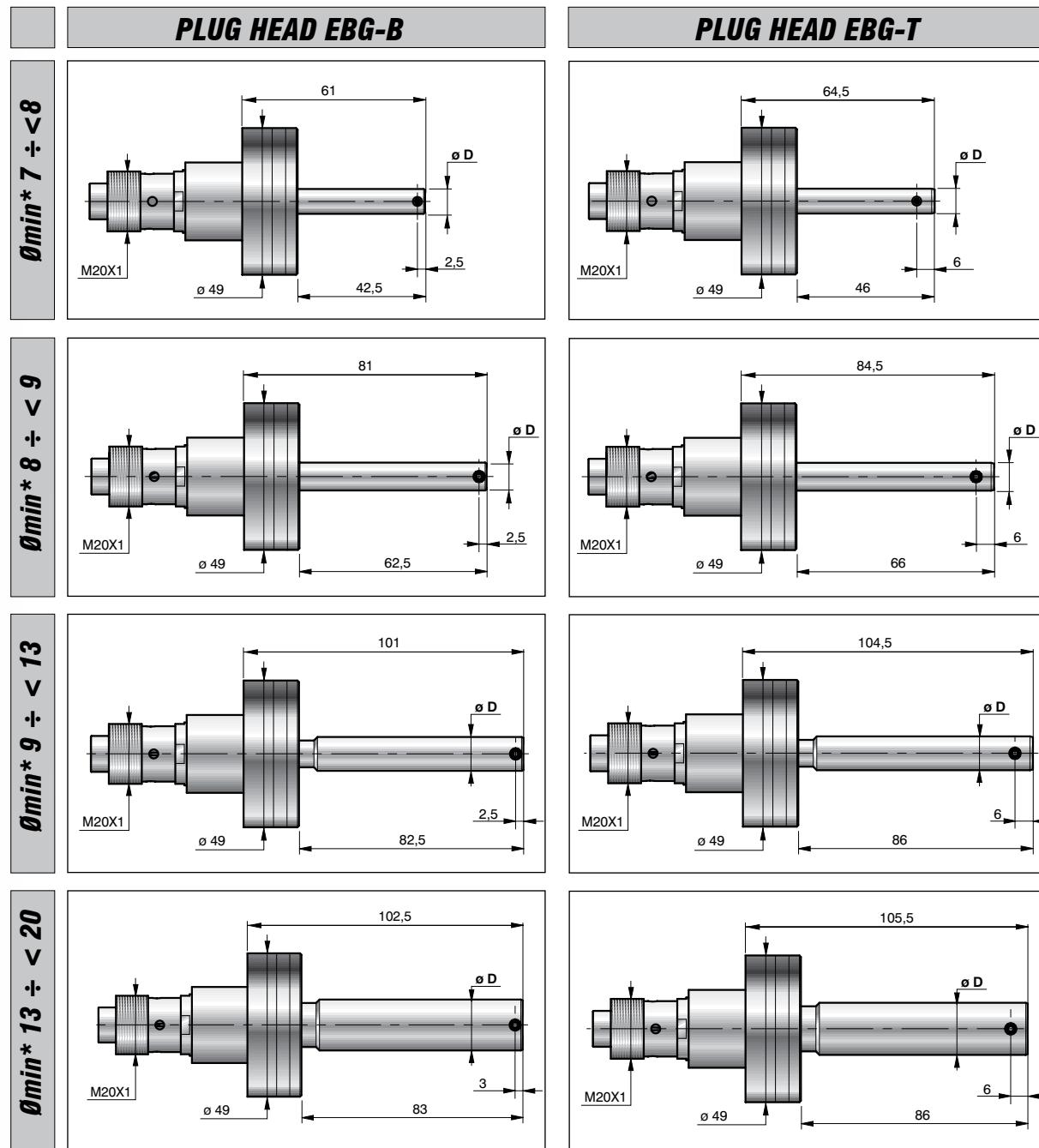
\*  $\varnothing_{min}$  = minimum bore diameter

CONTACTS FOR B-TYPE PLUG HEADS

$\varnothing D$	CARBIDE OR DLC		DIAMOND	
	R1	R2	R1	R2
$3 \div < 6$	0,25	-	-	-
$6 \div < 7$	0,5	1	-	-

CONTACTS FOR T-TYPE PLUG HEADS

$\varnothing D$	CARBIDE OR DLC		DIAMOND	
	R1	R2	R1	R2
$3 \div < 6$	0,25	-	-	-
$6 \div < 7$	0,5	1	-	-

