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MANUAL GAUGING
REFERENCE GUIDE

TESTAR
A MARPOSS DIVISION

... 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

TESTAR
A MARPOSS DIVISION

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 accreditated 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 committment 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.

TESTAR MARPOSS

Red Crown 2

…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.

THE PRODUCT LINE

Red Crown 2

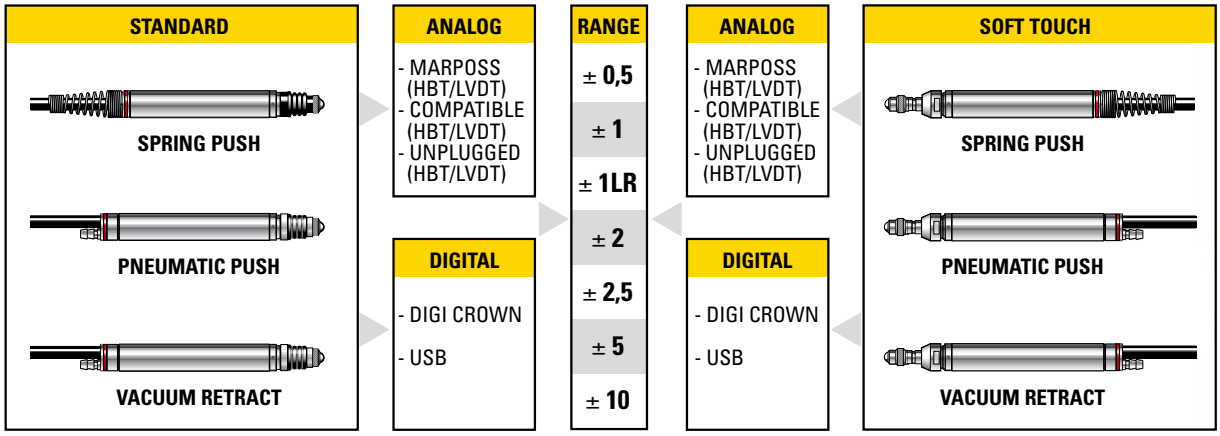
A line of analogue pencil probes, available with **LVDT** and **HBT** circuitry.

Digi Crown 2

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

Red Crown 2 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.



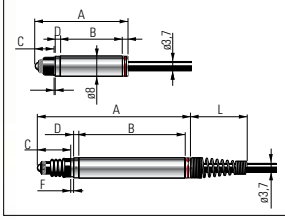
Red Crown2 is a line of pencil probes available in STANDARD (with gaiter –IP65) or SOFT TOUCH (without gaiter –IP54) configuration, with highly precise ball cage movements and various connection options according to the conditioning and display interfaces used.
The analogue version, with LVDT or HBT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

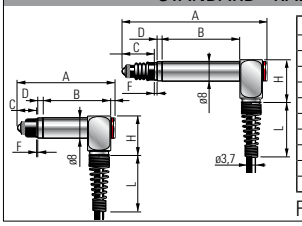
STANDARD - AXIAL - SPRING



	±05	±1	±2LR	±2,5	±5	±10
A	36,20	59,40	106,35	83,35	114,45	162,45
B	24,35	41,25	75,50	61,05	86,60	120,65
C	7,10	12,80	25,30	16,75	22,30	39,45
D	2,00	2,00	2,00	2,00	2,00	2,00
E	2,05	-	-	-	-	-
F	0,70	1,30	1,50	1,50	1,50	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
L	-	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

F= Max. pretravel adj. value

STANDARD - RADIAL- SPRING



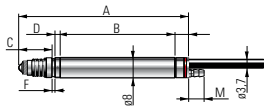
	±05	±1	±2LR	±2,5	±5	±10
A	37,50	57,78	107,85	84,85	115,95	163,95
B	17,20	??	88,58	54,10	79,65	112,50
C	7,10	12,80	25,30	16,75	22,30	39,45
D	2,00	2,00	2,00	2,00	2,00	-
E	1,50	-	-	-	-	-
F	0,70	1,30	1,50	1,50	1,50	-
G	-	-	-	-	-	-
H	15,20	-	15,20	15,20	15,20	15,20
L	-	-	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

F= Max. pretravel adj. value

MECHANICAL SPECIFICATIONS		**±0,5 mm**		**±1 mm**								**±2 mm LongRange**							
Cable (**A**=axial - **R**=radial)		A	R	A	R	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 strenght	(N/mm±15%)	0,17		0,14		0,04		0,023				0,023		0,03		0,02			
Measuring force	(N±25%)	1,00		0,70		0,8÷2,5		0,70				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							≤0,6								≤0,6			
	psi							≤0,9								≤0,9			
Cable length	(m)	2		2								2							
Gasket		Fluoroelast.		Fluoroelastometer								Fluoroelastometer							
Repeatability	(µm)	0,15		0,15								0,15							
Thermal drift	(µm/°C)	0,25		0,25								0,25							
Operating temperature	(°C)	(-10)+(+65)		(-10)+(+65)								(-10)+(+65)							
Storage temperature	(°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		F05	FR05	F10	FR10	FPA10	FP10	FVA10	FV10	-	-	F21	FR21	FPA21	FP21	FVA21	FV21	-	-
ORDER CODE		3PR01L0000	3PR01L1200	3PR02L0000	3PR02L1200	3PR02L0400	3PR02L1600	3PR02L0560	3PR02L1760	-	-	3PR10L0199	3PR10L1399	3PR10L0559	3PR10L1759	3PR10L0599	3PR10L1799	-	-
Sensitivity	(mV/V/mm)	230		230								230							
Accuracy error	(µm)	(**)		± MAX(1+|2*K|;|7*K|)(***)								± MAX(2+|2*K|;|7*K|)(***)							
Calibration spec.		3,5355V RMS with load 1MΩ//360pF/7,5kHz										3,5355V RMS with load 1MΩ//360pF/7,5kHz							
Red Crown 2 HBT MARPOSS (FOR MODELS COMPATIBLE TO TESA ELECTRONICS PLEASE REFER TO DEDICATED SECTION ON PAGE **6, 7, 10, 11**)																			
TRADE NAME		H05	HR05	H10	HR10	HPA10	HP10	HVA10	HV10	-	-	H21	HR21	HPA21	HP21	HVA21	HV21	-	-
ORDER CODE		3PR01N0000	3PR01N1200	3PR02N0000	3PR02N1200	3PR02N0400	3PR02N1600	3PR02N0560	3PR02N1760	-	-	3PR10N0199	3PR10N1399	3PR10N0559	3PR10N1759	3PR10N0599	3PR10N1799	-	-
Sensitivity	(mV/V/mm)	73,75		73,75								73,75							
Accuracy error	(µm)	(**)		± MAX(1+|2*K|;|7*K|)(***)								± MAX(2+|2*K|;|7*K|)(***)							
Calibration spec.		3,5355V RMS with load 2KΩ±0,1%/7,5kHz										3,5355V RMS with load 2KΩ±0,1%/7,5kHz							
RED CROWN 2 USB																			
TRADE NAME		U05	UR05	U10	UR10	UPA10	UP10	UVA10	UV10	-	-	-	-	-	-	-	-	-	-
ORDER CODE		3PR01Y0000	3PR01Y1200	3PR02Y0000	3PR02Y1200	3PR02Y0400	3PR02Y1600	3PR02Y0560	3PR02Y1760	-	-	-	-	-	-	-	-	-	-
Accuracy error	(µm)	±(0,2+K*1)		±(0,2+K*1)								-							
DIGI CROWN 2																			
TRADE NAME		D01	RD01	D02	RD02	PAD02	PD02	VAD02	VD02	-	-	-	-	-	-	-	-	-	-
ORDER CODE		3PD01L0000	3PD01L1200	3PD02L0000	3PD02L1200	3PD02L0400	3PD02L1600	3PD02L0560	3PD02L1760	-	-	-	-	-	-	-	-	-	-
Accuracy error	(µm)	±(0,2+K*1)		±(0,2+K*1)								-							

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

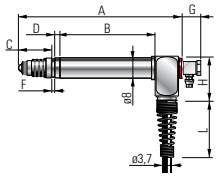
STANDARD - AXIAL - PNEUMATIC PUSH



	±05	±1	±2LR	±2,5	±5	±10
A	-	65,98	109,65	86,65	117,75	166,75
B	-	44,55	75,50	61,05	86,60	120,65
C	-	12,80	25,30	16,75	22,30	39,45
D	-	2,00	2,00	2,00	2,00	-
E	-	-	-	-	-	-
F	-	1,30	1,50	1,50	1,50	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
L	-	-	22,00	-	-	-
M	-	6,00	6,00	6,00	6,00	6,00

F= Max. pretravel adj. value

STANDARD - RADIAL - PNEUMATIC PUSH



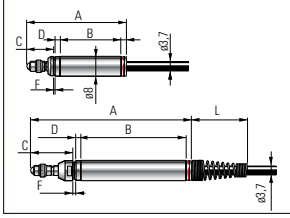
	±05	±1	±2LR	±2,5	±5	±10
A	-	71,75	107,85	84,85	115,95	163,95
B	-	36,10	68,55	52,60	78,15	112,50
C	-	12,80	25,30	16,75	22,30	39,45
D	-	2,00	2,00	2,00	2,00	-
E	-	-	-	-	-	-
F	-	1,30	1,50	1,50	1,50	-
G	-	7,30	7,50	7,30	7,30	7,30
H	-	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

F= Max. pretravel adj. value

	±2,5 mm								±5 mm								±10 mm							
	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	
	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							
	F25	FR25	FPA25	FP25	FVA25	FV25	-	-	F50	FR50	FPA50	FP50	FVA50	FV50	-	-	F100	FR100	FPA100	FP100	FVA100	FV100	-	-
	3PR05L0000	3PR05L1200	3PR05L0400	3PR05L1600	3PR05L0560	3PR05L1760	-	-	3PR10L0000	3PR10L1200	3PR10L0400	3PR10L1600	3PR10L0560	3PR10L1760	-	-	3PR20L0000	3PR20L1200	3PR20L0400	3PR20L1600	3PR20L0560	3PR20L1760	-	-
	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							
	H25	HR25	HPA25	HP25	HVA25	HV25	-	-	H50	HR50	HPA50	HP50	HVA50	HV50	-	-	H100	HR100	HPA100	HP100	HVA100	HV100	-	-
	3PR05N0000	3PR05N1200	3PR05N0400	3PR05N1600	3PR05N0560	3PR05N1760	-	-	3PR10N0000	3PR10N1200	3PR10N0400	3PR10N1600	3PR10N0560	3PR10N1760	-	-	3PR20N0000	3PR20N1200	3PR20N0400	3PR20N1600	3PR20N0560	3PR20N1760	-	-
	36,875								29,5								7,375							
	± 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							
	U25	UR25	UPA25	UP25	UVA25	UV25	-	-	U50	UR50	UPA50	UP50	UVA50	UV50	-	-	U100	UR100	UPA100	UP100	UVA100	UV100	-	-
	3PR05Y0000	3PR05Y1200	3PR05Y0400	3PR05Y1600	3PR05Y0560	3PR05Y1760	-	-	3PR10Y0000	3PR10Y1200	3PR10Y0400	3PR10Y1600	3PR10Y0560	3PR10Y1760	-	-	-	-	-	-	-	-	-	-
	±(0,6+K*2)								±(0,6+K*2)								±(1,2+K*2)							
	D05	RD05	PAD05	PD05	VAD05	VD05	-	-	D10	RD10	PAD10	PD10	VAD10	VD10	-	-	D20	RD20	PAD20	PD20	VAD20	VD20	-	-
	3PD05L0000	3PD05L1200	3PD05L0400	3PD05L1600	3PD05L0560	3PD05L1760	-	-	3PD10L0000	3PD10L1200	3PD10L0400	3PD10L1600	3PD10L0560	3PD10L1760	-	-	3PD20L0000	3PD20L1200	3PD20L0400	3PD20L1600	3PD20L0560	3PD20L1760	-	-
	±(0,6+K*2)								±(0,6+K*2)								±(1,2+K*2)							

SOFT TOUCH

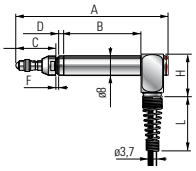
SOFT TOUCH - AXIAL - SPRING



	±05	±1	±2LR	±2,5	±5	±10
A	39,90	63,00	106,35	87,00	114,45	162,45
B	24,35	41,25	75,50	61,05	86,60	120,65
C	10,65	16,40	28,80	20,40	16,90	39,45
D	2,00	2,00	-	2,00	-	-
E	2,05	-	-	-	-	-
F	0,70	1,30	-	1,50	-	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
L	-	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

F= Max. pretravel adj. value

SOFT TOUCH - RADIAL - SPRING



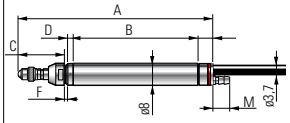
	±05	±1	±2LR	±2,5	±5	±10
A	-	61,43	107,85	88,50	115,95	163,95
B	-	31,20	68,55	54,10	79,65	112,50
C	-	16,40	28,80	20,40	16,90	39,45
D	-	2,00	-	2,00	-	-
E	-	-	-	-	-	-
F	-	1,30	-	1,50	-	-
G	-	-	-	-	-	-
H	-	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

F= Max. pretravel adj. value

SOFT TOUCH		±0,5 mm		±1 mm								±2 mm LongRange							
Cable (**A**=axial - **R**=radial)		A	R	A	R	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 strenght	(N/mm±15%)	0,070		0,06		0,045						0,016		0,010					
Total Measuring force	(N±25%)	0,40		0,30		0,18 ÷1,23				0,09 ÷ 1,41		0,30		0,18 ÷ 1,23				0,09 ÷ 1,41	
PP pressure	bar					0,5 ÷ 2				0,125 ÷ 2				0,5 ÷ 2				0,125 ÷ 2	
	psi					7,3 ÷ 29				1,825 ÷ 29				7,3 ÷ 29				1,825 ÷ 29	
Vacuum retract pressure	bar									≤0,6								≤0,6	
	psi									≤0,9								≤0,9	
Cable length	(m)	2		2								2							
Repeatability	(µm)	0,15		0,15								0,15							
Thermal drift	(µm/°C)	0,25		0,25								0,25							
Operating temperature	(°C)	(-10)+(+65)		(-10)+(+65)								(-10)+(+65)							
Storage temperature	(°C)	(-20)+(+100)		(-20)+(+100)								(-20)+(+100)							
Protection grade		IP50		IP50(IP54 PP version)								IP65							
Contact type		Nylon (PA66)		Nylon (PA66)								carbide							
Contact tread		M2,5		M2,5								M2,5							
Red Crown 2 LVDT MARPOSS																			
TRADE NAME		F05L	FR05L	F10L	FR10L	FPA10L	FP10L	-	-	FPVA10L	FPV10L	F21L	FR21L	FPA21L	FP21L	FVA21L	FV21L	FPVA21L	FPV21L
ORDER CODE		3PR01L5000	-	3PR02L5000	3PR02L6200	3PR02L5400	3PR02L6600	-	-	3PR02L5800	3PR02L7000	3PR10L5199	3PR10L6399	3PR10L5559	3PR10L6759	-	-	3PR10L5999	3PR10L7199
Sensitivity	(mV/V/mm)	230		230								230							
Accuracy error	(µm)	(**)		± MAX(1+|2*K|;|7*K|)(***)								± MAX(2+|2*K|;|7*K|)(***)							
Calibration spec.		3,5355V RMS with load 1MΩ//360pF/7,5kHz										3,5355V RMS with load 1MΩ//360pF/7,5kHz							
Red Crown 2 HBT TESA																			
TRADE NAME		H05L	HR05L	H10L	HR10L	HPA10L	HP10L	-	-	HPVA10L	HPV10L	H21L	HR21L	HPA21L	HP21L	HVA21L	HV21L	HPVA21L	HPV21L
ORDER CODE		3PR01T5000	-	3PR02T5000	3PR02T5200	3PR02T5400	3PR02T5600	-	-	3PR02T5800	3PR02T7000	3PR10T5199	3PR10T6399	3PR10T5559	3PR10T6759	-	-	3PR10T5999	3PR10T7199
Sensitivity	(mV/V/mm)	73,75		73,75								73,75							
Accuracy error	(µm)	(**)		± MAX(1+|2*K|;|7*K|)(***)								± MAX(2+|2*K|;|7*K|)(***)							
Calibration spec.		3V RMS with load 2kΩ ± 0,1%/13kHz										3,5355V RMS with load 2KΩ±0,1 %/7,5kHz							
RED CROWN 2 USB																			
TRADE NAME		U05L	-	U10L	UR10L	UPA10L	UP10L	-	-	UPVA10L	UPV10L	-	-	-	-	-	-	-	-
ORDER CODE		3PR01Y5000	-	3PR02Y5000	3PR02Y6200	3PR02Y5400	3PR02Y6600	-	-	3PR02Y5800	3PR02Y7000	-	-	-	-	-	-	-	-
Accuracy error	(µm)	±(0,2+K*1)		±(0,2+K*1)								-							
DIGI CROWN 2																			
TRADE NAME		D01L	RD01L	D02L	RD02L	PAD02L	PD02L	-	-	PVAD02L	PVD02L	-	-	-	-	-	-	-	-
ORDER CODE		3PD01L5000	-	3PD02L5000	3PD02L6200	3PD02L5400	3PD02L6600	-	-	3PD02L5800	3PD02L7000	-	-	-	-	-	-	-	-
Accuracy error	(µm)	±(0,2+K*1)		±(0,2+K*1)								-							

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

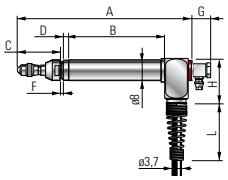
SOFT TOUCH - AXIAL - PNEUMATIC PUSH



	±05	±1	±2LR	±2,5	±5	±10
A	-	69,63	109,65	90,30	117,75	165,75
B	-	44,55	75,50	61,05	86,60	120,65
C	-	16,40	28,80	20,40	16,90	39,45
D	-	2,00	-	2,00	-	-
E	-	-	-	-	-	-
F	-	1,30	-	1,50	-	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
L	-	-	-	-	-	-
M	-	6,00	6,00	6,00	6,00	6,00

F= Max. pretravel adj. value

SOFT TOUCH - RADIAL - PNEUMATIC PUSH



	±05	±1	±2LR	±2,5	±5	±10
A	-	66,30	107,85	88,50	115,95	163,95
B	-	36,10	68,55	52,60	78,15	112,50
C	-	16,40	28,80	20,40	16,90	39,45
D	-	2,00	-	2,00	-	-
E	-	-	-	-	-	-
F	-	1,30	-	1,50	-	-
G	-	7,30	7,50	7,30	7,30	7,30
H	-	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

F= Max. pretravel adj. value

	±2,5 mm								±5 mm								±10 mm							
	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	
Measuring range	5								10								20							
Overtravel	6,6								11								21							
Mechanical life (cycles)	8								8								8							
Resolution	0,016		0,01						0,02		0,07						0,030		0,010					
Repeatability	0,30		0,18 ÷ 1,23				0,09 ÷ 1,41		0,30		0,18 ÷ 1,23				0,09 ÷ 1,41		0,30		0,18 ÷ 1,23				0,09 ÷ 1,41	
Measuring force (N)			0,5 ÷ 2				0,125 ÷ 2				0,5 ÷ 2				0,125 ÷ 2				0,5 ÷ 2				0,125 ÷ 2	
Measuring force adj.			7,3 ÷ 29				1,825 ÷ 29				7,3 ÷ 29				1,825 ÷ 29				7,3 ÷ 29				1,825 ÷ 29	
Measuring force variation							≤0,6								≤0,6								≤0,6	
Measuring force variation adj.							≤0,9								≤0,9								≤0,9	
Weight (g)	2								2								2							
Axial play	0,15								0,15								0,15							
Radial play	0,25								0,25								0,25							
Operating temperature	(-10)+(+65)								(-10)+(+65)								(-10)+(+65)							
Storage temperature	(-20)+(+100)								(-20)+(+100)								(-20)+(+100)							
Protection degree	IP50(IP54 PP version)								IP50(IP54 PP version)								IP50(IP54 PP version)							
Body material	Nylon (PA66)								Nylon (PA66)								Nylon (PA66)							
Fixing screw	M2,5								M2,5								M2,5							
	F25L	FR25L	FPA25L	FP25L	-	-	FPVA25L	FPV25L	F50L	FR50L	FPA50L	FP50L	FVA50L	FV50L	FPVA50L	FPV50L	F100L	FR100L	FPA100L	FP100L	-	-	FPVA100L	FPV100L
	3PR05L5000	3PR05L6200	3PR05L5400	3PR05L6600	-	-	3PR05L5800	3PR05L7000	3PR10L5000	3PR10L6200	3PR10L5400	3PR10L6600	-	-	3PR10L5800	3PR10L7000	3PR20L5000	3PR20L6200	3PR20L5400	3PR20L6600	-	-	3PR20L5800	3PR20L7000
Measuring range	115								115								23							
Linearity	± MAX(2,5+|2*K|;|7*K|)(***)								± MAX(5+|2*K|;|7*K|)(***)								± MAX(10+|2*K|;|7*K|)(***)							
Output	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							
	H25L	HR25L	HPA25L	HP25L	-	-	HPVA25L	HPV25L	H50L	HR50L	HPA50L	HP50L	-	-	HPVA50L	HPV50L	H100LL	HR100L	HPA100L	HP100L	-	-	HPVA100L	HPV100L
	3PR05T5000	3PR05T6200	3PR05T5400	3PR05T6600	-	-	3PR05T5800	3PR05T7000	3PR10T5000	3PR10T6200	3PR10T5400	3PR10T6600	-	-	3PR10T5800	3PR10T7000	3PR20T5000	3PR20T6200	3PR20T5400	3PR20T6600	-	-	3PR20T5800	3PR20T7000
Measuring range	73,75								29,5								7,375							
Linearity	± MAX(2,5+|2*K|;|7*K|)(***)								± MAX(5+|2*K|;|7*K|)(***)								± MAX(10+|2*K|;|7*K|)(***)							
Output	3V RMS with load 2kΩ ± 0,1%/13kHz								3V RMS with load 2kΩ ± 0,1%/13kHz								3V RMS with load 2kΩ ± 0,1%/13kHz							
	U25L	UR25L	UPA25L	UP25L	-	-	UPVA25L	UPV25L	U50L	UR50L	UPA50L	UP50L	-	-	UPVA50L	UPV50L	U100L	UR100L	UPA100L	UP100L	-	-	UPVA100L	UPV100L
	3PR05Y5000	3PR05Y6200	3PR05Y5400	3PR05Y6600	-	-	3PR05Y5800	3PR05Y7000	3PR10Y5000	3PR10Y6200	3PR10Y5400	3PR10Y6600	-	-	3PR10Y5800	3PR10Y7000	-	-	-	-	-	-	-	-
Linearity	±(0,6+K*2)								±(0,6+K*2)								±(1,2+K*2)							
	D05L	RD05L	PAD05L	PD05L	-	-	PVAD05L	PVD05L	D10L	RD10L	PAD10L	PD10L	-	-	PVAD10L	PVD10L	D20L	RD20L	PAD20L	PD20L	-	-	PVAD20L	PVD20L
	3PD05L5000	3PD05L5200	3PD05L5400	3PD05L6600	-	-	3PD05L5800	3PD05L7000	3PD10L5000	3PD10L6200	3PD10L5400	3PD10L6600	-	-	3PD10L5800	3PD10L7000	3PD20L5000	3PD20L6200	3PD20L5400	3PD20L6600	-	-	3PD20L5800	3PD20L7000
Linearity	±(0,6+K*2)								±(0,6+K*2)								±(1,2+K*2)							

UNPLUGGED

STANDARD		±0,5 mm		±1 mm								±2 mm LongRange							
Cable (**A**=axial - **R**=radial)		A	R	A	R	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 strenght	(N/mm±15%)	0,17		0,14		0,04		0,023				0,023		0,03		0,02			
Measuring force	(N±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							≤0,6								≤0,6			
	psi							≤0,9								≤0,9			
Cable length	(m)	2		2								2							
Gasket		Fluoroelast.		Fluoroelastometer								Fluoroelastometer							
Repeatability	(µm)	0,15		0,15								0,15							
Thermal drift	(µm/°C)	0,25		0,25								0,25							
Operating temperature	(°C)	(-10)+(+65)		(-10)+(+65)								(-10)+(+65)							
Storage temperature	(°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		F05	FR05	F10	FR10	FPA10	FP10	FVA10	FV10	-	-	F21	FR21	FPA21	FP21	FVA21	FV21	-	-
ORDER CODE		3PR01M0000	3PR01M1200	3PR02M0000	3PR02M1200	3PR02M0400	3PR02M1600	3PR02M0560	3PR02M1760	-	-	3PR10M0199	3PR10M1399	3PR10M0559	3PR10M1759	3PR10M0599	3PR10M1799	-	-
Sensitivity	(mV/V/mm)	233 ±5%		233 ±5%								233 ±5%							
Linearity error	(µm)	(**)		± MAX(1;|5*K|)(***)								± MAX(2;|5*K|)(***)							
Calibration spec.		3,5355V RMS with load 1MΩ//360pF/7,5kHz										3,5355V RMS with load 1MΩ//360pF/7,5kHz							
Red Crown 2 HBT MARPOSS																			
TRADE NAME		H05	HR05	H10	HR10	HPA10	HP10	HVA10	HV10	-	-	H21	HR21	HPA21	HP21	HVA21	HV21	-	-
ORDER CODE		3PR01Z0000	3PR01Z1200	3PR02Z0000	3PR02Z1200	3PR02Z0400	3PR02Z1600	3PR02Z0560	3PR02Z1760	-	-	3PR10Z0199	3PR10Z1399	3PR10Z0559	3PR10Z1759	3PR10Z0599	3PR10Z1799	-	-
Sensitivity	(mV/V/mm)	86 ±5%		83 ±5%								83 ±5%							
Linearity error	(µm)	(**)		± MAX(1;|5*K|)(***)								± MAX(2;|5*K|)(***)							
Calibration spec.		3,5355V RMS with load 2kΩ±0,1%/7,5kHz										3,5355V RMS with load 2KΩ±0,1%/7,5kHz							

* Movement S= spring - PP= pneumatic push - V= vacuum - PV= push/vacuum - ** Accuracy ±0,5 = +/-MAX(0,5;|5*K|) - *** K= Reading (mm)

	±2,5 mm								±5 mm								±10 mm							
	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	
	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		-		0,70			
			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							
	F25	FR25	FPA25	FP25	FVA25	FV25	-	-	F50	FR50	FPA50	FP50	FVA50	FV50	-	-	F100	FR100	FPA100	FP100	FVA100	FV100	-	-
	3PR05M0000	3PR05M1200	3PR05M0400	3PR05M1600	3PR05M0560	3PR05M1760	-	-	3PR10M0000	3PR10M1200	3PR10M0400	3PR10M1600	3PR10M0560	3PR10M1760	-	-	3PR20M0000	3PR20M1200	3PR20M0400	3PR20M1600	3PR20M0560	3PR20M1760	-	-
	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							
	H25	HR25	HPA25	HP25	HVA25	HV25	-	-	H50	HR50	HPA50	HP50	HVA50	HV50	-	-	H100	HR100	HPA100	HP100	HVA100	HV100	-	-
	3PR05Z0000	3PR05Z1200	3PR05Z0400	3PR05Z1600	3PR05Z0560	3PR05Z1760	-	-	3PR10Z0000	3PR10Z1200	3PR10Z0400	3PR10Z1600	3PR10Z0560	3PR10Z1760	-	-	3PR20Z0000	3PR20Z1200	3PR20Z0400	3PR20Z1600	3PR20Z0560	3PR20Z1760	-	-
	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°
HBT	H05	HR05	H10	HR10	H21	HR21	H20	HR20
TESA	3PR01T0000	3PR01T1200	3PR02T0000	3PR02T1200	3PR10T0199	3PR10T1399	3PR05T0199	-
MERCER	3PR01R0000	3PR01R1200	3PR02R0000	3PR02R1200	-	-	-	-
METEM	3PR01S0000	3PR01S1200	3PR02S0000	3PR02S1200	-	-	-	-
MAHR-FEINPRUEF	3PR01P0000	3PR01P1200	3PR02P0000	3PR02P1200	-	-	3PR05P0199	-
LVDT	F05	FR05	F10	FR10	F21	FR21	F20	FR20
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°
HBT			HPA10	HP10	HPA21	HP21	HPA20	HP20
TESA	NA	NA	3PR02T0400	3PR02T1600	3PR10T0559	3PR10T1759	-	-
MERCER	NA	NA	3PR02R0400	3PR02R1600	-	-	-	-
METEM	NA	NA	3PR02S0400	3PR02S1600	-	-	-	-
MAHR-FEINPRUEF	NA	NA	3PR02P0400	3PR02P1600	-	-	-	-
LVDT			FPA10	FPA10	FPA21	FPA21	FPA20	FPA20
MICROCONTROL	NA	NA	3PR02K0400	3PR02K1600	-	-	-	-

VACUUM	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
HBT			HVA10	HV10	HVA21	HV21	HVA20	HV20
TESA	NA	NA	3PR02T0560	3PR02T1760	3PR10T0599	3PR10T1799	-	-
MERCER	NA	NA	3PR02R0560	3PR02R1760	-	-	-	-
METEM	NA	NA	3PR02S0560	3PR02S1760	-	-	-	-
MAHR-FEINPRUEF	NA	NA	3PR02P0560	3PR02P1760	-	-	-	-
LVDT			FVA10	FV10	FVA21	FV21	FVA20	FV20
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°
HBT	H05L	HR05L	H10L	HR10L	H21L	HR21L	H20L	HR20L
TESA	3PR01T5000	3PR01T6200	3PR02T5000	3PR02T6200	3PR10T5199	3PR10T6399	3PR05T0199	-
METEM	3PR01S5000	3PR01S6200	3PR02S5000	3PR02S6200	-	-	-	-
LVDT	F05L	FR05L	F10L	FR10L	F21L	FR21L	F20L	FR11L
MICROCONTROL	-	-	-	3PR02K6200	-	-	-	-

PNEUM. PUSH	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
HBT			HPA10L	HP10L	HPA21L	HP21L	HPA20L	HP20L
TESA	NA	NA	3PR02T5400	3PR02T6600	3PR10T5559	3PR10T6759	-	-
METEM	NA	NA	3PS02S5400	3PS02S6600	-	-	-	-
LVDT			FPA10L	FP10L	FPA21L	FP21L	FPA20L	FP11L
MICROCONTROL	NA	NA	3PR02K5400	3PR02K6600	-	-	-	-

VACUUM	±05 mm		±1 mm		±2 mm LongRange		±2 mm	
Cable	AX	90°	AX	90°	AX	90°	AX	90°
HBT			HVA10L	HV10L	HVA21L	HV21L	HVA20L	HV20L
TESA	NA	NA	3PR02T5560	3PR02T6760	3PR10T5599	3PR10T6799	-	-
METEM	NA	NA	3PR02S5560	3PR02S6760	-	-	-	-
LVDT			FVA10L	FV10L	FVA21L	FV21L	FVA20L	FV11L
MICROCONTROL	NA	NA	3PR02K5560	3PR02K6760	-	-	-	-

	±2,5 mm		±5 mm		±10 mm	
	AX	90°	AX	90°	AX	90°
	H25	HR25	H50	HR50	H100	HR100
	3PR05T0000	3PR05T1200	3PR10T0000	3PR10T1200	3PR20T0000	3PR20T1200
	3PR05R0000	3PR05R1200	3PR10R0000	3PR10R1200	3PR20R0000	3PR20R1200
	3PR05S0000	3PR05S1200	3PR10S0000	3PR10S1200	3PR20S0000	3PR20S1200
	3PR05P0000	3PR05P1200	3PR10P0000	3PR10P1200	3PR20P0000	3PR20P1200
	F25	FR25	F50	FR50	F100	FR100
	3PR05K0000	3PR05K1200	3PR10K0000	3PR10K1200	3PR20K0000	3PR20K1200

	±2,5 mm		±5 mm		±10 mm	
	AX	90°	AX	90°	AX	90°
	HPA25	HP25	HPA50	HP50	HPA100	HP100
	3PR05T0400	3PR05T1600	3PR10T0400	3PR10T1600	3PR20T0400	3PR20T1600
	3PR05R0400	3PR05R1600	3PR10R0400	3PR10R1600	3PR20R0400	3PR20R1600
	3PR05S0400	3PR05S1600	3PR10S0400	3PR10S1600	3PR20S0400	3PR20S1600
	3PR05P0040	3PR05P1600	3PR10P0400	3PR10P1600	3PR20P0400	3PR20P1600
	FPA25	FP25	FPA50	FP50	FPA100	FP100
	3PR05K0400	3PR05K1600	3PR10K0400	3PR10K1600	3PR20K0400	3PR20K1600

	±2,5 mm		±5 mm		±10 mm	
	AX	90°	AX	90°	AX	90°
	HVA25	HV25	HVA50	HV50	HVA100	HV100
	3PR05T0560	3PR05T1760	3PR10T0560	3PR10T1760	3PR20T0560	3PR20T1760
	3PR05R0560	3PR05R1760	3PR10R0560	3PR10R1760	3PR20R0560	3PR20R1760
	3PR05S0560	3PR05S1760	3PR10S0560	3PR10S1760	3PR20S0560	3PR20S1760
	3PR05P0560	3PR05P1760	3PR10P0560	3PR10P1760	3PR20P0560	3PR20P1760
	FVA25	FV25	FVA50	FV50	FVA100	FV100
	3PR05K0560	3PR05K1760	3PR10K0560	3PR10K1760	3PR20K0560	3PR20K1760

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

	±2,5 mm		±5 mm		±10 mm	
	AX	90°	AX	90°	AX	90°
	H25L	HR25L	H50L	HR50L	H100L	HR100L
	3PR05T5000	3PR05T6200	3PR10T5000	3PR10T6200	3PR20T5000	3PR20T6200
	3PR05S5000	3PR05S6200	3PR10S5000	3PR10S6200	3PR20S5000	3PR20S6200
	F25L	FR25L	F50L	FR50L	F100L	FR100L
	3PR05K5000	3PR05K6200	3PR10K5000	3PR10K6200	3PR20K5000	3PR20K6200

	±2,5 mm		±5 mm		±10 mm	
	AX	90°	AX	90°	AX	90°
	HPA25L	HP25L	HPA50L	HP50L	HPA100L	HP100L
	3PR05T5400	3PR05T6600	3PR10T5400	3PR10T6600	3PR20T5400	3PR20T6600
	3PR05S5400	3PR05S6600	3PR10S5400	3PR10S6600	3PR20S5400	3PR20S6600
	FPA25L	FP25L	FPA50L	FP50L	FPA100L	FP100L
	3PR05K5400	3PR05K6600	3PR10K5400	3PR10K6600	3PR20K5400	3PR20K6600

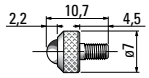
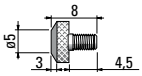
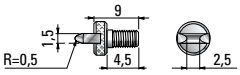
	±2,5 mm		±5 mm		±10 mm	
	AX	90°	AX	90°	AX	90°
	HVA25L	HV25L	HVA50L	HV50L	HVA100L	HV100L
	3PR05T5560	3PR05T6760	3PR10T5560	3PR10T6760	3PR20T5560	3PR20T6760
	3PR05S5560	3PR05S6760	3PR10S5560	3PR10S6760	3PR20S5560	3PR20S6760
	FVA25L	FV25L	FVA50L	FV50L	FVA100L	FV100L
	3PR05K5560	3PR05K6760	3PR10K5560	3PR10K6760	3PR20K5560	3PR20K6760

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

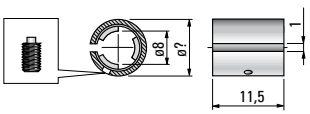
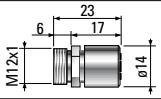
SPRINGS

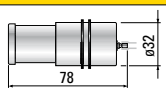
SPRING	FORCE	Measuring Range						Order code
		±05	±1	±2LR	±2,5	±5	±10	
	0,4 (N)	X						1024099751
	2 (N)	X						1024099753
	2,5 (N)	X						1024099754
	1 (N)		X					1042414337
	2 (N)		X					1042414336
	2,5 (N)		X					1042414335
	1 (N)				X			1042414435
	1,6 (N)				X			1042414441
	2 (N)				X			1042414436
	2,5 (N)				X			1042414437
	1 (N)					X		1042414537
	1,6 (N)					X		1042414561
	2 (N)					X		1042414536

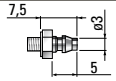
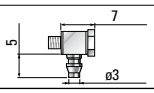
ACCESSORIES

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
LVDT / HBT	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

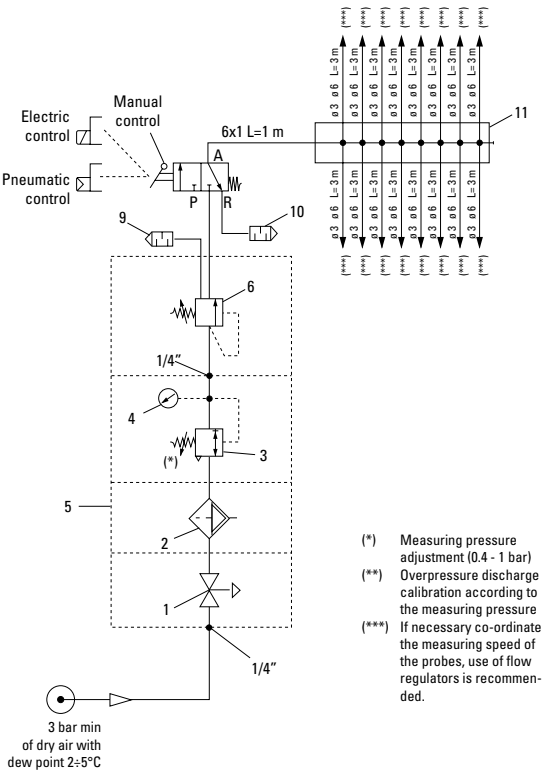
OTHER ACCESSORIES	Description	Order code
	Vacuum pump + L = 1 m tubing	4717008002
	Double ended wrench Ch. 7/8 (thickness 1,5 mm)	1320709000

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

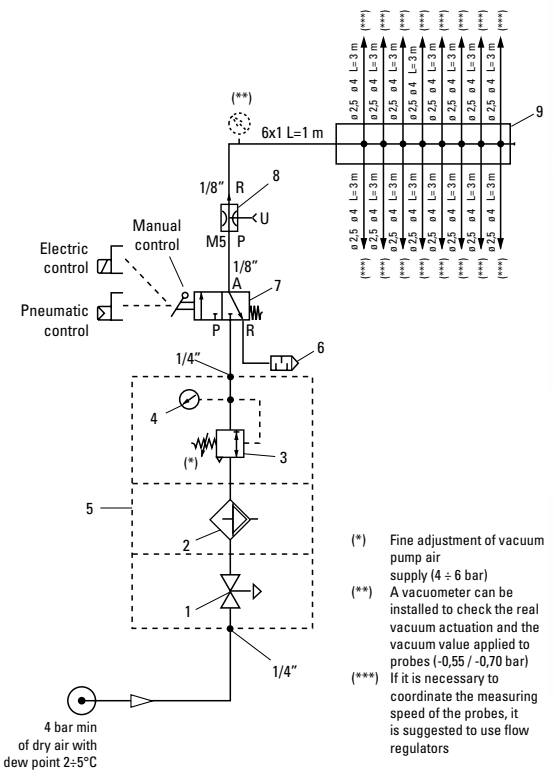


(*) Measuring pressure adjustment (0.4 - 1 bar)
(**) Overpressure discharge calibration according to the measuring pressure
(***) If necessary co-ordinate the measuring speed of the probes, use of flow regulators is recommended.

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



(*) Fine adjustment of vacuum pump air supply (4 ÷ 6 bar)
(**) A vacuometer can be installed to check the real vacuum actuation and the vacuum value applied to probes (-0,55 / -0,70 bar)
(***) If it is necessary to coordinate the measuring speed of the probes, it is suggested to use flow regulators

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 Sensor vs Interface Units

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
●	(*) ●			TCI1/4/8	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
		●			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	SW ACQUISITION				VISUALIZATION
SERIAL 232	EMBEDDED	→			BARGRAPH
SERIAL 232 / DIGIMATIC / BCD	EMBEDDED	→			BARGRAPH
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
DIRECT	EMBEDDED	→	MERLIN		8,4" LCD DISPLAY
USB/232	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

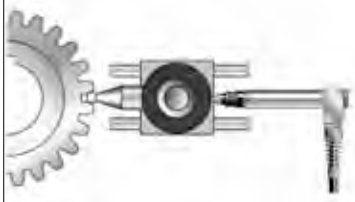
(1) Please refer to the Easy Box section in Testar catalogue
(2) Please refer to the Digi Net section in Testar catalogue

APPLICATION EXAMPLES

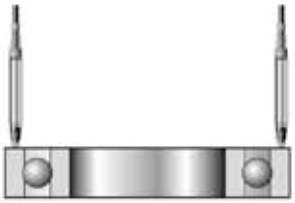
AUTOMOTIVE

AUTOMOTIVE COMPONENTS

GEARS

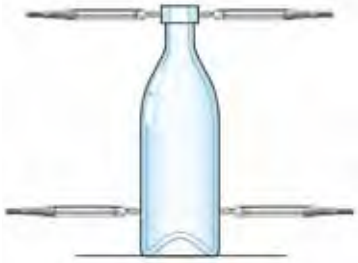


BEARING INDUSTRY

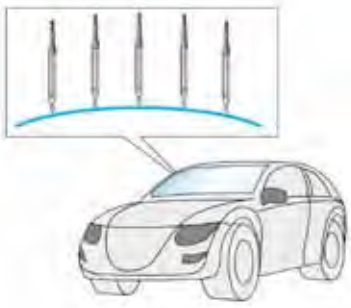


CONTAINERS & PACKAGING

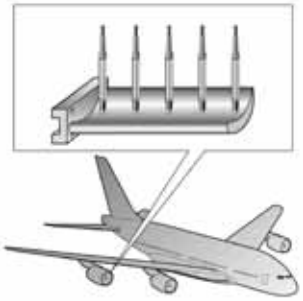
GLASS CONTAINERS



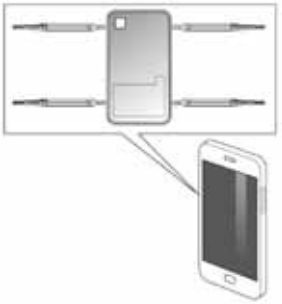
AUTOMOTIVE GLASS



AEROSPACE



CONSUMER ELECTRONICS



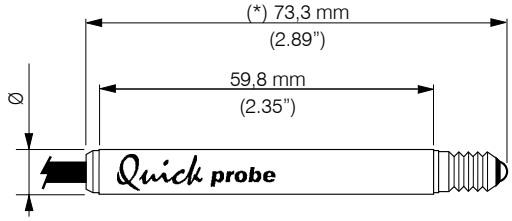
TESTAR a MARPOSS DIVISION

Quick probe

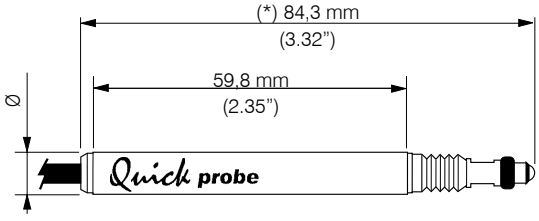
PENCIL PROBES

- 8 models of full-bridge (LVDT) and half-bridge (HBT) probes with clamping diameter 8 mm or 3/8" and measuring range ± 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 work-shop as well as in the laboratory, can solve various measur-ing problems at a very competi-tive price/performance ratio.
- Available with fixed or interchange-able 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

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		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"	ø 8 mm	ø 3/8"
Order Code	3424011000	3424011050	3424011500	3424011550

Half-bridge (HBT) electrical specifications

Trade name	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"	ø 8 mm	ø 3/8"
Order Code	3424014000	3424014050	3424014500	3424014550

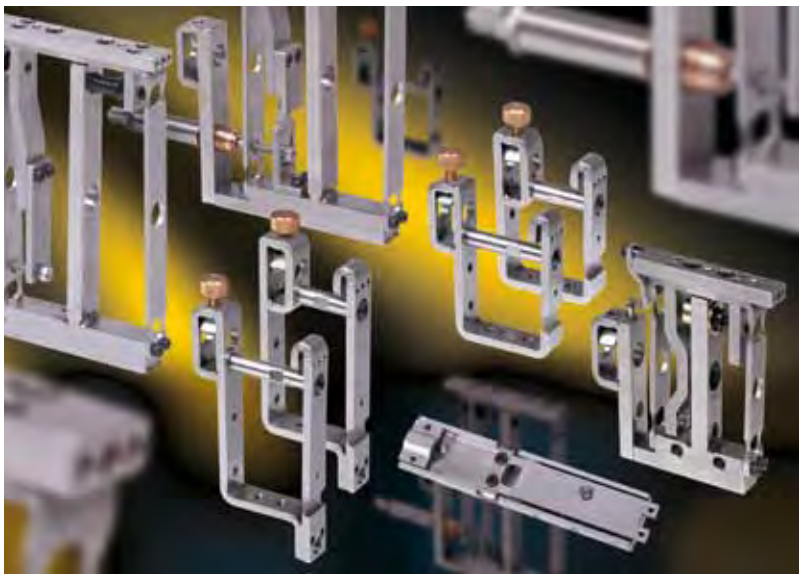
Half-bridge (HBT) electrical specifications of the version compatible with amplifiers of TESA

Trade name	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	
Order Code	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 devel-oped 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.