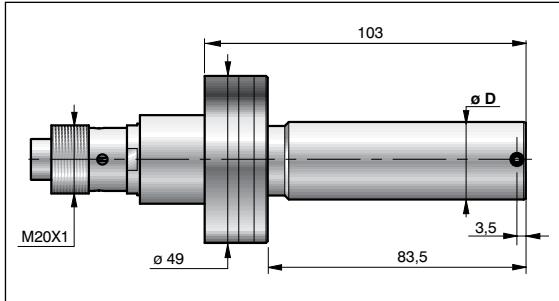
**DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES**

CONTACTS FOR B-TYPE PLUG HEADS				
$\varnothing D$	CARBIDE OR DLC		DIAMOND	
	R1	R2	R1	R2
7 $\div$ < 8	0,5	1	0,4	-
8 $\div$ < 10,5	1,5	2,5	0,4	-
10,5 $\div$ < 13	1,5	2,5	0,75	-
13 $\div$ < 20	2	5	2	5

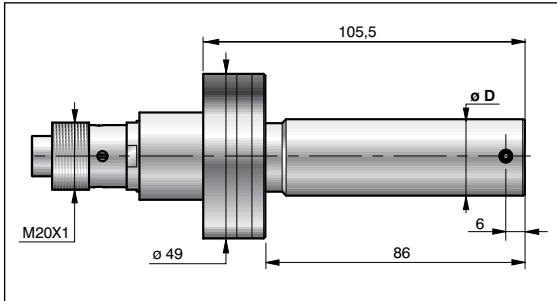
CONTACTS FOR T-TYPE PLUG HEADS				
$\varnothing D$	CARBIDE OR DLC		DIAMOND	
	R1	R2	R1	R2
7 $\div$ < 8	0,5	1	0,4	-
8 $\div$ < 10,5	1,5	2,5	0,4	-
10,5 $\div$ < 13	1,5	2,5	0,75	-
13 $\div$ < 20	2	5	2	5

## DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES

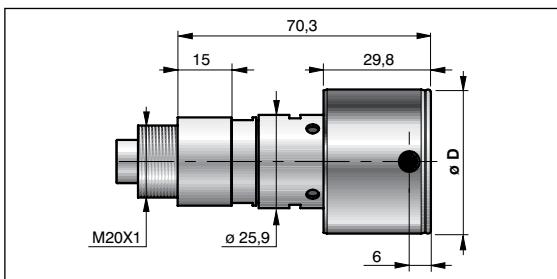
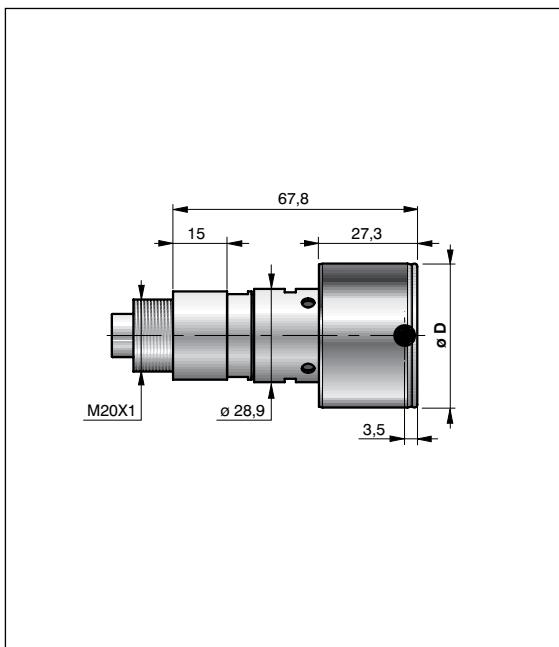
**PLUG HEAD EBG-B**



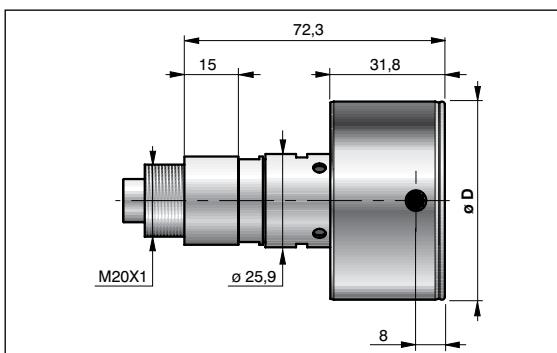
**PLUG HEAD EBG-T**



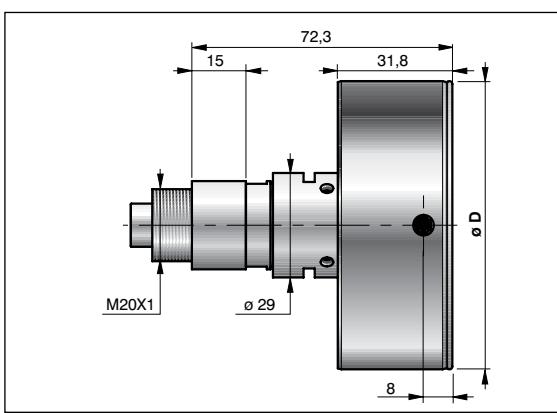
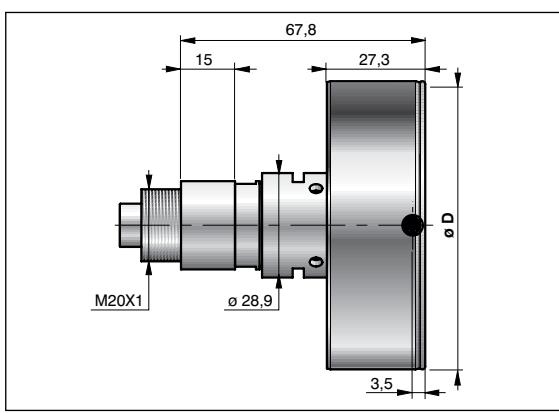
**$\varnothing_{min} * 20 \div < 26$**



**$\varnothing_{min} * 26 \div < 40$**



**$\varnothing_{min} * 40 \div < 74$**



**$\varnothing_{min} * 74 \div < 375$**

\* Ømin = minimum bore diameter

"T" handles available from Ø>200mm

**CONTACTS FOR B-TYPE PLUG HEADS**

<b>ø D</b>	CARBIDE OR DLC		DIAMOND	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <375	4	10	4	10

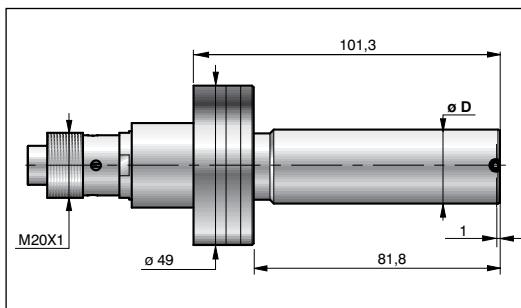
**CONTACTS FOR T-TYPE PLUG HEADS**

<b>ø D</b>	CARBIDE OR DLC		DIAMOND	
	<b>R1</b>	<b>R2</b>	<b>R1</b>	<b>R2</b>
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <375	4	10	4	10

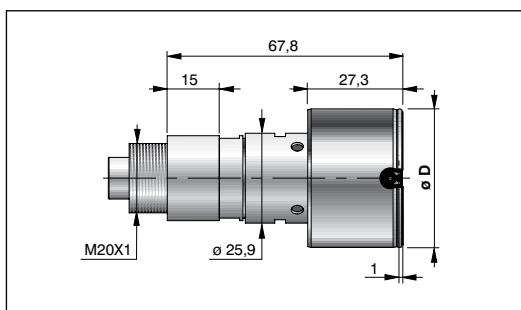
## DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG HEADS