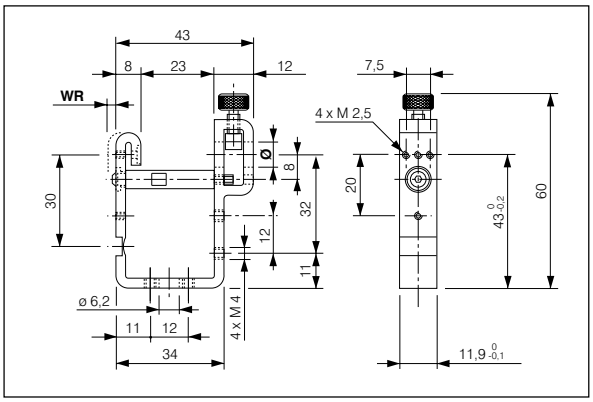
Offered by a world-wide market leader, the **AMA™ is a new and economical way of designing high quality solutions using Off The Shelf modular gauging components.**

TB - Transmission Basic Device

TB10

Working Range (**WR**) 1.0 mm

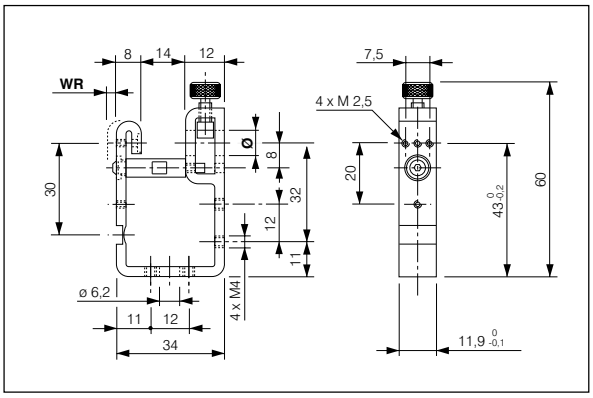
Model	Order Code
ø 8 mm	2927364005
ø 3/8"	2927364035



TB10C

Working Range (**WR**) 1.0 mm

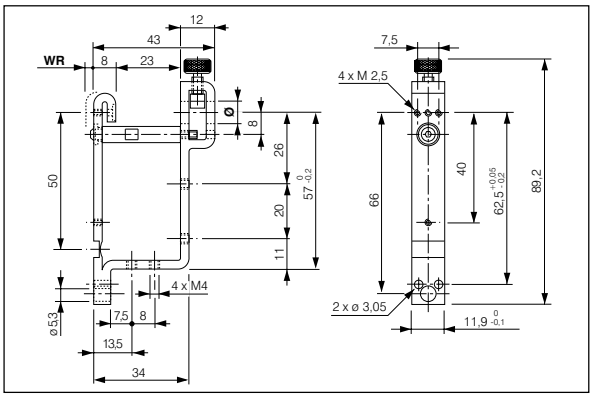
Model	Order Code
ø 8 mm	2927364006
ø 3/8"	2927364036



TB16

Working Range (**WR**) 1.6 mm

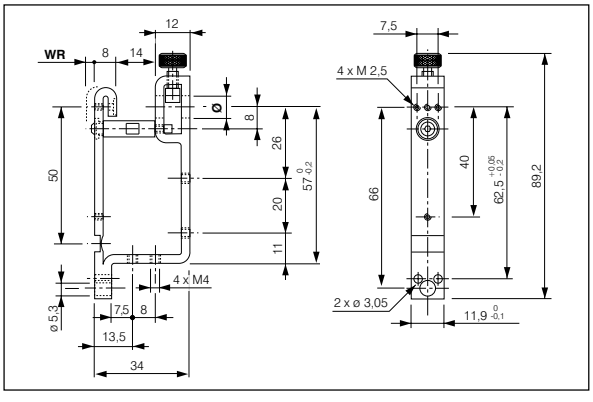
Model	Order Code
ø 8 mm	2927364003
ø 3/8"	2927364033



TB16C

Working Range (**WR**) 1.6 mm

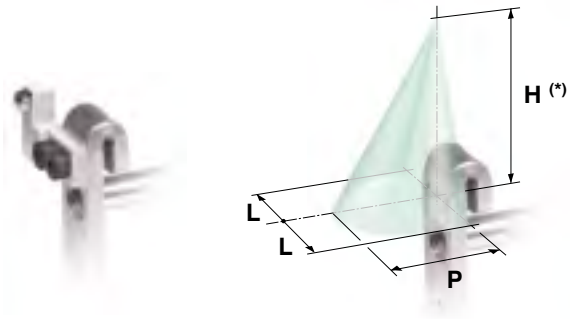
Model	Order Code
ø 8 mm	2927364004
ø 3/8"	2927364034



For ø 3/8" models: M2.5 –> 4-48 UNF

CONTACT OFF-SET APPLICATION LIMITS

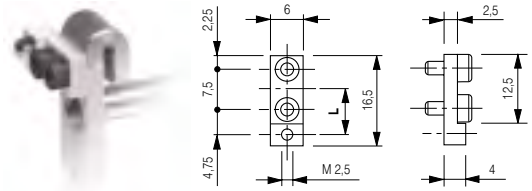
MODEL	H (*) (mm)	L (mm)	P (mm)
TB10	30	14	20
TB10C	30	14	20
TB16	50	14	20
TB16C	50	14	20



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

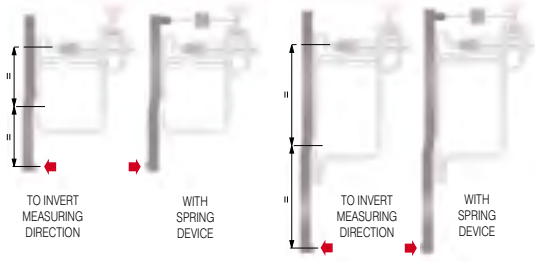
ACCESSORIES

OFF-SET ARMSET (ARM RATIO 1:1)



MODEL		OFF-SET L (mm)	ORDER CODE
TB10	M 2,5	8,5	2924017150
TB10C		10	2924017151
TB16	4-48 UNF	8,5	2924017152
TB16C		10	2924017153

STRAIGHT ARMSET (ARM RATIO 1:1)



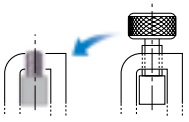
MODEL		ORDER CODE
TB10	8 mm	3192736405
TB10C	3/8"	3192736435
TB16	8 mm	3192736403
TB16C	3/8"	3192736433

SPRING DEVICE

MODEL	ORDER CODE
TB10 - TB16	2027364001
TB10C - TB16C	2027364002

ALTERNATIVE CLAMPING DEVICE
(alternative to standard clamping)

ORDER CODE
2027364000



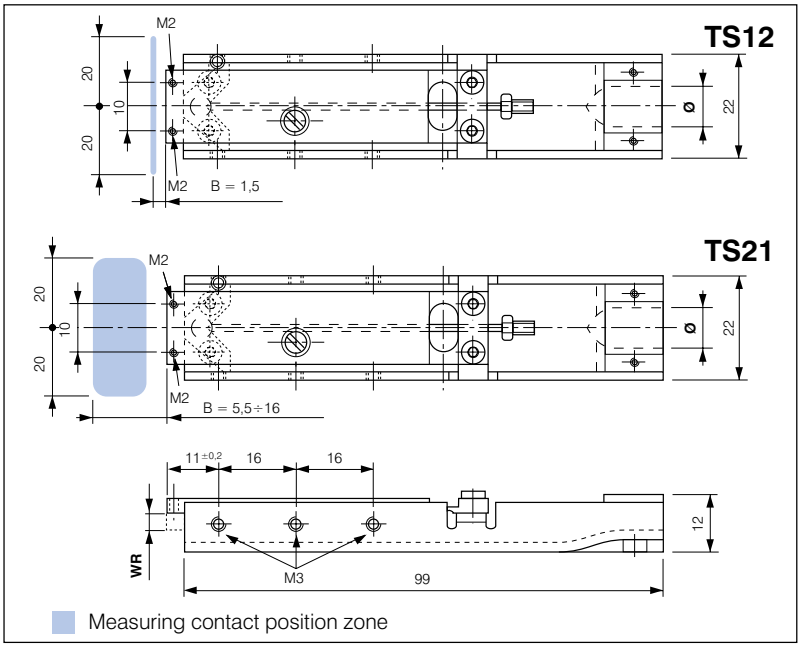
APPLICATION EXAMPLES

TS - Transmission Shoulder Device

TS12 - TS21

Working Range (**WR**) 1.0 mm

Model	ø	Order Code
TS12	8 mm	2927364100
	3/8"	2927364130
TS21	8 mm	2927364101
	3/8"	2927364131



TECHNICAL DATA

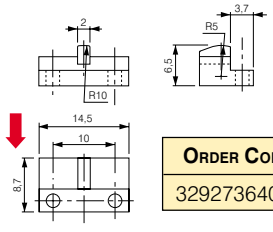
Mod.	Working Range (WR) (mm)	Arm Ratio (AR)	Repeat. (2.77 σ)	Sensit. (max err. %)
TS12	1,2	1	<0,5µm	± 2
TS21	1,8 ÷ 2,1 0,02857·**B**+1,643	1,5÷ 1,75 0,0238·**B**+1,37		

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).

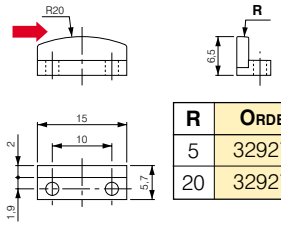
ACCESSORIES

Contact for **TS12** (ar 1:1)



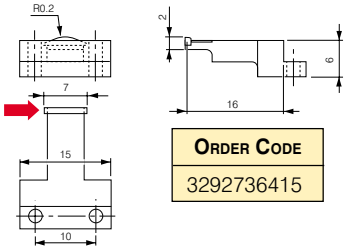
Order Code
3292736401

Contact for **TS12** (ar 1:1)



R	Order Code
5	3292736405
20	3292736410

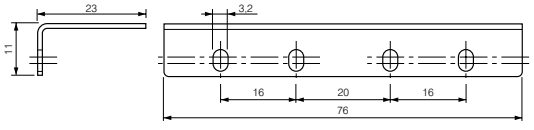
Armset for grooves for **TS21** (ar 1:1.75)



Order Code
3292736415

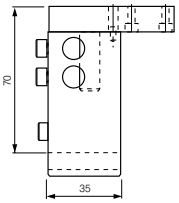
Workpiece loading direction

Side cover



Order Code
2927364145

Interface block for Quick Set Support Bracket



Order Code
2927364150

TP - Transmission Parallelogram Device

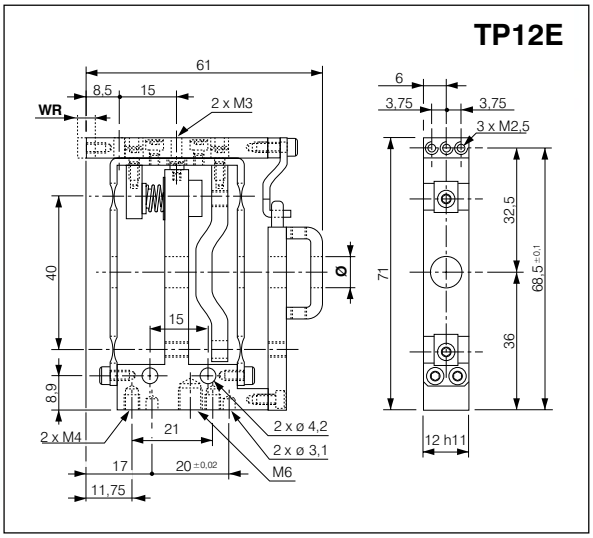
Working Range (WR) 1.2 mm

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

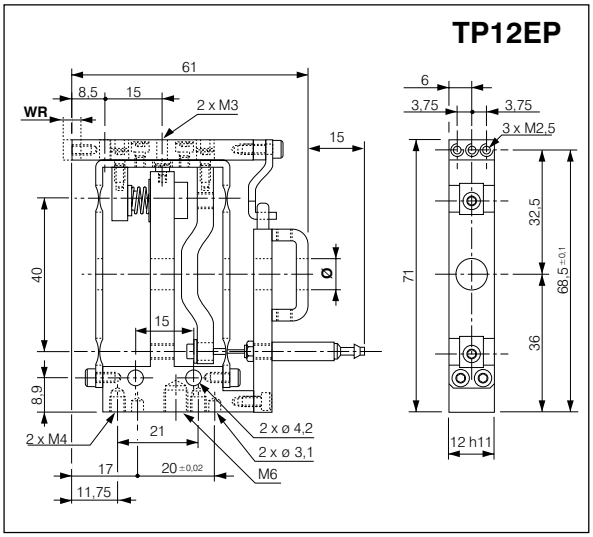


TP12EP
(external checks
with pneumatic retraction)

Model	Order Code
ø 8 mm	3024051204
ø 3/8"	3024051206

TP12IP
(internal checks
with pneumatic retraction)

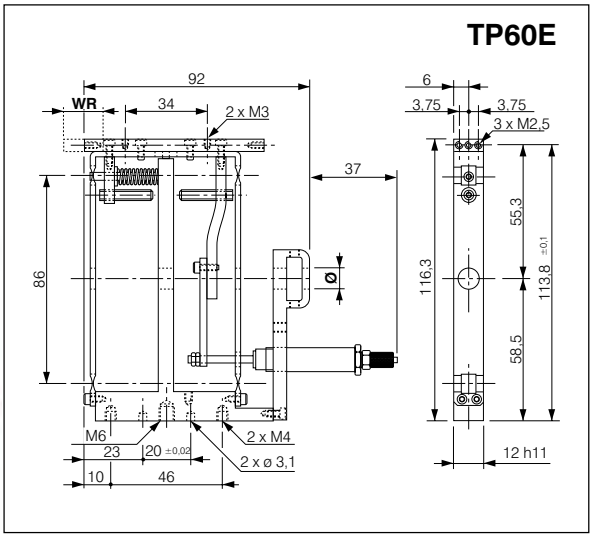
Model	Order Code
ø 8 mm	3024051205
ø 3/8"	3024051207



Working Range (WR) 6.0 mm

TP60E
(external checks
with pneumatic retraction)

Model	Order Code
ø 8 mm	2924051400
ø 3/8"	2924051430

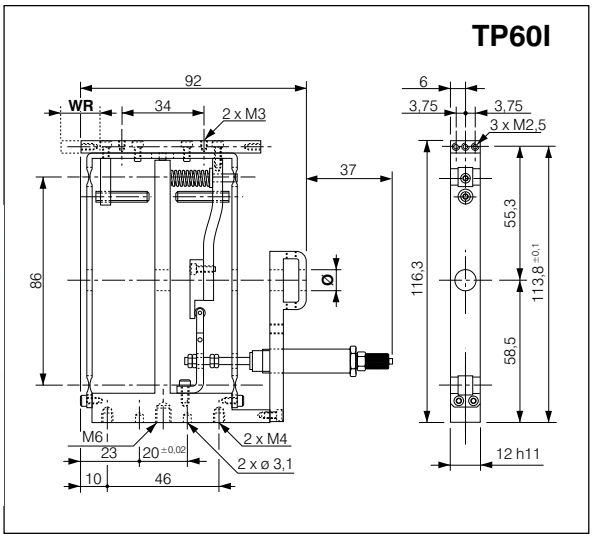


For ø 3/8" models: M2,5 → 4-48 UNF

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

TP12SI

(ELEMENT FOR SELF-CENTERING GROUP FOR INTERNAL CHECKS)

Modello	Order Code
ø 8 mm	2924051228
ø 3/8"	2924051229

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

TP60SI

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

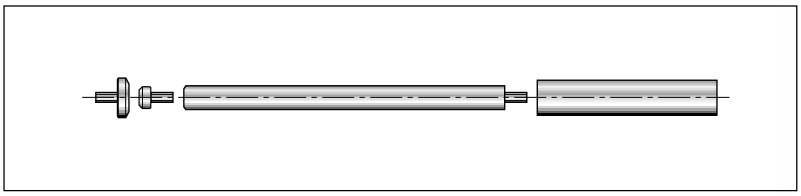
Modello	Order Code
ø 8 mm	2924051406
ø 3/8"	2924051408

SELF-CENTERING 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)

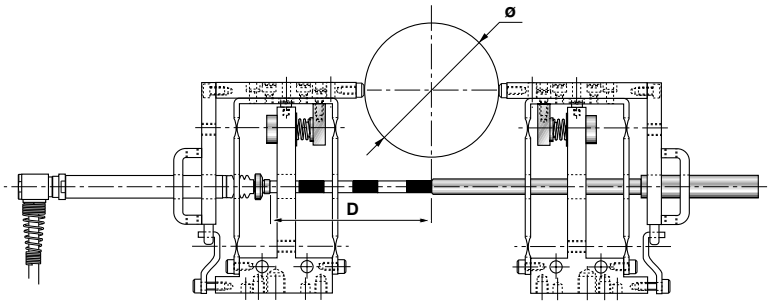
SELF-CENTERING KIT

Model	ø	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



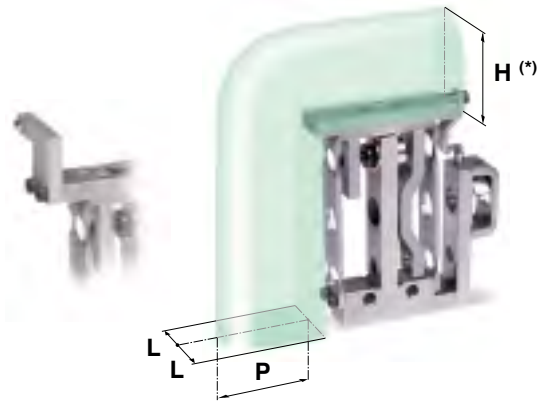
TP12	**ø (mm)**	0-3	3-8	8-13	13-18	18-23	23-28	28-33	33-38	38-43	43-48	48-53	53-58
	D (mm)	10	15	20	25	30	35	40	45	50	55	60	65
TP60	**ø (mm)**	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-	-
	D (mm)	-	10	20	30	40	50	60	70	80	90		

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

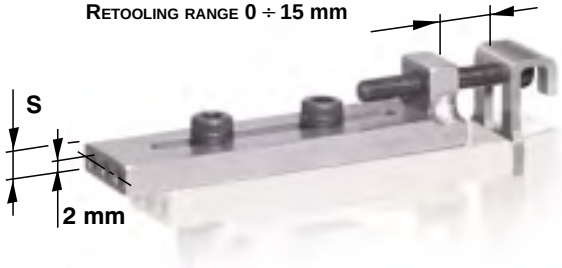
(*) The Arm Ratio is 1:1 for any contact position.



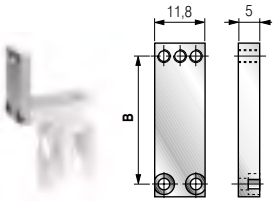
ACCESSORIES

Descrizione	Model		H (*) MAX (mm)	S	Order code
Slide	TP12	M 2,5	20	4	2924051211
			40	6	2924051219
		4-48 UNF	20	4	2924051212
			40	6	2924051220
	TP60	M 2,5	90	6	2924051405
		4-48 UNF	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

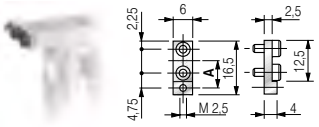
Retooling range 0 ÷ 15 mm

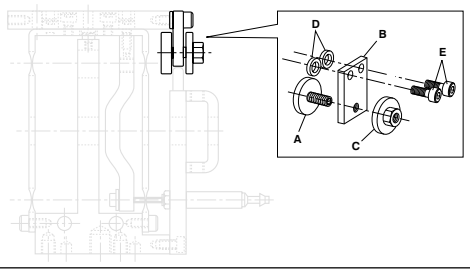


Armset



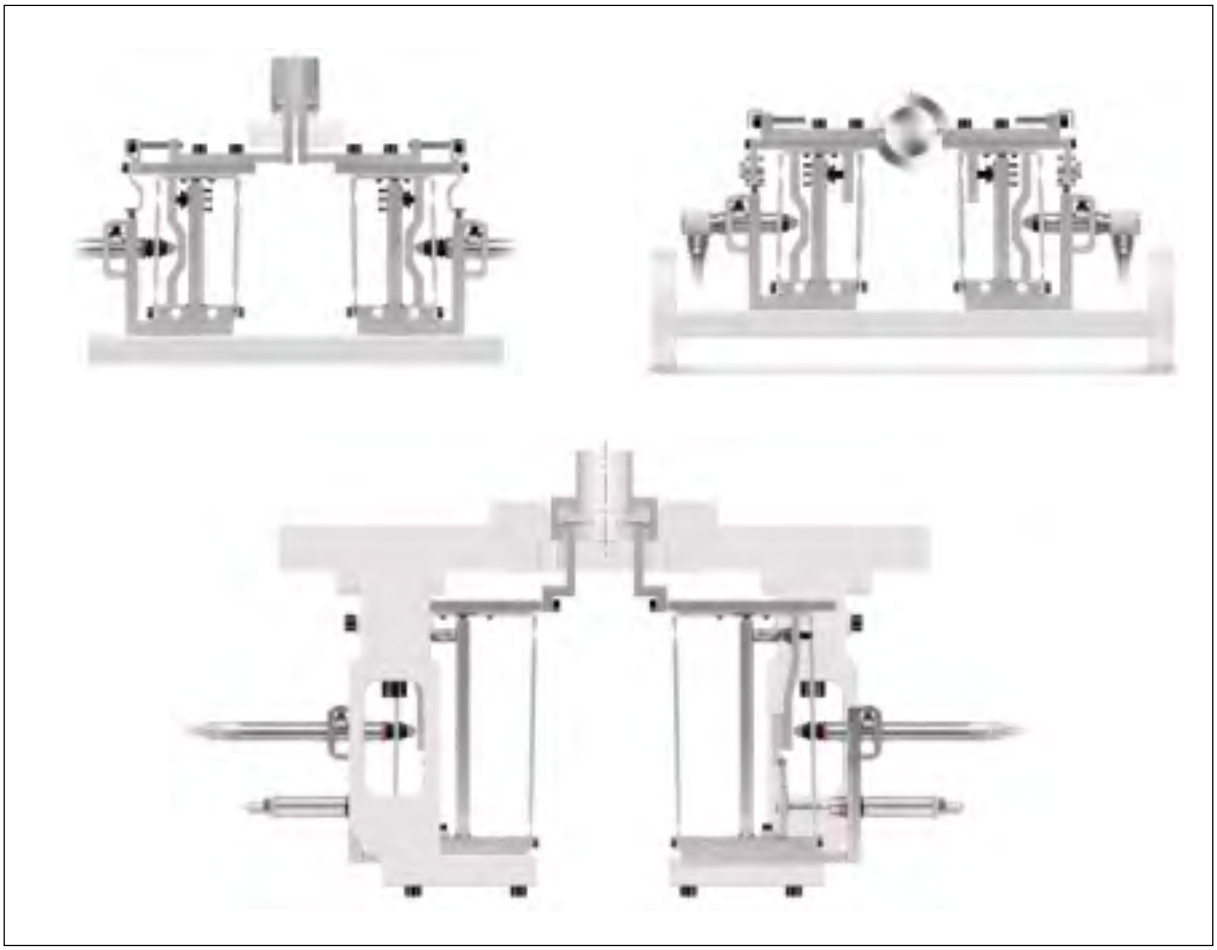
Off-set Armset



DESCRIPTION	MODEL	ORDER CODE	
PRETRAVEL/ OVERTRAVEL LIMITER	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 ± 0,5 mm.

APPLICATION EXAMPLES



DOCUMENTATION

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

UNIVERSAL MEASURING ARMSET

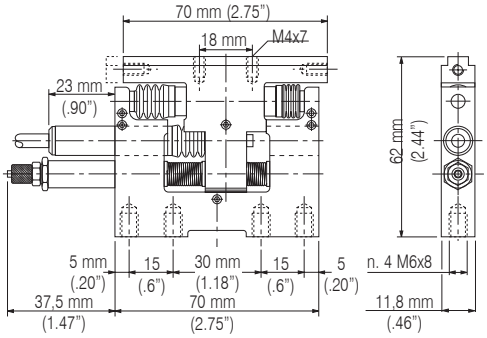
- Universal measuring armset with axial movement for inspection of internal and external diameters and distances on multigauging devices.
  It is available in two versions:
  - as complete single measuring unit [measuring range ± 1 mm (.04")] with built-in full-bridge (LVDT) or half-bridge (HBT) transducer also compatible with any electronics already present on the market.
  - as simple mechanical transmission, to be used with other meas-uring gauges with clamping diameter 8 mm or 3/8", such as TESTAR Red Crown™ pencil probes, Quick probe™, Quick Read™ and Quick Digit™.
- Each version can be also equipped with pneumatic actuation to facilitate part loading/unloading in the measuring station.
- Contact support retooling range of 20 mm.
- Wide range of measuring arms and contacts, which allows up to 5 external diameter measurements on a length of only 8 mm.
- Easy to apply and to set-up, it is particularly suitable as a component of the Quick Set™ for Post-Process applications with robot part loading and unloading.

TECHNICAL SPECIFICATIONS	QBF100 - LVDT	QBH100 - HBT	QB600
MEASURING RANGE	± 1 mm (.04")		According to measuring probe
TOTAL STROKE	6 mm (.24")		6 mm (.24")
PRETRAVEL TO ELECTRICAL ZERO	1.1 - 1.2 mm (.04" - .05") retoolable		According to measuring probe
LINEARITY ERROR	< 5 µm (0.25%)		According to measuring probe
REPEATABILITY	< 0.5 µm		< 0.5 µm
THERMAL DRIFT	< 0.25 µm/°C		< 0.25 µm/°C
TEMPERATURE RANGE	-10/+65 °C		-10/+65 °C
MEASURING FORCE	1 N ± 20%		1.70 N ± 20% (without measuring probe)
GUIDE	Ball bearing		Ball bearing
CABLE LENGTH	2 m		According to measuring probe
STANDARD CONNECTOR	Lumberg SV50/6		According to measuring probe
PROTECTION LEVEL (*)	IP65		IP65
END-STROKE ADJUSTMENT	Up to 3 mm (.12")		Up to 3 mm (.12")
OPERATION PRESSURE	3 - 6 bar		3 - 6 bar

(*) Relevant to ball bearing guide and built-in transducer

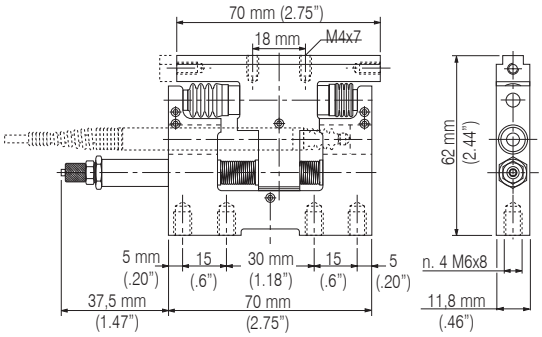
QBF 100 • QBH 100

MEASURING UNIT: BUILT-IN TRANSDUCER VERSION AVAILABLE WITH PRETRAVEL ADJUSTMENT OR PNEUMATIC CYLINDER



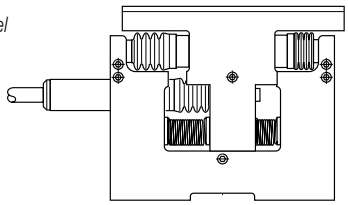
QB 600

MEASURING TRANSMISSION: PENCIL PROBE ø 8 mm - 3/8" VERSION AVAILABLE WITH PRETRAVEL ADJUSTMENT OR PNEUMATIC CYLINDER

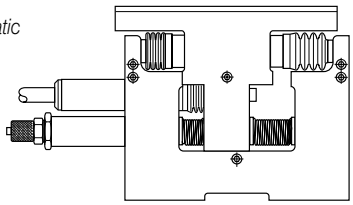


COMPONENTS AND ACCESSORIES

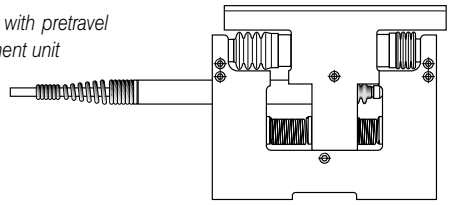
QBF100 • QBH100
Version with pretravel adjustment unit
1



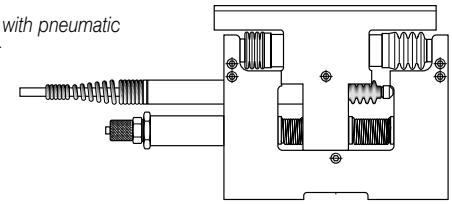
QBF100 • QBH100
Version with pneumatic cylinder
2



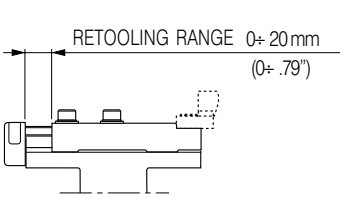
QB600
Version with pretravel adjustment unit
3



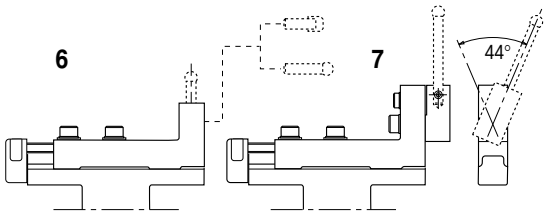
QB600
Version with pneumatic cylinder
4



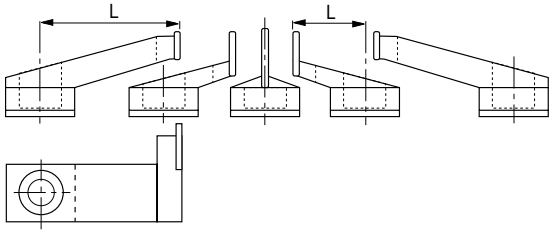
5



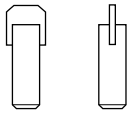
6 **7**



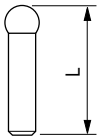
11 **12** **13** **14** **15**



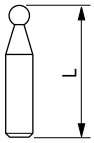
8

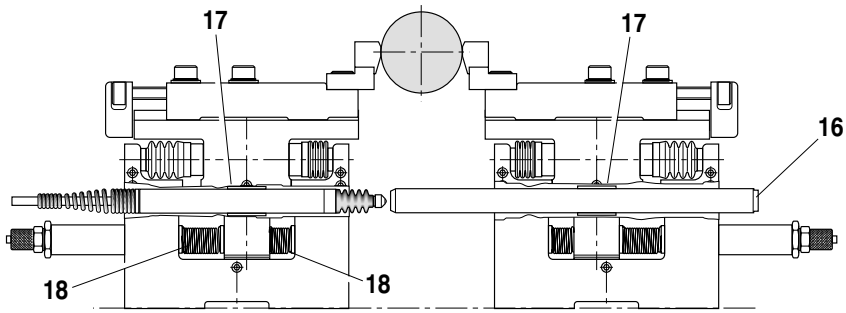


9



10





How to Order

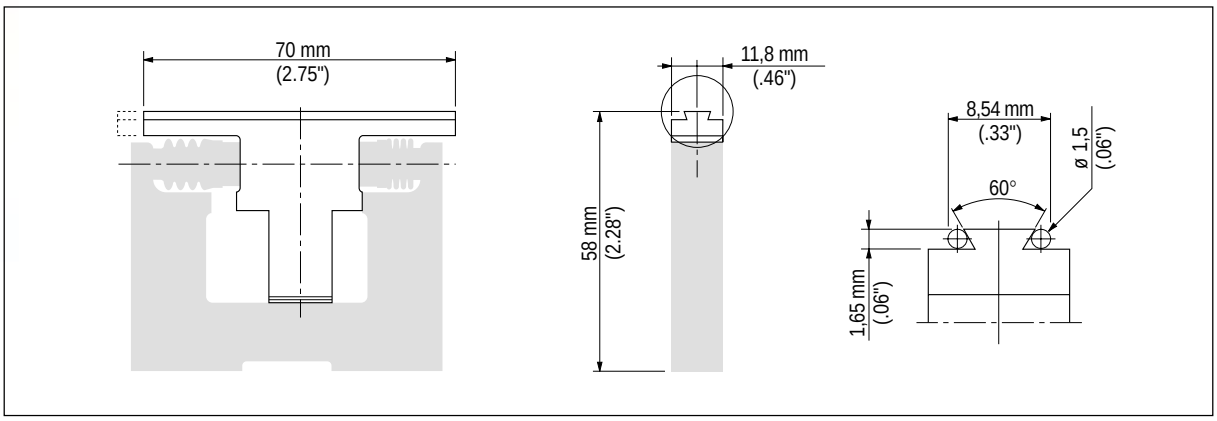
Ref.	Description		Order Code
1	QBF100 LVDT (full-bridge) ± 1mm with pretravel adjustment unit		3419883300
	QBH100 HBT (half-bridge) ± 1mm with pretravel adjustment unit		3419883350
	QBH100 HBT (half-bridge)± 1mm with pretravel adjustment unit - dovetail compatible with contacts of tesa		3419883360
2	QBF100 LVDT (full-bridge) ± 1mm with pneumatic cylinder		3419883305
	QBH100 HBT (half-bridge) ± 1mm with pneumatic cylinder		3419883355
	QBH100 HBT (half-bridge) ± 1mm with pneumatic cylinder - dovetail compatible with contacts of tesa		3419883365
3	QB600 (transmission only) with pretravel adjustment unit	**A**	3019883001
4	QB600 (transmission only) with pneumatic cylinder	**A**	3019883002
5	Support for offset cut contact **11, 12, 13, 14, 15,** M4 thread [retooling range 0-20 mm (0 -.79")]		2019883060
6	Support for simple cut contact **8** or spherical contact **9, 10** [retooling range 0-20 mm (0 -.79")]		2019883050
7	Contact support with side rotation [retooling range 0-20 mm (0.79")]		2019883550
8	Simple cut contact		3391988325
9	Spherical contact L = 20 mm, diameter 5 mm		3391988301
	Spherical contact L = 40 mm, diameter 5 mm		3391988302
	Spherical contact L = 60 mm, diameter 5 mm		3391988303
10	Spherical contact L = 20 mm, diameter 3 mm		3391988310
	Spherical contact L = 40 mm, diameter 3 mm		3391988311
	Spherical contact L = 60 mm, diameter 3 mm		3391988312
11	Left off-set cut contact L = 24 mm		3391988336
12	Left off-set cut contact L = 12 mm		3391988335
13	Off-set cut contact		3391988330
14	Right off-set cut contact L = 12 mm		3391988337
15	Right off-set cut contact L = 24 mm		3391988338
16	Mechanical reference shaft (external dia. 8 mm, L = 120 mm)		1119883071
17	Adapting bushing for pencil probes dia. 8 mm	**B**	1019826001
	Adapting bushing for pencil probes dia. 3/8"	**B**	1019883072
18	Spring 0.63N (blue)		1019883035
	Spring 1.7N (black)		1019883034
	Spring 2N (green)		1019883031
	Spring 2.6N (red)		1019883032
	Spring 4N (yellow)		1019883036
	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 QBF100 / QBH100	**C**	D4340013X1
	User manual QB600	**C**	D4340014X1

NOTES

A • The code is not comprehensive of the pencil probe, for which a separate order is necessary.
B • To be always used with QB600, to fix the pencil probe or the mechanical reference shaft (ref. 16)
C • X = I (Italian); U (English); D (German); F (French); E (Spanish)

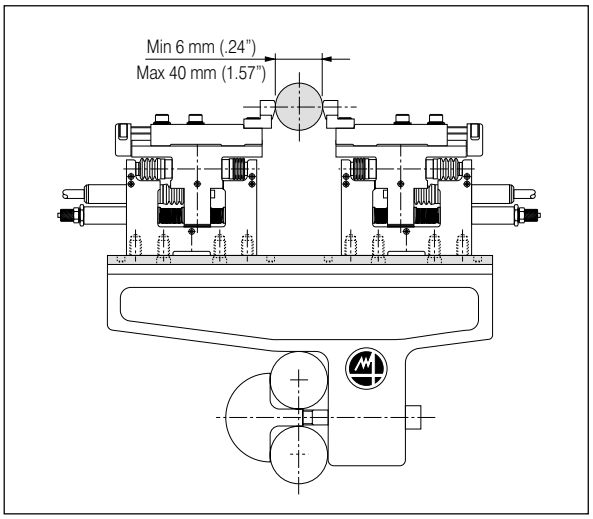
Special version with dovetail compatible with contacts of Tesa

Available on request. Technical specifications same as above.



Interface for Quick Set Bench Gauge

To integrate the Quick Block with the Quick Set bench gauge, a support bracket L = 200 mm with interface is available for measuring diameters up to 40 mm (1.57").
For measuring bigger diameters [up to 90 mm (3.54")] a mounting interface is used with a bracket L = 250 mm.
The measure height of the contact, with respect to the bracket, is the same of the Quick Set standard transmissions.



Description	Order Code
Support bracket L = 200 mm for diameters up to 40 mm, with interface for two quick blocks	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

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.

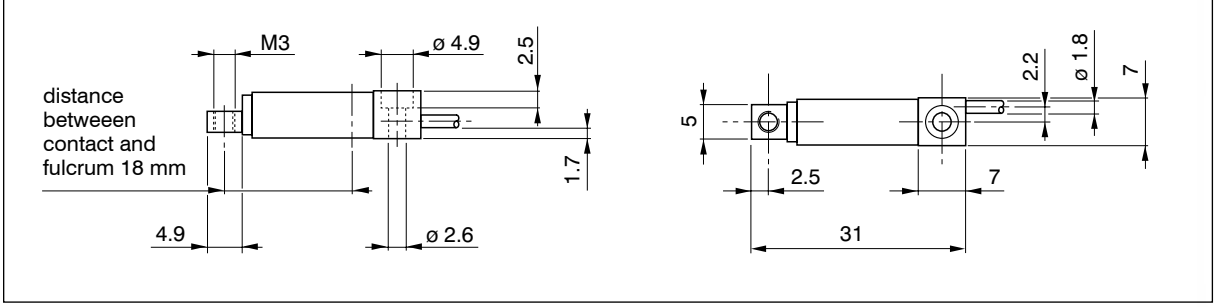
2. Despite these small dimensions A124 is provided with a replaceable contact, a feature normally available only in larger measuring devices. Therefore contact replacement would no longer require disassembly of the complete measuring cell resulting in time and cost savings. This design allows also use of different types of contacts depending on the application requirement without the need for a special cell configuration.

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 char-acteristics allow connection to TESTAR or MARPOSS measur-ing amplifiers as well as electron-ics 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	± 200 µm
Pre-travel at electrical zero	270 ± 30 µm
Overtravel from electrical zero	290 ± 40 µm
Tip force at electrical zero	0,9 ± 0,2 N
Repeatability (σ x 2,77)	≤ 0,1 µm
Degree of protection CEI/IEC 529	IP67
Standard contact (R = 1,5 mm)	M3
Linearity error	≤ 3 µm
Thermal drift at zero	≤ 0,3 µm/°C
Operating temperature	+5 / +40 °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

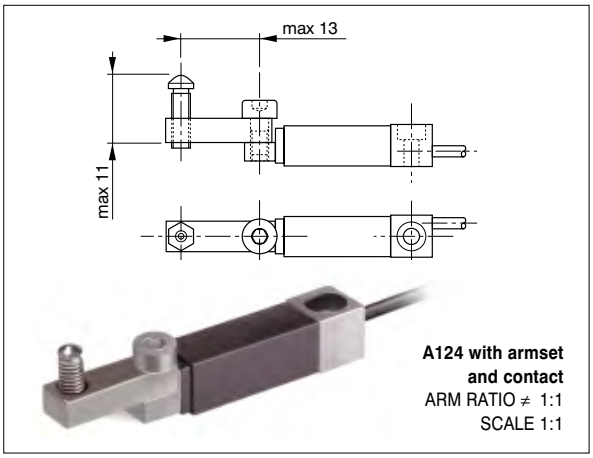
Type of transducer	LVDT compatible with TESTAR / MARPOSS amplifiers
Calibration frequency	7,5 KHz
Calibrated at	3,5 V RMS with load 1 MOhm/360 pF
Max. current	5 mA / V
I/O phase shift	≤ 8°
Sensitivity	230 mV/V/mm ± 1%
Order Code	3419886153

Half-bridge (HBT) electrical specifications

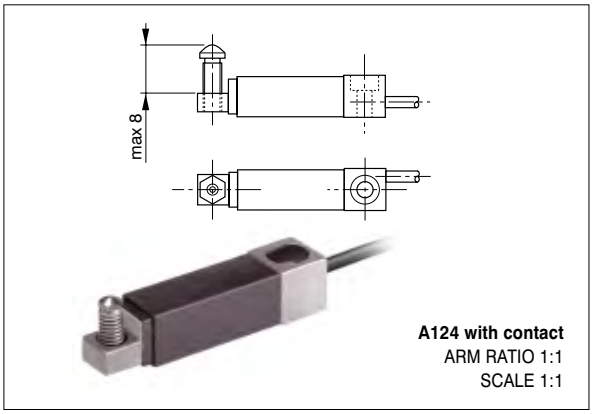
Type of transducer	HBT compatible with TESTAR / MARPOSS amplifiers
Calibration frequency	7,5 KHz
Calibrated at	3,5 V RMS with load 2 KOhm ± 0,1%
Max. current	4 mA / V
I/O phase shift	≤ 10°
Sensitivity	73,75 mV/V/mm ± 1%
Order Code	3419886154

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 ± 0,1%
Max. current	2,5 mA / V
I/O phase shift	≤ 8°
Sensitivity	73,75 mV/V/mm ± 1%
Order Code	3419886155



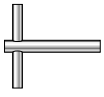
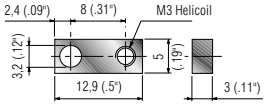
A124 with armset and contact
ARM RATIO ≠ 1:1
SCALE 1:1



A124 with contact
ARM RATIO 1:1
SCALE 1:1

Application example

ACCESSORIES

Accessories	Description	Order Code
	Carbide contact R=1,5 mm; L=12 mm	1408612020
	Diamond contact R=1,5 mm; L=12 mm	1408612035
	Carbide contact R=3,5 mm; L=12 mm	3321120230
	Diamond contact R=3,5 mm; L=12 mm	3360120230
	Carbide contact R=10 mm; L=12 mm	3323120230
	Diamond contact R=10 mm; L=12 mm	3362120230
	Contact wrench (2,5 mm)	1300538000
	Contact wrench (4 mm)	1300540000
	Wrench for diameter set-up	1320893000
	Standard armset L= 8 mm	3191988600

TESTAR a MARPOSS DIVISION

M1 Star

Mechanical Bore Gauge

MECHANICAL BORE GAGE

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

MAIN FEATURES

- Measurable diameters: 3 to 300 mm (0.12”-11.81”). Special versions available for diameters up to 525 mm.
- 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.

TECHNICAL SPECIFICATIONS

DESCRIPTION	WORKING RANGE								
STANDARD MEASURING RANGE FOR TYPE B AND T (mm)	Ø 3 - 4,5	Ø 4,5 - 5,5	Ø 5,5 - 26			Ø 26 - 300			
	0,055	0,070	0,120			0,150			
EXTENDED MEASURING RANGE FOR TYPE B AND T (mm) (*)	Ø 3 - 4,5	Ø 4,5 - 5,5	Ø 5,5 - 7,5	Ø 7,5 - 15	Ø 15 - 26	Ø 26 - 38	Ø 38 - 100	Ø 100 - 150	Ø 150 - 300
	-	-	-	0,120 - 0,170	0,120 - 0,200	0,150 - 0,200	0,150 - 0,400	0,150 - 0,350	0,150 - 0,300
STANDARD MEASURING RANGE FOR TYPE SB AND BC (mm)	Ø 3 - 4,5	Ø 4,5 - 5,5	Ø 5,5 - 26			Ø 26 - 60	Ø 60 - 150		Ø 150 - 300
	0,055	0,070	0,120			0,150	0,120		0,080
REPEATABILITY (2,77 σ) (µm)	≤ 1								

(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 GAUGE**: 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 gauge 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 ≤ 2 μm / Rz < 6,3.
R2: bigger radius for Ra ≥ 2 μm / 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.