### PLUG HEAD EBG-SB

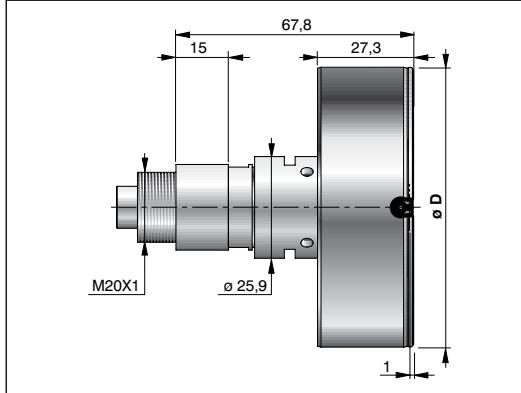
**$\varnothing_{min} * 13 \div < 26$**



**$\varnothing_{min} * 26 \div < 74$**



**$\varnothing_{min} * 74 \div < 375$**



\* Ømin = minimum bore diameter

"T" handles available from Ø>200mm

CONTACTS FOR SB-TYPE PLUG HEADS					
Ø D	CARBIDE OR DLC		DIAMOND		
	R1	R2	R1	R2	
13 ÷ < 26	2	5	-	-	
26 ÷ < 375	4	10	-	-	

## STANDARD HANDLES

### HANDLE FOR BORE GAUGE WITH CABLE

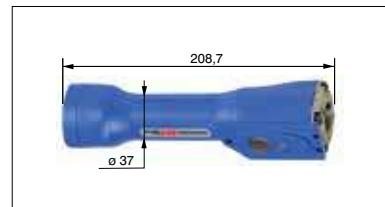
DESCRIPTION	ORDER CODE
Handle without cable	2THS000000
Cable 2 mt LVDT - connector SV50/6	2TG0000026
Cable 3,5 mt LVDT - connector SV50/6	2TG0000356
Cable 5 mt LVDT - connector SV50/6	2TG0000056
Cable 2 mt LVDT - connector S3	2TG0000023
Cable 2 mt TESA COMPATIBLE - connector SV50/6	2TG000TS026
Cable 2 mt HBT - connector SV50/6	2TG0001026
Cable 3,5 mt HBT - connector SV50/6	2TG0001356
Cable 5 mt HBT - connector SV50/6	2TG0001056



## HANDLES WITH WIRELESS TRANSMISSION

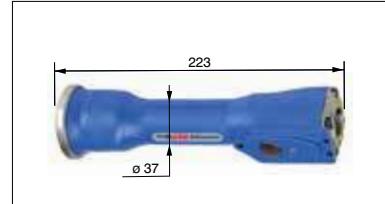
### WAVE HANDLE WITH ALKALINE BATTERIES

DESCRIPTION	ORDER CODE
Wave handle with alkaline batteries	2TW0SFB000



### WAVE HANDLE WITH LI-ION INDUCTIVE BATTERIES

DESCRIPTION	ORDER CODE
Wave handle with Li-Ion inductive batteries	2TW0SFI000



## ACCESSORIES

### MECHANICAL INTERFACE FOR PLUG HEAD

DESCRIPTION	ORDER CODE
Interface adapter to fix EBG plug heads to Wave handle	2TIESF0000



### "CLIP ON" MANUAL CHARGER

DESCRIPTION	ORDER CODE
"Clip On" manual charger for Wave handle with Li-Ion batteries (the power supply unit is included in the supply)	2TOIRMS000



### STAND CHARGER WITH PLUG SUPPORT

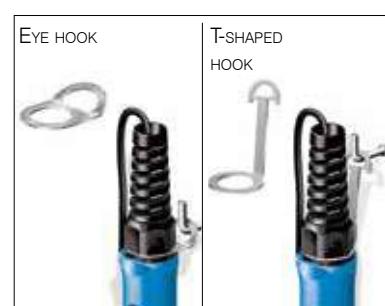
DESCRIPTION	ORDER CODE
Stand with battery charger for Wave handle with Li-Ion batteries	2TOIRBS001
Power supply unit for one stand with battery charger	2TOIRCS000
Power supply unit and junction box for up to four stands with charger	2TOIRSS004



### HOOKS

Hooks to hang up the M1 Star EBG bore gauges are available in two styles, as shown (see the figures).

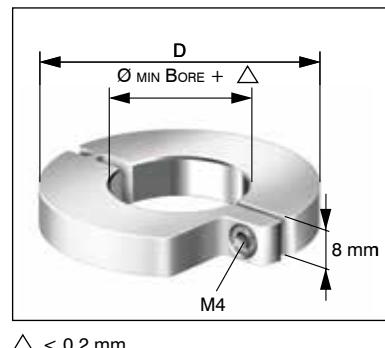
DESCRIPTION	ORDER CODE
Eye hook for handle with cable	1TOJHS0810
T-shaped hook for handle with cable	1TOJHS0811



## DEPTH STOPS FOR NOSEPIECE

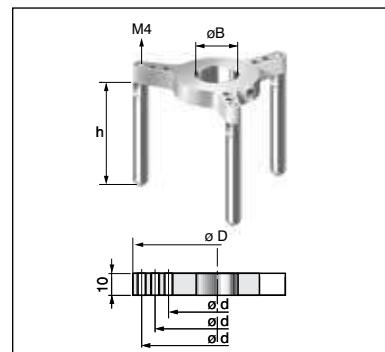
$\phi$ min Bore (mm)	$\phi$ D (mm)
8 ≤ $\phi$ < 11	33
11 ≤ $\phi$ < 15	37
15 ≤ $\phi$ < 20	42
20 ≤ $\phi$ < 25	51
25 ≤ $\phi$ < 30	56
30 ≤ $\phi$ < 35	61
35 ≤ $\phi$ < 40	66

$\phi$ min Bore (mm)	$\phi$ D (mm)
40 ≤ $\phi$ < 45	71
45 ≤ $\phi$ < 50	76
50 ≤ $\phi$ < 60	86
60 ≤ $\phi$ < 70	96
70 ≤ $\phi$ < 80	106
80 ≤ $\phi$ < 90	116
90 ≤ $\phi$ ≤ 100	126



## DEPTH STOPS FOR EXTENSION

$\phi$ B (mm)	$\phi$ D (mm)	h (mm)	$\phi$ d (mm)	ORDER CODE
22	45	63,3	38	2TDEE220A0
	75		44	2TDEE220B0
	110		56	2TDEE220C0
	160		68	2TDEE220D0
	220		79	2TDEE220E0
			117 129 141 153	
			177 189 201 213	



## EXTENSIONS

The stainless steel extensions, when inserted between the plug head and the handle, make it possible to reach the correct position in a bore, where the measurement must be read. The following codes can be ordered:

DIAMETER RANGE (mm)	L (mm)	ORDER CODE
26÷375	20	1TX0S00020
	30	1TX0S00030
	40	1TX0S00040
	50	1TX0S00050
	65	1TX0S00065
	80	1TX0S00080
	100	1TX0S00100
	125	1TX0S00125
	250	1TX0S00250
	500	1TX0S00500



## STAND

Used on the bench, this stand positions the gauge in vertical or horizontal position, or at any angle between -45° and +45° from vertical, allowing the workpiece to be referenced or located on the plug. With 1 or 2 extra plug support kit, it is possible to install up to 2 or 3 gauges on the same stand.

DESCRIPTION	ORDER CODE
Multiposition Stand for EBG and MBG	2TS0001111
Extra plug support kit for stand 2TS0001111	2TS0002222





# M1 Wave



## WIRELESS BORE GAUGE

M1 Wave™ is an innovative bore gauge featuring Bluetooth® transmission technology, which offers maximum flexibility and operating freedom while the measurements are performed. Wireless offers following advantages: No

cable entanglement or breaks, ergonomic operations, measuring directly at the machine.

M1 Wave is composed of a standard EBG (Electronic Bore Gauge) plug head with built-in transducer and of a handle containing the Bluetooth® transmitter and the power supply batteries. It is avail-

able with standard "C" alkaline or Li-Ion inductive rechargeable batteries, allowing approx. 220 or 40 hours continuous working time respectively.

By simply replacing the plug head, the M1 Wave can be easily retooled to measure different diameters.

By simply pressing the button on top of the handle, the bore gauge can communicate in real time with the electronic display, showing the measured value. With the same button it is possible to acquire data in order to perform statistical operations, and to control advanced cycles or guided sequences. The IP67 protection rating of the entire M1 WAVE bore gauge guarantees reliability of the device when used in severe shop floor environments.

Due to the absence of mechanical transmission errors, the M1 WAVE guarantees excellent repeatability of 0,5 micron or .000020 inch.

The measurement value is transmitted at a distance of up to 10m to the associated electronic display unit. This is done even in the manufacturing environment in a safe and reliable way.

## ELECTRONIC INTERFACES

The M1 WAVE communicates wirelessly to Bluetooth® enabled MARPOSS electronic displays and measurement units, such as: Merlin, Merlin Mobile, E9066 and E4N Wave. Communication software, developed by MARPOSS, is also available to allow connection of the M1 Wave to commercial computers.



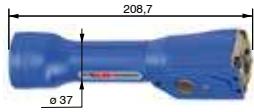
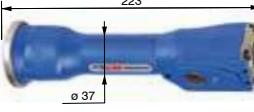
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## TECHNICAL SPECIFICATION OF THE M1 WAVE HANDLE

BATTERIES		PROTECT. DEGREE	COMMUNIC. DISTANCE	WEIGHT
TYPE	MIN. DURATION	IP67	Bluetooth® Class 2 (10m)	540g
Alkaline Type "C"	220 hours*			
Inductive Li-Ion**	40 hours*			

\* The duration of the batteries can be further increased up to several months in normal operating conditions by means of the programmable auto-shutdown option (Power Safe mode).

\*\*For a full charge of the battery 5 to 6 hours are required. 2 hours are enough to reach 80% of the full charge.

	DESCRIPTION	ORDER CODE
	Wave Handle with alkaline batteries	2TW0SFB000
	Wave Handle with Li-Ion inductive batteries	2TW0SFI000
	Interface adapter to fix EBG plug heads to Wave handle	2TIESF0000
	"Clip On" manual charger for Wave handle with Li-Ion batteries (the power supply unit is included in the supply)	2T0IRMS000
	Stand with battery charger for Wave handle with Li-Ion batteries	2T0IRBS001
	Power supply unit for one stand with battery charger	2T0IRCS000
	Power supply unit and junction box for up to four stands with charger	2T0IRSS004

## BATTERY CHARGER APPLICATION EXAMPLES



"Clip on" charger



Charging station