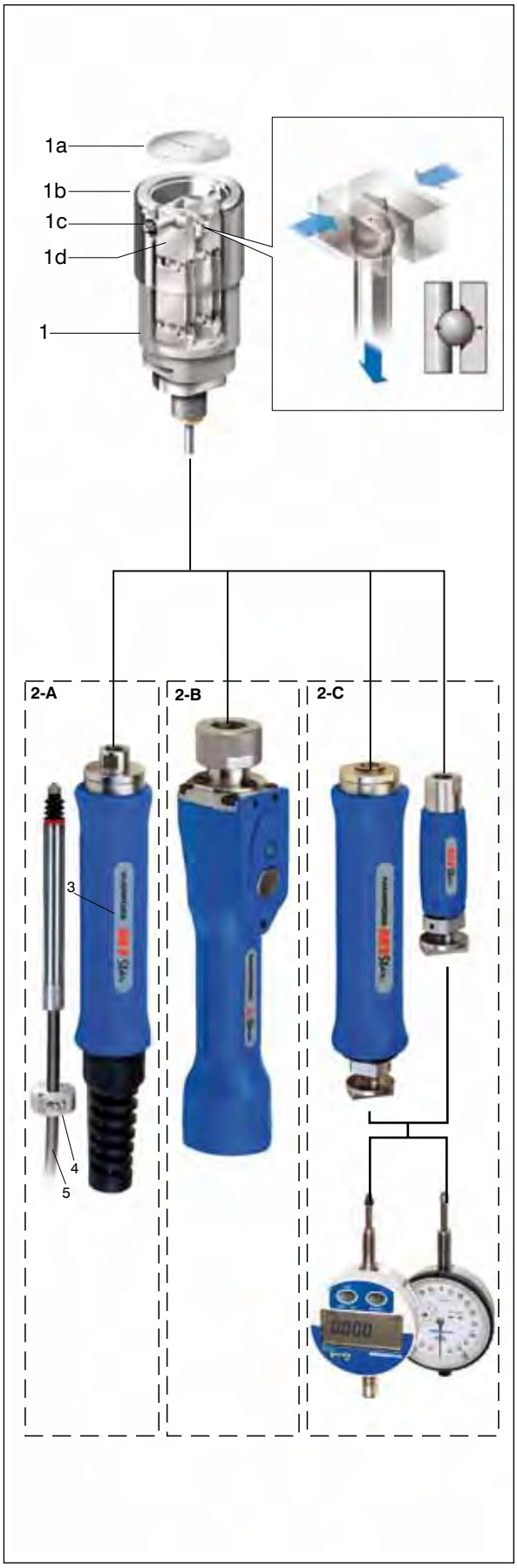
1d **MEASURING ARMSET**: it is made by either 2 or 4 fulcrum elements, depending on the diameter range. The measurement is transferred to the display device by a transfer rod with spherical head that slides on a cradle formed by a V-shaped guide and an inclinated plane.

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.

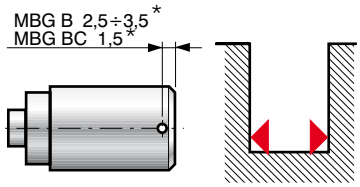
3 **NUMBER PLATE**: it can be marked with the bore gauge size or any other information required by the customer.

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.

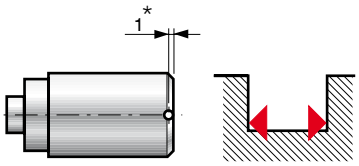
5 **CABLE**: it is a special reinforced cable (ø 4,7 mm) specifically developed for use in manual gauges, which considerably reduces the risk of damage and unintended torsion.



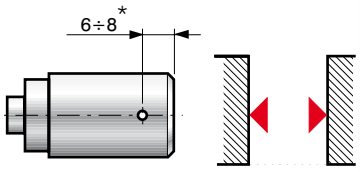
M1 STAR - Standard Versions



MBG-B/BC Plug Gauges
For blind bores.



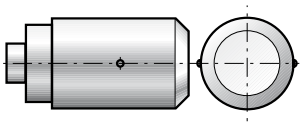
MBG-SB Plug Gauges
For superblind bores.



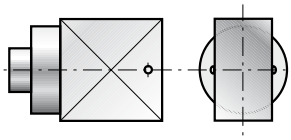
MBG-T Plug Gauges
For through bores.

M1 STAR - Dedicated Solutions (Examples)

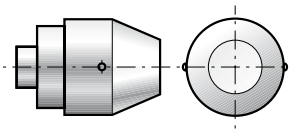
Dedicated Solutions complete the standard product line, and provide solutions for measuring conditions outside the capabilities of Standard Bore Gauges. A wide range of special measuring solutions are available, for your applications, with our series of dedicated plug-gauges.



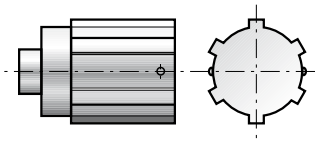
WITH LONG NOSEPIECE
Guides the plug gauge when measuring discontinuous/interrupted deep bores.
Example: cylinder block.



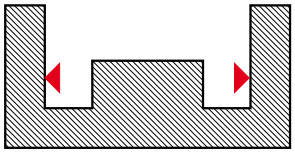
FOR PARALLEL WALLED BORES
To be used for gap measurements.
Example: keyways or splines



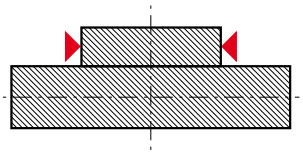
WITH PILOT CONE
For CNC automatic applications the cone helps the entry of the nosepiece into the workpiece, reducing the possibility of accidental damages.



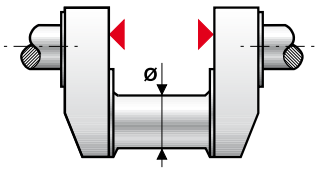
WITH CARBIDE BAR INSERTS
The carbide bars will increase the life of the gauge, reducing the wear on the nosepiece and preventing jamming caused by the presence of metal cinders swarf or debris.



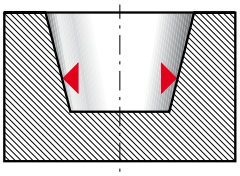
BORES WITH CENTRAL HUB
For the measuring of internal diameters where there is a central hub projection.
Example: automatic transmission components.



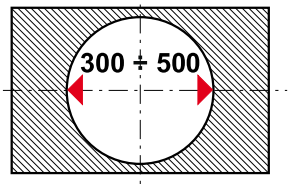
OUTSIDE DIAMETER
For the measuring of the ending section of flywheel shafts, or the short outside diameters often found on transmission & pump components and end caps on electric motors etc.



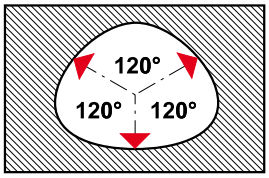
"V"-SHAPED PLUG GAUGE
Designed for the measurement of straight sided gaps in crankshafts or similar components.



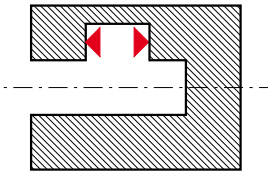
CONE SHAPED PLUG GAUGE
For tapered bores.
Example: front or rear knuckles.



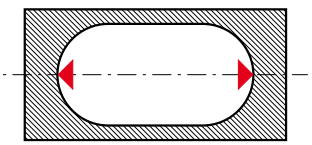
MACRO-LITE
Particularly light and easy to be used for diameters up to 500 mm.
Example: large pipes, oil & gas industries.



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

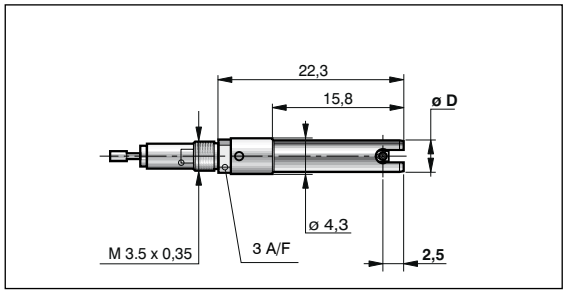
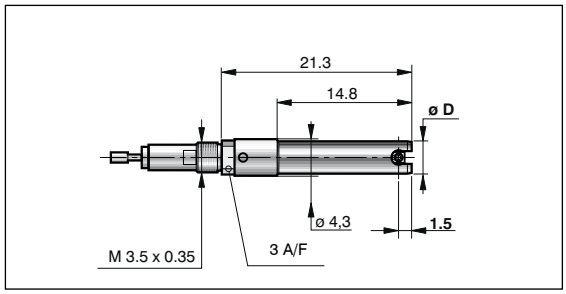
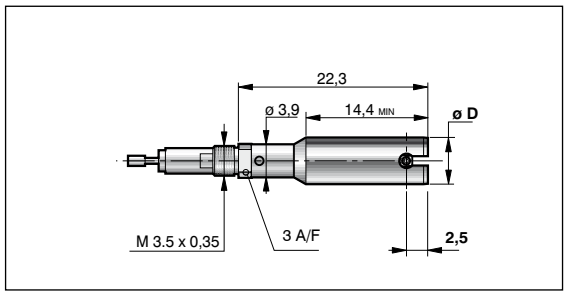
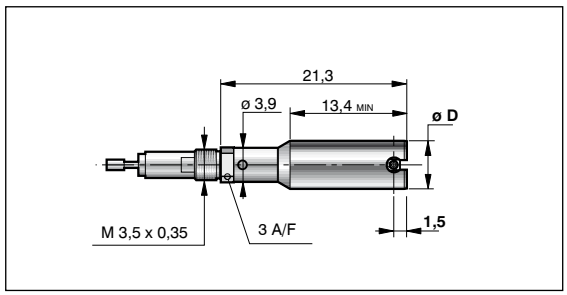
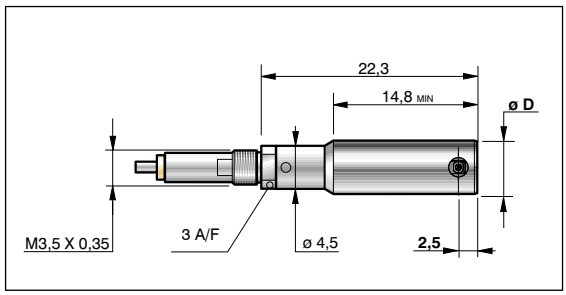
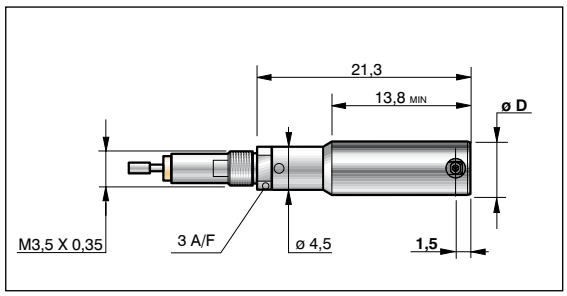
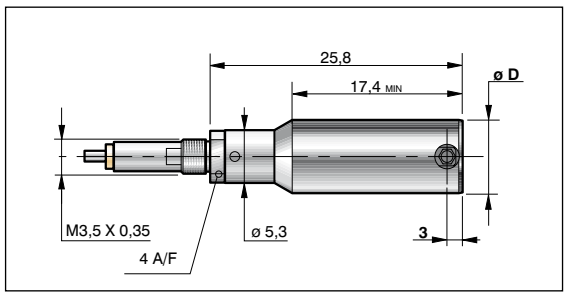
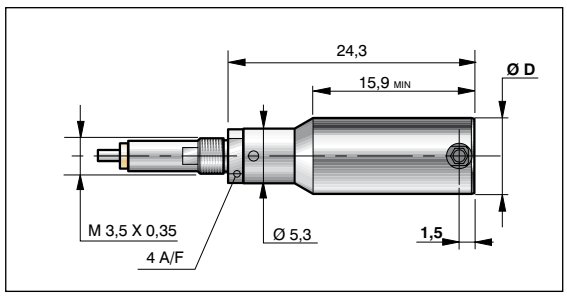
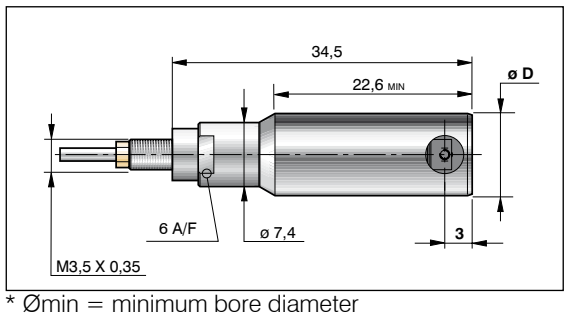
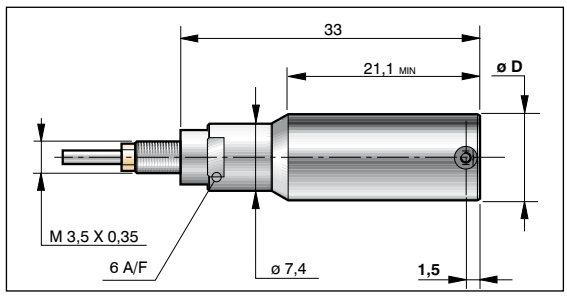


RIGHT ANGLE PLUG GAUGE
For measuring bores with perpendicular axis to the direction of gage insertion, or for limited space applications.
Example: differential carrier.



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

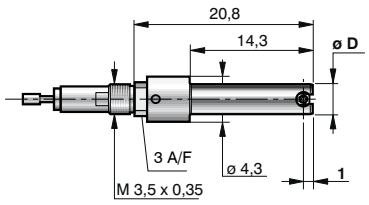
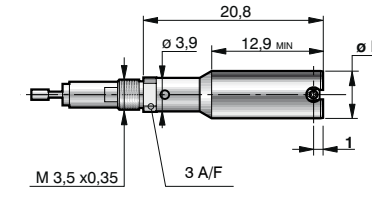
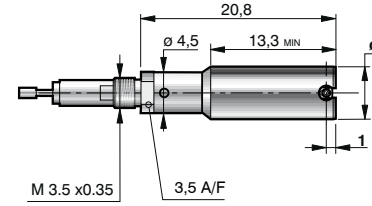
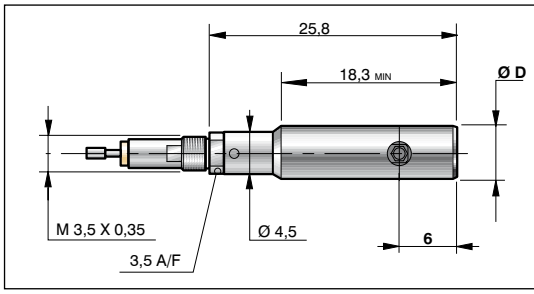
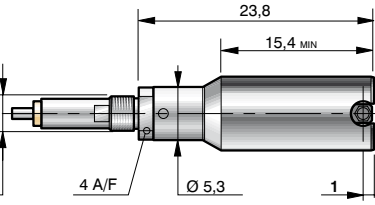
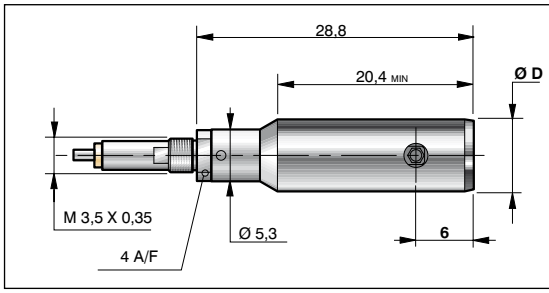
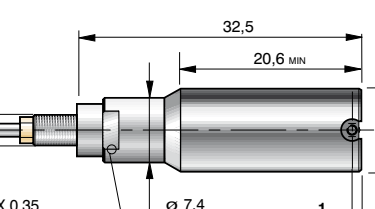
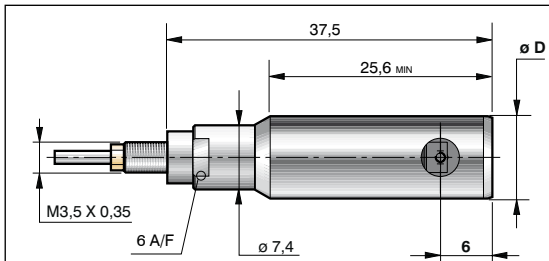
DIMENSIONAL SPECIFICATIONS OF STANDARD VERSIONS

	PLUG GAUGE MBG-B	PLUG GAUGE MBG-BC
Ømin* 3 to <4		
Ømin* 4 to < 4,5		
Ømin* 4,5 to < 5,5		
Ømin* 5,5 to < 7,5		
Ømin* 7,5 to < 9,5		

* Ømin = minimum bore diameter

MEASURING CONTACTS FOR PLUG GAUGES TYPE **B**				
	CARBIDE OR DLC - COATED		DIAMOND	
ø D	**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	-

MEASURING CONTACTS FOR PLUG GAUGES TYPE **BC**				
	CARBIDE OR DLC - COATED		DIAMOND	
ø D	**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	-	-

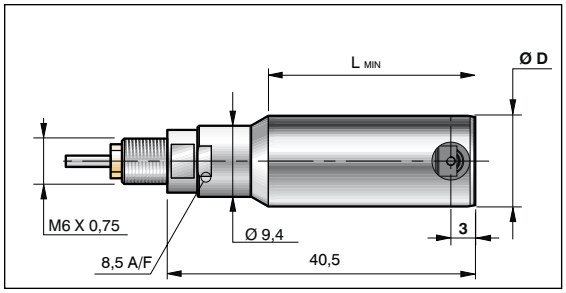
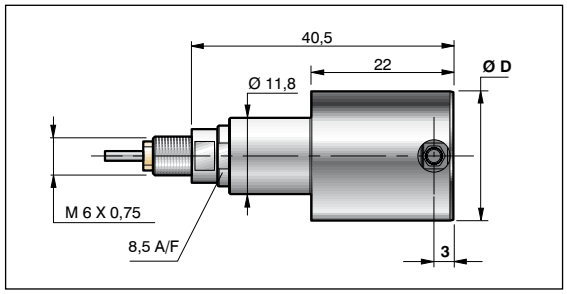
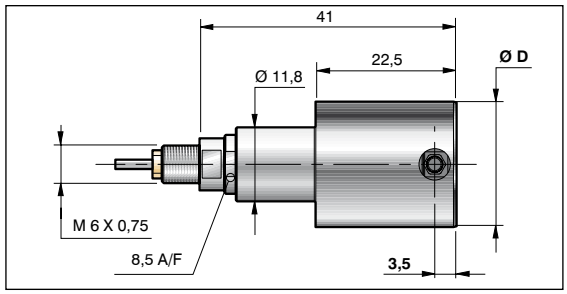
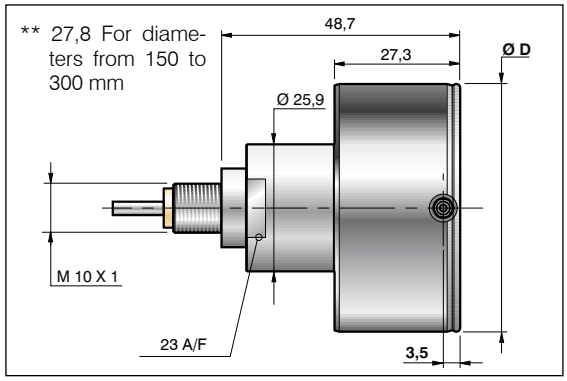
	PLUG GAUGE MBG-SB	PLUG GAUGE MBG-T	
		N.A.	Ømin* 3 to<4
		N.A.	Ømin* 4 to < 4,5
			Ømin* 4,5 to < 5,5
			Ømin* 5,5 to < 7,5
			Ømin* 7,5 to < 9,5

* Ømin = minimum bore diameter

MEASURING CONTACTS FOR PLUG GAUGES TYPE **SB**				
	CARBIDE OR DLC - COATED		DIAMOND	
ø D	**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	-	-

MEASURING CONTACTS FOR PLUG GAUGES TYPE **T**				
	CARBIDE OR DLC - COATED		DIAMOND	
ø D	**R1**	**R2**	**R1**	**R2**
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 GAUGE MBG-B	PLUG GAUGE MBG-BC	
Ømin* 9,5 to < 15		N.A.	
Ømin* 15 to < 20		N.A.	
Ømin* 20 to < 26			
Ømin* 26 to < 300		N.A.	

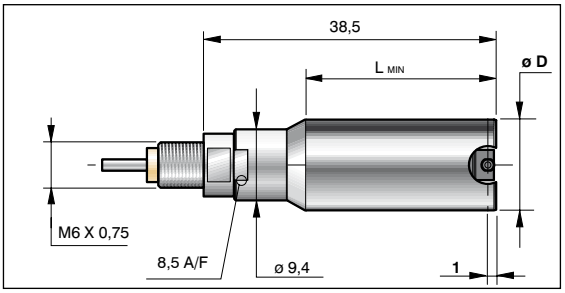
* Ømin = minimum bore diameter

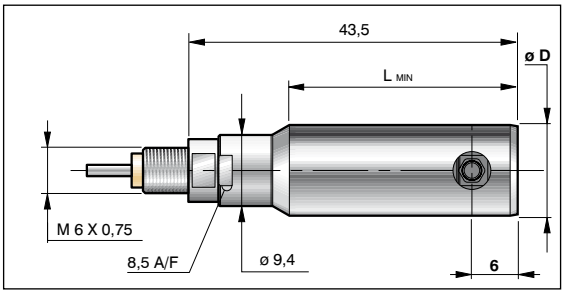
MEASURING CONTACTS FOR PLUG GAUGES TYPE B				
	CARBIDE OR DLC - COATED		DIAMOND	
ø D	R1	R2	R1	R2
9,5 ÷ <15	2	3,5	0,75	-
15 ÷ <16	2	5	0,75	-
16 ÷ <20	2	5	2	-
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <300	4	10	4	10

PLUG GAUGE MBG-SB

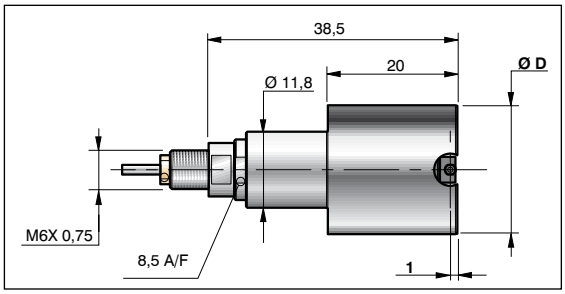
PLUG GAUGE MBG-T

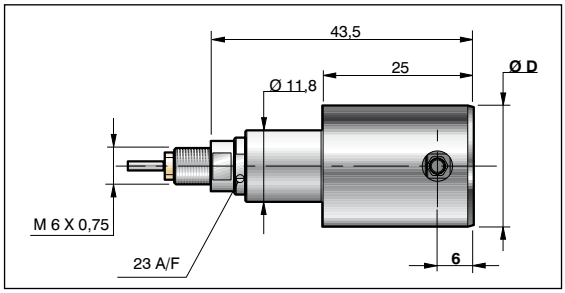
Ømin* 9,5 to < 15



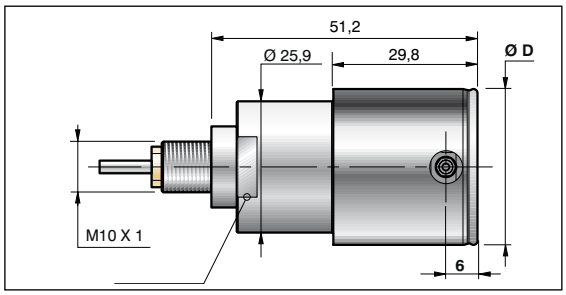


Ømin* 15 to < 26

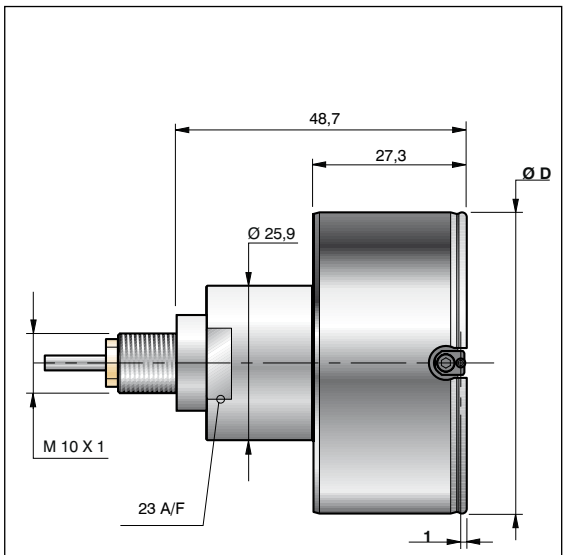




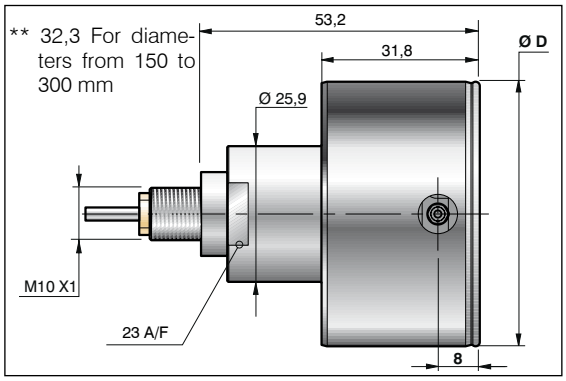
Ømin* 26 to < 40



Ømin* 40 to < 300



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



* Ømin = minimum bore diameter

MEASURING CONTACTS FOR PLUG GAUGES TYPE SB				
	CARBIDE OR DLC - COATED		DIAMOND	
ø D	R1	R2	R1	R2
9,5 ÷ <15	2	3,5	-	-
15 ÷ <26	2	5	-	-
-	-	-	-	-
26 ÷ <300	4	10	-	-

MEASURING CONTACTS FOR PLUG GAUGES TYPE T				
	CARBIDE OR DLC - COATED		DIAMANT	
ø D	R1	R2	R1	R2
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

NOSEPIECE DIMENSIONS

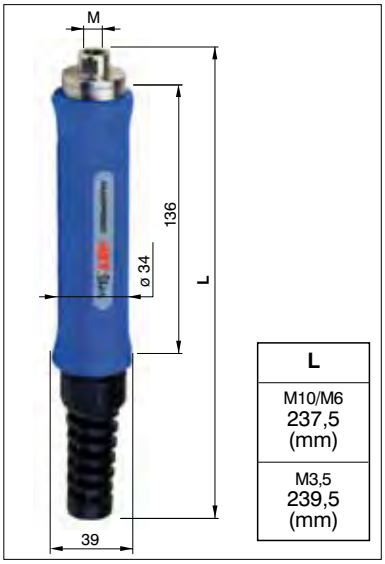
Ø D (nominal diameter of the nosepiece)=
Ø min – [0,0007 * (Ø min + 12)]
The following table shows the tolerances for ø D.

D NOMINAL RANGE	TOLL +	TOLL -
3 ÷ 26	0	-0,015
26 ÷ 50	0	-0,02
50 ÷104	0	-0,03
104 ÷ 150	-0,01	-0,05
150 ÷180	-0,01	-0,08
180 ÷ 300	-0,01	-0,08

STANDARD HANDLES

PENCIL PROBE HANDLES

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

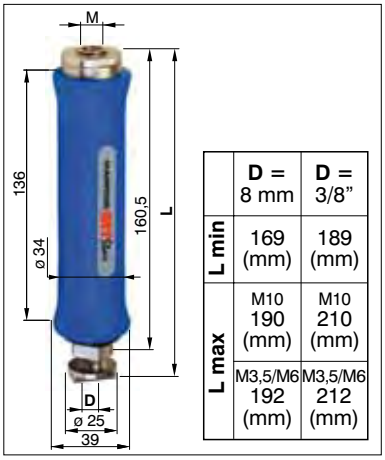


L
M10/M6 237,5 (mm)
M3,5 239,5 (mm)

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



	D = 8 mm	D = 3/8"
L min	169 (mm)	189 (mm)
L max	M10 190 (mm)	M10 210 (mm)
	M3,5/M6 192 (mm)	M3,5/M6 212 (mm)

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

	D = 8 mm	D = 3/8"
L min	88 (mm)	108 (mm)
L max	M10 108 (mm)	M10 128 (mm)
	M3,5/M6 110 (mm)	M3,5/M6 130 (mm)

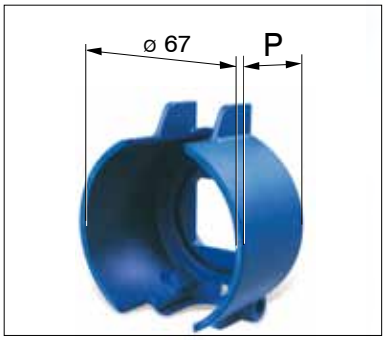
HOOKS

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
T-shaped hook for indicator handle	1T0JHS0813

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	2T0DICS000

HANDLES WITH WIRELESS TRANSMISSION

i-WAVE HANDLE WITH ALKALINE BATTERIES

DESCRIPTION	ORDER CODE
i-Wave handle with alkaline batteries (one adapter for plug gauges with M6 and M10 thread is included in the supply)	2TWISFB000

i-WAVE HANDLE WITH LI-ION BATTERIES

Description	Order Code
i-Wave handle with Li-Ion inductive batteries (one adpter for plug gauges with M6 and M10 thread is included in the supply)	2TWISFI000

"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

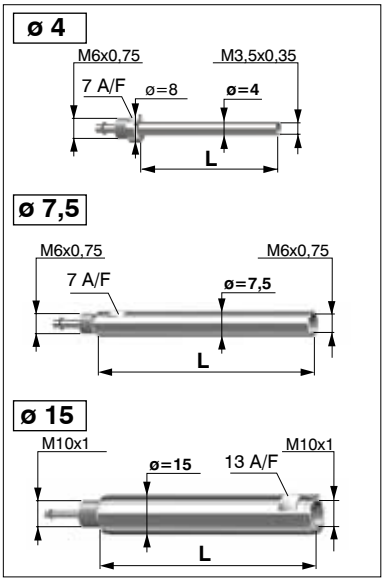
STAND CHARGER WITH PLUG SUPPORT

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

DEPTH EXTENSIONS

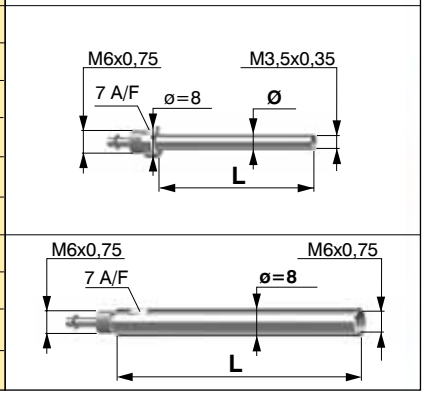
The extensions make it possible to reach the deeper measuring positions, when inserted between the plug gauge and the handle:

Length	Order Code		
L (mm)	**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



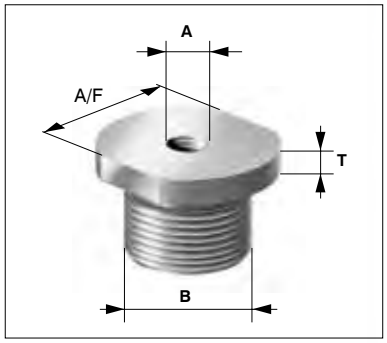
SPECIAL DEPTH EXTENSIONS

For special applications and used where the extension diameter must not exceed the plug gauge 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

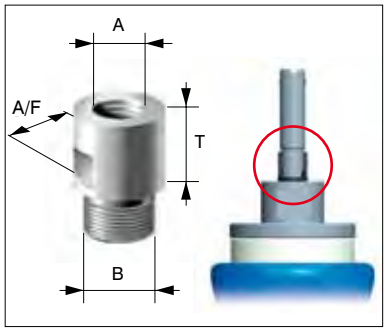
Thread adaptors improve applications capability and interchangeability of the accessories.



Standard thread adaptors:

RANGE	Thread A (1)	Thread B (1)	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 gauges with M3,5x0,35 thread)

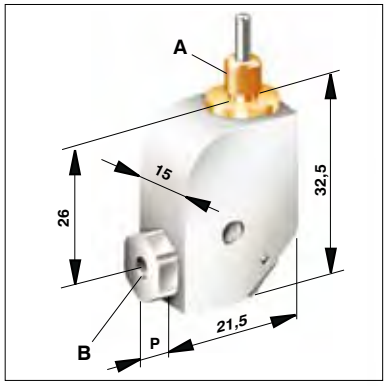


RANGE	Thread A (1)	Thread B (1)	A/F	T (mm)	Order Code
3 - 4	M3,5X0,35	M6X0,75	6	6	1TAP350600
4 - 4,5			6	6	1TAP350601
4,5 - 5,5			6	6	1TAP350602
5,5 - 7,5			6	6	1TAP350603
7,5 - 9,5			9	9	1TAP350604

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

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 (1)	Thread A (1)	P (mm)	Order Code
M3,5 X 0,35	M6 X0,75	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

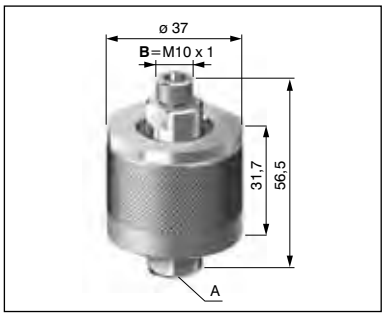
(1)NOTE: Thread **A**: handle-side thread - Thread **B**: plug gauge-side thread

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 (1)	ORDER CODE
M6X0,75	2TR060S000
M10X1	2TR100S000

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



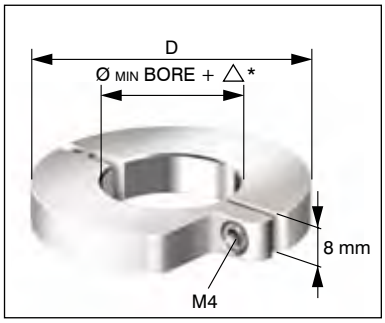
DEPTH STOPS

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*)
8 < 11 *(0.3150" < 0.4331")*	33 *(1.29")*
11 < 15 *(0.4331" < 0.5905")*	37 *(1.45")*
15 < 20 *(0.5905" < 0.7874")*	42 *(1.77")*
20 < 25 *(0.7874" < 0.9842")*	51 *(2.00")*
25 < 30 *(0.9842" < 1.1811")*	56 *(2.20")*
30 < 35 *(1.1811" < 1.378")*	61 *(2.40")*
35 <40 *(1.378" <1.5748")*	66 *(2.59")*

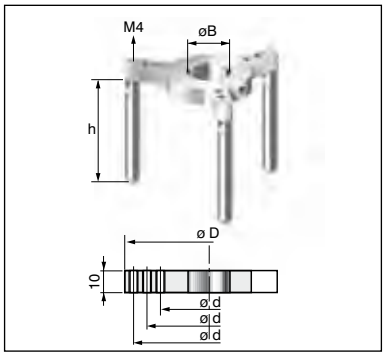
ø min Bore (mm) (*inch*)	ø D (mm) (*inch*)
40 < 45 *(1.5748" < 1.7716")*	71 *(2.79")*
45 < 50 *(1.7716" < 1.9685")*	76 *(2.99")*
50 < 60 *(1.9685" < 2.3622")*	86 *(3.38")*
60 < 70 *(2.3622" < 2.7559")*	96 *(3.77")*
70 < 80 *(2.7559" < 3.1496")*	106 *(4.17")*
80 < 90 *(3,1496" < 3.5433")*	116 *(4.56")*
90 ≤100 *(3.5433" ≤ 3.937")*	126 *(4.96")*



△ < 0,2 mm

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
	75		44	56	68		2TDEM150B0
	110		79	91	103		2TDEM150C0
	160		117	129	141	153	2TDEM150D0
	220		177	189	201	213	2TDEM150E0



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

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.

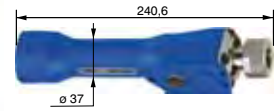
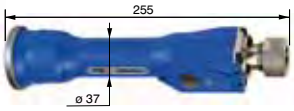
ELECTRONIC INTERFACES

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.

TECHNICAL SPECIFICATION OF THE i-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
	i-Wave Handle with alkaline batteries (one adapter for plug gauges with M6 and M10 thread is included in the supply) (*)	2TWISFB000
	i-Wave Handle with Li-Ion inductive batteries (one adapter for plug gauges with M6 and M10 thread is included in the supply) (*)	2TWISFI000
	"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

TESTAR
A MARPOSS DIVISION

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 taper of bores, wherever a high-precision performance is required.

MAIN CHARACTERISTICS

- **Application range**
  Diameters from 3 to 300 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 gauge and cable is made with a connector allowing quick replacement of the plug gauge 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)	Ø 3 - 8		Ø 8 - 13	Ø 13 - 26	Ø 26 - 50	Ø 50 - 150	Ø 150 - 300
	0,050		0,060	0,060	0,070	0,070	0,080
EXTENDED MEASURING RANGE FOR TYPE B AND T (mm)	Ø 3 - 6	Ø 6 - 8	Ø 8 - 13	Ø 13 - 26	Ø 26 - 38	Ø 38 - 150	Ø 150 - 300
	0,050 - 0,070	0,050 - 0,100	0,060 - 0,150	0,060 - 0,200	0,070 - 0,200	0,070 - 0,350	0,080 - 0,300
STANDARD MEASURING RANGE FOR TYPE SB AND BC (mm)				Ø 13 - 26	Ø 26 - 50	Ø 50 - 150	Ø 150 - 300
				0,060	0,070	0,070	0,080
REPEATABILITY (2,77 σ) (µm)	≤ 0,5						
THERMAL DRIFT (µm/°C)	≤ 0,3						

(*): 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 gauge 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 (Ø 4,7 mm) specifically developed for use in manual gauges, with considerably reduces the risk of demage and unintended torsion. It complies with EMC Standards for manual gauges.

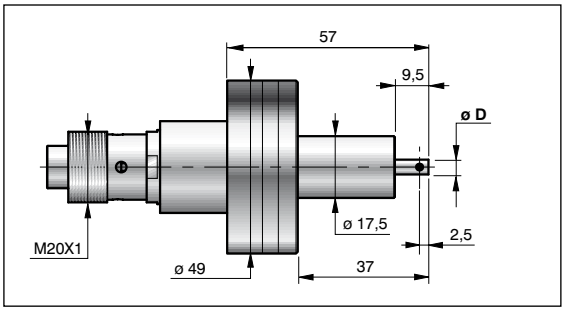
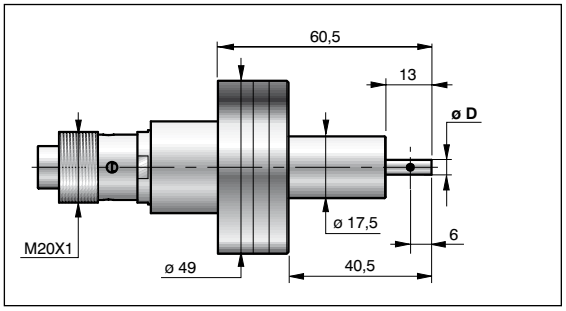
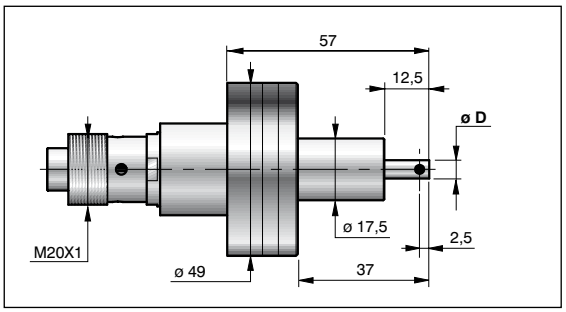
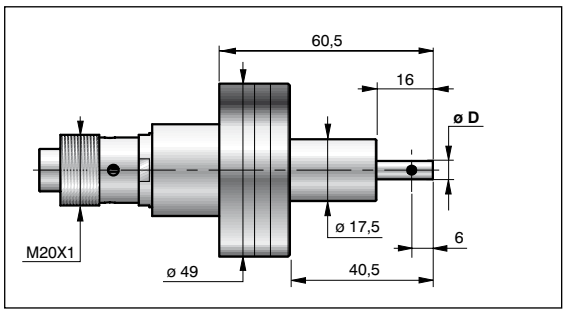
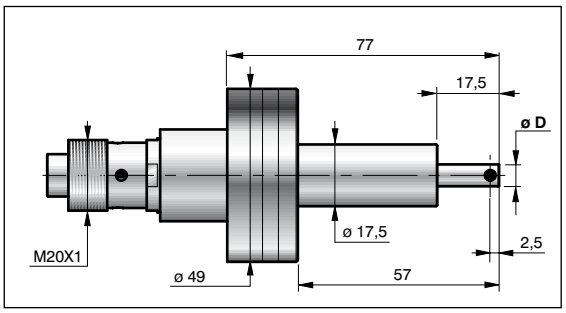
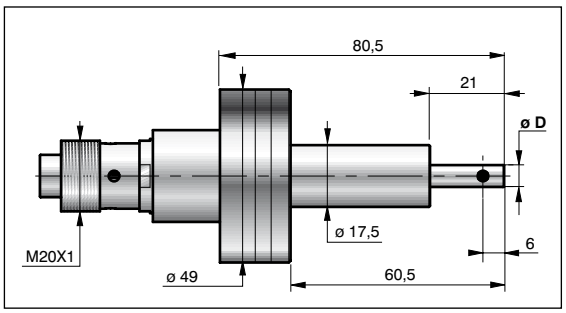
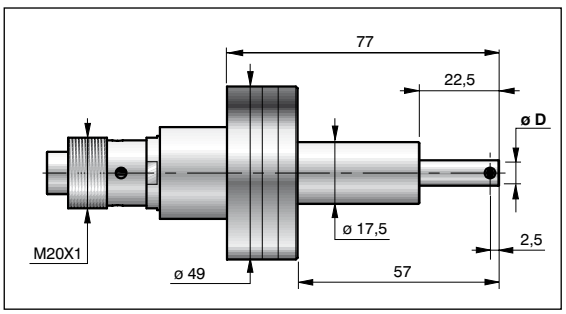
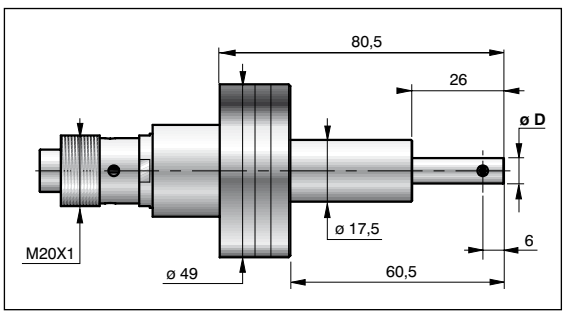
8 **CONNECTION TO ELECTRONIC DISPLAY UNIT**: for connection to electronic display units the EBG is supplied with a Lumberg type SV50/6 or S3. Extensions with dedicated connectors can be supplied, making it possible to achieve compatibility with many of the electronic display units available on the market.

NOSEPIECE DIMENSIONS

Ø D (nominal diameter of the nosepiece)=
Ø min – [0,0007 * (Ø min + 12)]
The following table shows the tolerances for Ø D.

D NOMINAL RANGE	TOLL +	TOLL -
3 ÷ 26	0	-0,015
26 ÷ 50	0	-0,02
50 ÷104	0	-0,03
104 ÷ 150	-0,01	-0,05
150 ÷180	-0,01	-0,08
180 ÷ 300	-0,01	-0,08

DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES

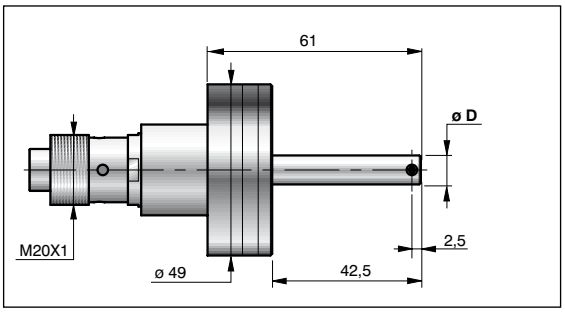
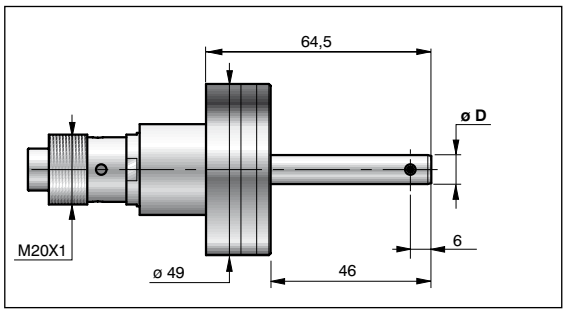
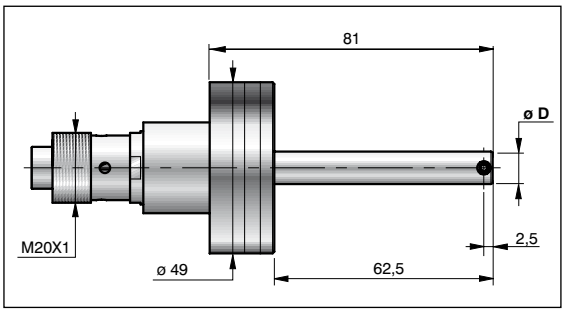
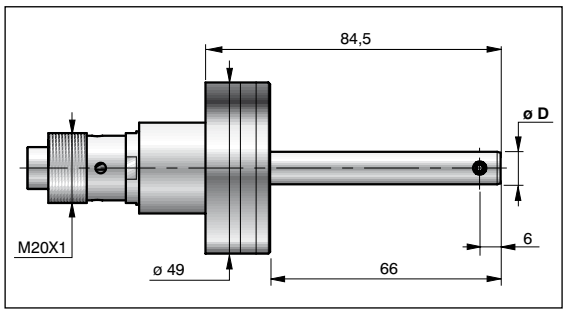
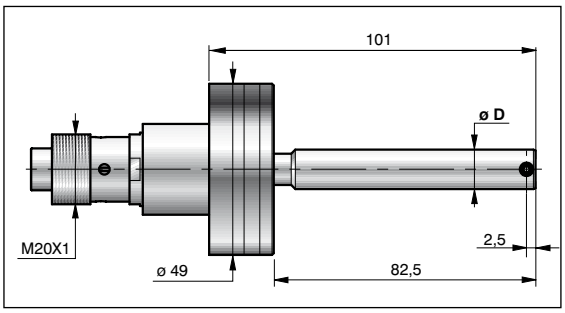
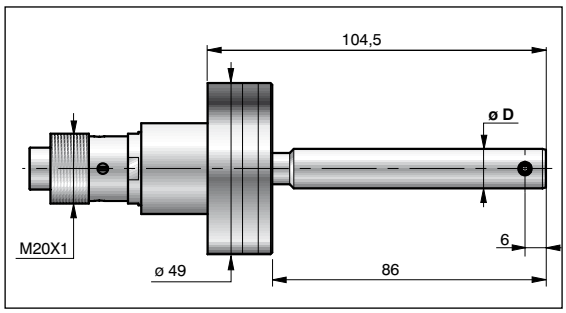
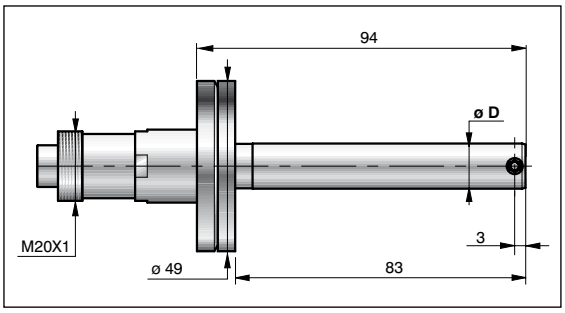
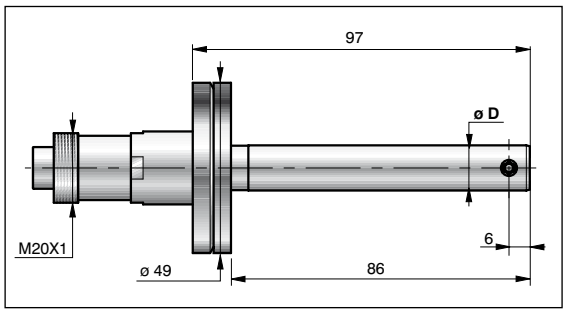
PLUG GAUGE EBG-B	PLUG GAUGE EBG-T	
		**Ømin* 3 ÷ <4**
		**Ømin* 4 ÷ < 5**
		**Ømin* 5 ÷ < 6**
		**Ømin* 6 ÷ < 7**

* Ømin = minimum bore diameter

CONTACTS FOR B-TYPE PLUG GAUGE				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
3 ÷ <6	0,25	-	-	-
6 ÷ <7	0,5	1	-	-

CONTACTS FOR T-TYPE PLUG GAUGE				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
3 ÷ <6	0,25	-	-	-
6 ÷ <7	0,5	1	-	-

DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES

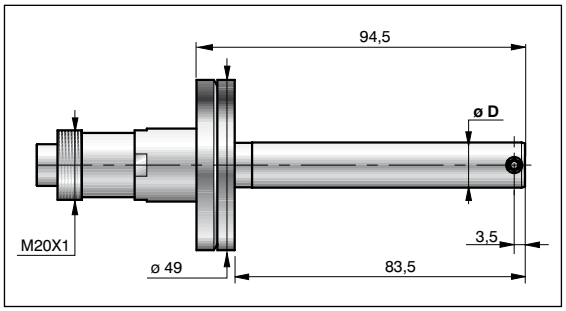
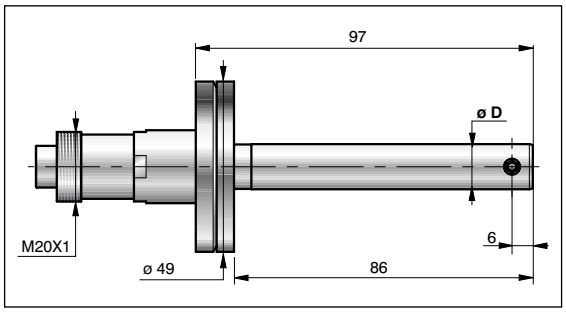
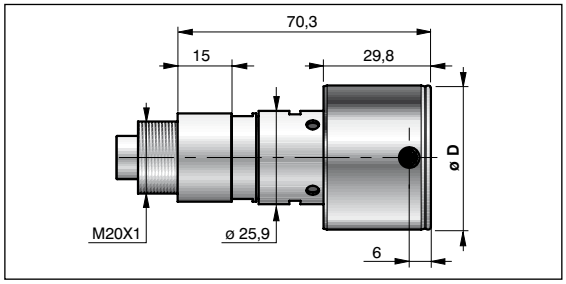
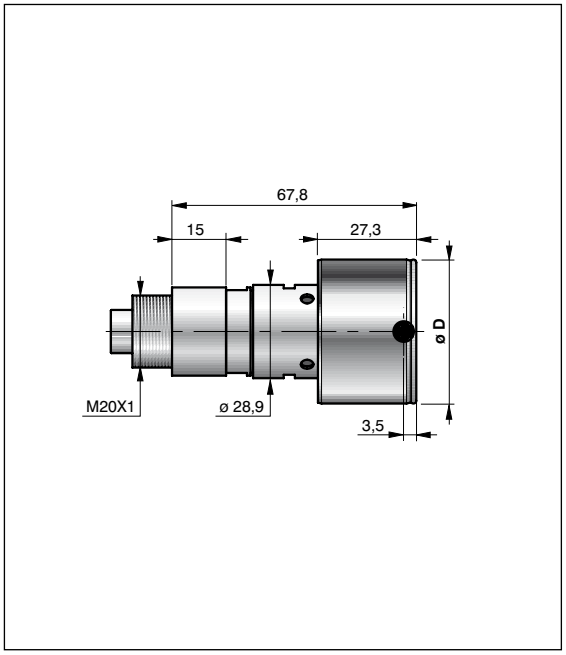
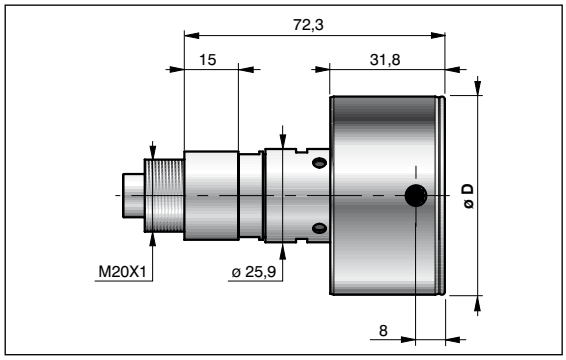
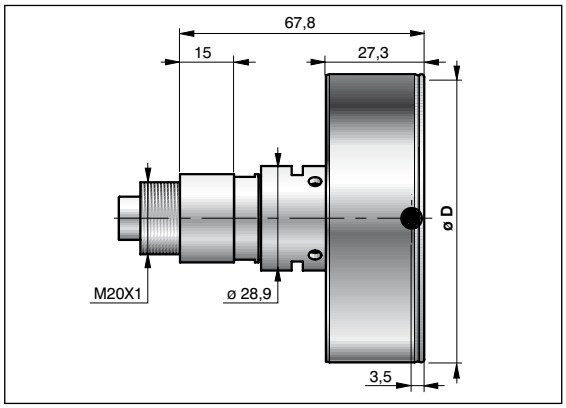
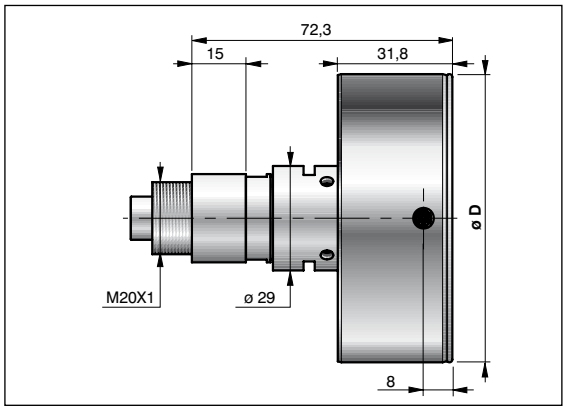
	PLUG GAUGE EBG-B	PLUG GAUGE EBG-T
Ømin* 7 ÷ <8		
Ømin* 8 ÷ < 9		
Ømin* 9 ÷ < 13		
flmin* 13 ÷ < 20		

* Ømin = minimum bore diameter

CONTACTS FOR B-TYPE PLUG GAUGE				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
7 ÷ <8	0,5	1	0,4	-
8 ÷ <10,5	1,5	2,5	0,4	-
10,5 ÷ <13	1,5	2,5	0,75	-
13 ÷ <20	2	5	2	5

CONTACTS FOR T-TYPE PLUG GAUGE				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
7 ÷ <8	0,5	1	0,4	-
8 ÷ <10,5	1,5	2,5	0,4	-
10,5 ÷ <13	1,5	2,5	0,75	-
13 ÷ <20	2	5	2	5

DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES

PLUG GAUGE EBG-B	PLUG GAUGE EBG-T	
		Ømin* 20 ÷ <26
	Ømin* 26 ÷ <40	
		Ømin* 40 ÷ < 74
		Ømin* 74 ÷ < 300

* Ømin = minimum bore diameter

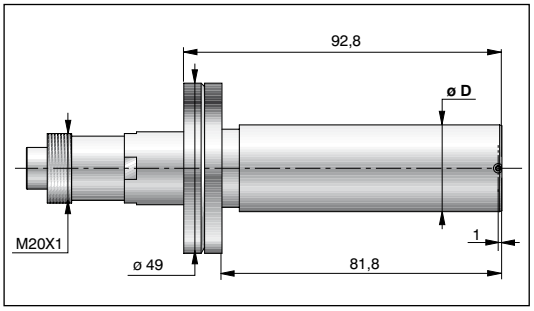
CONTACTS FOR B-TYPE PLUG GAUGE				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <300	4	10	4	10

CONTACTS FOR T-TYPE PLUG GAUGE				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <300	4	10	4	10

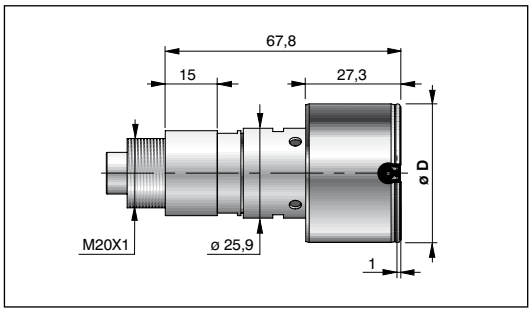
DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES

PLUG GAUGE EBG-SB

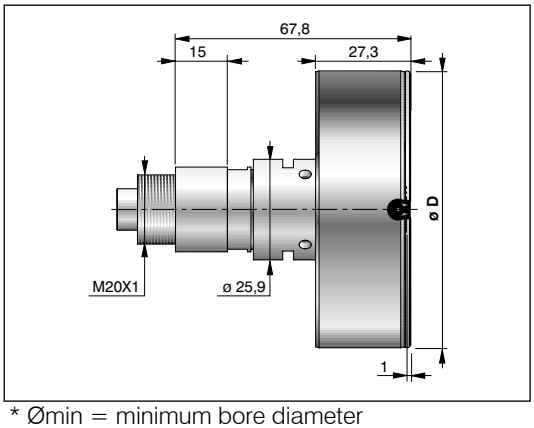
Ømin* 20 ÷ <26



Ømin* 26 ÷ < 74



Ømin* 74 ÷ < 300



* Ømin = minimum bore diameter

CONTACTS FOR SB-TYPE PLUG GAUGE				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
13 ÷ <26	2	5	-	-
26 ÷ <300	4	10	-	-

Standard Handles

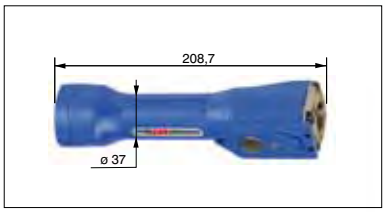
HANDLE FOR BORE GAUGE WITH CABLE

Description	Order Code
Handle for bore gauge with 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	2TG00TS026
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

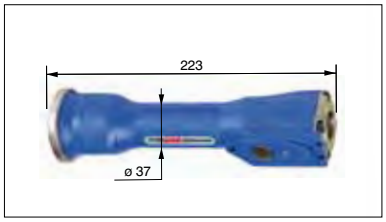
WAVE HANDLE WITH ALKALINE BATTERIES

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



MECHANICAL INTERFACE FOR PLUG GAUGE

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)	2T0IRMS000

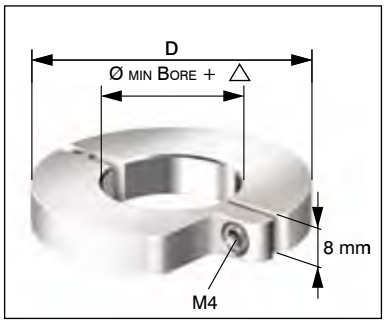
STAND CHARGER WITH PLUG SUPPORT

Description	Order Code
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

DEPTH STOPS FOR NOSEPIECE

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

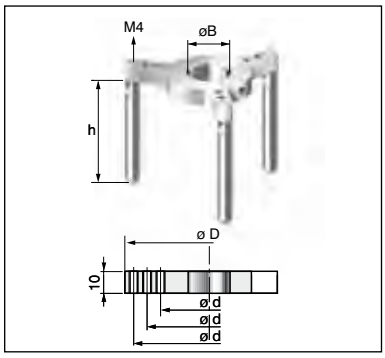
ø min Bore (mm)	ø D (mm)
40 ≤ ø < 45	71
45 ≤ ø < 50	76
50 ≤ ø < 60	86
60 ≤ ø < 70	96
70 ≤ ø < 80	106
80 ≤ ø < 90	116
90 ≤ ø ≤100	126



△ < 0,2 mm

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
	75		44	56	68		2TDEM150B0
	110		79	91	103		2TDEM150C0
	160		117	129	141	153	2TDEM150D0
	220		177	189	201	213	2TDEM150E0



EXTENSIONS

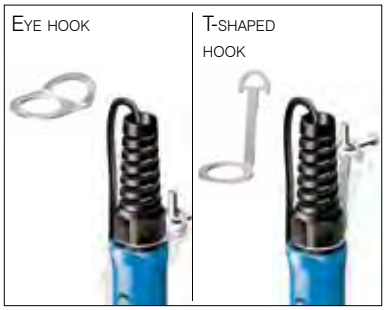
The stainless steel extensions, when inserted between the plug gauge and the handle, make it possible to reach the correct position in a bore, where the measurement must be read. The following codes can be ordered:

Diameter Range (mm)	L (mm)	Order Code
26÷300	20	1TX0S00020
	30	1TX0S00030
	40	1TX0S00040
	50	1TX0S00050
	65	1TX0S00065
	80	1TX0S00080
	100	1TX0S00100
	125	1TX0S00125
	250	1TX0S00250
	500	1TX0S00500

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
T-shaped hook for indicator handle	1T0JHS0813



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 available 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.

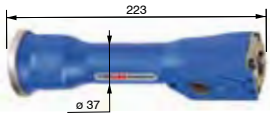
ELECTRONIC INTERFACES

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.

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

M1 AIR BORE GAUGES

M1 Air, pneumatic bore gauge, is particularly suitable to test components within very tight tolerances (from IT2 to IT7), and roughness ≤ 0,8 mm Ra.

The measurement principle is based on the variation of pressure, that is proportional to the distance between the bore gauge nozzles and the part under test.

The measurement is obtained by means of the so called “balanced pneumatic bridge” system, with differential pressure transducers and electronic amplification of the signal.

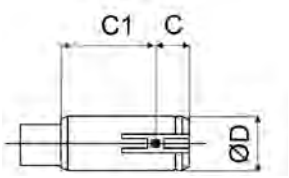
The signal is converted from analogue to digital through electronic converters.

M1 Air bore gauges are entirely manufactured by:

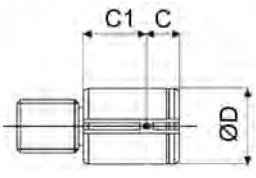
OMG A MARPOSS COMPANY

TPS - Pneumatic Plug Gauges

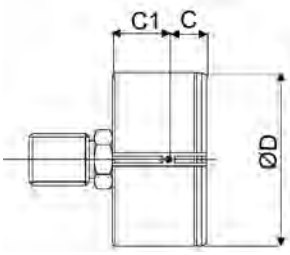
		Through bore				Blind bore			
→ D	range	C	C1	E	Type	C	C1	F	Type
3 - 4,15	0,03	6,5	31,5	1,8	T	3,5	34,5	4,4	B
4,15 - 6,3	0,05	9,5	28,5	2,5		3,5	34,5	4,8	
6,3 - 10	0,1	13	25	3		3,5	34,5	5	



		Through bore				Blind bore			
→ D	range	C	C1	E	Type	C	C1	F	Type
10 - 20	0,1	13	25	3	T	4	34	5,5	B
20 - 30	0,1	13	25	3		4	34	5,5	
30 - 42	0,1	13	25	3		4	34	5,5	
42 - 55	0,1	13	25	3		4	34	5,5	



		Through bore				Blind bore			
→ D	range	C	C1	E	Type	C	C1	F	Type
55 - 70	0,1	13	25	3	T	4	34	5,5	B
70 - 85	0,1	13	25	3		4	34	5,5	
85 - 100	0,1	13	25	3		4	34	5,5	



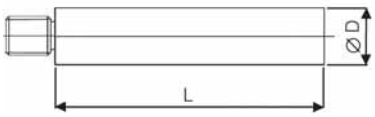
TPS - Technical Specifications

RETOOLING RANGE	**3 - 4,15**	**4,15 - 6,3**	**6,3 - 100**
MEASURING RANGE	max. 0,03 mm	max. 0,05 mm	max. 0,1 mm
REPEATABILITY	≤ 0,5 μm		
AIR SUPPLY	Dry air carefully filtered and purified (filtering degree < 5 μm)		
PIPE FOR AIR SUPPLY	Internal → 4 mm - length 2 meters		
AVERAGE CONSUMPTION	< 1000 l/h		

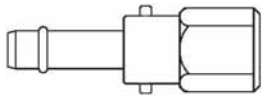
Accessories

EXTENSIONS

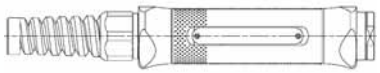
→ D	L	code
20	50	PLPM-50
20	100	PLPM-100
20	200	PLPM-200



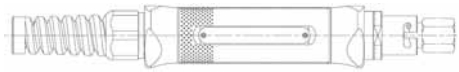
QUICK CONNECTION



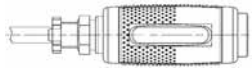
HANDLES



STANDARD

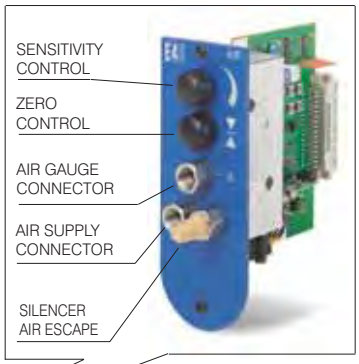


WITH QUICK CONNECTION



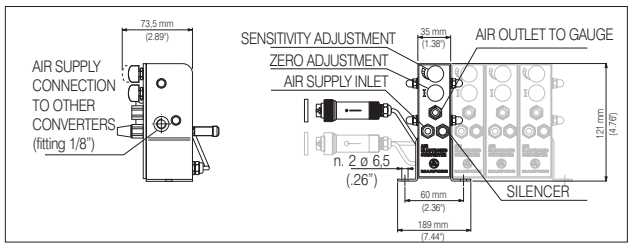
MINI

E4N AIR - External Air / Electronic converters for E4N (type: sensor's pressure)



E4N microprocessor column can display static or dynamic measurements, it features pneumatic-electronic converter with 1 input.

External A/E converter.
The M1 Air bore gauge can be connected to the electronic column E4N by means of an external A/E converter.



SNAP GAUGE

M3 Star™ is a line of manual mechanical snap gauges for checking external diameters on shaft-like parts such as transmission shafts, crankshafts, camshafts, etc.
It combines high technology with high quality in a body of only 10 mm thickness.
Two models are available, which can be retooled in the range 5-30 mm and 30-70 mm respectively.
M3 Star can be supplied with an adjustable V-part reference of 10 mm or 20 mm thickness; the first one allows the measurement to be carried out within narrow spaces or at a distance of only 5 mm from shoulders.
The snap gauge can be combined, through the M10x1 connection thread, with various handles and a wide range of accessories. Three handles are available: a dial/digital indicator holder, an electronic pencil probe holder or the i-Wave wireless handle.

TECHNICAL SPECIFICATIONS

Thickness	10 mm	
Thickness of the "V" part reference	10 mm or 20 mm	
Repeatability error (2,77 σ)	< 0,002 mm	
Measurable diameters and retooling range	5 - 30 mm	5 - 18 mm
		18 - 30 mm
	30 - 70 mm	30 - 34 mm
		34 - 46 mm
		46 - 58 mm
		58 - 70 mm
Working range	0,6 mm	
Clamping diameter for indicator/probe	8 mm h6	

M3 STAR - MECHANICAL SNAP GAUGE

1 **CONTACT PROTECTIONS**: protect the contacts from accidental damage.

2 **BODY**: it is 10mm-thick designed to house and protect the measuring mechanism. Inside the body two parallelogram measuring armsets transfer the measurement to the display device by a rod with spherical head that slides on a cradle formed by a "V"-shaped guide and an inclined plane.

3 **MEASURING CONTACTS**: The screwed contacts made of tungsten carbide allow the snap retooling and can be easily replaced.

4 "**V"-PART REFERENCE**: with tungsten carbide planes in the support area, the snap gauge is referenced to the workpiece, on the cylindrical section to be measured. It is available in two versions: 10mm - or 20mm-thick. A re-adjustment of the "V"-part with respect to the body allows to retool the gauge (change the center line) inside the measuring range.

5 **HANDLE**: used to hold the snap gauge it has been specifically designed for best handling. It can be a pencil probe holder (in electromechanical applications, 5-A), an i-Wave handle with wireless transmission (5-B) or an indicator holder (for digital or dial indicators, 5-C). The latter can be selected in a suitable size: standard or mini.

6 **NUMBER PLATE**: it can be marked with any information required by the customer.

7 **CABLE GUIDE AND CABLE CLAMP**: they are present in the pencil probe handle and prevent damage of the cable due to tearing, pulling or bending at the cable exit.

8 **CABLE**: it is a special reinforced cable (ø 4,7 mm) specifically developed for use in manual gauges, which considerably reduces the risk of damage and unintended torsion.

Complete Snap Gauge

The complete snap gauge includes the measuring head, plus the handle, chosen to suit the customer's application.

Pencil probe handle Available:
- Without probe
- With LVDT probe, 2m cable with connector SV50/6
- With HBT probe, 2m with connector SV50/6

Other probes available on request.

Snap Gauge	Sub-Range (mm)	Mini Indicator Handle		Indicator Handle	
		10mm "V"	20mm "V"	10mm "V"	20mm "V"
 5 - 30 mm	5 - 18	3TBMA1C0MH	3TBMA2C0MH	3TBMA1C0IH	3TBMA2C0IH
	18 - 30	3TBMA1D0MH	3TBMA2D0MH	3TBMA1D0IH	3TBMA2D0IH
 30 - 70 mm	30 - 34	3TBMA1E0MH	3TBMA2E0MH	3TBMA1E0IH	3TBMA2E0IH
	34 - 46	3TBMA1F0MH	3TBMA2F0MH	3TBMA1F0IH	3TBMA2F0IH
	46 - 58	3TBMA1G0MH	3TBMA2G0MH	3TBMA1G0IH	3TBMA2G0IH
	58 - 70	3TBMA1H0MH	3TBMA2H0MH	3TBMA1H0IH	3TBMA2H0IH

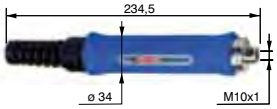
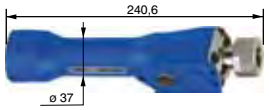
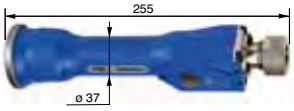
Snap Gauge	Sub-Range (mm)	Pencil Probe Handle					
		Without Probe		With LVDT Probe		With HBT Probe	
		10mm "V"	20mm "V"	10mm "V"	20mm "V"	10mm "V"	20mm "V"
 5 - 30 mm	5 - 18	3TBTA1C0PP	3TBTA2C0PP	3TBTA1C0F2	3TBTA2C0F2	3TBTA1C0H2	3TBTA2C0H2
	18 - 30	3TBTA1D0PP	3TBTA2D0PP	3TBTA1D0F2	3TBTA2D0F2	3TBTA1D0H2	3TBTA2D0H2
 30 - 70 mm	30 - 34	3TBTA1E0PP	3TBTA2E0PP	3TBTA1E0F2	3TBTA2E0F2	3TBTA1E0H2	3TBTA2E0H2
	34 - 46	3TBTA1F0PP	3TBTA2F0PP	3TBTA1F0F2	3TBTA2F0F2	3TBTA1F0H2	3TBTA2F0H2
	46 - 58	3TBTA1G0PP	3TBTA2G0PP	3TBTA1G0F2	3TBTA2G0F2	3TBTA1G0H2	3TBTA2G0H2
	58 - 70	3TBTA1H0PP	3TBTA2H0PP	3TBTA1H0F2	3TBTA2H0F2	3TBTA1H0H2	3TBTA2H0H2

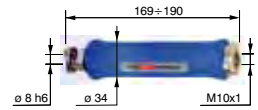
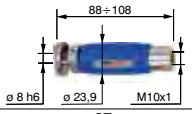
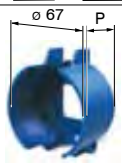
Snap Gauge	Sub-Range (mm)	i-Wave Handle with Alk. Batt.		i-Wave Handle with Li-Ion Batt.	
		10mm "V"	20mm "V"	10mm "V"	20mm "V"
 5 - 30 mm	5 - 18	3TBJA1C0AL	3TBJA2C0AL	3TBJA1C0LI	3TBJA2C0LI
	18 - 30	3TBJA1D0AL	3TBJA2D0AL	3TBJA1D0LI	3TBJA2D0LI
 30 - 70 mm	30 - 34	3TBJA1E0AL	3TBJA2E0AL	3TBJA1E0LI	3TBJA2E0LI
	34 - 46	3TBJA1F0AL	3TBJA2F0AL	3TBJA1F0LI	3TBJA2F0LI
	46 - 58	3TBJA1G0AL	3TBJA2G0AL	3TBJA1G0LI	3TBJA2G0LI
	58 - 70	3TBJA1H0AL	3TBJA2H0AL	3TBJA1H0LI	3TBJA2H0LI

The Snap Gauge

Range (mm)	Snap Gauge	Sub-Range (mm)	Order Code	
			With 10mm "V"	With 20mm "V"
5 - 30		5 - 18	3TTMA1C000	3TTMA2C000
		18 - 30	3TTMA1D000	3TTMA2D000
30 - 70		30 - 34	3TTMA1E000	3TTMA2E000
		34 - 46	3TTMA1F000	3TTMA2F000
		46 - 58	3TTMA1G000	3TTMA2G000
		58 - 70	3TTMA1H000	3TTMA2H000

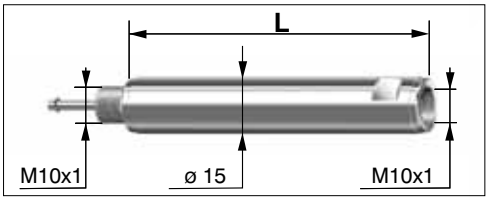
Handles

	Description	Order Code
	Without Probe	2TPLA00030
	With Red Crown LVDT Probe, 2 m cable with Lumberg SV50/6 connector	2TPLAF2030
	With Red Crown HBT Probe, 2 m cable with Lumberg SV50/6 connector	2TPLAH2030
	i-Wave Handle with alkaline batteries (one adapter for plug gauges with M6 and M10 thread is included in the supply)	2TWISFB000
	i-Wave Handle with Li-Ion inductive batteries (one adapter for plug gauges with M6 and M10 thread is included in the supply)	2TWISFI000
	"Clip On" manual charger for i-Wave handle with Li-Ion batteries (the power supply unit is included in the supply)	2T0IRMS000

	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
	Indicator handle	2TCLAS0030
	Mini Indicator handle	2TCSAS0030
	Protective shell for mechanical Indicator (P=38 mm)	2T0DIPS001
	Protective shell for digital Indicator (P=52 mm)	2T0DIPS000
	Protective dome for the upper lifting rod of Quick Digit Digit indicator	2T0DICS000

Depth Extensions

Length L (mm)	Order Code
50	2TXMSF0050
65	2TXMSF0065
80	2TXMSF0080
100	2TXMSF0100
125	2TXMSF0125



Components

Bodies		Contacts		Contact Protections	
					
Range (mm)	**Order Code**	**Range (mm)**	**Order Code**	**Range (mm)**	**Order Code**
5 - 30	2TTBB00000	5 - 18	3TXCD00010	5 - 18	2TTPB00000
		18 - 30	3TXCV00010		
		30 - 34	3TXCQ00011	18 - 30	2TTPC00000
30 - 70	2TTBD00000	34 - 46	3TXCR00024		
		46 - 58	3TXCU00010	30 - 70	2TTPD00000
		58 - 70	3TXCV00010		

10mm-thick V-part Reference		
Range (mm)	10mm "V"	Order Code
5 - 18		1TT0A1C000
18 - 30		1TT0A1D000
30 - 34		1TT0A1E000
34 - 46		1TT0A1F000
46 - 58		1TT0A1G000
58 - 70		1TT0A1H000

20mm-thick V-part Reference		
Range (mm)	20mm "V"	Order Code
5 - 18		1TT0A2C000
18 - 30		1TT0A2D000
30 - 34		1TT0A2E000
34 - 46		1TT0A2F000
46 - 58		1TT0A2G000
58 - 70		1TT0A2H000

Wrenches

Wrench	Description	Order Code
	3,5mm A/F Contact wrench	1346041110
	3,5mm A/F "U-shape" Sicutool wrench	4413673604
	3,5mm A/F "U-shape" special wrench	1346040026
	2mm Hex wrench	4413675303
	2,5mm Hex wrench	4413675304

Spare Parts

	Description	Order Code
	Screw for "V"-adjument with nut	2T0VSWS000
	Pins for adjustable "V" - 2 pcs	2T0PINS000
	Kit of side protections with screws – range 5 - 30 mm	2T0KSPS001
	Kit of side protections with screws - range 30 - 70 mm	2T0KSPS000

	Description	Order Code
	Kit of springs - 2 pcs	1T0SPS0000
	Kit of screws for spring limitations - 2 pcs	1T0LSS0000
	Bushing for attachment of M10x1 handle with screws	1T0TBS0201
	Transfer Rod	1TGN000004
	Rod bushing	1TGL000070

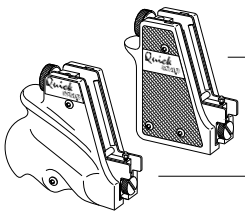
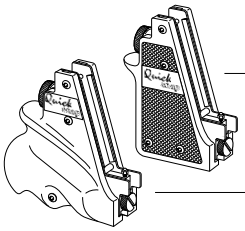
MANUAL SNAP GAUGE

- Rugged manual snap gauge for the mass-control of outside diameters of cylindrical parts in the range 3 to 150 mm (.12" to 5.90").

It can be used both directly on the part in the machine tool and as a simple fixture (an optional bench support is also available).

- Quick and easy to retool without any special tools. The mechanical zero setting is not requiring the assembly of the measuring instrument.
- No maintenance is needed, thanks to its long life carbide reference prisms and contacts.
- Available with two different types of handle, anatomic and slim.
- It can be used with any measuring gauge with clamping diameter 8 mm or 3/8", such as our Red Crown pencil probes, Quick Read compact electronic display unit and, through an optional adapter, Quick Digit electronic digital indicator.
- A wide range of accessories providing flexibility is available, such as off-set measuring contacts to allow checks close to shoulders, bench support, pushing device for part location.

CONFIGURATION LAYOUT AND RETOOLING RANGE

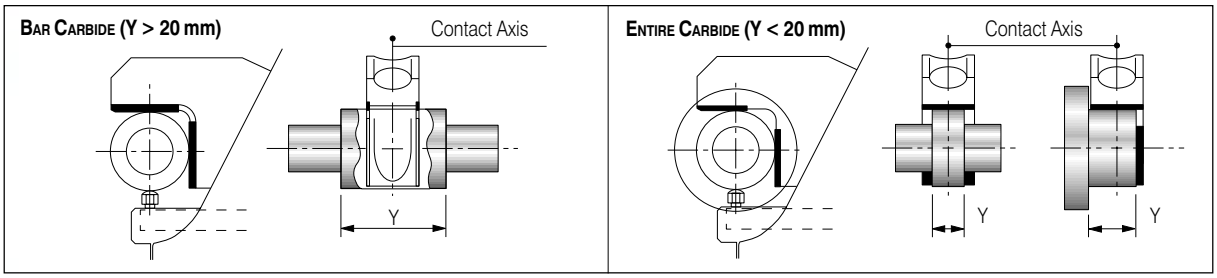
RANGE	SNAP GAUGE BODY	PRETRAVEL ADJUSTER	REFERENCE PRISM UNIT
ø 3 - 25 mm (.12" - .98")		WITHOUT PUSHER WITH PUSHER	3 - 5 mm (.12" - .20") WITH ENTIRE CARBIDE 5 - 10 mm (.20" - .39") WITH ENTIRE CARBIDE 10 - 25 mm (.39" - .98") WITH ENTIRE CARBIDE
ø 25 - 50 mm (.98" - 1.97")		WITHOUT PUSHER WITH PUSHER	WITH ENTIRE CARBIDE WITH BAR CARBIDE
ø 50 - 100 mm (1.97" - 3.94")		WITHOUT PUSHER WITH PUSHER	WITH ENTIRE CARBIDE WITH BAR CARBIDE
ø 100 - 150 mm (3.94" - 5.90")		WITHOUT PUSHER WITH PUSHER	WITH ENTIRE CARBIDE WITH BAR CARBIDE

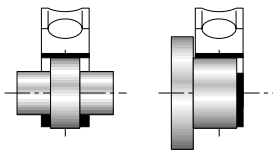
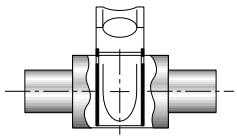
Technical Specifications

Retooling Range (mm)	3 - 25	25 - 50	50 - 150
Measuring Range	± 0.300 mm	± 0.400 mm	± 0.500 mm
Repeatability	≤1 µm		
Weight	0.340 - 0.420 kg	0.640 - 0.875 kg	0.850 - 1.085 kg
Measuring Force	Subject to the measuring instrument		

Reference Prism Unit

These units are supplied with wear resistant entire carbide. For parts with external diameter in the range 25 to 150 mm they are available also with wear resistant bar carbide, but can be used only to measure workpieces longer than 20 mm.

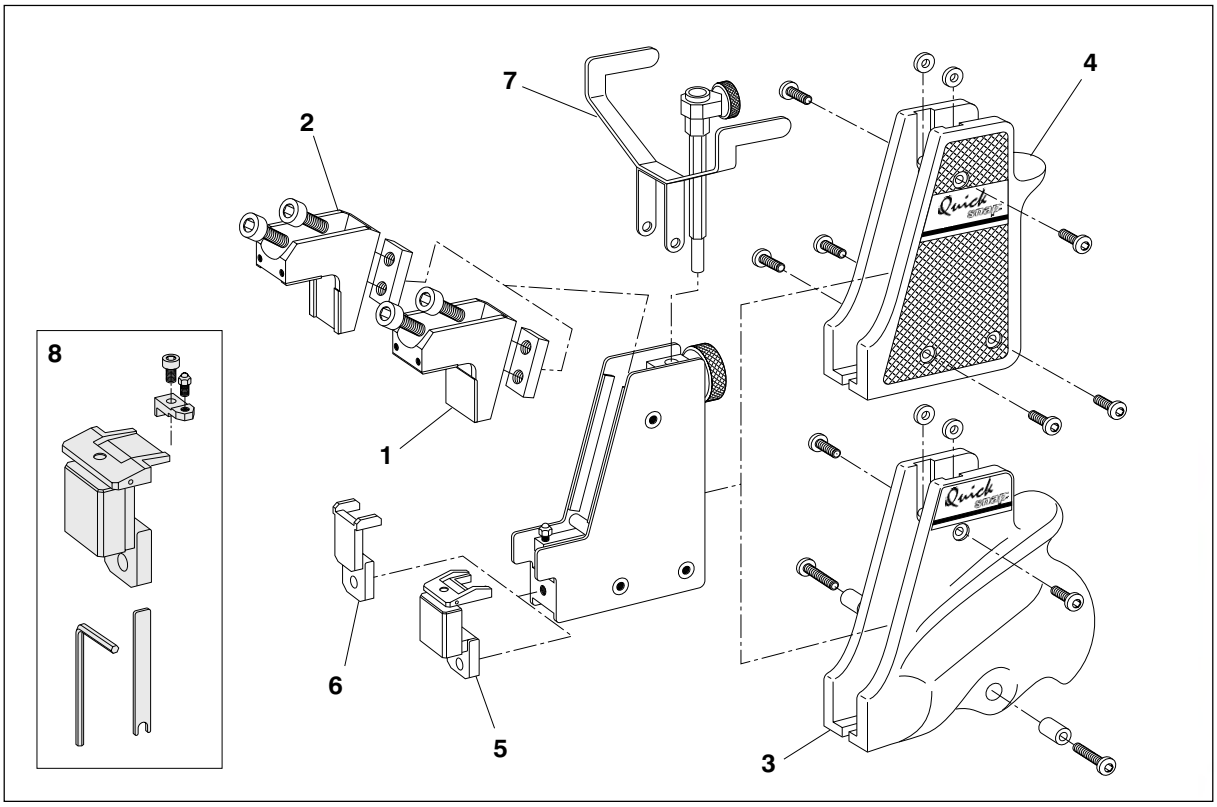


Type of Snap Gauge			Anatomic Handle		Slim Handle	
Reference Prism Unit	Retooling Range	Pretravel Adjuster	Diameter 8 mm Order Code	Diameter 3/8" Order Code	Diameter 8 mm Order Code	Diameter 3/8" Order Code
 With Entire Carbide	3 - 5 mm (.12" - .20")	WITH PUSHER	N/A	N/A	3519750282	3519750287
		W/O PUSHER	N/A	N/A	3519750292	3519750297
	5 - 10 mm (.20" - .39")	WITH PUSHER	N/A	N/A	3519750281	3519750286
		W/O PUSHER	N/A	N/A	3519750291	3519750296
	10 - 25 mm (.39" - .98")	WITH PUSHER	N/A	N/A	3519750280	3519750285
		W/O PUSHER	N/A	N/A	3519750290	3519750295
	25 - 50 mm (.98" - 1.97")	WITH PUSHER	3519750060	3519750065	3519750080	3519750085
		W/O PUSHER	3519750070	3519750075	3519750090	3519750095
	50 - 100 mm (1.97" - 3.94")	WITH PUSHER	3519750160	3519750165	3519750180	3519750185
		W/O PUSHER	3519750170	3519750175	3519750190	3519750195
	100 - 125 mm (3.94" - 4.92")	WITH PUSHER	N/A	N/A	3519750600	3519750605
		W/O PUSHER	N/A	N/A	3519750620	3519750625
	125 - 150 mm (4.92" - 5.90")	WITH PUSHER	N/A	N/A	3519750650	3519750655
		W/O PUSHER	N/A	N/A	3519750670	3519750675
 With Bar Carbide	25 - 50 mm (.98" - 1.97")	WITH PUSHER	3519750061	3519750066	3519750081	3519750086
		W/O PUSHER	3519750071	3519750076	3519750091	3519750096
	50 - 100 mm (1.97" - 3.94")	WITH PUSHER	3519750161	3519750166	3519750181	3519750186
		W/O PUSHER	3519750171	3519750176	3519750191	3519750196
	100 - 125 mm (3.94" - 4.92")	WITH PUSHER	N/A	N/A	3519750610	3519750615
		W/O PUSHER	N/A	N/A	3519750630	3519750635
	125 - 150 mm (4.92" - 5.90")	WITH PUSHER	N/A	N/A	3519750660	3519750665
		W/O PUSHER	N/A	N/A	3519750680	3519750685

Description	Order Code
USER MANUAL	D0080000X1 (*)

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

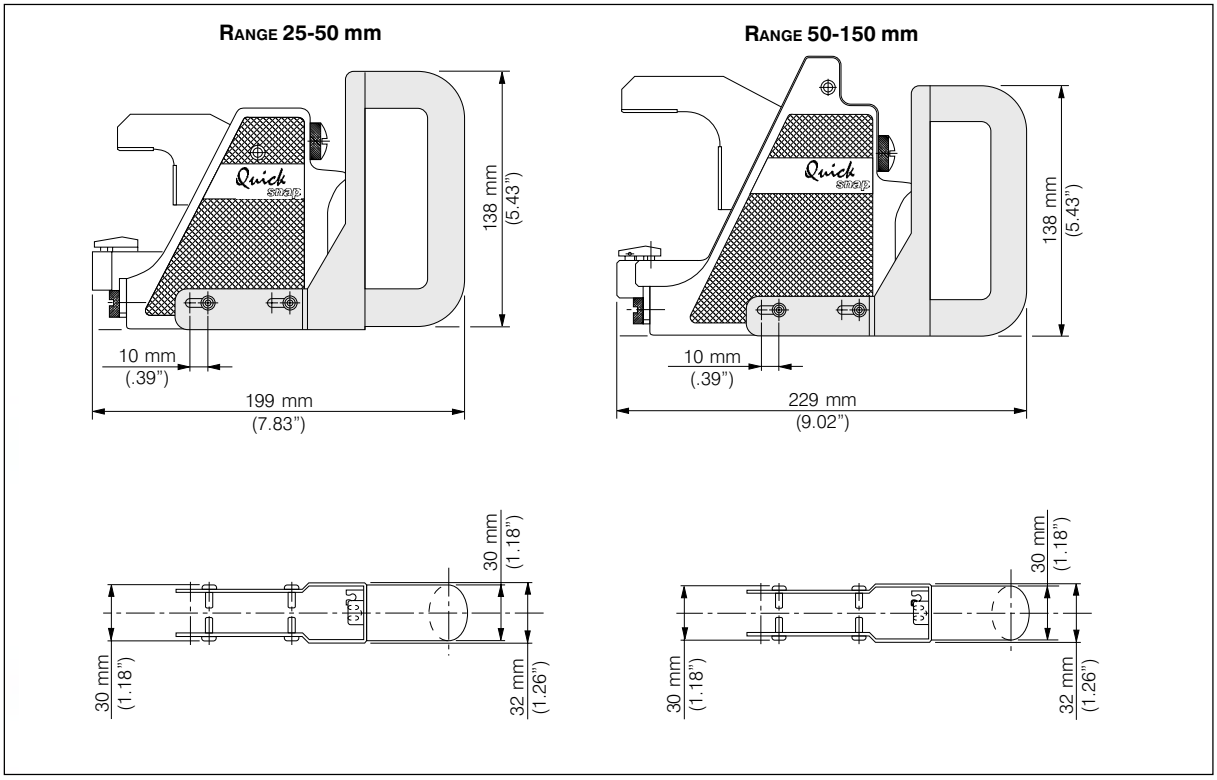
COMPONENTS AND ACCESSORIES



REF.	DESCRIPTION	RANGE ø	ORDER CODE
1	REFERENCE PRISM UNIT WITH ENTIRE CARBIDE	3 - 5 mm (.12" - .20")	2919750072
		5 - 10 mm (.20" - .39")	2919750071
		10 - 25 mm (.39" - .98")	2919750070
		25 - 50 mm (.98" - 1.97")	2919750081
		50 - 100 mm (1.97" - 3.94")	2919750170
		100 - 125 mm (3.94" - 4.92")	2919750600
		125 - 150 mm (4.92" - 5.90")	2919750650
2	REFERENCE PRISM UNIT WITH BAR CARBIDE	25 - 50 mm (.98" - 1.97")	2919750082
		50 - 100 mm (1.97" - 3.94")	2919750171
		100 - 125 mm (3.94" - 4.92")	2919750610
		125 - 150 mm (4.92" - 5.90")	2919750660
3	ANATOMIC HANDLE UNIT	25 - 50 mm (.98" - 1.97")	2919750078
		50 - 100 mm (1.97" - 3.94")	2919750161
4	SLIM HANDLE UNIT	3 - 25 mm (.12" - .98")	2919750061
		25 - 50 mm (.98" - 1.97")	2919750086
		50 - 150 mm (1.97" - 5.90")	2919750181
5	PRETRAVEL ADJUSTER WITH PUSHER	3 - 25 mm (.12" - 98")	2919750220
		25 - 150 mm (.98" - 5.90")	2919750150
6	PRETRAVEL ADJUSTER WITHOUT PUSHER	3 - 25 mm (.12" - .98")	1019750209
		25 - 150 mm (.98" - 5.90")	1019750059
7	DIAL INDICATOR ADAPTER UNIT WITH MOUNTING DIA. 8 mm	3 - 25 mm (.12" - .98")	2919750240
		25 - 50 mm (.98" - 1.97")	2919750090
		50 - 100 mm (1.97" - 3.94")	2919750120
		100 - 150 mm (3.94" - 5.90")	2919750670
7	DIAL INDICATOR ADAPTER UNIT WITH MOUNTING DIA. 3/8"	3 - 25 mm (.12" - .98")	2919750245
		25 - 50 mm (.98" - 1.97")	2919750095
		50 - 100 mm (1.97" - 3.94")	2919750115
		100 - 150 mm (3.94" - 5.90")	2919750675
8	KIT FOR OFF-SET CONTACT (*)	3 - 25 mm (.12" - .98")	2919750310
		25 - 150 mm (.98" - 5.90")	2919750320

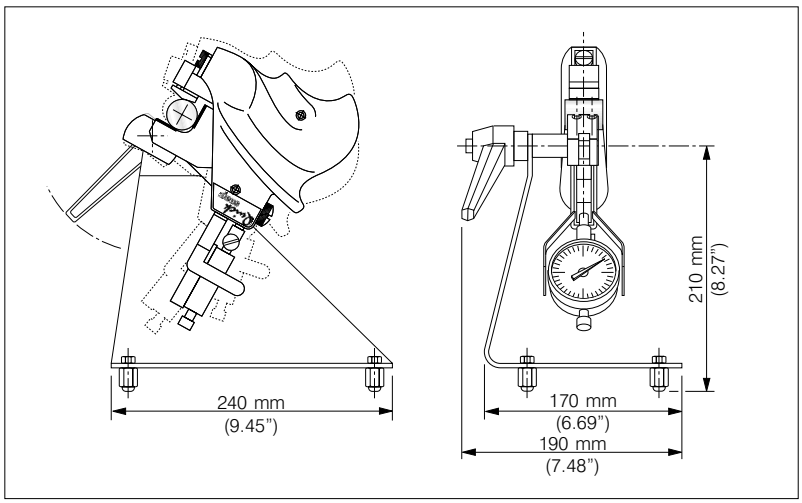
(*) It allows measurements to be performed at a minimum distance of 3 mm from a shoulder by means of a contact extension (with the standard contact the minimum distance is 10 mm).

OPTIONS

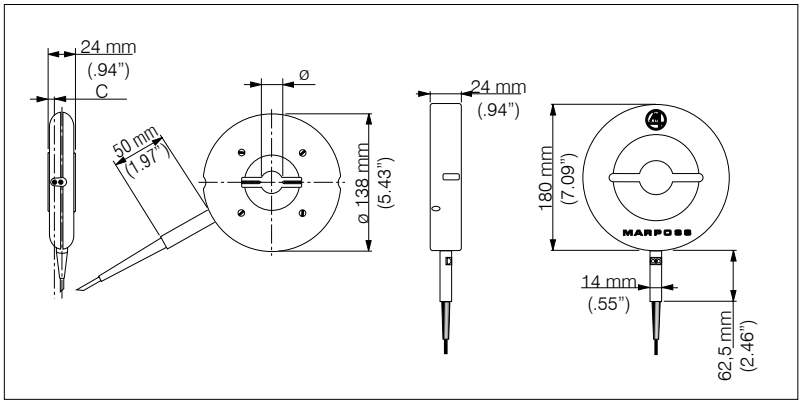


DESCRIPTION	ORDER CODE
Handle (*)	2919750880

(*) Available for slim type handle range 25 - 150 mm (0.98" - 5.90") only.



DESCRIPTION	ORDER CODE
Bench Gauge Support	2919750020



The M4 comes with various C measurement point distance values that allow great flexibility in the measurement position. The C dimension comes in 2,5 mm for close to flange measurements, in 6 mm for normal measurements and in 12 mm for bottom measurements.

MANUAL RING

- Electronic manual ring gauge with full-bridge (LVDT) transducer for checking outside diameters of shaft and pin type parts in the range 4 to 100 mm (.16" to 3.98"). Particularly suitable to perform measurements close to a shoulder.
- It is composed of a ring body and standard interchangeable nosepiece; within its range of use each ring is completely retoolable by changing the nosepiece and the contacts.
- Accurate, rugged and reliable, needs no maintenance and has practically no operating costs.
- Thanks to its outstanding qualities, it can be used in the most difficult working conditions without any affect to its technical characteristics.
- It can be used both directly on the workpiece and as a simple fixture using the optional support.
- The measurement value can be displayed on the TESTAR E18, E4, E4N and, through the Gage Box data acquisition system, on the E9066s Industrial PC.

TECHNICAL CHARACTERISTICS

RETOOLING RANGE (mm)	***4 - 50***	***50 - 100***
REPEATABILITY	*≤1 µm*	
THERMAL DRIFT	*≤0.15 µm/°C*	*≤0.7 µm/°C*
MEASURING FORCE	*1.2 N ±10%*	*0.70 N ±30%*
WEIGHT	*0.7 ÷ 0.8 kg*	*1.8 ÷ 2 kg*
CABLE LENGTH	*1.8 m*	
CONNECTOR TYPE	*Lumberg S3 (DIN 41524) or SV50/6 (DIN 45322)*	

N.B. The above measuring range cannot be covered with only one nosepiece, but a dedicated nosepiece is necessary for each diameter to be measured (SEE HOW TO ORDER A FINISHED RING).

How to Order a Finished Ring

Type of connector:
S3 *= Lumberg S3 - 3 pin - used with E4 and E18*
SV50 *= Lumberg SV50/6 - 5 pin - used with E4N and Gage Box*

Type of contact:
C *= Carbide*
D *= Diamond*

Type of handle:
B *= Basic without handle*
A *= Axial Handle*

Distance (C) *from the edge of the nosepiece to the contacts (mm):*
C *= 2.5 / 6 / 12*

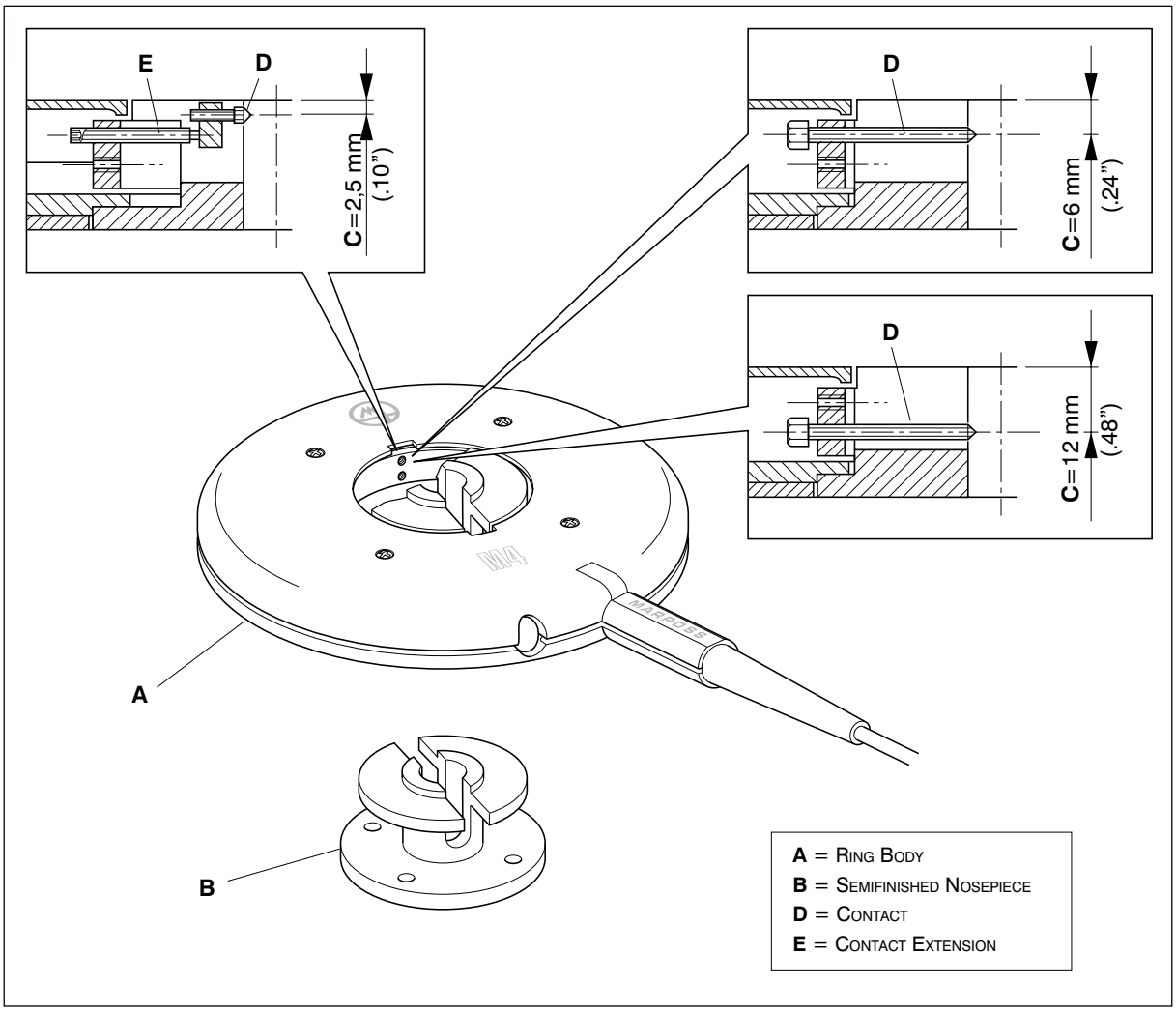
Measurement unit:
M *= Millimeter*
I *= Inch*

M4						Ø max.	Ø min.

Example: Need to order an M4 with C=2.5 mm, carbide contacts, E4N connector, without handle, max. ø 38.735 mm (1.525 inch), min. ø 38.710 mm (1.524 inch).

M4	2.5	C	SV50	B	M	38.735	38.710

Components and Accessories



Retooling Range		C		(A) Ring Body			
				Order Code	Cable Length		Connector Type
(mm)	(inch)	(mm)	(inch)		(m)	(inch)	
4 - 50	.16" - 1.97"	2.5 / 6 / 12	.10" / .24" / .48"	3708602200	1.8	70.86"	LUMBERG S3
				3708602210	1.8	70.86"	LUMBERG SV50/6
50 -100	1.97" - 3.94"	2.5 / 6 / 12	.10" / .24" / .48"	3708602401	1.8	70.86"	LUMBERG S3
				3708602411	1.8	70.86"	LUMBERG SV50/6

Retooling Range		C		(B) Semifinished Nosepieces	(D) Contacts		(E) Contact Extensions
				Order Code	Order Code		Order Code
(mm)	(inch)	(mm)	(inch)		CARBIDE	DIAMOND	
4 - 12	.16" - .47"	6 / 12	.24" / .47"	1408602014	3390860201	3390860205	
		2.5	.10"	1408602013	3390860210	3390860215	1108602201
12 - 25	.47" - .98"	6 / 12	.24" / .47"	1408602015	3390860201	3390860205	
		2.5	.10"	1408602015	3390860210 (*)	3390860215 (*)	1108602201
					3390860212 (**)	3390860217 (**)	1108602201
25 - 30	.98" - 1.18"	6 / 12	.24" / .47"	1408602015	3390860202	3391342601	
		2.5	.10"		3390860212	3390860217	1108602201
30 - 50	1.18" - 1.97"	6 / 12	.24" / .47"	1408602016	3390860202	3391342601	
		2.5	.10"		3390860212	3390860217	1108602201
50 - 90	1.97" - 3.54"	6 / 12	.24" / .47"		3390860201	3390860205	
		2.5	.10"		3390860210 (***)	3390860215 (***)	1108602201
					3390860212 (****)	3390860217 (****)	1108602201
90 - 100	3.54" - 3.94"	6 / 12	.24" / .47"		3390860202	3391342601	
		2.5	.10"		3390860212	3390860217	1108602201

Note: Quantity for order code =1pcs; Not available where not indicated.

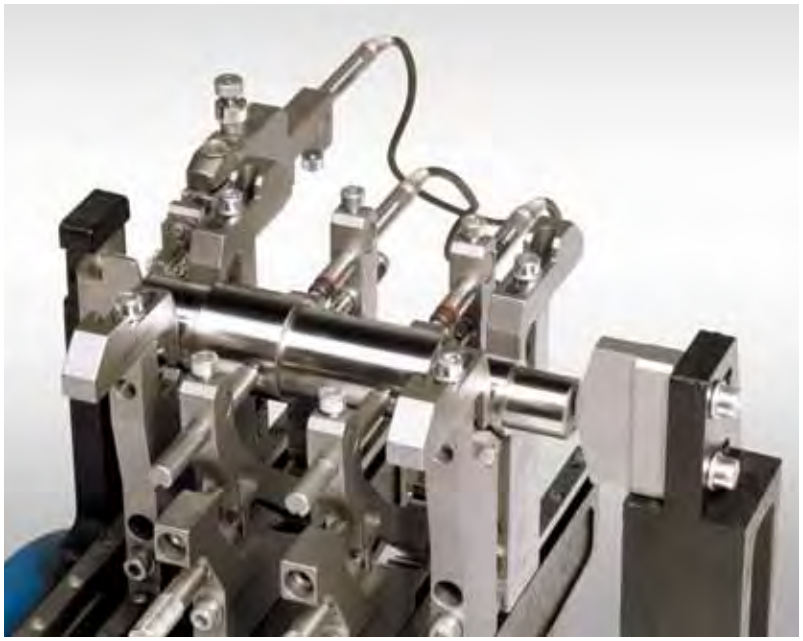
(*) Only for range 12 to 20 mm (.47" to .79")
(**) Only for range 20 to 25 mm (.79" to .98")
(***) Only for range 50 to 85 mm (1.97" to 3.35")
(****) Only for range 85 to 90 mm (3.35" to 3.54")

Description	Order Code
Hex Wrench 1.5 mm	1300725000
Tube Wrench 2.5 mm	1300728000
Tube Wrench 4.0 mm	1300729000
Hex Contact Extension Wrench	1300730000
V for part introduction	1008602207
Axial Handle Transformation Kit (Range 4 to 50 mm)	2908602000
Axial Handle Transformation Kit (Range 50 to 100 mm)	2908602400
Stand	1300610000
Interface Cable Lumberg S3 to SV50/6	6738536000
Interface Cable Lumberg SV50/6 to S3	6735832000
Extension Cable with Lumberg SV50/6 (2 m)	6735932015
Extension Cable with Lumberg SV50/6 (5 m)	6735932016
Extension Cable with Lumberg SV50/6 (10 m)	6735932017
User Manual (Range 4 to 50 mm)	D0040004X1 (*)
User Manual (Range 50 to 100 mm)	D0040008X1 (*)

(*) X= I (Italian), U (English), D (German), E (Spanish), F (French), J (Japanese), P (Portuguese).

Stand

The Stand (same as M1) is designed to enable the use of the M4 electronic ring gauge as a bench gauge. It can accomodate the M4 range 4 to 50 mm in both versions with radial and axial cable output; the M4 range 50 to 100 mm can be accomodated only in axial cable output version. It is particularly helpful when quantities of work pieces with close tolerances are to be gauged.



MODULAR MEASURING SYSTEM

Quick Set™ is a retoolable modular system that can be assembled in three different gauging configurations:

- horizontal and vertical for multidimensional and geometric checking of shaft-like parts;
- chuck for multidimensional and geometric checking on parts that cannot be referenced horizontally with vees or held between centers, such as bushings, bearings, pistons and cylindrical parts that are manufactured with a flange.

Its flexibility guarantees quick retooling without any special tools, using shop-floor components available off the shelf.
The narrow 12 mm (.47") width of all components allows a large number of measuring sections on a short part surface. Several measuring assemblies can be mounted on the base to carry on diameter, distance and geometric measurements.
Part support options allow static as well as dynamic inspection.
It can accomodate any measuring gauge with clamping diameter 8 mm or 3/8", such as TESTAR Red Crown™ and Quick probe™, Quick Read™ compact electronic display unit, Quick Digit™ electronic digital indicator.

PART WEIGHT AND DIMENSIONS REFERENCE TABLE

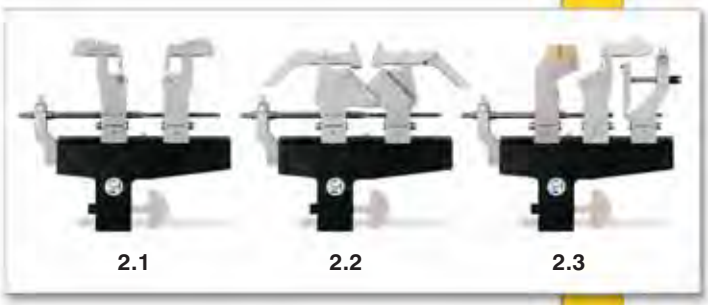
Gauge Configuration	Measurable Diameter	Max. Non-measurable Diameter	Max. Measurable Length	Weight
Quick Set-Horizontal	5 – 160 mm (.02" – 6.30")	260 mm (10.24")	700 mm (27.56")	up to 14 kg
Quick Set-Vertical	5 – 160 mm (.02" – 6.30")	260 mm (10.24")	520 mm (20.47")	up to 8 kg
Quick Set-Chuck	5 – 160 mm (.02" – 6.30")	260 mm (10.24")	250 mm (9.84")	-


Quick Set - Horizontal

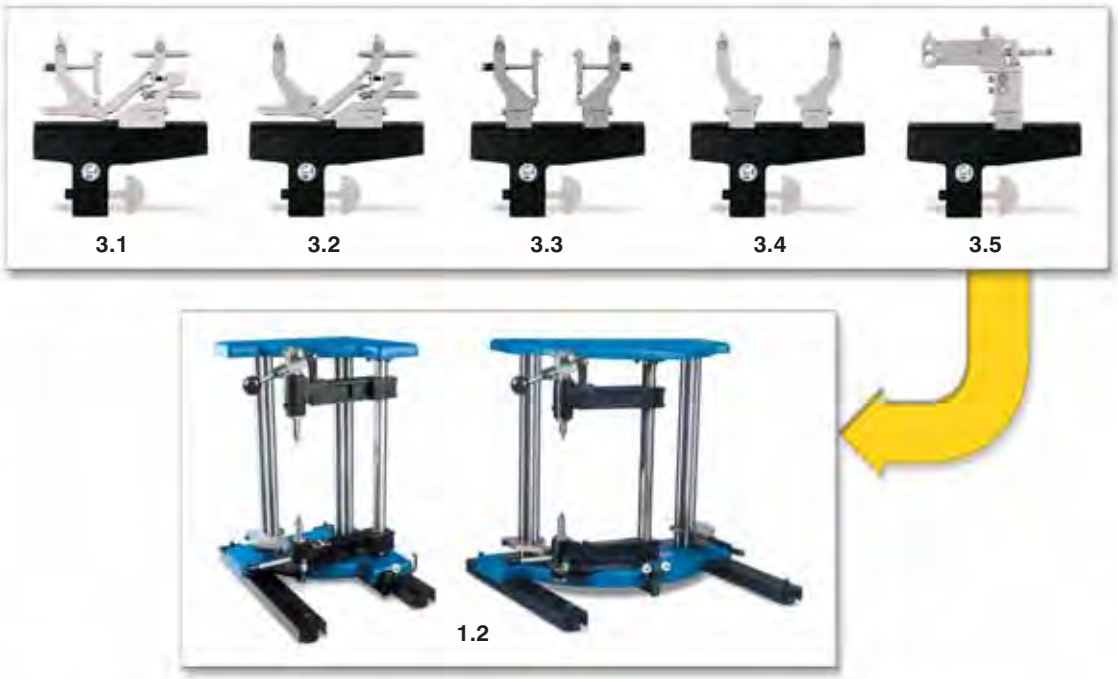

Quick Set - Vertical


Quick Set - Chuck

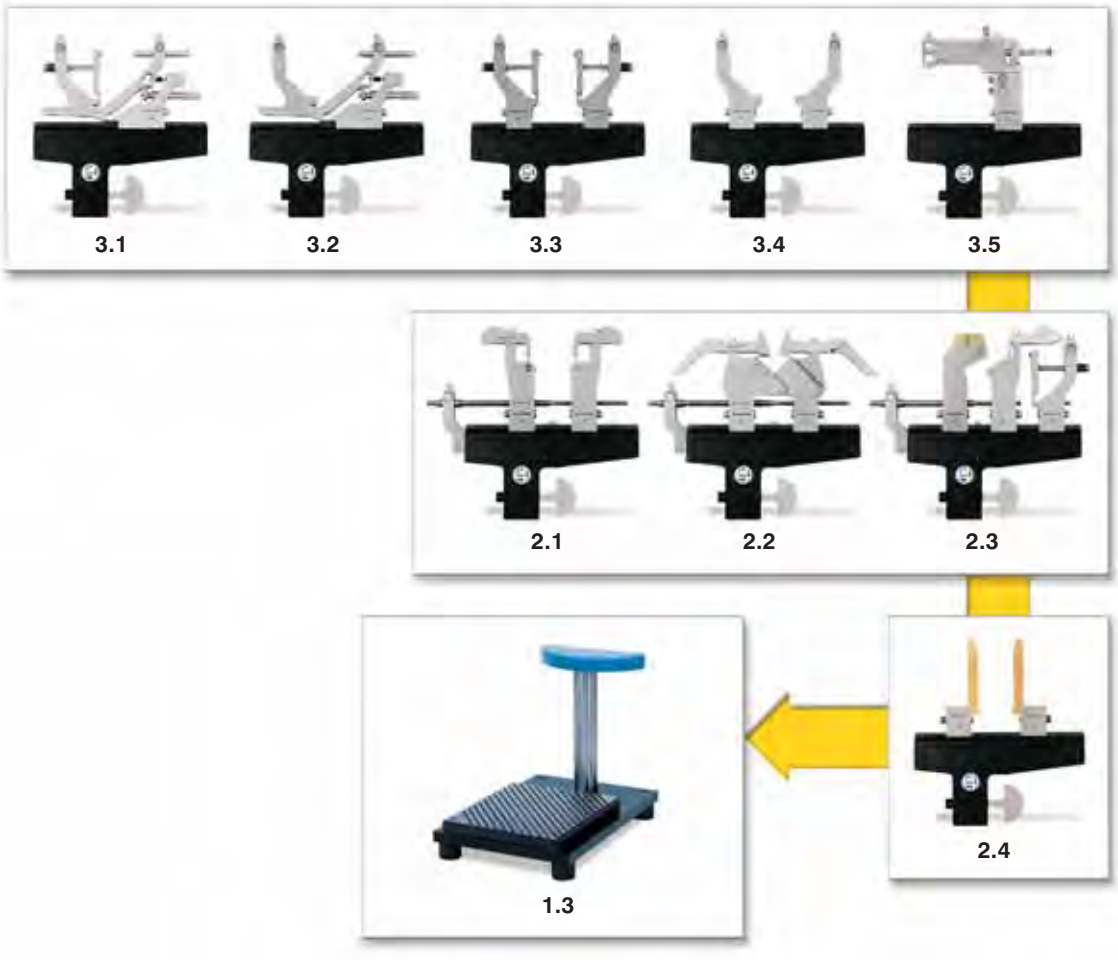
Quick Set - Horizontal



Quick Set - Vertical



Quick Set - Chuck

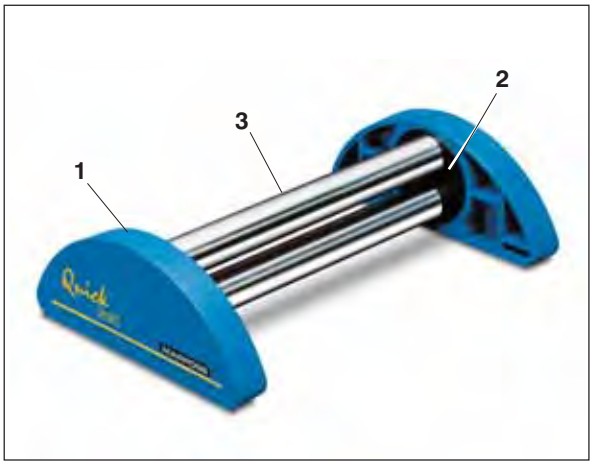


INDEX

1 - Base structure assembly

30 mm diameter stainless steel bars assure rigidity and exact positioning of the bench gauge elements. The bar system allows easy retooling and size expansion of the bench. The bars are fixed to the support by means of a screwed clamp fitted inside the support.

1.1 Base structure assembly for Quick Set-Horizontal



Bars Length		Bench with "V"				Bench with Pivoting centers	
		Max. part length with 2 introducing axial limiters		*Max. part length with 1 introducing axial limiter and 1 measuring axial limiter*		*Max. part length*	
(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)
200	7.87"	100	3.94"	70	2.76"	80	3.15"
300	11.81"	200	7.87"	170	6.69"	180	7.08"
400	15.75"	300	11.81"	270	10.63"	280	11.02"
500	19.69"	400	15.75"	370	14.57"	380	14.96"
600	23.62"	500	19.69"	470	18.50"	480	18.89"
800	31.50"	700	27.56"	670	26.38"	680	26.77"

The base structure assembly includes bars, support feet and clamping devices.

Ref.	Description	Order Code
1	SUPPORT FEET (PAIR)	2924017005
2	CLAMPING DEVICES (PAIR)	2924017115
3	BARS L = 200 mm (PAIR)	2924017010
	BARS L = 300 mm (PAIR)	2924017020
	BARS L = 400 mm (PAIR)	2924017030
	BARS L = 500 mm (PAIR)	2924017040
	BARS L = 600 mm (PAIR)	2924017050
	BARS L = 800 mm (PAIR)	2924017070

1.2 Base structure assembly for Quick Set-Vertical

Single Station

Dual Station

Bars Length		Quick set-Vertical							
		Part length with lower center support L=12 mm				*Part length with lower center support L=37 mm*			
		Min.		Max.		Min.		Max.	
(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)
500	19.69”	24	0.94”	220	8.66”	5	0.20”	200	7.87”
600	23.62”	24	0.94”	320	12.60”	5	0.20”	300	11.81”
700 (*)	27.56”	24	0.94”	420	16.54”	5	0.20”	400	15.75”
800 (*)	31.50”	24	0.94”	520	20.47”	5	0.20”	500	19.69”

(*) Only for dual station.

Max. part weight: 6 kg for the single station, 8 kg for the dual station.
The base structure assembly is composed of base, bars, lower center support and centers. The upper center support is supplied with the base.

Ref.	Description	Order Code
1	SINGLE STATION BASE	3024025500
	DUAL STATION BASE	3024025000
2	BARS L = 500 mm	3024025025
	BARS L = 600 mm	3024025026
	BARS L = 700 mm (*)	3024025027
	BARS L = 800 mm (*)	3024025028
3	LOWER CENTER SUPPORT L = 12 mm	3024025220
	LOWER CENTER SUPPORT L = 37 mm	3024025210
	UNIVERSAL CENTER	1024017753
	SHORT CENTER	1024017755
	SUPPORT BRACKET WITH BACK HOLES FOR TOOL	2924025255
	RETOOLING TOOL (ONLY FOR BRACKET WITH BACK HOLES)	2924025050

(*) Only for dual station.

1.3 Base structure assembly for Quick Set-Chuck

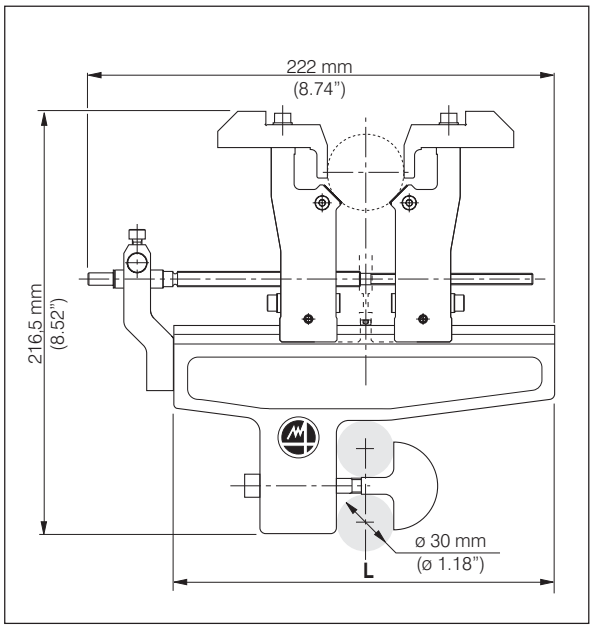
The base structure assembly is composed of bars, support feet, clamping devices, serrated referencing surface and support plate.

Ref.	Description	Order Code
1	SUPPORT FEET (PAIR)	2924017005
2	CLAMPING DEVICES (PAIR)	2924017115
3	BARS L = 300 mm (PAIR)	2924017880
4	SERRATED REFERENCING PLATE (220 x 250 mm)	2924017885
5	SUPPORT PLATE (INCLUSIVE OF RUBBER FEET)	2924017890

2 - Part Support and Reference

2.1 Frontal "V" Assembly

Assembly width: 12 mm (.47")
Version with self-centering screw



The frontal "V" accurately defines the measuring mechanical axis of the part. The assembly is available in two versions:

- with self-centering screw, for fast and frequent retooling;
- without self-centering screw, for economical part positioning.

Two assemblies are normally required to support the part.

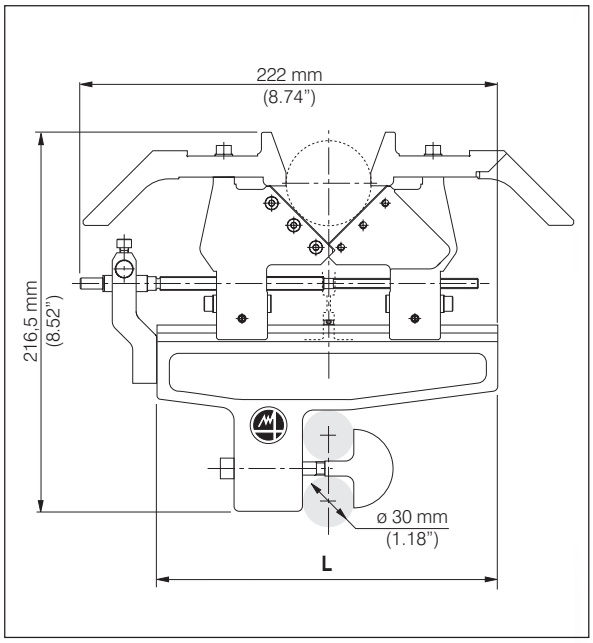
The assembly is composed of one support bracket and one frontal "V".

	Support Bracket			Frontal "V"		
	Length L (mm)	(inch)	Order Code	Range (mm)	(inch)	Order Code
Assembly with self-centering screw	200	7.87"	3024017540	5 - 10	.19" - .39"	3024017633
				10 - 15	.39" - .59"	3024017643
				15 - 24	.59" - .94"	3024017653
				24 - 40	.94" - 1.57"	3024017663
				40 - 70	1.57" - 2.76"	3024017673
				55 - 100	2.16" - 3.94"	3024017693
Assembly without self-centering screw	200	7.87"	3024017000	5 - 10	.19" - .39"	3024017632
				10 - 15	.39" - .59"	3024017642
				15 - 24	.59" - .94"	3024017652
				24 - 40	.94" - 1.57"	3024017662
				40 - 70	1.57" - 2.76"	3024017672
				55 - 100	2.16" - 3.94"	3024017692
	250	9.84"	3024017050	100 - 150	3.94" - 5.91"	3024017695

Description	Order Code
OPTIONAL GUIDE FOR VEE RANGE 55–100 mm (IT HAS TO BE USED WHEN ONTO THE SAME SUPPORT BRACKET OF THE VEE , TWO SINGLE TRANSMISSIONS ARE ASSEMBLED TO CHECK THE DIAMETER (55–100 mm))	2924017695

2.2 Crossed "V" Assembly

Assembly width: 12 mm (.47")
Version with self-centering screw



The crossed "V" is used for very frequent retooling and when a large retooling range is needed. The assembly is available in two versions:

- with self-centering screw, for fast and frequent retooling;
- without self-centering screw, for economical part positioning.

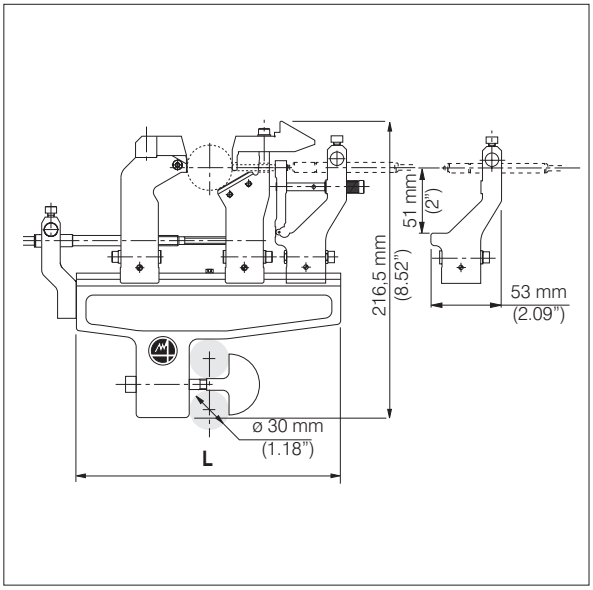
Two assemblies are normally required to support the part.

The assembly is composed of one support bracket and one crossed "V".

	Support Bracket			Crossed "V"		
	Length L (mm)	(inch)	Order Code	Range (mm)	(inch)	Order Code
Assembly with self-centering screw	200	7.87"	3024017540	5 - 100	.19" - 3.94"	3024017553
Assembly without self-centering screw	200	7.87"	3024017000	5 - 100	.19" - 3.94"	3024017552

2.3 Measuring "V" Assembly

Assembly width: 12 mm (.47")
Version with self-centering screw



The measuring "V" is used when both part reference and part diameter measurement have to be carried on in the same section. The measurement is performed by using a special contact for measuring "V" mounted on a single transmission unit or on a direct probe unit (see 4.2 Contacts for Measuring "V").

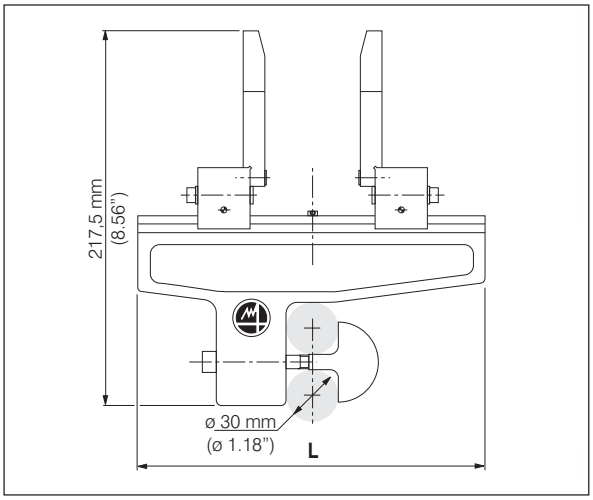
The assembly is composed of one support bracket, one measuring "V", and one single transmission unit or one direct probe unit. The special contact for measuring "V" and the probe to be mounted in the transmission unit or in the direct probe unit must be ordered separately (see section Transducers and Measurement Transmissions).

	Support Bracket			Measuring "V"		
	Length L (mm)	(inch)	Order Code	Range (mm)	(inch)	Order Code
Assembly with self-centering screw and single transmission or direct probe unit	200	7.87"	3024017540	5 - 35	.19" - 1.38"	3024017524
				35 - 65	1.38" - 2.56"	3024017526
Assembly without self-centering screw, with single transmission or direct probe unit	200	7.87"	3024017000	5 - 35	.19" - 1.38"	3024017520
				35 - 65	1.38" - 2.56"	3024017522

Probe Support	Clamping ø for Probe	Order Code
SINGLE TRANSMISSION UNIT	8 mm	3024017155
	3/8"	3024017157
DIRECT PROBE UNIT	8 mm	3024017145
	3/8"	3024017147

2.4 Part Radial Limiters Assembly

Assembly width: 12 mm (.47")



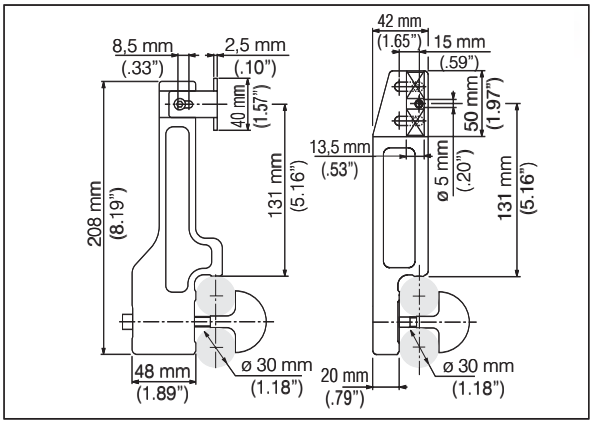
The part radial limiters limit the part radial movement and allows correct part introduction in the bench.
Two versions are available:
- steel limiter;
- brass limiter for parts with low hardness.

The assembly is composed of one support bracket and one pair of radial limiters.

Assembly with radial limiters	Support Bracket		
	Length L (mm)	(inch)	Order Code
	200	7.87"	3024017000
	250	9.84"	3024017050

Description	Order Code
STEEL RADIAL LIMITERS (PAIR)	3024017200
BRASS RADIAL LIMITERS (PAIR)	3024017210

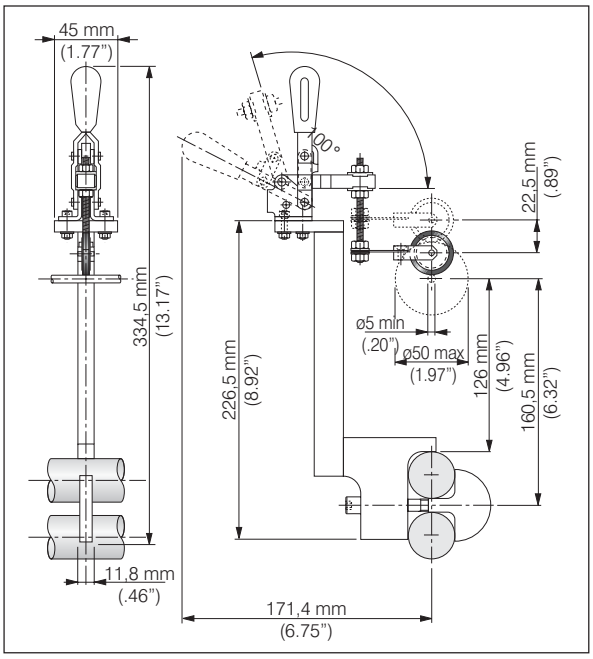
2.5 Part Axial Limiters



The part axial limiter limits the part axial movement and allows correct part positioning in the bench.
Two versions are available:
- Introducing axial limiter to limit part position;
- Measuring axial limiter used both to limit part position and as mechanical reference for a distance measurement carried on by a shoulder transmission unit (see 3. Part measuring assembly).

Description	Order Code
INTRODUCING AXIAL LIMITER	3024017214
MEASURING AXIAL LIMITER	3024017218

2.6 Part Pusher

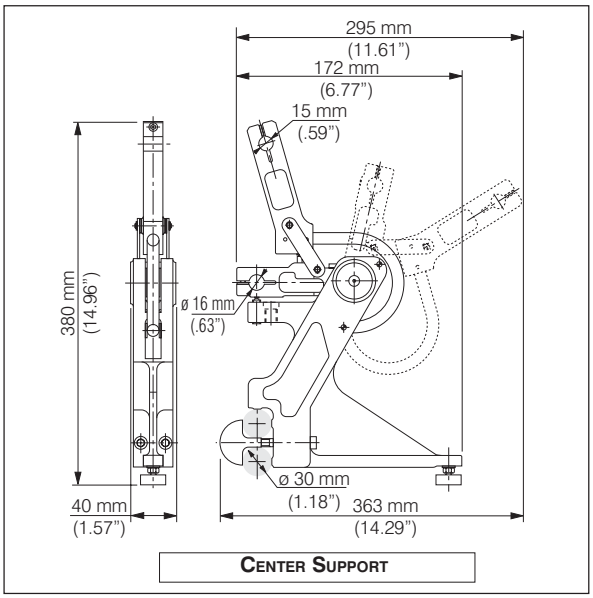


The part pusher guarantees the contact between the part and the "V" supports. It is particularly suitable for parts with weight lower than 200 gr.

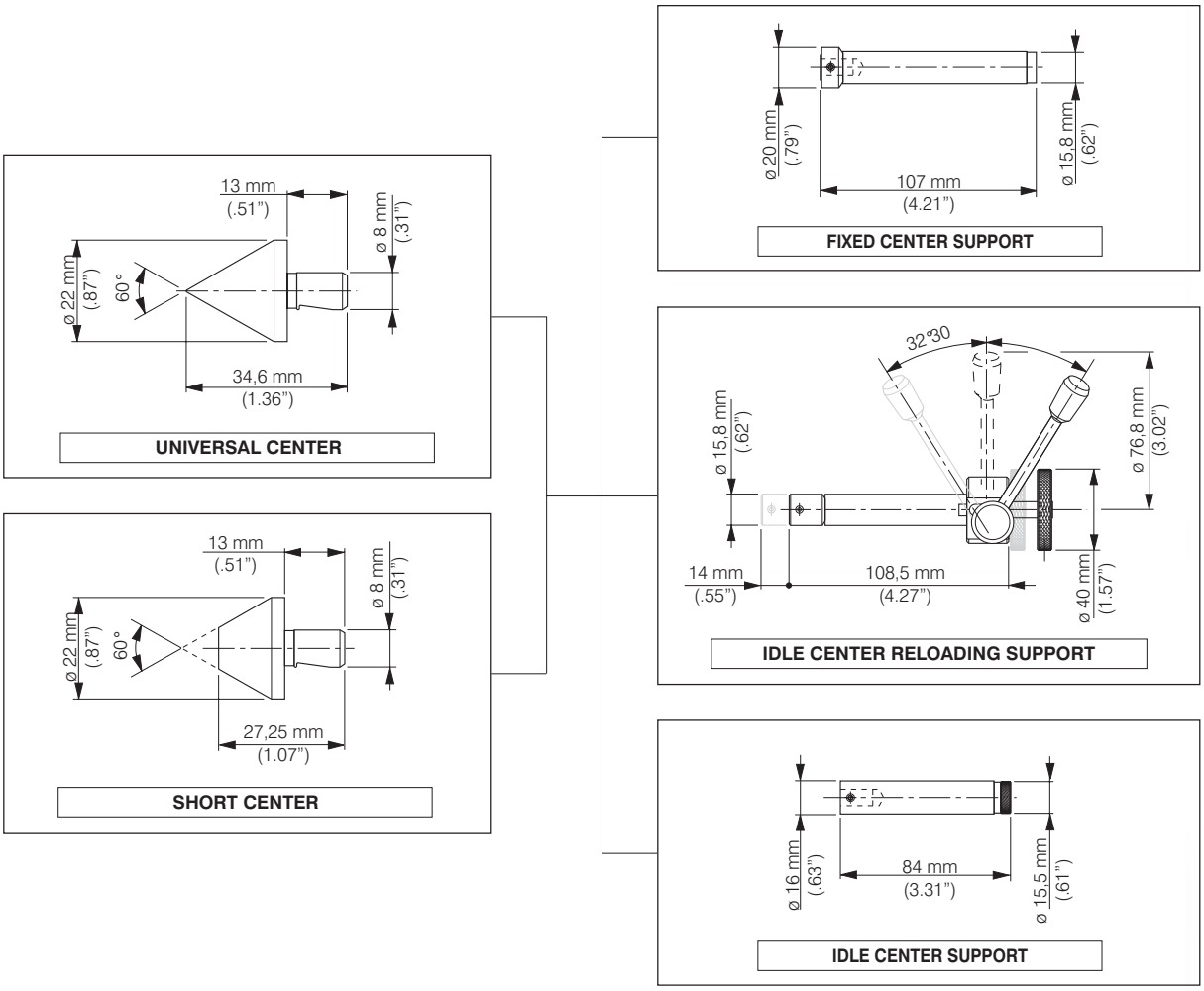
- Suitable for part diameters from 5 to 50 mm (.19" - 1.97")

Description	Order Code
PART PUSHER	3024017980

2.7 Pivoting Centers Unit



This unit is needed when the part to be measured is provided with centers holes. The part is loaded between the centers and then introduced into the measuring station.
It is recommended for small parts [max. part weight 3 kg and max. flywheel overall diameter 170 mm (6.69")]. Dampers are available to avoid impacts during part positioning in the measuring station.



The pivoting centers unit is composed of one pair of center supports and their connecting shaft, whose length depends on the length of the bars of the base structure assembly.
The centers, their supports and the dampers must be ordered separately. To order the base structure assembly see 1. BASE STRUCTURE ASSEMBLY.

CENTER SUPPORTS (PAIR)					CONNECTING SHAFT FOR CENTER SUPPORTS		
BASE BARS LENGTH L (mm)	(inch)	MAX PART LENGTH (mm)	(inch)	ORDER CODE	LENGTH L (mm)	(inch)	ORDER CODE
200	7.87"	80	3.15"	3024017355	360	14.17"	1024017369
300	11.81"	180	7.08"		460	18.11"	1024017371
400	15.75"	280	11.02"		560	22.04"	1024017373
500	19.69"	380	14.96"		660	25.98"	1024017375
600	23.62"	480	18.89"		760	29.92"	1024017377
800	31.50"	680	26.77"		960	37.79"	1024017379

DESCRIPTION	ORDER CODE
FIXED CENTER SUPPORT	1024017567
IDLE CENTER SUPPORT	3024017325
IDLE CENTER RELOADING SUPPORT	3024017315
UNIVERSAL CENTER	1024017753
SHORT CENTER	1024017755
DAMPER (FOR MAX. PART WEIGHT 1,5 kg)	44331AC000
DAMPER (FOR MAX. PART WEIGHT 3 kg)	44331AC001

N.B.

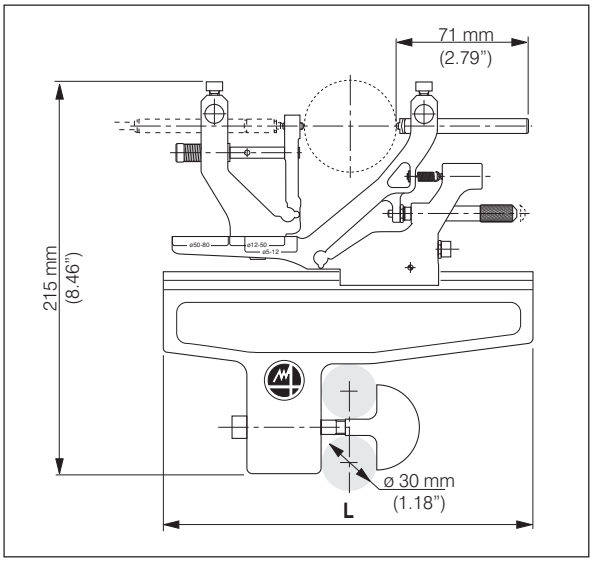
WITH THIS UNIT DIAMETER, OVALITY AND DISTANCE MEASUREMENTS ONLY CAN BE CARRIED ON. FOR MEASUREMENTS SUCH AS PERPENDICULARITY, T.I.R., CONCENTRICITY, ETC.,THAT ARE REFERRED TO THE CENTERS AXIS, PLEASE CONTACT YOUR NEAREST MARPOSS OFFICE.

3 - Part Measuring Assembly

3.1 Assembly with Self-Centering Unit with Transmission

Working range 1,150 mm

Assembly width: 12 mm (.47")



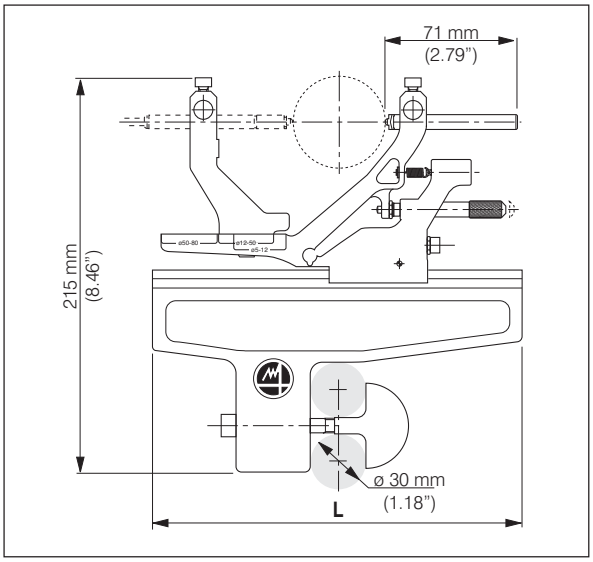
The self-centering unit with transmission is used to carry out diameter measurements only. It can accomodate both pencil probes and dial indicators with diameter 8 mm or 3/8". The probe is not in direct contact with the part and is therefore preserved from radial impact by part loading/unloading.

The assembly is composed of one support bracket and one self-centering unit with transmission. The probe and the two contacts to be mounted on the unit must be ordered separately (see 4. Contacts and Armsets and section Transducers and measurement transmissions).

Support Bracket			Self-Centering Unit with Transmission			
Length L (mm)	(inch)	Order Code	Range (mm)	(inch)	Clamping ø for Probe	Order Code
200	7.87"	3024017000	5 - 80	.20" - 3.15"	8 mm	3024017460
					3/8"	3024017462

3.2 Assembly with Self-Centering Unit with Direct Probe

Assembly width: 12 mm (.47")



The self-centering unit with direct probe is used to carry out diameter measurements only. It can accomodate both pencil probes and dial indicators with diameter 8 mm or 3/8".

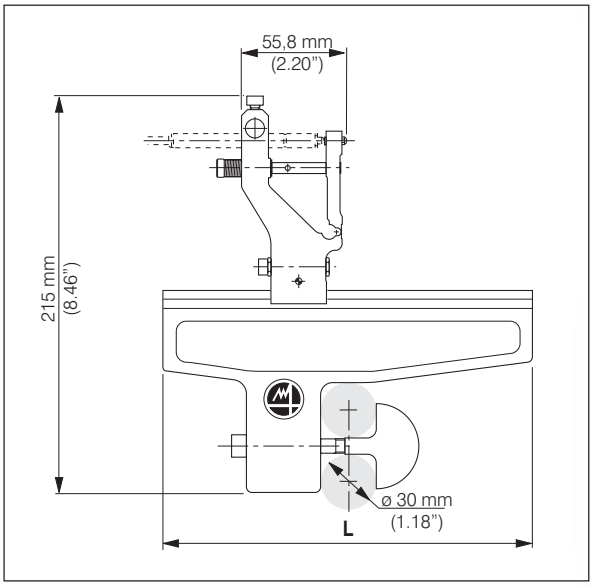
The assembly is composed of one support bracket and one self-centering unit with direct probe. The probe and the contact to be mounted on the unit must be ordered separately (see 4. Contacts and Armsets and section Transducers and measurement transmissions).

Support Bracket			Self-Centering Unit with Direct Probe			
Length L (mm)	Length L (inch)	Order Code	Range (mm)	Range (inch)	Clamping ø for Probe	Order Code
200	7.87"	3024017000	5 - 80	.20" - 3.15"	8 mm	3024017470
					3/8"	3024017472

3.3 Assembly with Single Transmission Unit

Working range of one single transmission unit 1.150 mm/.0452"

Assembly width: 12 mm (.47")



The single transmission unit is used to carry out both diameter and form measurements. It can accomodate both pencil probes and dial indicators with diameter 8 mm or 3/8". The probe is not in direct contact with the part and is therefore preserved during part loading/unloading.
The assembly with only one transmission unit is particularly used for T.I.R. measurements.

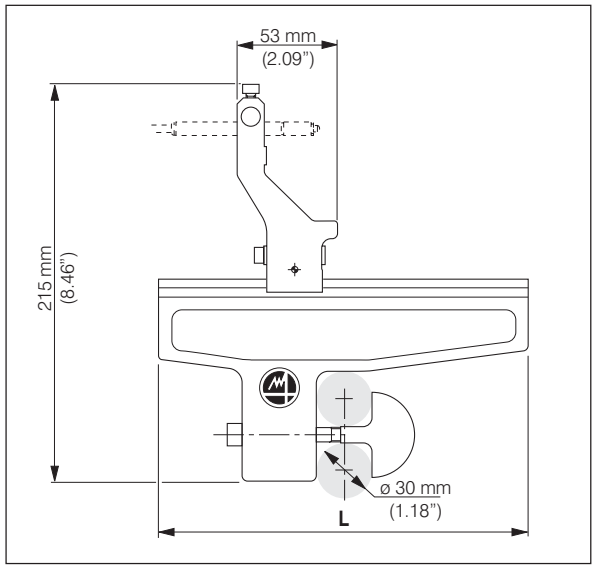
The assembly is composed of one support bracket (L=200 mm or 250 mm) and one or two single transmission units. The probe and the contact to be mounted on the unit must be ordered separately (see 4. Contacts and Armsets and section Transducers and measurement transmissions).

Support Bracket				
Length L (mm)	Length L (inch)	Range (mm)	Range (inch)	Order Code
200	7.87"	3 - 118	.12" - 4.64"	3024017000
250	9.84"	3 - 160	.12" - 6.30"	3024017050

Probe Support	Clamping ø for Probe	Order Code
SINGLE TRANSMISSION UNIT	8 mm	3024017155
	3/8"	3024017157

3.4 Assembly with Direct Probe Unit

Assembly width: 12 mm (.47")



The direct probe unit is used to carry out both diameter and form measurements. It can accomodate both pencil probes and dial indicators with diameter 8 mm or 3/8".

The assembly is composed of one support bracket (L=200 mm or 250 mm) and one or two direct probe units. The probe to be mounted on the unit must be orderd separately (see section Transducers and measurement transmissions).

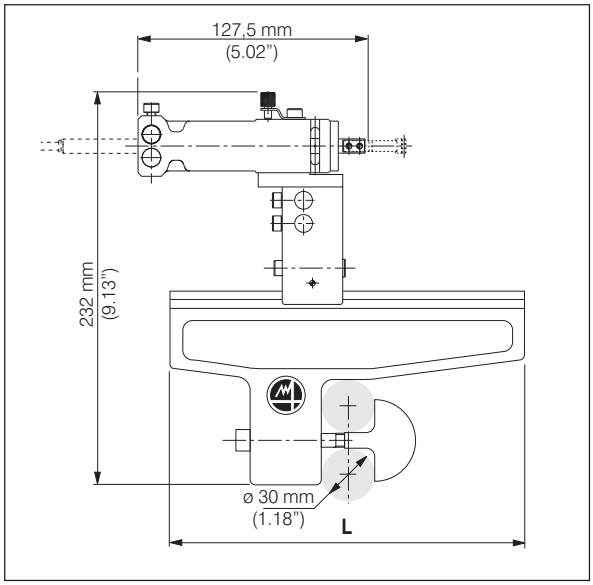
Support Bracket				
Length L (mm)	(inch)	Range (mm)	(inch)	Order Code
200	7.87"	3 - 118	.12" - 4.64"	3024017000
250	9.84"	3 - 160	.12" - 6.30"	3024017050

Probe Support	Clamping ø for Probe	Order Code
DIRECT PROBE UNIT	8 mm	3024017145
	3/8"	3024017147

3.5 Assembly with Shoulder Transmission Unit

Working range 1.50 mm/.059"

Assembly width: 12 mm (.47")



To carry out distance measurements. It can accomodate both pencil probes and dial indicators with diameter 8 mm or 3/8". The probe is not in direct contact with the part and is therefore preserved during part loading/ unloading.
Distance measurements can be carried out by using two assemblies or one assembly and a measuring axial limiter.

The assembly is composed of one support bracket and one shoulder transmission unit. The armset and the contact to be mounted on the unit must be ordered separately (see 4. CONTACT AND ARMSETS).

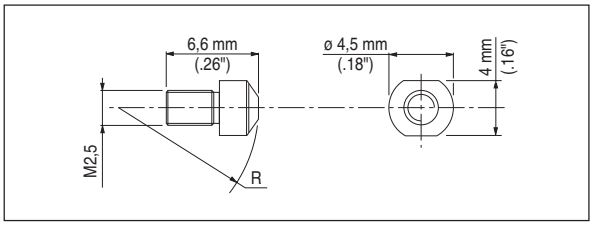
SUPPORT BRACKET		
LENGTH L (mm)	(inch)	ORDER CODE
200	7.87"	3024017000
250	9.84"	3024017050

	CLAMPING Ø FOR PROBE	ORDER CODE
SHOULDER TRANSMISSION UNIT	8 mm	3024017330
	3/8"	3024017331

4 - CONTACTS AND ARMSETS

All contacts and extensions to be fitted on Quick Set components must be M 2,5. Contacts 4-48 UNF are listed as accessory to 3/8" pencil probes and dial indicators.

4.1 STANDARD CONTACTS

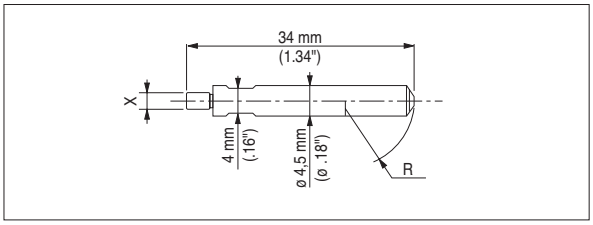


To be used with:

- Self - centering unit with transmission (Q.ty = 2)
- Self - centering unit with direct probe (Q.ty = 1)
- Single transmission unit (Q.ty = 1)

RADIUS R (mm)	(inch)	MATERIAL	ORDER CODE
10	.39"	CARBIDE	3392401702
50	1.97"	CARBIDE	3392401705
100	3.94"	CARBIDE	3392401706
10	.39"	DIAMOND	3392401722
50	1.97"	DIAMOND	3392401725
100	3.94"	DIAMOND	3392401726

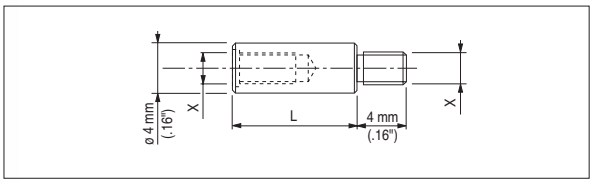
4.2 CONTACTS FOR MEASURING "V"



Special carbide contact to be mounted on the single transmission unit or directly on the probe.

RADIUS R (mm)	(inch)	THREAD X	ORDER CODE
10	.39"	M 2,5	3392401701
50	1.97"	M 2,5	3392401720
100	3.94"	M 2,5	3392401721

4.3 Contact Extensions



Available with thread M 2.5 or 4-48 UNF. It can be used:

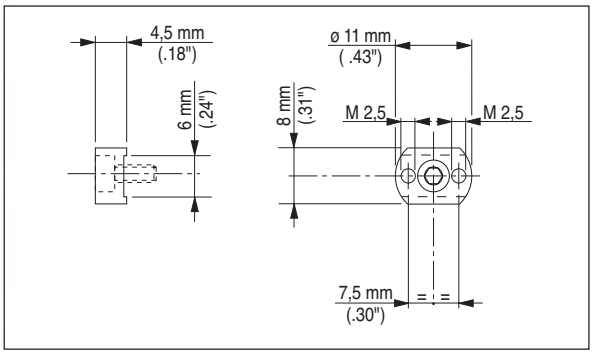
- With self-centering unit
- With single transmission unit
- With direct probe unit
- With dial indicators

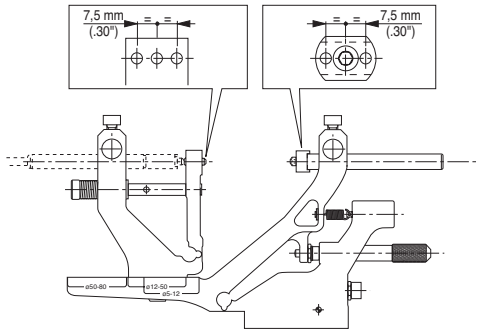
L (mm)	L (inch)	Thread X	Order Code
10	.39"	M 2.5	1024017105
15	.59"	M 2.5	1024017106
20	.79"	M 2.5	1024017107
25	.98"	M 2.5	1024017108
30	1.18"	M 2.5	1024017109
10	.39"	4 - 48 UNF	1024017115
15	.59"	4 - 48 UNF	1024017116
20	.79"	4 - 48 UNF	1024017117
25	.98"	4 - 48 UNF	1024017118
30	1.18"	4 - 48 UNF	1024017119

4.4 Off-Set Arms

4.4.1 Armset for Self-Centering Unit with Transmission

It is needed to carry on measurements very close to each other and close to a shoulder (min. 3 mm) by offsetting the contact.



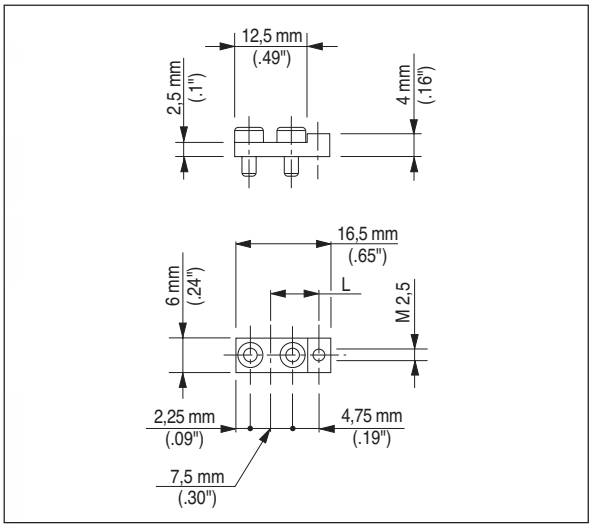


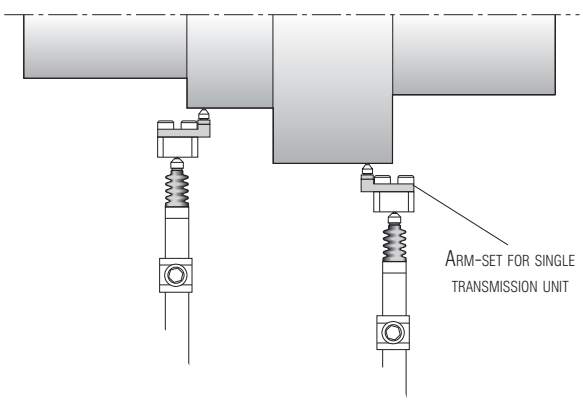
Min. distance between two measuring sections: 5,2 mm

Armset + fixing screw	Order Code
	2924017405

4.4.2 Armset for Single Transmission Unit

For contact off-set when measurements close to each other must be carried on.

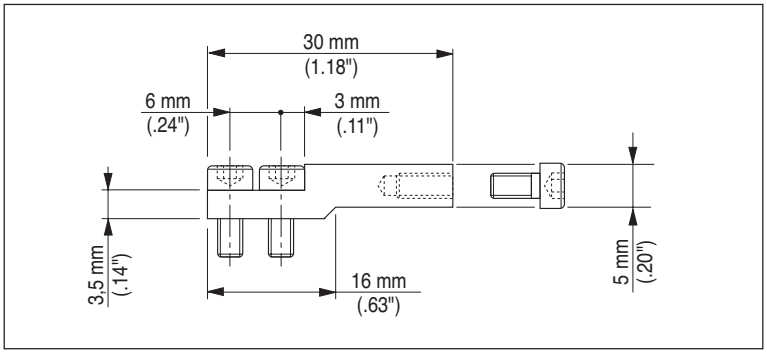




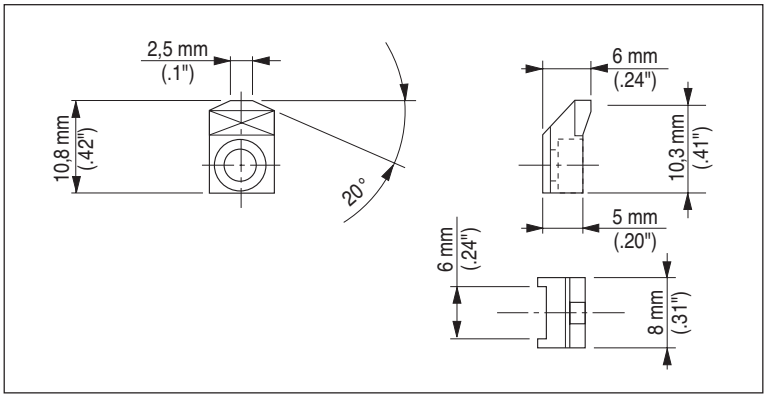
Min. distance between two measuring sections: 5,2 mm

ARMSET + FIXING SCREW	OFF-SET L (mm)	OFF-SET L (inch)	ORDER CODE
	8.5	.33"	2924017150
	10	.39"	2924017151

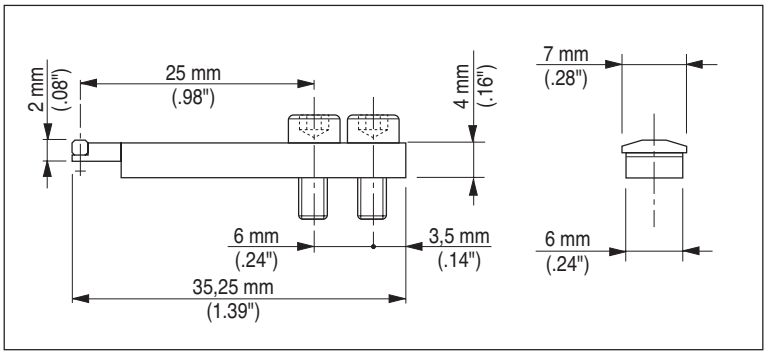
4.5 CONTACTS AND ARMSETS FOR SHOULDER TRANSMISSION UNIT



ARMSET
It is the interface for the mounting of the contact on the unit.



CONTACT
Available with carbide or diamond tip.



ARMSET FOR GROOVES
It is equipped with a carbide contact and must be directly mounted on the unit

DESCRIPTION	ORDER CODE
ARMSET	2924017302
CARBIDE CONTACT	3292401702
DIAMOND CONTACT	3292401712
ARMSET FOR GROOVES	3292401705

5 - Wrench Set

For bench assembly and set-up.

Description	Order Code
WRENCH SET	2924017990

6 - Instruction Manual

Description	Order Code
INSTRUCTION MANUAL	D0QS0002X1

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

7 - Quick Set Configurator Program

PC based program to determine the bench gauge composition. It provides the item list for assembly.

Description	Order Code
QUICK SET CONFIGURATOR PROGRAM	ON REQUEST

Quick set universal

GAUGE SYSTEM FOR CYLINDRICAL PARTS

Flexible modular measuring system for multidimensional and geometric checks of cylindrical parts such as bushings, hubs, gear wheels.

Its flexibility guarantees quick retooling without any special tools, and easy reconfiguration through standard components.

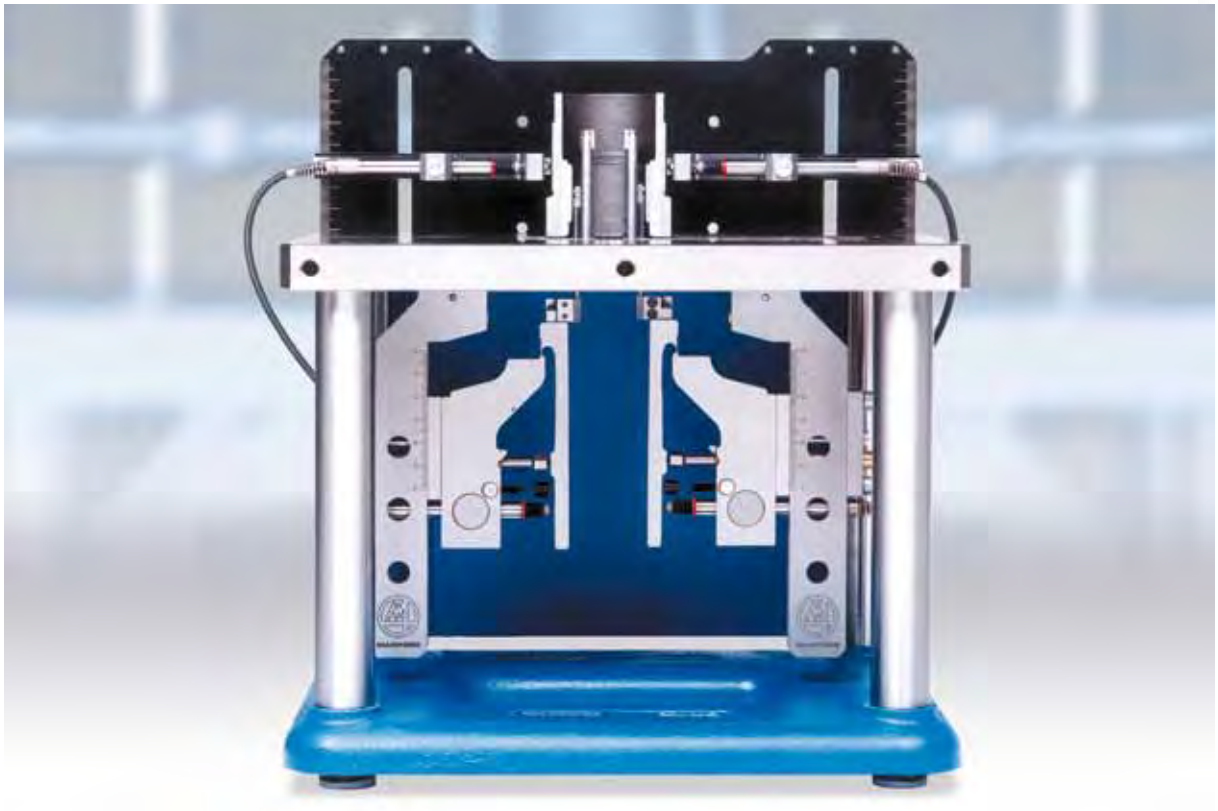
Parts with:

- internal diameter 10 ÷ 100 mm
- external diameter 14 ÷ 160 mm
- max. height 130 mm

can be measured.

It can accomodate any electronic pencil probe with clamping diameter 8 mm or 3/8" such as TESTAR Red Crown™ or Quick Probe™.

Special versions with dedicated nosepieces, automatic part rotation for dynamic measurements, pneumatic slide, pneumatic part lifting device for automatic part loading and unloading can be supplied on request.



Components and Accessories

1. Base

BASE		
Size	Dimensions (mm)	Order Code
SMALL	280 X 230	3024070025
MEDIUM	350 X 230	3024070020

2. Base Plate

It holds all components used for part referencing and measuring.

BASE PLATE		
Size	Dimensions (mm)	Order Code
SMALL	280 X 230	3024070051
MEDIUM	350 X 230	3024070050

3. Guards

GUARDS		
Size	Dimensions (mm)	Order Code
LONG SIDE FOR SMALL BASE	213 X 171	2924070026
LONG SIDE FOR MEDIUM BASE	283 X 171	2924070021
SHORT SIDE FOR BOTH SMALL AND MEDIUM BASE	163 X 171	2924070022

4. Retoolable nosepiece

This unit allows correct part referencing and protects the contacts.

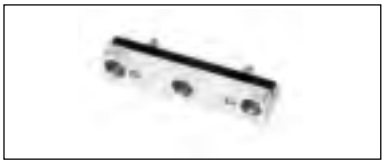
RETOOLABLE NOSEPIECE	
Range (mm)	Order Code
10 ÷ 14	3024070100
14 ÷ 18	3024070105
18 ÷ 25	3024070110
25 ÷ 32	3024070115
32 ÷ 45	3024070120
45 ÷ 75 (*)	3024070125
75 ÷ 100 (*)	3024070130

(*) Only with MEDIUM size BASE PLATE.

5. Guide for transmission unit for internal diameters

This guide is mounted on the underside of the base plate and holds the transmission units for checking internal diameters.

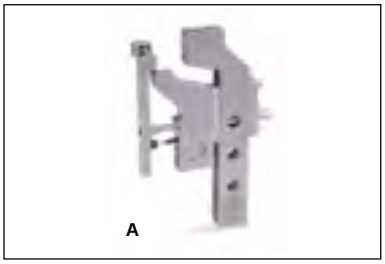
GUIDE
Order Code
2924070040



6. Transmission unit for checking internal diameters

Internal diameters in the range 10 to 100 mm can be measured using two of this components. When the size is between 25 and 100 mm, up to 3 inside diameters can be measured. Transmissions with integral fulcrum have ± 1 mm measuring range, transmissions with cross fulcrum have ± 5 mm measuring range.

(A) TRANSMISSION WITH INTEGRAL FULCRUM	
ø Probe	Order Code
8 mm	3024070000
3/8"	3024070001



(B) TRANSMISSION WITH CROSS FULCRUM	
ø PROBE	ORDER CODE
8 mm 3/8"	3024070011 3024070013

(C) TRANSMISSION WITH CROSS FULCRUM AND PNEUMATIC ACTUATION	
ø PROBE	ORDER CODE
8 mm 3/8"	3024070010 3024070012

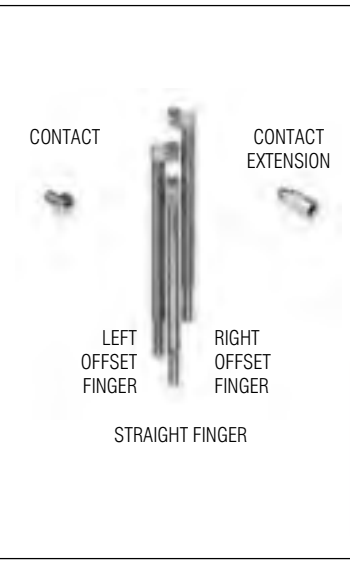
7. FINGERS AND CONTACTS

Using standard fingers and contacts the arm ratio is 1:1.

FINGERS		
DIAMETER (mm)	TYPE	ORDER CODE
3 4 4 4	STRAIGHT STRAIGHT LEFT OFFSET RIGHT OFFSET	3192407004 3192407007 3192407005 3192407006

CONTACTS			
LENGTH (mm)	RADIUS (mm)	TYPE	ORDER CODE
1.8 2.8 3.5	2 2 2	CARBIDE CARBIDE DIAMOND	3392407001 3392407002 3392407010

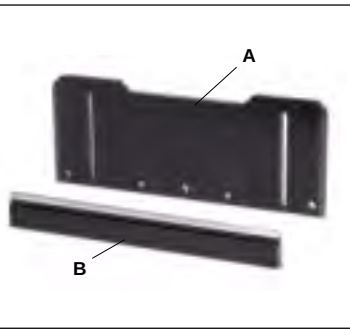
CONTACT EXTENSION	
LENGTH (mm)	ORDER CODE
6.2	1024070014



8. SUPPORT PLATE AND GUIDE FOR EXTERNAL MEASUREMENTS

The support plate can be mounted directly on the base plate or on the manual slide. On this plate (A) up to six guides (B) can be fixed. On the guides the Quick Set measuring elements and transmissions for checking external diameters and thickness are mounted.

SUPPORT PLATE AND GUIDE	
	ORDER CODE
PLATE (A) **GUIDE** (B)	2924070045 2924070046



9. MANUAL SLIDE FOR EXTERNAL MEASUREMENTS

This unit must be used when the measuring components will interfere with part loading (i.e. measuring a groove diameter). It holds the support plate and the guides for the measuring transmissions for checking external diameters and thickness.

MANUAL SLIDE
ORDER CODE
2924070200

10. Transmission unit for checking external diameters

Two units are needed for checking one diameter. The maximum measurable diameter is 160 mm.

TRANSMISSION UNIT FOR EXTERNAL DIAMETERS	
ø Probe (mm)	Order Code
8 mm 3/8"	3024017155 3024017157

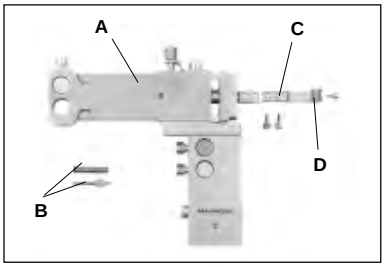
CONTACTS			
Length (mm)	Radius (mm)	Type	Order Code
2.8	10	CARBIDE	3392401702
2.8	10	DIAMOND	3392401722
2.8	50	CARBIDE	3392401705
2.8	50	DIAMOND	3392401725

11. Transmission unit for thickness measurement

It has to be fixed onto the guide for external measurements.

(A+B) TRANSMISSION FOR THICKNESS	
ø Probe (mm)	Order Code
8 mm 3/8"	3024017330 3024017331

Description	Order Code
(C) FINGER (D) CONTACT	2924017302 3292401702

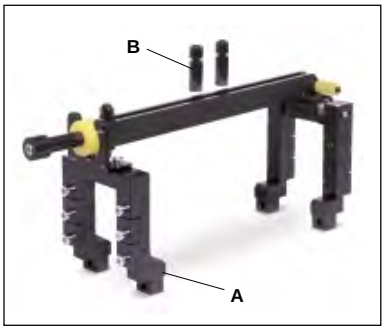


12. Pivoting arm for thickness measurement

This arm holds the probes which carry out the thickness measurements; it is mounted onto the base plate and brings the probes in measuring position after having loaded the part on the referencing nosepiece.

(A) PIVOTING ARM
Order Code
2924070060

(B) PROBE SUPPORT		
Length (mm)	ø Probe	Order Code
60	8 mm 3/8"	2924019070 2924019072
85	8 mm 3/8"	2924019071 2924019073



13. Probe support for plate

This support is fixed under the base plate and allows to measure thickness.

PROBE SUPPORT FOR PLATE	
ø Probe (mm)	Order Code
8 mm 3/8"	2924019075 2924019076

Description	Order Code
WRENCH SET	2924070990
USER MANUAL	D0QS0005X1 (*)

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

DIAL INDICATORS

High quality dial indicators, whose design, accurate components, precision engineered mechanism and robust construction offer accuracy, reliability, durability and long working life.

Standard features for all models are:

- Adjustable tolerance markers to set tolerance limits
- Hardened, stainless steel mounting shank and measuring spindle are corrosion proof
- Lapped spindle increasing resistance to wear
- Sturdy metal housing

High precision dial indicator TD1/TD1S/TD2R

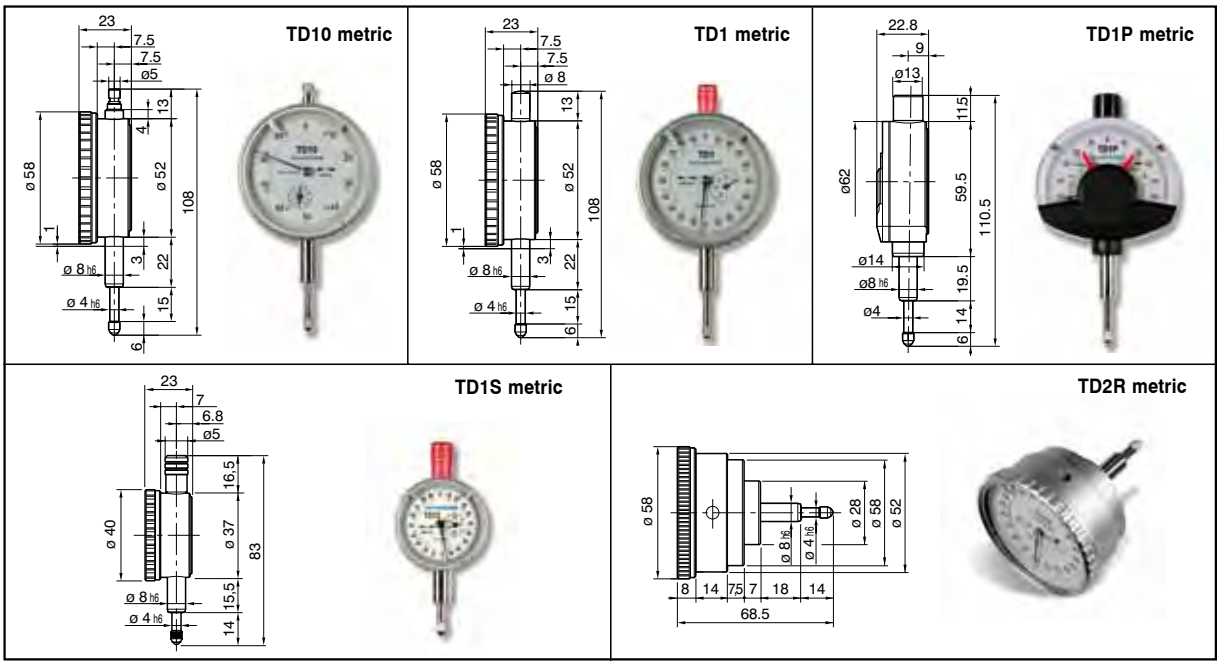
- High magnification gear train and high-resolution dials allow a very precise reading of the measuring value
- Precisely matched measuring spindles and stems minimise lateral play
- All gear pivots run in high class ceramic bearings
- Bezel rotates fully 360° to set zero in any position

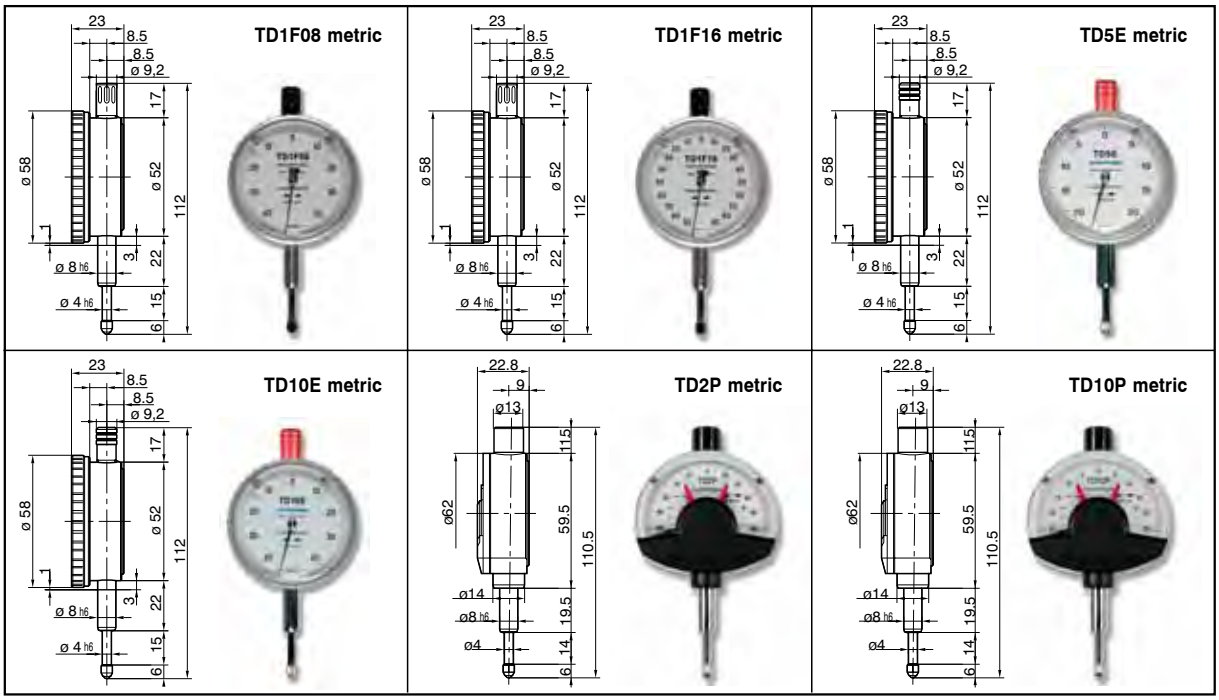
Dial comparator gauge TD1P/TD1PL/TD2P/TD10P

- Jewelled movement and precision pinions and shafts
- Measuring spindle mounted in high-precision guide. This allows high measurement accuracy and minimal hysteresis
- Effective shockproof system
- Quick zero setting with fine adjustment over the total measuring range through the screw on top
- Additional overtravel assists with the insertion of workpieces into the measuring device

Error free dial indicators TD5E/TD10E/TD1F08/TD1F16

- Measurin range is limited to less than one revolution of the pointer
- TD1F08 and TD1F16 feature a combined gear and lever transmission which guarantees high accuracy and low hysteresis
- Effective shockproof system
- Additional overtravel assists with the insertion of workpieces into the measuring device





TECHNICAL SPECIFICATIONS - HOW TO ORDER

MODEL	MEAS. RANGE	RANGE PER REVOLUTION	GRADUATION (RESOLUTION)	SCALE READING	NUMBER OF GRADUATIONS ON THE SCALE	ORDER CODE
TD10 metric	10 mm	1 mm	0,010 mm	0 - 100	100	0E31010100
TD1 metric	1 mm	0,2 mm	0,001 mm	0 - 100 - 0	200	0E31020200
TD1S metric	1 mm	0,2 mm	0,001 mm	0 - 100 - 0	200	0E31020250
TD1P metric	0,100 mm	-	0,001 mm	50 - 0 - 50	100	0E31030200
TD1PL metric	0,100 mm	-	0,001 mm	50 - 0 - 50	100	0E31030250
TD2R metric	0,400 mm	0,2 mm	0,002 mm	0 - 100 - 0	200	0E31040300
TD1F08 metric	0,080 mm	-	0,001 mm	40 - 0 - 40	80	0E31050200
TD1F16 metric	0,160 mm	-	0,001 mm	80 - 0 - 80	160	0E31060200
TD5E metric	0,400 mm	-	0,005 mm	20 - 0 - 20	80	0E31040400
TD10E metric	0,800 mm	-	0,010 mm	40 - 0 - 40	80	0E31070100
TD2P metric	0,200 mm	-	0,002 mm	100 - 0 - 100	100	0E31090300
TD10P metric	0,500 mm	-	0,010 mm	25 - 0 - 25	50	0E31080100

MODEL	BEZEL DIAMETER	STEM DIAMETER	CONTACT THREAD	REPEATABILITY (f_w)	ACCURACY (f_e) (*)	MEASURING FORCE (±10%) (N)
TD10 metric	58 mm	8 h6 mm	M 2,5	0,003 mm	0,015 mm	07 - 1,2
TD1 metric	58 mm	8 h6 mm	M 2,5	0,003 mm	0,005 mm	0,8 - 1,6
TD1S metric	40 mm	8 h6 mm	M 2,5	0,003 mm	0,005 mm	1 - 1,2
TD1P metric	62 mm	8 h6 mm	M 2,5	0,0005 mm	0,001 mm	1,2 - 1,4
TD1PL metric	62 mm	8 h6 mm	M 2,5	0,0005 mm	0,001 mm	0,5 - 0,75
TD2R metric	58 mm	8 h6 mm	M 2,5	0,005 mm	0,005 mm	2 - 2,2
TD1F08 metric	58 mm	8 h6 mm	M 2,5	0,0015 mm	0,002 mm	1,5
TD1F16 metric	58 mm	8 h6 mm	M 2,5	0,0015 mm	0,002 mm	1,5
TD5E metric	58 mm	8 h6 mm	M 2,5	0,003 mm	0,007 mm	1,2
TD10E metric	58 mm	8 h6 mm	M 2,5	0,003 mm	0,007 mm	1,5
TD2P metric	62 mm	8 h6 mm	M 2,5	0,0006 mm	0,002 mm	1,5
TD10P metric	62 mm	8 h6 mm	M 2,5	0,003 mm	0,010 mm	1,5

(*) Span of error being the plunger pressed in

DIGITAL INDICATOR

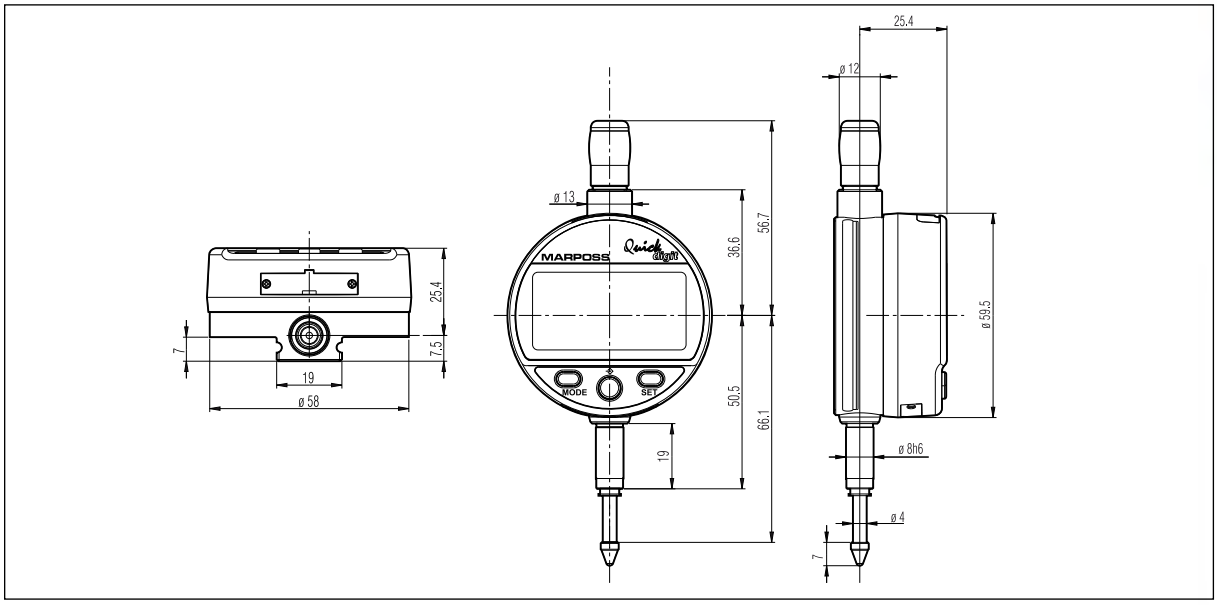
- Aluminium case, polyamide front cover
- Highly accurate capacitive measuring system
- Available measuring range: 12,5 mm/0.5” (25 mm/1.0”, 50 mm/2.0”, 100 mm/4.0” only on request)
- 0,001 mm resolution
- Large 11 mm digits for fast and error-free reading of the measuring value
- LCD display rotates through 270°
- Hardened and ground stainless-steel measuring spindle
- Power supply: replaceable 3V lithium battery, type CR2032, 220 mAh. Average battery life: 8000 h. External power supply using Power type cable for data transmission.
- Working temperature range: 5 °C to 40 °C
- Storage temperature range: - 10 ° C to 60 °C
- Protection degree (CEI/IEC 60529): IP51
- RS232 compatible output
- M 2,5 interchangeable contact

FUNCTIONS

- Direct metric / inch conversion
- Preset
- Zero setting at any point within the measuring range
- Choice of measurement sign (positive or negative)
- Memory HOLD
- Automatic switch-off without loss of the origin value
- Data transmission

ADDITIONAL FUNCTIONS FOR ADVANCED MODEL

- REF I / REF II dual reference point
- Dynamic Min./Max./TIR measuring mode
- Setting and display of tolerance limits
- Measuring value classification through tolerance indicator lights (green, yellow, red)
- Input of a multiplicative coefficient



TECHNICAL SPECIFICATIONS - HOW TO ORDER

MODEL	MEAS. RANGE		RESOLUTION		ACCURACY	REPEATABILITY (± 2σ)	PROT. DEGREE	MEAS. FORCE (± 20%)	WEIGHT	ORDER CODE
	(mm)	(inch)	(mm)	(inch)	(μm)	(μm)		(N)	(gr)	
12,5 S Basic model	12,5	.49"	0,001	.00005"	4	2	IP51	0,65 - 0,90	120	0E21201010
12,5 S Advanced model	12,5	.49"	0,001	.00005"	3	2	IP51	0,65 - 0,90	120	0E21201012
12,5 SL Basic model with low force	12,5	.49"	0,001	.00005"	4	2	IP51	0,40 - 0,55	120	0E21201011
12,5 SL Advanced model with low force	12,5	.49"	0,001	.00005"	3	2	IP51	0,40 - 0,55	120	0E21201013

The value of the measuring force is referred to indicator in vertical position and with outgoing spindle.

ACCESSORIES

DESCRIPTION		ORDER CODE
	POWER – RS232 CABLE FOR BIDIRECTIONAL DATA TRANSMISSION (L = 3 m)	4420240001
	PROXIMITY – RS232 CABLE FOR BIDIRECTIONAL DATA TRANSMISSION (L = 3 m)	4420240002

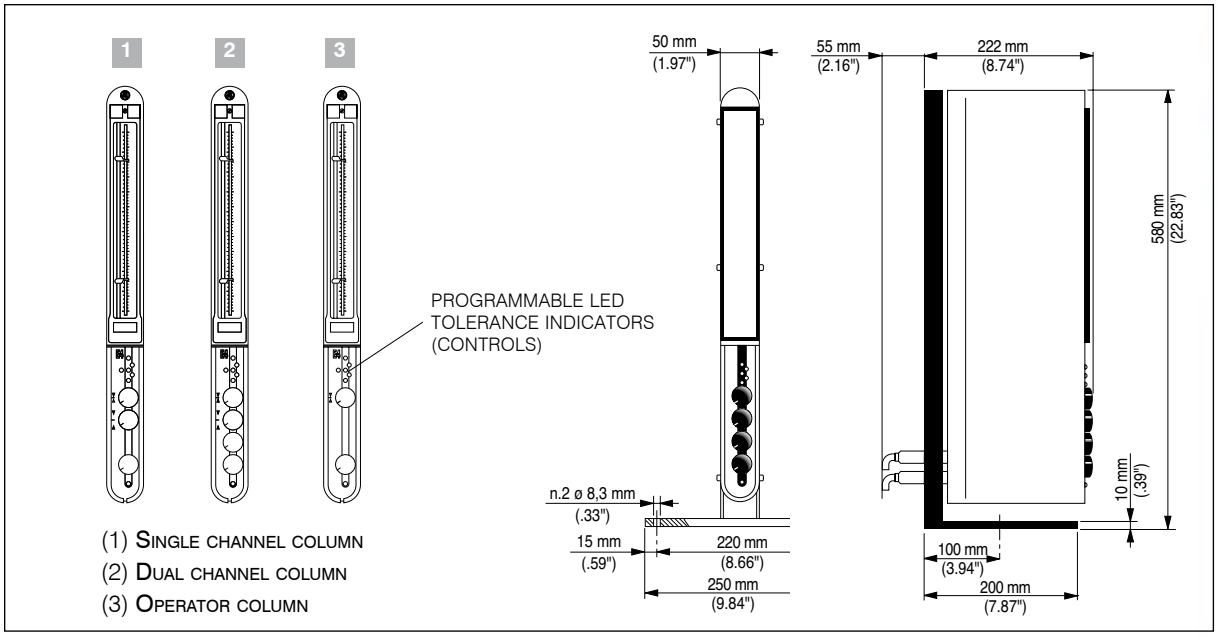
For a full list of address locations, please consult the Marposs official website

D6Q00804G0 - *Edition 09/2012 - Specifications are subject to modifications*

Marposs has an integrated system to manage the Company quality, the environment and safety, attested by ISO 9001, ISO 14001 and OHSAS 18001 certifications. Marposs has further been qualified EAQF 94 and has obtained the Q1-Award.

MODULAR ELECTRONIC MEASUREMENT DISPLAY

- Modular electronic measurement display system for the processing and the display of measurements provided by simple or complex gauging equipments.
- As a single unit, it can be used with TESTAR full-bridge (LVDT) Red Crown pencil probes, manual plugs M1, manual rings M4, snap gauges Quick Snap; with Quick Set bench type gauges it can be expanded into a powerful electronic processing system, capable of displaying more complex geometric measurements.
- Available in three basic configurations, each having standard and optional features:
  - single channel module with one input channel, that can be used with single transducer gauges;
  - dual channel module with two input channels, also capable to display sum and differ-ence of the measurements of two transducers;
  - operator module, that can be connected to two dual-channel modules for the arithmetic processing of a maximum of four transducer signals.
- 101 LED bargraph display, equipped with adjustable tolerance indicators. As an option programmable LED tolerance indicators on the front panel, to show part status (oversize, within size, undersize) are available.



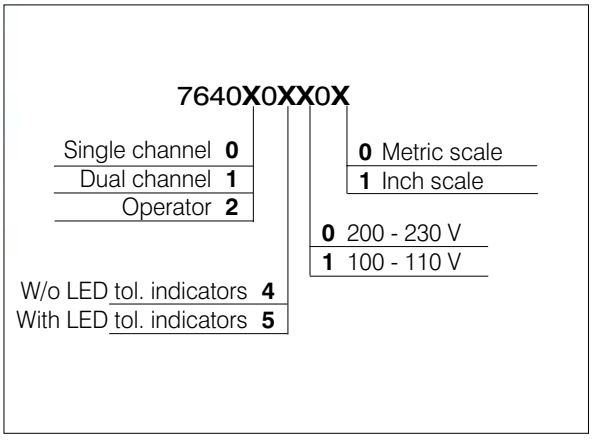
(1) SINGLE CHANNEL COLUMN
(2) DUAL CHANNEL COLUMN
(3) OPERATOR COLUMN

TECHNICAL SPECIFICATIONS

POWER SUPPLY	100-110 V, 120-127 V, 200-230 V, 240-254 V; 50 - 60 Hz
MAXIMUM VOLTAGE VARIATION	± 10%
MAXIMUM ABSORBED POWER	10 VA
SCALE LENGTH	254 mm (10")
DISPLAY RESOLUTION	0,2 µm - .0000080" (full scale ± 10 µm) 0,6 µm - .000024" (full scale ± 30 µm) 2,1 µm - .000080" (full scale ± 100 µm) 6,4 µm - .00024" (full scale ± 300 µm)
ZEROING	*Single channel module:* - Rough zeroing: ± 300 µm - Fine zeroing: ± 10 µm *Dual channel module:* ± 100 µm (1 potentiometer for each channel) *Operator module:* ± 100 µm
OPERATING TEMPERATURE	0/+50 °C
STORING TEMPERARURE	-40/+70 °C
PROTECTION LEVEL	IP50
TIME FOR STABILIZATION AFTER POWER-ON	20 minutes
MEASUREMENT VARIATION IN RELATION TO TEMPERATURE	Lower than the display resolution
TOTAL MEASURING ACCURACY AT 20°C	± 2% of selected full scale
RESPONSE TIME IN DISPLAY MIDDLE SCALE POSITION	150 ms (full scale ± 10 µm) 70 ms (full scale ± 30 µm) 50 ms (full scale ± 100 µm) 40 ms (full scale ± 300 µm)
ANALOG OUTPUT: RANGE - OUTPUT IMPEDANCE - LOADING IMPEDANCE - MEASURING ACCURACY AT 20°C - MEASURING VARIATION IN RELATION TO TEMPERATURE - RESPONSE TIME -	 ± 2,4 V full scale 15 mohm 105 kohm ± 1% of selected full scale ± 0,015 µm/°C 120 ms (full scale ± 10 µm) 40 ms (full scale ± 30 µm) 12 ms (full scale ± 100 µm) 4 ms (full scale ± 300 µm)
CONNECTOR TYPE	7 pin (DIN 45329)

HOW TO ORDER

To order an E4 column it is necessary to complete the following coding plan:



DESCRIPTION		ORDER CODE
SUPPORT STAND FOR UP TO 7 COLUMNS (SAME AS E4N)		6131410040
SUPPORT STAND LINK STUDS (2 REQUIRED FOR EACH ADDITIONAL MODULE)		1529040210
POWER SUPPLY CABLE W/O PLUG		6739998503
POWER SUPPLY CABLE WITH PLUG	USA	6739696120
	CH	6739696121
	F-D	6739696122
	E	6739696123
	I	6739696124
POWER JUMP LEADS		6790020087
ADAPTER CABLE FOR CONNECTING GAUGES WITH LUMBERG SV50/6 CONNECTOR		6735832000

EXAMPLE: The order code for a dual channel column with LED tolerance indicators, metric scale and power supply 200 - 230 V is 7640105000.

COMPACT ELECTRONIC DISPLAY UNIT

Quick Read™ family is made up of three slim, compact versions, each complete with analog and digital displays, and easily programmed via local keypad.

UNIQUE CLEAR DISPLAY

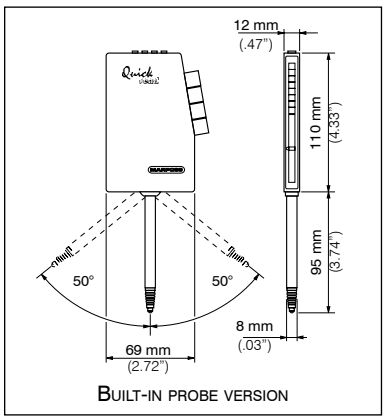
The 3-colour (green, yellow and red) analog display and 8-digit alphanumeric display provide clear definition and easy reading of the measurement results.

PROGRAMMABLE PARAMETERS

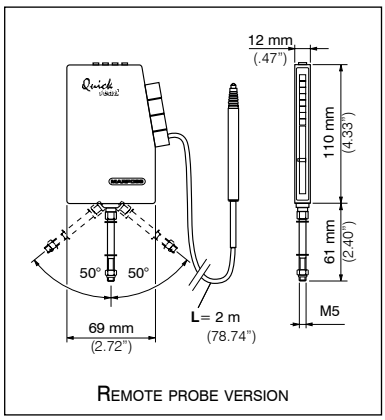
Using the local keypad, the Quick Read™ can be easily programmed to set the digital display resolution, measuring unit, tolerance limits, master deviation, full scale, measurement multiplying coefficient, absolute or comparative reading of the measurement result and the data format for serial transmission.

SERIAL OUTPUT

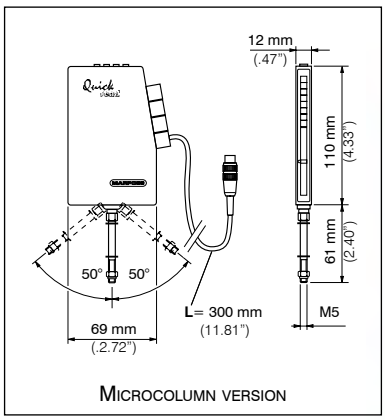
The RS232 output port allows for connection to a PC, statistical printer or data collector for SPC purposes, and to a PLC (data can be sent in ASCII or binary format).



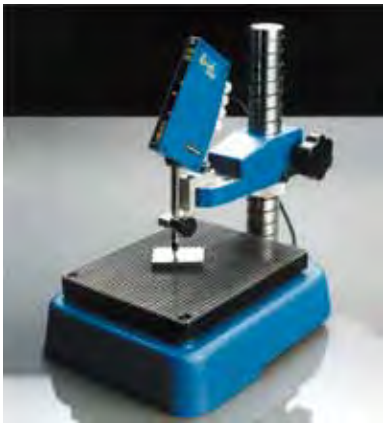
BUILT-IN PROBE VERSION



REMOTE PROBE VERSION



MICROCOLUMN VERSION



BUILT-IN PROBE VERSION

Having the measuring probe directly integrated into the main structure makes it suitable for single, simple implementation and multi-dimensional applications where the measuring locations are close to each other.

REMOTE PROBE VERSION

The pencil probe in this version is attached to the main structure by means of a standard 2 m (78.7") cable. This allows location of the display away from the measur-ing device. In multi-dimensional applications, all the Quick Read displays can be mounted to a standard base structure so that they are located in one common area.

General specifications	
Power supply	7 - 7,5 Vdc ± 5% (300 mA)
Protection level (CEI/IEC 529 - DIN VDE 0470-1)	IP50
Accuracy	± (1% reading value + resolution)
Measurement thermal drift	max 0,25 µm/°C
Output	RS232
Working temperature	0 ÷ 50 °C
Storage temperature	- 40 ÷ 50 °C

Digital display	
Resolution	0,0001/0,001 mm (.00001"/.00005")
Type	8 alphanumeric digits
Measurement multiplying coefficient	-2 to +2 with 0,01 step

Analog display	
Available scales	auto; 0,010 mm (.00050"); 0,020 mm (.00100"); 0,050 mm (.00250"); 0,100 mm (.00500"); 0,250 mm (.01000"); 0,500 mm (.02500"); 1,000 mm (.04000")
Resolution	1/10 of the programmed scale, from 0,001 mm (.00005") to 0,100 mm (.00500")
Type	21 three colour LEDs (green, yellow, red)

Measuring probe	
Prestroke	1,5 mm (adjustable)
Overstroke	1,5 mm
Measuring range	± 1 mm (.04")
Clamping diameter	8h6 mm or 3/8"
Contact	carbide, Ø 3 mm, interchangeable, M 2,5 or 4-48 UNF
Measuring force	0,75 N ± 25%
Repeatability (2,77 σ)	< 0,25 µm

Description	Order Code
Built-In Probe Version (Probe ø 8 mm)	0E01992106
Remote Probe Version (Probe ø 8 mm)	0E01991640
Wrench to adjust the probe pretravel	1320709000

Note : One User manual is supplied with each Quick Read.

MICROCOLUMN VERSION

This version incorporates half-bridge technology (HBT) and allows to connect TESTAR /MARPOSS standard sensors with half-bridge transducer ranging from ± 0,25 mm (.010") to ± 5 mm (.200").
Two versions are available :

- For connection of one sensor to carry out one static measurement .
- For connection of one or two sensors to carry out one static or dynamic measurement [Hold, Max, min, Max-min, (Max- min)/2, (Max+min)/2]. To connect two sensors the specific Y-cable is needed.

FOR CONNECTION OF ONE SENSOR ONE STATIC MEASUREMENT

FOR CONNECTION OF ONE OR TWO SENSORS ONE STATIC OR DYNAMIC MEASUREMENT

GENERAL SPECIFICATIONS	
POWER SUPPLY	7 - 7,5 Vdc ± 5% (300 mA)
PROTECTION LEVEL (CEI/IEC 529 - DIN VDE 0470-1)	IP50
ACCURACY	± (1% reading value + resolution)
MEASUREMENT THERMAL DRIFT	0,1 µm/°C for range up to ± 1 mm (.04000"); 0,2 µm/°C for range ± 2,5 mm (.10000") and ± 5 mm (.20000")
OUTPUT	RS232
WORKING TEMPERATURE	0 ÷ 50 °C
STORAGE TEMPERATURE	- 40 ÷ 50 °C

DIGITAL DISPLAY	
RESOLUTION	0,0001/0,001 mm (.00001"/.00005") for measuring range up to ± 1 mm (.04000"); 0,001 mm (.00005") for range ± 2,5 (.10000") and ± 5 mm (.20000")
TYPE	8 alphanumeric digits
MEASUREMENT MULTIPLYING COEFFICIENT	-2 to +2 with 0,01 step

ANALOG DISPLAY	
AVAILABLE SCALES	auto; 0,010 mm (.00050"); 0,020 mm (.00100"); 0,050 mm (.00250"); 0,100 mm (.00500"); 0,250 mm (.01000"); 0,500 mm (.02500"); 1,000 mm (.05000"); 2,5 mm (.10000"); 5 mm (.25000"); 10 mm (.50000")
RESOLUTION	1/10 of the programmed scale, from 0,001 mm (.00005") to 1,000 mm (.05000")
TYPE	21 three colour LEDs (green, yellow, red)

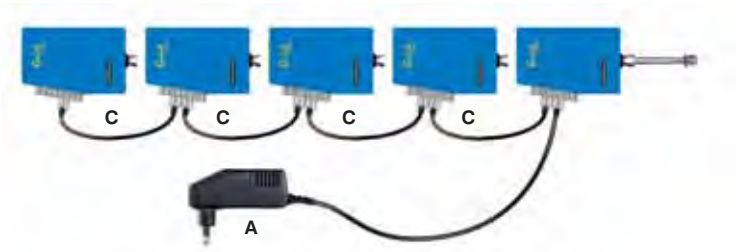
MANAGEABLE TRANSDUCER
1 or 2 half-bridge (*) with Lumberg SV50/6 connector

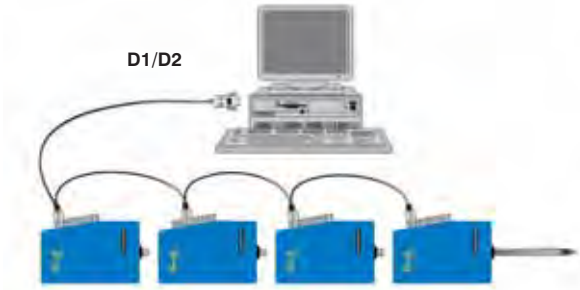
(*) HBT standard TESTAR/MARPOSS. For third parties transducer compatibility please contact the nearest MARPOSS office.

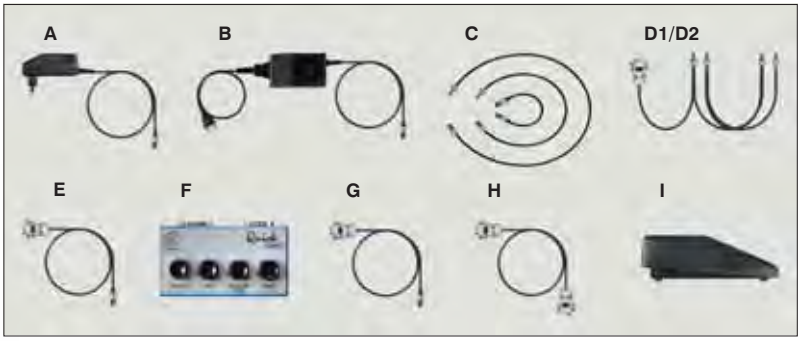
DESCRIPTION	ORDER CODE
MICROCOLUMN VERSION FOR ONE SENSOR (ONE STATIC MEASUREMENT)	0E01991650
MICROCOLUMN VERSION FOR ONE OR TWO SENSORS (ONE STATIC OR DYNAMIC MEASUREMENT)	0E01991612
MICROCOLUMN VERSION FOR ONE OR TWO SENSORS COMPATIBLE TO TESA AMPLIFIERS (ONE STATIC OR DYNAMIC MEASUREMENT)	0E01991670
Y-CABLE FOR CONNECTION OF TWO SENSORS	6735532001

NOTE : One User manual is supplied with each Quick Read.

ACCESSORIES







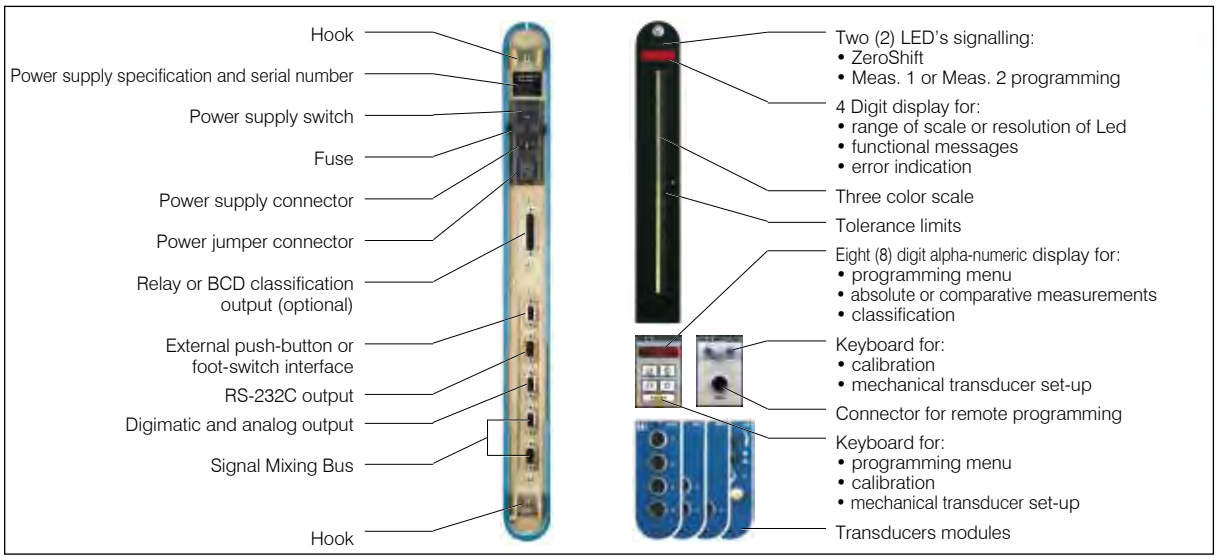
Ref.	Description	Order Code
A	Power supply unit for max. 5 quick read, with EU plug	6871140067
	Power supply unit for max. 5 quick read, with U.S.A. plug	6871140068
	Power supply unit for max. 5 quick read, with U.K. plug	6871140069
B	Power supply unit for max. 5 quick read, with EU mains cable	6871140070
	Power supply unit for max. 5 quick read, with U.S.A. mains cable	6871140071
C	Power jumper cable L = 150 mm	6739696138
	Power jumper cable L = 300 mm	6739696128
	Power jumper cable L = 600 mm	6739696129
D1	Chain serial cable (L = 4 m) for connection of up to 4 Quick Read to pushbutton box, footswitch or PC (9 pins); distance between quick read = 300 mm	6739696299
D2	Chain serial cable (L = 4 m) for connection of up to 4 Quick Read to pushbutton box, footswitch or PC (9 pins); distance between quick read = 600 mm	6739696300
E	Serial cable (L = 2 m) for connection of one Quick Read to pushbutton box, footswitch or PC (9 pins)	6739696157
F	Pushbutton box for remote control of zeroing, dyn. cycle and data transmission to PC	6139013100
G	Power supply cable (L = 2 m) for pushbutton box (power feed is from Quick Read)	6739696301
H	Serial cable (L = 3 m) to connect pushbutton box to PC (9 pins)	6737957002
I	Footswitch with 1,5 m cable for connection to pushbutton box or to Quick Read (in this case cable E is needed)	6738099030
M	Stand for remote probe or microcolumn version (it holds up to 10 units)	2919916500

MICROPROCESSOR COLUMN

- Microprocessor column designed to display dimensional and geometrical measurements, in either static or dynamic elaboration.
- The measurement value is displayed:
  - in an analog way on the three-colour LED bargraph scale, showing the measurement status (green = good; red=scrap; yellow=prescrap).
  - in a digital way on the eight-digit display; in this second case the measurement can be comparative or absolute.
- Measuring unit, tolerance limits, range, resolution can also be displayed.
- It can be configured according to specific application needs, employing different transducer modules provided with 1, 2 or 4 input channels.

These modules can be either:
- Full-bridge (LVDT), half-bridge (HBT) with 1, 2 or 4 inputs.
- MRT (Marposs Resistance Transducer) with 1, 2 or 4 inputs.
- AIR, pneumo-electronic converter with 1 input. When supplied with this module, the E4N can easily and conveniently retrofit and upgrade a wide variety of air gauging applications. The converter card is perfectly interchangeable with the other modules (LVDT, HBT, MRT).

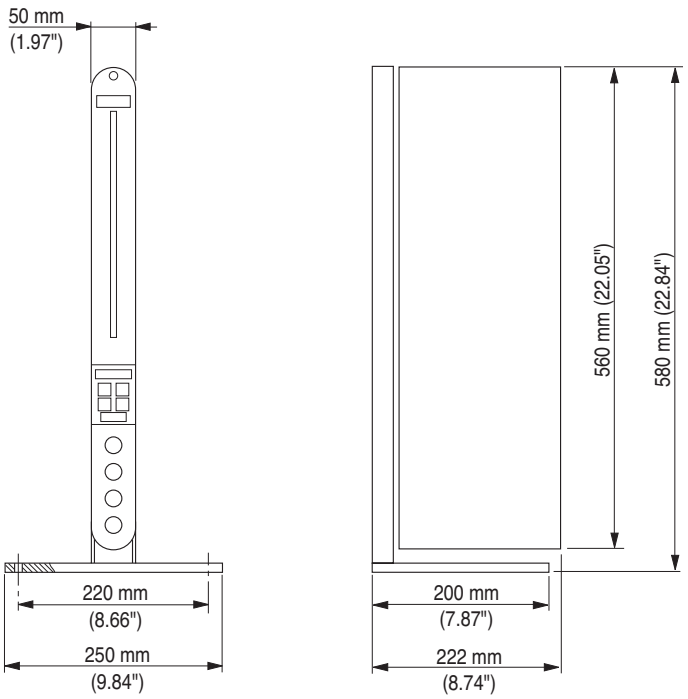
- The E4N features a wide range of interfaces:
  - Digimatic and analog to send data to statistical printers or data collectors.
  - RS232-C to send data to PC or standard printers.
  - Relay/BCD to provide a signal for alarms, resume lamps etc.
  - connector to interface external push-buttons or foot-switches.
- It can be programmed via local keypad or PC (by means of the specific E4N-PC LINK software, which also allows data collection).



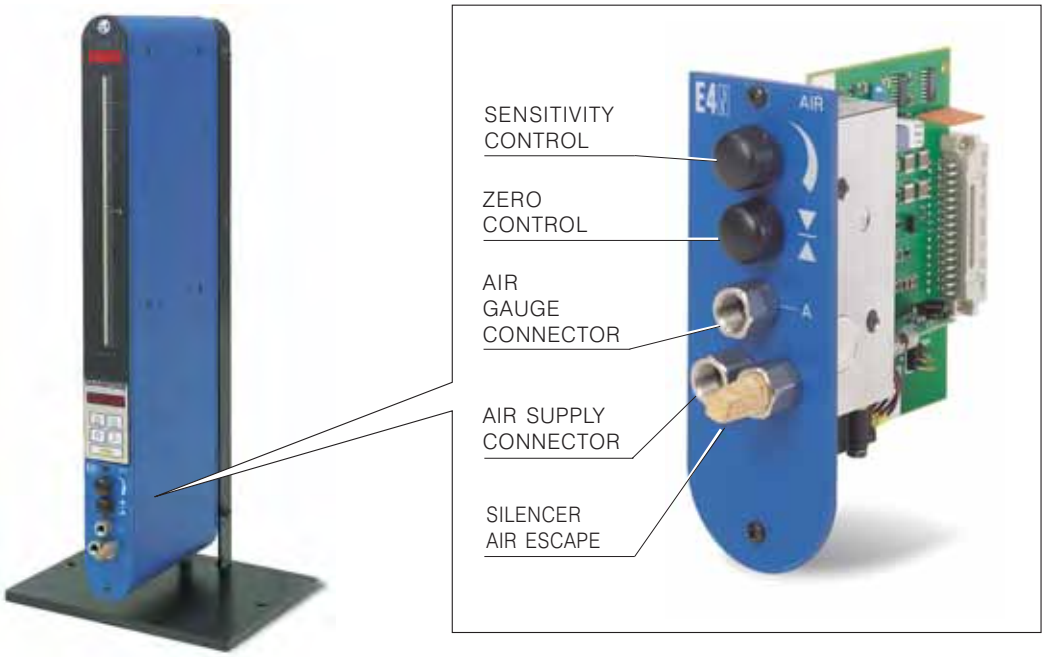
TECHNICAL SPECIFICATIONS

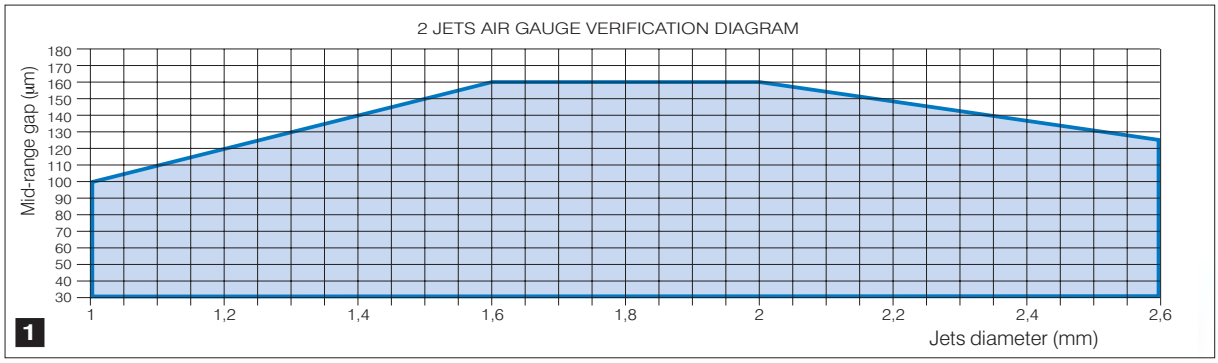
POWER CONTROL UNIT	85/265 VAC 50/60 Hz
VOLTAGE VARIATION	± 10%
MAX. CONSUMPTION	40 VA
FUSE	2A delayed
PROTECTION LEVEL	IP 50
STORAGE TEMPERATURE	-40/+60 °C
WORKING TEMPERATURE	0/+50 °C
WEIGHT	3,7 kg approx
DISPLAY	
BAR LED	101 LED scale
COLOR	3 color LED (auto switch)
HEIGHT	257 mm (bottom to central)
PROGRAMMING POSSIBILITY	Intensity, reponse speed
8 DIGIT DOT MATRIX DISPLAY	Differential, absolute measurements
MEASURING UNITS	Millimeters, inches, grams, degrees
TYPE OF MEASUREMENTS	Static or dynamic (Max + Min) /2 Max - Min (Max - Min) /2
MANAGEABLE TRANSDUCERS	1 - 8
TRANSDUCER PROGRAMMING: STANDARD MEASURING RANGE	Up to ± 1 mm (.04")
TRANSDUCER PROGRAMMING: WIDE MEASURING RANGE	Up to ± 5 mm (.2")
ARM RATIO AND SENSITIVITY ADJUSTMENT	-4 +4 with 0,001 step
ACCURACY AT 20°C	± 0,5 % reading value ± resolution
MEASUREMENT THERMAL DRIFT	150 ppm/°C
MEASUREMENT THERMAL DRIFT/CHANNEL	50 ppm/°C
SCALE	Up to 10 programmable range, from ± 0,005 to ± 5 mm (.000250" to .2")
SCALE RESOLUTION	1/100 of range, from 0,1 to 100 μm (.000005" to .004")
CONNECTOR TYPE	
LVDT INPUT	6 Pin (DIN 45322) for gauges with Lumberg SV50/6 connector
HBT INPUT	6 Pin (DIN 45322) for gauges with Lumberg SV50/6 connector
MRT INPUT	7 Pin (DIN 45329) for gauges with Lumberg SV71 connector

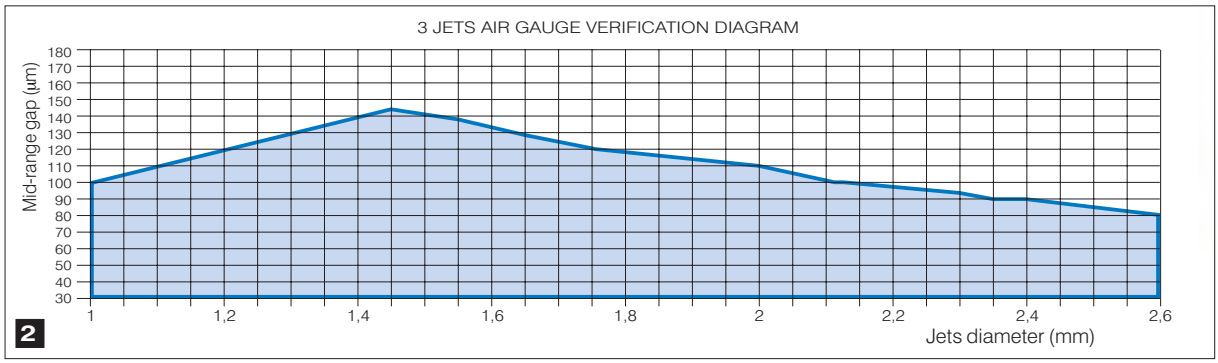
Reference Standards: EN61010-1 (safety); EN61326-1, EN 61326-A1, EN61000-3-2, EN61000-3-3 (EMC)



E4N Air / Electronic Converter





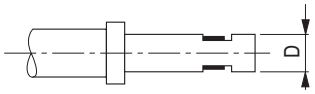


The MARPOSS and/or non-MARPOSS air gauges, with specifications inside the blue area of diagrams no.1 and 2, can be easily and immediately connected to the E4N column and take benefit by its power. The parameters to be considered are the following:

- air supply pressure
- number of air gauge jets
- diameter of air gauge jets
- “mid-range gap”, as to the difference between the mid-tolerance diameter of the part to be measured and the distance between the air gauge jets.

EXAMPLE OF MEASUREMENT WITH AIR-PLUG

- air supply pressure: 3 bar ± 0.1
- number of jets : 2
- diameter of jets: 2mm (.0787")
- diameter of the part to be measured = 10 mm ± 0.030 (.3937" ± .0012")
- mid tolerance diameter = 10 mm (.3937")
- distance between the jets D = 9.90 mm (.3898")



We obtain:

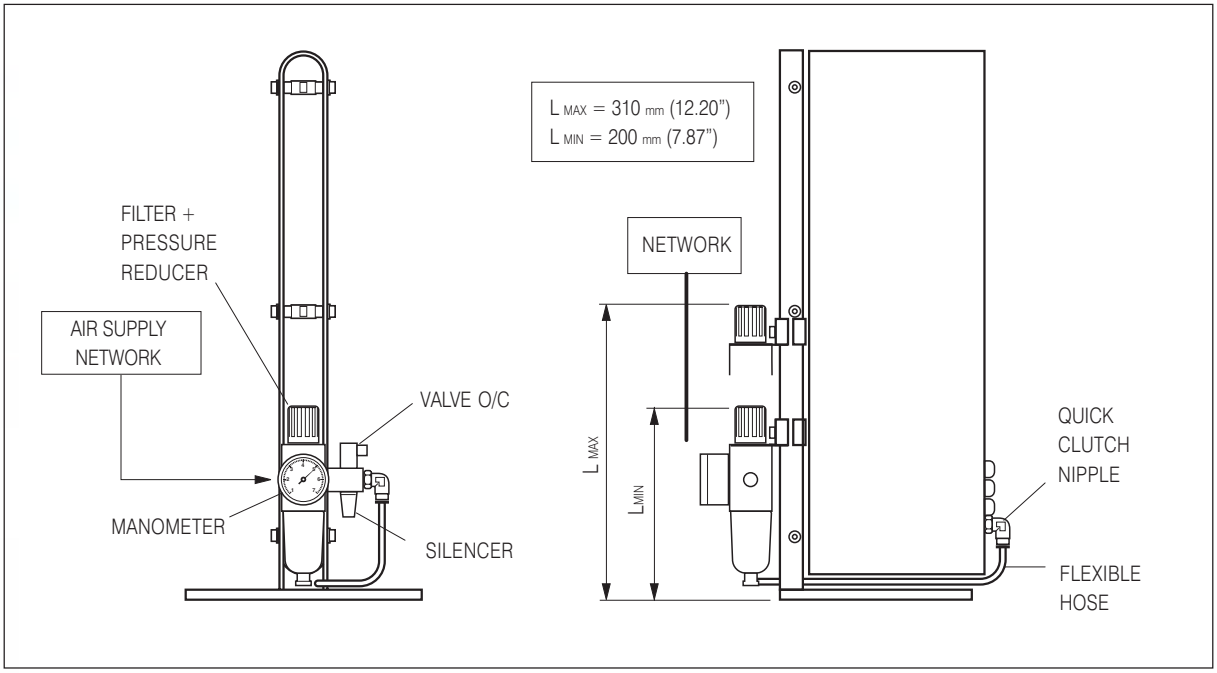
- "mid tolerance gap": (10 - 9.90) = 0.10 mm = 100 μm
  As shown in the diagram no.1 the intersection between the value of the "mid-range gap", 100 μm (.0039"), and the diameter of the jet, 2 mm (.0787"), stays inside the blue area: the application can be therefore realized.

WORKING RANGE	
AIR SUPPLY PRESSURE	1,5 - 4 bar
MEASURING RANGE	± 50 μm (± .0020")

NOMINAL PERFORMANCES	
AIR SUPPLY PRESSURE	3 bar
MEASURING RANGE	± 30 μm (± .0012")
REPEATABILITY	0,7 μm (.0000275")
ACCURACY	1,5 μm (.00006")

AIR TREATMENT SPECIFICATIONS	
FILTERING	5 μm
HOURLY CONSUMPTION	2 m^3/h
AIR MUST BE DRY AND UNOILED	

ACCESSORIES



How to Order

Column with local Programmer	Transd. Type	Transd. Input	Basic Version	BCD Relais	Column with remote programmer (E4N pc-link)	Transd. Type	Transd. Input	Basic Version	BCD Relais
	LVDT	1	76510020X0	76510021X0		LVDT	1	76510040X0	76510041X0
		2	76510120X0	76510121X0			2	76510140X0	76510141X0
		4	76510220X0	76510221X0			4	76510240X0	76510241X0
	HBT	1	76513020X0	76513021X0		HBT	1	76513040X0	76513041X0
		2	76513120X0	76513121X0			2	76513140X0	76513141X0
		4	76513220X0	76513221X0			4	76513240X0	76513241X0
	MRT	1	76516020X0	76516021X0		MRT	1	76516040X0	76516041X0
		2	76516120X0	76516121X0			2	76516140X0	76516141X0
		4	76516220X0	76516221X0			4	76516240X0	76516241X0
	AIR	1	76519020X0	76519021X0		AIR	1	76519040X0	76519041X0

X = 3 Latest SW release 4.0 replacing previous version 3.3
5 SW release 2.72, replacing previous versions 2.71, 2.7, 2.3, 2.1, 2.0
6 SW release 6.3 allowing elaboration and visualization of up to four measurements.

Accessories

Description			Order Code
3 - colour meter module with local programmer (basic version)			76519920X0
3 - colour meter module with local programmer (BCD relais)			76519921X0
3 - colour meter module with remote programmer (basic version)			76519940X0
3 - colour meter module with remote programmer (BCD relais)			76519941X0
Amplifier module 1 LVDT input transducer			6876004013
Amplifier module 2 LVDT input transducer			6876004012
Amplifier module 4 LVDT input transducer			6876004011
Amplifier module 1 HBT input transducer			6876004005
Amplifier module 2 HBT input transducer			6876004004
Amplifier module 4 HBT input transducer			6876004003
Amplifier module 1 MRT input transducer			6876004008
Amplifier module 2 MRT input transducer			6876004007
Amplifier module 4 MRT input transducer			6876004006
Amplifier module 1 AIR input transducer			6876004009
E4N AIR USA with local programmer (basic version)			76519120X0
E4N AIR USA with local programmer (BCD relais)			76519121X0
E4N AIR USA with remote programmer (basic version)			76519140X0
E4N AIR USA with remote programmer (BCD relais)			76519141X0
BCD relais interface card			6344360100
Bus cable for signals exchange among E4N columns			6738057011
Y-cable	Connecting cable from 1 LVDT transducer to 2 E4N inputs (L= 1,2 m)		6735932014
	Connecting cable from 1 MRT transducer to 2 E4N inputs (L= 1,2 m)		6739796001
RS232-cable	From remote programming module to a PC (L= 3 m)	25 pin	6735916001
		9 pin	6735957001
	From rear serial output to a PC (L= 3 m)	25 pin	6737916000
		9 pin	6737957002
	Chain serial cable from 2 E4N to a PC		6739797030
	Chain serial cable from 3 E4N to a PC		6739797029
	Chain serial cable from 4 E4N to a PC		6739797028
	Chain serial cable from 5 E4N to a PC		6739797027
Connecting cable from Digimatic output to Mitutoyo DP1 - DP2 - DP3 (L= 1 m)			6738099016
Connecting cable from Digimatic output to Datamyte 862			92162 (Datamyte-code)
Connecting cable from Digimatic output to Datamyte 529-15			92160 (Datamyte-code)
Cable for analog output			6738098009
External pushbutton panel (4 buttons) with cable (L= 1,5 m)			6139012600
Footswitch with connecting cable to the column or to the pushbutton panel (cable L= 2 m)			6738099015

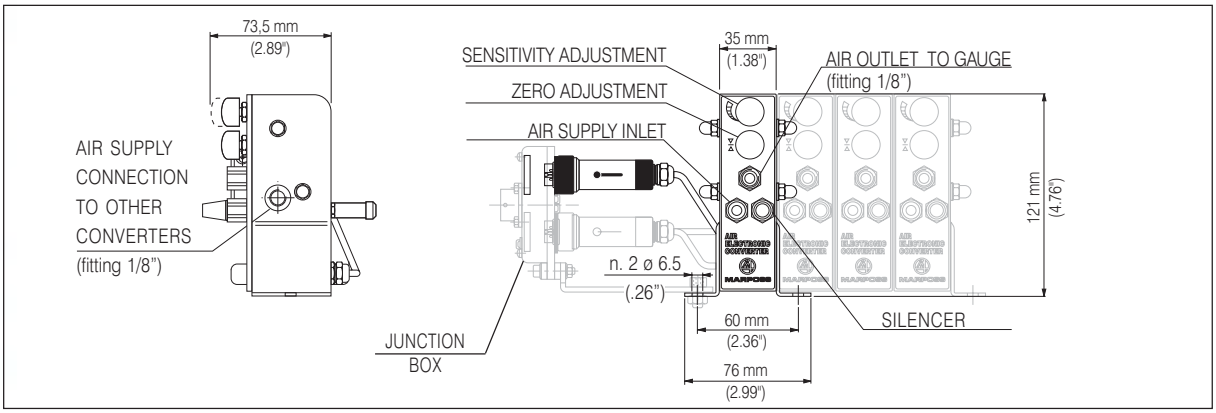
X = 3 SW release 4.0 replacing previous version 3.3
5 SW release 2.72, replacing previous versions 2.71, 2.7, 2.3, 2.1, 2.0

Description		Order Code
Connecting cable of 2 E4N columns to pushbutton or footswitch keyboard		6738097009
Connecting cable of 3 E4N columns to pushbutton or footswitch keyboard		6738097010
Connecting cable of 4 E4N columns to pushbutton or footswitch keyboard		6738097011
Connecting cable of 5 E4N columns to pushbutton or footswitch keyboard		6738097012
Connecting cable of 6 E4N columns to pushbutton or footswitch keyboard		6738097007
Connecting cable of 7 E4N columns to pushbutton or footswitch keyboard		6738097008
Power supply cables (L= 2 m)	USA	6739696030
	CH	6739696031
	WITHOUT PIN	6739696034
	ITALY	6739696036
	F/D	6739696033
	SPAIN	6739696035
Power jumper cable from E4N to E4N		6739696029
Adapter extension from lumberg S3 to 6 pin connector on E4N for LVDT input (L= 400 mm)		6738536000
Adapter extension from lumberg S7 to 7 pin connector on E4N for MRT input (L= 400 mm)		6738536001
Support stand (for up to 5 columns)		6131410040
Support stand link studs (2 required for each additional module)		1529040210
Card with adhesive stickers (Graphic symbols)		1529040460
Air filtering and adjusting unit		2915490053
2 x 90° quick clutch nipple		2915490052
2 x straight quick clutch nipple		2915490050
sensitivity adjustment knob cover		1015420614
sensitivity and zero adjustment knob cover		1015420615
User manual for E4N software release 4.0		D2040034X1
User manual for E4N software release 2.72		D2040027X1

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

External Air/Electronic Converters for E4N (Pressure sensor type)

Through the external A/E converters pneumatic measuring gauges can be connected to E4N columns with LVDT or MRT inputs.



Type of converter	LVDT	MRT
Measuring range	± 50 µm	
Nominal sensitivity at buffer output	230 µV / µm / V ± 25%	5 mV / µm ± 25%
Linearity error in the range ± 30 µm	≤ 2µm	
Linearity error in the range ± 50 µm	≤ 5µm	
Noise	≤ 0,3 µm	
Measure stability in 3 minutes	≤ 0,2 µm	

Description	Order code			
	W/O Junction box		With junction box	
	LVDT	MRT	LVDT	MRT
Group with 1 air/ electronic converter	2915459915	2915459913	2915459914	2915459910
Group with 2 air/ electronic converters	2915459925	2915459923	2915459924	2915459920
Group with 3 air/ electronic converters	2915459935	2915459933	2915459934	2915459930
Group with 4 air/ electronic converters	2915459945	2915459943	2915459944	2915459940

COLUMN FOR WIRELESS GAUGES

E4N Wave is the latest model of the E4N product family, featuring Bluetooth® wireless technology and developed for use with MARPOSS wireless gauges, such as for example M1 Wave bore gauge. It can connect up to four gauges at one time and manage four measurements carried on in switching mode or simultaneously.

The measurement value is displayed:

- in an analog way on the three-colour LED bargraph scale, showing the measurement status (green = good, red = scrap, yellow = prescrap)
- in a digital way on the eight-digit display; in this case the measurement can be comparative or absolute

The measurement number is displayed on the upper four-digit display.

The Wave input module is characterized by:

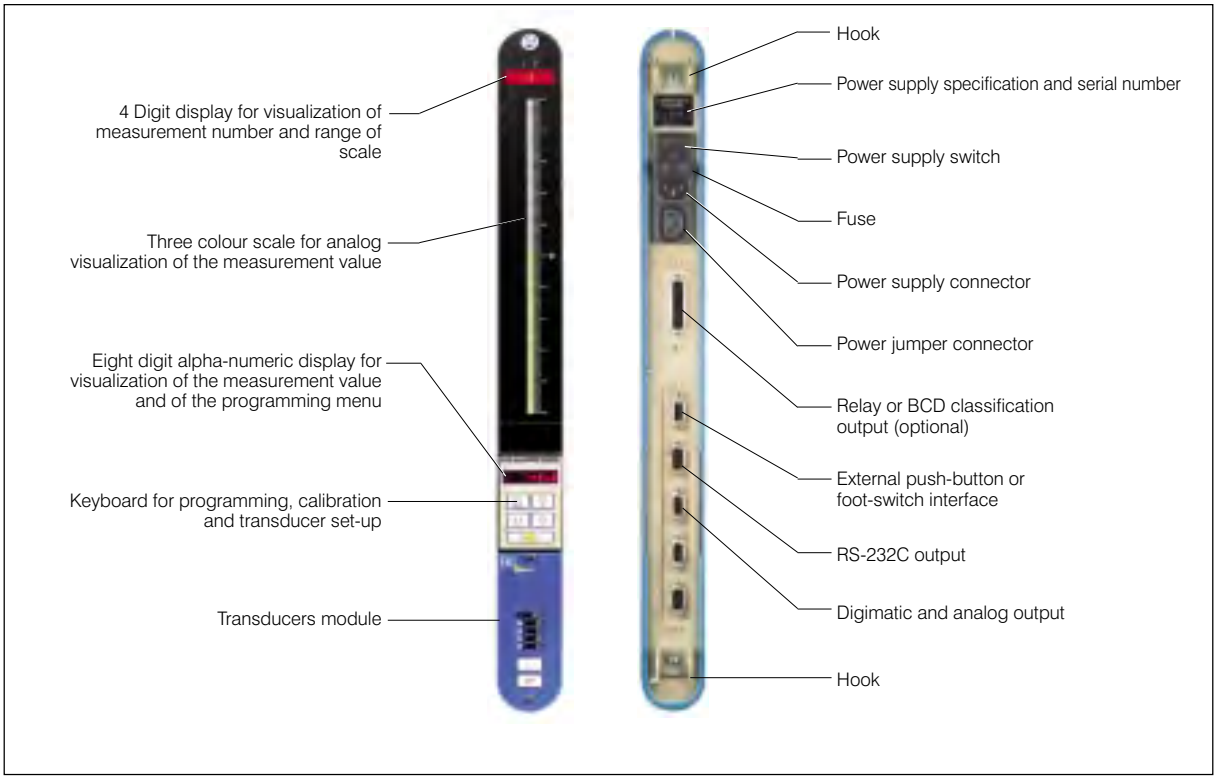
- blue LED's showing status of the channels and diagnostics related to the connected gauges and to the module itself
- two buttons which allow respectively for the selection of the specific channel to which a gauge shall be paired and for enabling of the pairing procedure between channel and measuring gauge.

It is perfectly interchangeable with any other traditional E4N module (for LVDT, HBT, MRT wired sensors) and can therefore conveniently retrofit existing E4N columns and upgrade gauging applications where wired M1 Star EBG bore gauges are used.

Following basic parameters related to the M1 Wave to be connected can be configured in each module through dip-switches:

- type of battery (alkaline, rechargeable NimH)
- sampling rate (10, 20 or 40 samples/second)
- transducer type (HBT, LVDT)
- measuring range (± 500 or ± 1000 microns)
- time to automatic gauge switch-off for battery saving when it is not used (1 min/2 min/10 min/1 hour)

E4N Wave can communicate with MARPOSS wireless gauges within a distance of 10 meters in any kind of conditions. Longer distances can be covered depending on the working environment.



How to Order

Description		Order Code
E4N WAVE for 4 wireless LVDT/HBT gauges		7651592060
E4N WAVE for 4 wireless LVDT/HBT gauges, with BCD relais		7651592160
Wave amplifier module 4 LVDT/HBT input channels		6876004016
Support stand (for up to 5 columns)		6131410040
Support stand link studs (2 required for each additional column)		1529040210
Power supply cable L=2m	USA	6739696030
	CH	6739696031
	WITHOUT PIN	6739696034
	ITALY	6739696036
	F/D	6739696033
	SPAIN	6739696035
Power jumper cable from E4N to E4N		6739696029
User manual		D2040037X1

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

Note : For the order codes of the accessories not listed here see E4N catalogue

SUBCOMPACT EMBEDDED GAUGE COMPUTER

Nemo, compact, robust and reliable professional computer has been designed for simple measuring applications up to 8 sensors and 4 measures and offers innovative features that enable to perform simple measurement applications intuitively and rapidly. Nemo is capable of acquiring data from traditional and wireless measurement devices and storing them locally or uploading them to a LAN network. The 5.7" colour display guarantees easy to read measurements, and the touch screen enables the operator to carry out programming operations and acquire data, without the need for external input devices. Thanks to its embedded architecture, the Nemo is smaller than a sheet of A5 paper, while the built in Secure Digital micro card provides powerful memory capacity. Nemo software guarantees a friendly and easy to use operator interface. Its touch-screen designed human interface allows to program and acquire measures without any additional input/command device.

MAIN HARDWARE CHARACTERISTICS

CASE	Robust industrial-grade plastic case
PROTECTION	IP 54 on front panel; IP 40 on rear panel
TOUCH SCREEN	4 wire analog-resistive
LCD DISPLAY TYPE	5.7'' color TFT
ETHERNET LAN	2 x 10/100 Mbps RJ45 connector
USB PORTS	2 x type B + 1 x type A
SERIAL PORT	1 x RS232C
BENCH-TOP SUPPORT	Reclinable
DIMENSIONS	160 x 138 x 33 mm (6.3'' x 5.4'' x 1.3'') L x H x D

Main page

Multiple bargraph display

MEASUREMENTS

- Up to 8 sensors connectable via USB, RS232 or Bluetooth® wireless technology
- Data collection from Marposs Easy Box™, Digi Crown™, M1 Wave™, i-Wave™ and third-party serial devices
- Measurement capability up to 4 characteristics
- Multiple measurement display with numeric and graphical layout
- Acquisition command through external signal (footswitch, push buttons) or touch-screen
- Part counters
- Remote data storage through Ethernet LAN (Integrated FTP Server) or removable USB memory device
- Data storage format: .DFQ (Q-DAS® qs-STAT®) and .CSV (Microsoft® Excel Comma Separated Values).

Settings

Characteristics programming

CONFIGURATION AND PROGRAMMING

- Multi-language support for European and Asian languages: English, Italian, German, French, Spanish, Brazilian Portuguese, Swedish, Japanese, Chinese. Other language versions available upon request
- Programming interface designed to be used with touch-screen
- Configuration Backup-Restore-Update by USB memory devices or through Ethernet LAN
- Password protected multi-user management

How to Order

Derscription	Order Code
NEMO for DIGI BOX	830NA00000
NEMO for EASY BOX	830NA00010

EMBEDDED GAUGE COMPUTER

Merlin represents a new concept of gage computer using the same technologies created for portable electronics, for data collection and basic statistical analysis from traditional or wireless measuring devices.

It is available as basic version with Microsoft® Windows® CE operating system, designed for simple measuring applications up to 16 sensors/measurements, and as Plus version with Microsoft® Windows® XP Embedded operating system, designed for enterprise applications up to 32 sensors/measurements. Embedded technology allows: small dimensions (the whole system footprint is smaller than an A4 sheet of paper), fanless architecture and no moving parts (flash disk storage media), assuring the highest level of system reliability.
Merlin gage software guarantees a friendly and easy to use operator interface. Its touch-screen designed human interface allows to program and acquire measures without any additional input/command device. The Merlin Plus with Microsoft® Windows® Xp adds to Merlin enhanced data storage capabilities for the most demanding network environment.

MAIN HARDWARE CHARACTERISTICS

	Merlin	Merlin Plus
CASE	Robust industrial-grade plastic case	
PROTECTION	IP 65 (on front panel)	
TOUCH SCREEN	4 wire analog-resistive	
LCD DISPLAY TYPE	8.4'' color TFT - supporting SVGA resolution (800x600)	8.4'' color TFT - supporting SVGA resolution (1024x768)
STORAGE MEDIA	Internal removable compact flash up to 512 MB	Internal removable compact flash up to 8 GB
ETHERNET LAN	10/100 Mbps RJ45 connector	
USB PORTS	4 Host + 1 Device	5 Host
	1 internal to support a *Bluetooth*® adapter	
SERIAL PORT	1 x RS232C	
BENCH-TOP SUPPORT	Reclinable (VESA compliant for pivoting-arm solutions)	
DIMENSIONS	230 x 180 x 45 mm (9'' x 7'' x 1.8'') L x H x D	
OPERATING SYSTEM	Microsoft® Windows® CE 5.0	Microsoft® Windows® XP Embedded

Multiple bargraph display

MEASUREMENTS

- Up to 16/32 sensors connectable via USB, RS232 or ***Bluetooth***® wireless technology.
- Data collection from Marposs Easy Box™, Digi Crown™, M1 Wave™ and third-party serial devices.
- Measurement capability up to 16/32 characteristics
- Multiple measurement display with numeric and graphical layout.
- Acquisition command through external signal (foot-switch, push buttons) or touch-screen.

Histogram

Quality Control Chart

STATISTICAL PROCESS CONTROL

- Statistical Analysis with graphic display (Histogram, Control Charts, Value Chart...) and numeric summary (Cp, Cpk, Spread, Average...).
- Data segregation (by machine, product batch, analysis purposes).
- Part counters.
- Local data storage on internal memory and/or removable USB memory devices.
- Remote data storage through Ethernet LAN.
- Data storage format: .DFQ (Q-DAS® qs-STAT®) and .CSV (Microsoft® Excel Comma Separated Values).
- Print of charts

Virtual keyboard

Programming interface

CONFIGURATION AND PROGRAMMING

- Multi-language support for East/West European and Asian languages. Other language versions available upon request.
- Programming interface designed to be used with touch-screen.
- Password protected multi-user management.

How to Order

Description	Order Code
MERLIN with East/Western European operating system	830MEABC00
MERLIN with Japanese operating system	830MECBC00
MERLIN with Korean operating system	830MEEBC00
MERLIN with Chinese operating system	830MEFBC00
MERLIN PLUS with Western Windows XP Embedded operating system	830MPAAC00

TESTAR a MARPOSS division

Merlin mobile

SOFTWARE CHARACTERISTICS

- Up to 16 characteristics per part program
- Up to 50 part programs
- Static and dynamic measurement acquisitions
- Up to 4 bar graphs per page with value and status color
- Part counters
- Local data storage on SD card or real time data export to corporate network via WLAN in .csv or .dfq (Q-DAS® ASCII Transfer Format)
- Data transmission secured by WEP, WPA, WPA2 encoding
- Microsoft® Windows CE operating system

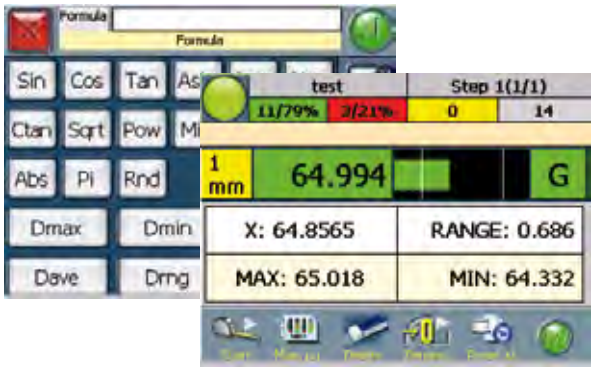
MOBILE GAUGE COMPUTER

Merlin Mobile is a wrist band unit for measurement display and data storage, which expresses the highest level of operating freedom, giving the possibility to the operator to acquire measurements all around the plant. Associated with Marposs Wave and i-Wave measuring devices, it allows to realize totally wireless applications:

- no cables to connect measuring devices to the display unit (using Marposs Wave Bluetooth® interface).
- no cables to connect the display unit to corporate network (using integrated Wireless LAN interface)
- the ergonomic design and the light weight allow the user to wear Merlin Mobile comfortably on a wrist.

MAIN HARDWARE CHARACTERISTICS

DISPLAY	3.5“ LCD colour display (320 x 240 Pixel)
TOUCH SCREEN	4-wire analog-resistive
WIFI	WIFI 802.11 B/G WLAN interface
BLUETOOTH	integrated Bluetooth interface for wireless connection to the device
STORAGE	removable SD memory card
ARMBAND	adjustable strap with Velcro closure



USER INTERFACE

Merlin Mobile can be operated in a easy and intuitive way through the touch screen display. Even the programming of extensive measuring tasks can be simply and quickly done, because the measurement software is optimized through the touch screen display. Easy operation and clear visualization of the measurement values through bar graphs make Merlin Mobile a versatile and practical device for wireless, mobile data acquisition of out of process measurement.

How to Order

	Description	Order Code
	Merlin Mobile (west-european operating system)	830MMAAA00
	Battery charger base for up to four batteries (power supply unit is included)	4703915007
	Single battery holder	4703915008
	Battery	4703915009
	Extended battery pack with EU mains cable Extended battery pack with U.S.A. mains cable Extended battery pack with U.K. mains cable	4703915012 4703915013 4703915014

E9066T

THIN PANEL INDUSTRIAL COMPUTER

The E9066T™ Thin Panel Industrial Computer is the ideal companion for the Marposs Easy Box™ and Gage Box™ data acquisition systems. When bundled with its' Quick SPC™ for Windows® Measurement & SPC software, and innovative user interface, your applications will be just a few keystrokes or mouse clicks away.

SMALL ON SPACE

With a mere 50mm in depth, the E9066T™ has been designed to satisfy all space-constricted applications, without compromising features and functionalities of a complete, industrial PC at a truely competitive price.
Thanks to its reduced footprint and small weight, it is suitable for bench-top, panel mount, wall-mount and swing-arm solutions alike.

BIG ON FEATURES

Its standard configuration includes a 15" LCD TFT display, 512MB RAM, two built-in Ethernet ports, a built-in Fieldbus socket, six USB ports and all standard computer interface ports.
Options are available for a 17" LCD TFT display, touch screen, expansion slots, various types of mass storage devices and solid state memory disks.

E9066T™ represents a truly innovative family of small, modular and reliable Industrial Computers for Data Collection, Industrial Control and Production/Factory Automation.

The system's flexible, multi-platform mechanical design makes it readly adapted for panel, wall or swing-arm mounting, DIN rail assemblies and bench top mounting as well.

1 - Panel mount assembly
(PC module with front panel)

2 - Bench top assembly
(PC module with front panel and cabinet)

TECHNICAL SPECIFICATIONS

FRONT PANEL SPECIFICATIONS	
LCD DISPLAY TYPE	15" and 17" TFT LCD
RESOLUTION	Color SVGA / XGA / SXGA
CONTRAST RATIO	400:1
BRIGHTNESS	450 cd/m^2 (450 nit)
LAMPS	4 x CCFT
SCREEN	impact resistant / anti-glare
PROTECTION (PANEL MOUNT)	IP65

COMPUTER SPECIFICATIONS	
CPU	All-in-one motherboard
PROCESSORS	INTEL® MOBILE CELERON® and PENTIUM® up to 2.0GHz or INTEL CORE DUO/CORE 2 DUO up to 3.33 GHz
RAM (MIN - MAX)	512 MB - 2GB (2 x SODIMM DDR2); 1 GB - 4 GB (CORE DUO/CORE 2 DUO)
VIDEO CONTROLLER / RESOLUTION	INTEL GMA 900 VGA / SVGA / XGA / SXGA; INTEL GMA X3100
VIDEO RAM	128MB - 256MB
HARD DISK DRIVE	internal 2.5" - 80GB minimum SATA
SERIAL PORTS	2 x RS232C; 1 x RS232C/422/485; 1 x RS232C (touch screen)
KEYBOARD PORT	PS/2
MOUSE PORT	PS/2
USB PORTS	6 (type 2.0)
ETHERNET PORTS	10/100Mbps. 1 x RJ45 connector; 10/100/1000Mbps. 1 x RJ45 connector
POWER SUPPLY	Universal AC input. 100W. 100-240 Vac @ 50 ÷ 60Hz
PC MODULE DIMENSIONS	327 x 238 x 50.5 mm (12.87" x 9.37" x 1.98")
FRONT PANEL DIMENSIONS	430 x 315 x 30 mm (16.92" x 12.40" x 1.18")
WEIGHT (WITHOUT CABINET)	7.9 kg (17,4 lbs)

OPTIONS	
TOUCH SCREEN	5 wire analog-resistive
FIELDBUS	Built-in socket supporting COM modules for Profibus, Interbus-S and others
POWER SUPPLY	24 Vdc - 100W
DVD DRIVE (FOR H3 MODEL ONLY)	Intern slim / DVD RW

MOUNTING SOLUTIONS	
PANEL MOUNT	standard
CABINET & FREE-STANDING PEDESTAL	option
SWING-ARM	option
DIN RAIL MOUNT	option

ENVIRONMENTAL	
RELATIVE HUMIDITY	5 ÷ 80 % (non condensing)
TEMPERATURE (OPERATING)	5 ÷ 40 °C (41 ÷ 104 °F) with disk unit
	0 ÷ 40 °C (32 ÷ 104 °F) diskless
TEMPERATURE (NON OPERATING)	- 20 ÷ 60 °C (-4 ÷ 140 °F)

USB INTERFACE BOX

Easy Box™ is a line of interface boxes for easy and economical management via USB port of inductive and incremental transducers, air gauges, Digimatic and serial gauges, I/O signals, thermocouples. It can be used with the MARPOSS compact gauge computers Nemo and Merlin, with the Industrial PC E9066, or with any commercial Personal Computer.

AVAILABLE MODELS

- U4F to connect up to 4 MARPOSS standard full-bridge (LVDT) transducers.
- U4F-HR to connect up to 4 MARPOSS standard full-bridge (LVDT) transducers, for applications requiring a very high measurement resolution
- U4H to connect up to 4 MARPOSS standard half-bridge transducers (HBT).
- U4T to connect up to 4 half-bridge transducers (HBT) compatible with amplifiers of TESA.
- U4E to connect up to three incremental transducers such as linear probes, linear and rotary encoders, etc
- U1AIR, U3AIR, U4AIR with adjustable sensitivity and zeroing nozzles to connect one, three, four air transducers respectively.
- U4D to connect up to 4 Digimatic gauges (such as Mitutoyo calipers, digital dial gauges, etc..).
- U4S to connect up to 4 gauges with RS232 output (cable shall feature Cannon 9-pin female connector).
- U4TP-E, U4TP-J, U4TP-K to connect up to four thermocouples type E, J, K respectively
- U8I/O managing 8 Input/Output powered 24Vdc.

USB OUTPUT

Both Easy Box™ power supply and transmission to a PC of the measuring values of the connected transducers are realized through the USB port. A single cable is therefore required for both functions. Some models may require an external power feed according to the type of connected transducer.

APPLICATION FIELDS

The Easy Box™ is suitable for static measurement acquisition or for continuous acquisition where the workpiece is rotated manually or automatically.

DATA TRIGGERING

The Easy Box™ continuously provides to the PC (via USB port) the values of the sensors connected to the box.
Whenever a data trigger is necessary, it can be made in the following way:

- With the external signal of a footswitch connected to the Easy Box™
- With a data request from the host PC
- With the data button available on the Digimatic device (gauge data send button)

SOFTWARE PACKAGES

- MARPOSS DLL drivers library for Windows® operating systems, allowing to interface Easy Boxes with any Windows 98® (or higher release) compatible application program with minimum software programming skills.
- Easy Acquisition™ software package for data acquisition and SPC on Excel® worksheets: a complete and easy to operate software package to import data, program measurements, perform data collection and SPC analysis and reporting.
- Quick SPC™ process and quality control software for Windows®, a suite of software products designed to comply with any requirement ranging from simple measurement acquisition to complex gauging applications.

TECHNICAL SPECIFICATIONS

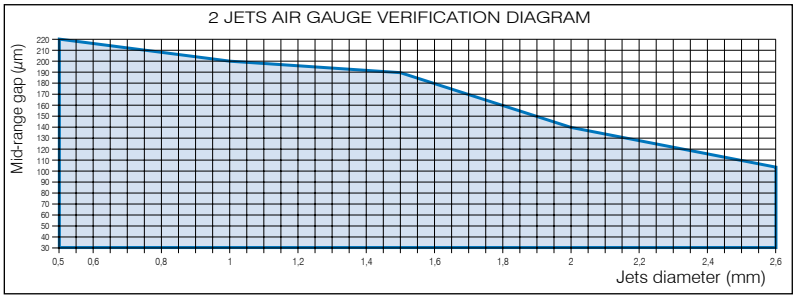
	U4F	U4F-HR	U4H	U4T	U4E
					
NUMBER OF INPUT CHANNELS	4	4	4	4	3
TYPE OF INPUT CHANNELS	MARPOSS standard Full-Bridge (LVDT)	MARPOSS standard Full-Bridge (LVDT)	MARPOSS standard Half-Bridge (HBT)	Half Bridge (HBT) compatible with Tesa amplifiers	Digital and analog incremental transducers (*)
PROGRAMMABLE MEASURING RANGES NORMAL RANGE LONG RANGE EXTRA LONG RANGE	 up to ±1000 µm (0.04") up to ±5000 µm (0.20") ------	 up to ±1000 µm (0.04") up to ±5000 µm (0.20") ------	 ± 250 µm (0.01")/± 1000 µm (0.04") ± 500 µm (0.02")/± 2000 µm (0.08") ± 625 µm (0.025")/± 2500 µm (0.1")	 up to ±2000 µm (0.08") up to ±5000 µm (0.2") ------	 depending on the transducer used
OUTPUT TYPE	1 x USB (connector type B)				
OUTPUT TRANSMISSION SPEED	12 MBit / sec.				
SAMPLING RATE	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)	max. 40 samples /s	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)
ACCURACY AT 20° C	± 0,5% of the measuring value ± resolution				depending on the transducer used
POWER SUPPLY SOURCE	from USB port				from USB port or external power supply
CURRENT REQUIREMENT	<350 mA (§§)	<350 mA (§§)	<100 mA (§)	<350 mA (§§)	<300 mA (§§)
NUMBER OF EASY BOX CONNECTABLE TO ONE USB PORT	Max. 16				
DATA TRIGGERING MODES	external footswitch / host command				external footswitch / host command / RS422/485 signal / 24V optoInsulated input
FOOTSWITCH OPTION	1 input for each box (female connector ø 3,5 mm stereophonic plug on box rear side)				
PROTECTION DEGREE	IP40 (on front panel) IP30 (on rear panel)				
STORAGE TEMPERATURE	-40 / +70° C				
OPERATING TEMPERATURE	0 / +50° C				
DIMENSIONS W x D x H	157 x 90 x 45 mm (6,2" x 3,5" x 1,8")				
WEIGHT	ca. 0.5 Kg				

(*) Any digital encoder or linear scale featuring differential Line Driver output, 6,4 MHz max. frequency, requiring 5 V power supply. Any voltage analog encoder or linear scale featuring 1 Vpp sinusoidal output, 250 kHz max. frequency, requiring 5 V power supply. Any current analog encoder or linear scale featuring 11 µA output, 250 kHz. max. frequency, requiring 5V power supply, by means of a specific adapter (not included in the supply).
(**) For any gauge other than Mitutoyo requiring an external power supply.
(#) Air supply: air must be dry and unoiled, filtered to 5 µm and at a pressure of 3 bar (the working range of the converter is 1,5 to 4 bar).
(§) Max. 4 boxes of this type can be connected to a HUB powered by a USB port. For connection of more than 4 boxes a self-powered HUB is required.
(§§) To connect more than one box to a HUB a self-powered HUB is required

U1AIR - U3AIR - U4AIR APPLICATION RANGE

The MARPOSS and/or non-MARPOSS air gauges, with specifications inside the blue area of the diagram, can be easily and immediately connected to the U1AIR. The parameters to be considered are the following:

- air supply pressure
- number of air gauge jets
- diameter of air gauge jets
- "mid-range gap", as to the difference between the mid-tolerance diameter of the part to be measured and the distance between the air gauge jets.

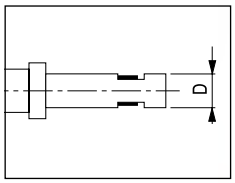


U1AIR/U3AIR U4AIR (#) (***)	U4D	U4S	U4TP-E	U4TP-J	U4TP-K
					
1/3/4	4	4	4	4	4
Air	Mitutoyo Digimatic compatible	RS232	Thermocouples Type E	Thermocouples Type J	Thermocouples Type K
±500 µm (0.02") --- ---	depending on the Digimatic gauge used	depending on the serial gauge used	0 - 100 °C	0 - 100 °C	0 - 100 °C
1 x USB (connector type B)					
12 MBit / sec.					
max. 40 samples /s (up to 1000 samples/s if used with Quick SPC)	max. 40 samples /s (depending on the Digimatic gauge used)	max. 40 samples /s (depending on the serial gauge used)	max. 40 samples /s	max. 40 samples /s	max. 40 samples /s
±0,5% of the measuring value ±resolution	depending on the Digimatic gauge used	depending on the serial gauge used	±[0,6° + 0,2% (Tmeas.-T amb.)]	±[0,6° + 0,2% (Tmeas.-T amb.)]	±[0,6° + 0,2% (Tmeas.-T amb.)]
from USB port	from USB port or external power supply (**)	from USB port			
<350 mA (§§)	<100 mA (§)	<150 mA (§§)	<200 mA (§§)	<200 mA (§§)	<200 mA (§§)
Max. 16					
external footswitch / host command	external footswitch / host command / Data send button on gauge	external footswitch / host command			
1 input for each box (female connector ø 3,5 mm stereophonic plug on box rear side)					
IP40 (on front panel) IP30 (on rear panel)	IP30 (on both front and rear panel)	IP40 (on front panel) IP30 (on rear panel)			
-40 / +70° C					
0 / +50° C					
157 x 90 x 65 mm (6,2" x 3,5" x 2,6")	157 x 90 x 45 mm (6,2" x 3,5" x 1,8")	157 x 90 x 65 mm (6,2" x 3,5" x 2,6")	157 x 90 x 45 mm (6,2" x 3,5" x 1,8")		
ca. 1 Kg	ca. 0.5 Kg	ca. 0.6 Kg	ca. 0.5 Kg		

(***) U3AIR - U4AIR

EXAMPLE OF MEASUREMENT WITH AIR-PLUG

- air supply pressure: 3 bar ± 0.1
- number of jets : 2
- diameter of jets: 2mm (.0787")
- diameter of the part to be measured = 10 mm ± 0.030 (.3937" ± .0012")
- mid tolerance diameter = 10 mm (.3937")
- distance between the jets D = 9.90 mm (.3898")



We obtain:

- "mid tolerance gap": (10 - 9.90) = 0.10 mm = 100 µm
  As shown in the diagram the intersection between the value of the "mid-range gap", 100 µm (.0039"), and the diameter of the jet, 2 mm (.0787"), stays inside the blue area: the application can be therefore realized.

I/O MODEL

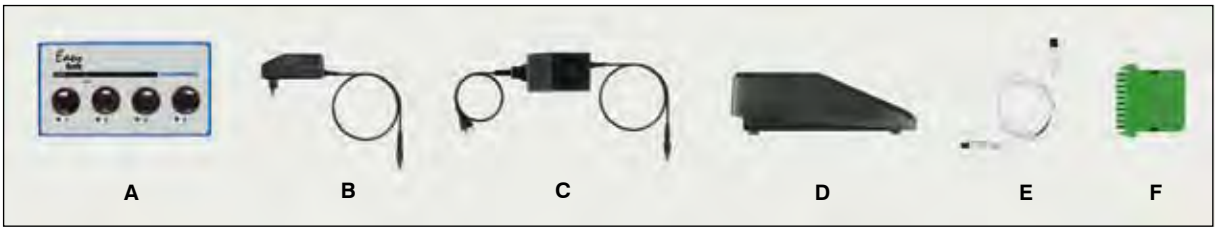
- 8 optoinsulated 24Vdc Input/Output, each free configurable as Input, Output or Input/Output.
- sink or source type I/O's (not in mix); the selection is made by means of a switch located on the rear side of the box
- output current for each Output can be (according to EN61131-2 Standard for Outputs in direct current at 24Vdc):
  max. 100 mA by use of 8 Outputs
  max. 250 mA by use of 4 Outputs
  max. 500 mA by use of 2 Outputs (available only for source type Output)
- The power supply for the Outputs (24Vdc for source outputs, 0V for sink outputs) can be interrupted for safety reasons without compromising the working of the Inputs.

U8 I/O

How to Order

Description	Order Code
Easy Box U4F with 4 MARPOSS standard LVDT inductive inputs	6871250021
Easy Box U4F-HR (HIGH RESOLUTION) with 4 MARPOSS standard LVDT inductive inputs	6871250022
Easy Box U4H with 4 MARPOSS standard HBT inductive inputs	6871250000
Easy Box U4T with 4 HBT inductive inputs compatible with amplifiers of TESA	6871250030
Easy Box U4E with 3 incremental transducer inputs	6871250090
Easy Box U1AIR with 1 air transducer input	6871250101
Easy Box U3AIR with 3 air transducer input	6871250111
Easy Box U4AIR with 4 air transducer input	6871250122
Easy Box U4D with 4 DIGIMATIC inputs	6871250012
Easy Box U4S with 4 RS232 inputs	6871250060
Easy Box U4TP-E with 4 thermocouple inputs type E	6871250080
Easy Box U4TP-J with 4 thermocouple inputs type J	6871250083
Easy Box U4TP-K with 4 thermocouple inputs type K	6871250086
Easy Box U8I/O with 8 INPUT/OUTPUT	6871250050

Accessories



Ref.	Description	Order Code
A	Easy Box U4P pushbutton box for remote control of data acquisition, zeroing, etc. with Easy Acquisition and Quick SPC Software	6871250070
B	Power supply unit for Easy Box U4E, with EU plug	6871140167
	Power supply unit for Easy Box U4E, with U.S.A. plug	6871140168
	Power supply unit for Easy Box U4E, with U.K. plug	6871140169
C	Power supply unit for Easy Box U4E, with EU mains cable	6871140170
	Power supply unit for Easy Box U4E, with U.S.A. mains cable	6871140171
B	Power supply unit for Easy Box U4D, with EU plug (*)	6871140155
	Power supply unit for Easy Box U4D, with U.S.A. plug (*)	6871140156
	Power supply unit for Easy Box U4D, with U.K. plug (*)	6871140157
C	Power supply unit for Easy Box U4D, with EU mains cable (*)	6871140158
	Power supply unit for Easy Box U4D, with U.S.A. mains cable (*)	6871140159
B	Power supply unit for Easy Box U8I/O, with EU plug	6871140133
	Power supply unit for Easy Box U8I/O, with U.S.A. plug	6871140134
	Power supply unit for Easy Box U8I/O, with U.K. plug	6871140135
C	Power supply unit for Easy Box U8I/O, with EU mains cable	6871140136
	Power supply unit for Easy Box U8I/O, with U.S.A. mains cable	6871140137
D	Footswitch with 2 m cable for data triggering function (not for Easy Box U8I/O)	6131000110
E	USB cable L= 1 m (type A-B) from Easy Box to the PC USB port	4701300229
	USB cable L= 3 m (type A-B) from Easy Box to the PC USB port	4701300230
F	Cable terminal for 10 pin connector of Easy Box U8I/O (one piece is always supplied in the packaging with the Easy Box)	6872010015

(*) For any gauge other than Mitutoyo requiring an external power supply.

MODULAR DATA ACQUISITION SYSTEM

The Gage Box™ remote Data Acquisition System is a shop floor proof, expandable gauging system.

The system is composed of dedicated, stackable modules to manage analog sensors and digital Input/Output signals.

All modules are daisy-chained together and exchange measurement data, programming data and I/O signals with the E9066T™ Industrial PC through a USB or a simple RS232 serial link. Any commercial PC can also be used.

The system allows direct interfacing and data collection from TESTAR probes or measuring cells, and from a wide variety of third party sensors. All data acquisition functions (sampling, signal conditioning, A/D conversion) are performed locally (free-ing the computer from any over-head or operating system latency), and then conveniently transferred to the system's companion Industrial PC, the E9066T™, or to any PC-compatible data collector, via a standard RS232 port.

MAIN HARDWARE FEATURES

- Processor module for data synchronization and communication with the PC
- Data Acquisition modules (DAQ):
  - 16 analog sensors per module
  - Up to 8 DAQ modules: 8 x 16 =128 sensors
  - Sensors type full-bridge (LVDT), half-bridge (HBT), Strain Gauge and DC
  - Different sensor type modules can be mixed together (i.e. LVDT+HBT)
- Digital I/O modules
  - 32 I/O per module
  - Up to 8 I/O modules: 8 x 32 =256 I/O
- All modules are daisy chained to the Processor Module
- IP52 rated environmental protection
- Dimensions: 280 x 70 x 225mm (71" x 17.8" x 57.1")
- Power supply: universal AC input (external) or $24V_{dc}$

MAIN SOFTWARE FEATURES

- All modules are configured with a simple download command from Quick SPC™ software
- Static and dynamic measurements (smooth and interrupted surfaces, manual and automatic part rotation)
- Compatible with Quick SPC™ software (versions for MS-DOS® and Windows® operating systems)
- Interfaceable to third party data collection software

VEAM connectors composition

Gage Box™ with E9066s™ Panel PC and Quick SPC™ software

Gage Box™ with notebook computer and Quick SPC™ software

SYSTEM COMPOSITION

- Main Processor Module, including basic Digital I/O for simple application needs (e.g. footswitch, cycle commands, resume lamp column)
- Data Acquisition Modules for full-bridge (LVDT), half-bridge (HBT), Strain Gauge sensors or DC signals
- Digital I/O Modules for cycle commands, BCD output for machine tool compensation or dedicated I/O commands
- Maximum distance between Processor and PC: 10 meters (RS232); 25 meters (USB)

How to Order

Description	Transducer Type	Connector	Order Code
16 Channels	LVDT	LUMBERG	866KAACAX0
		VEAM	866KABCAX0
	HBT	LUMBERG	866KACCAX0
		VEAM	866KADCAX0
16 Channels and 7 IN/5 OUT on Processor Module	LVDT	LUMBERG	866KCACAX0
		VEAM	866KCBCAX0
	HBT	LUMBERG	866KCCCAX0
		VEAM	866KCDCAX0
16 Channels 32 I/O	LVDT	LUMBERG	866KAACBX0
		VEAM	866KABCBX0
	HBT	LUMBERG	866KACCBX0
		VEAM	866KADCBX0
32 Channels 32 I/O	LVDT	LUMBERG	866KAAEBX0
		VEAM	866KABEBX0
	HBT	LUMBERG	866KACEBX0
		VEAM	866KADEBX0

Length of the cable supplied along with the Gage Box:
X = B 3 m for RS232; **X** = F 10 m for RS232; **X** = E 5 m for RS422/USB; **X** = H 15 m for RS422/USB;
X = I 25 m for RS422/USB

Accessories

Description	Order Code
PROCESSOR MODULE	
STANDARD PROCESSOR	7513101400
STANDARD PROCESSOR WITH 7 IN/5 OUT	7513101401
DAQ MODULES	
16 LUMBERG LVDT/HBT	7513101420
16 LUMBERG MRT/DC	7513101430
4 VEAM LVDT/HBT	7513101421
4 VEAM MRT/DC	7513101431
I/O MODULE	
32 I/O OPTOINSULATED	7513101410
POWER SUPPLY MODULE	
POWER SUPPLY 2.3A WITH SUPPORT	6871140028
SERIAL CABLES	
SERIAL CABLE RS232 3m	6737957002
SERIAL CABLE RS232 10 m	679100001L
SERIAL CABLE RS422 5 m	679050001K
SERIAL CABLE RS422 15 m	679150001K
SERIAL CABLE RS422 25 m	679250001K
MANUALS	
HARDWARE MANUAL	D2660005XG

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

TRANSDUCER CONDITIONING INTERFACE

TCI is a line of transducer conditioning interfaces composed of three models featuring one, four, eight channels respectively.
It has been developed with technical and functional features particularly suitable to convert a position or dimensional measurement carried out by LVDT or HBT transducers into a signal compatible with most of the analog cards for data acquisition. The output of this unit provides a direct electric signal (voltage or current), proportional to the measurement value of the sensor at the input stage. The output signal can be fetched by PLC analog cards, in order to control and manage process automations and to be further elaborated by systems such as SCADA supervisors.

TCI interfaces are PLUG&PLAY units. They are delivered specifically calibrated for the sensor to be connected to. In this way the machine downtime is dramatically reduced, thanks to quicker installation and maintenance operations.

SENSORS COMPATIBILITY

Both LVDT (full bridge) and HBT(half bridge) sensors can be connected to the TCI. The compatibility is also extended to other brands such as Solartron, Tesa, etc. The specifications of the transducer model/brand to be connected to the TCI are required on the purchase order, in order to perform an ad-hoc calibration.

OUTPUT SIGNAL

Two different output signals are available:
- Voltage (±5Vdc, ±10Vdc, 0-10Vdc)
- Current (4-20mA).

POWER SUPPLY

The electrical supply is provided by the same connector used for the output signal. The TCI can be ordered both in dual voltage mode (±15Vdc/±12Vdc) and single voltage mode (24Vdc)

How to Order

The code to order a TCI 1 is defined by means of the following specifications.
1. Transducer type (LVDT or HBT)
2. Number of channels
3. Measuring range of the sensor
4. Power supply type
5. Compatibility (*)
6. Output type

Example

6 7 4 6	T	N	X	A	C	U
6 7 4 6	0	0	1	1	0	2
LVDT						
1 CHANNEL						
±1 mm						
24 V						
MARPOSS						
CURRENT 4-20 mA						

	6 7 4 6	T	N	X	A	C	U
Transducer type	LVDT	0					
	HBT	1					
Number of channels	1 CH		0				
	4 CH		2				
	8 CH		3				
Measuring range	±0,5			0			
	±1			1			
	±1,5			2			
	±2,5			3			
	±5			4			
Power supply	±15 V / ±12 V				0		
	24 V				1		
Compatibility (*)	Marposs					0	
	Microcontrol					1	
	Solartron					2	
	Mercer					3	
	Tesa					4	
Output signal	±5 V						0
	±10 V						1
	4-20 mA						2
	0 - 10 V						3

Note. (*) If the transducer type is not included in the list, please contact your nearest MARPOSS office to define the specific order code.

TECHNICAL SPECIFICATIONS

MECHANICAL SPECIFICATIONS

	TCI-1	TCI-4/TCI-8
PROTECTION DEGREE (WITH CONNECTORS PLUGGED IN):	IP52	IP54
WEIGHT:	0,14 kg	0,8 kg
DIMENSIONS	see figure below	
OPERATING TEMPERATURE:	0°/+ 50 °C	
STORING TEMPERATURE:	-25°/+ 75 °C	
OPERATING RELATIVE HUMIDITY (NOT CONDENSING):	20% - 80%	
STORING RELATIVE HUMIDITY (NOT CONDENSING):	10% - 95%	

ELECTRICAL SPECIFICATIONS

	TCI-1	TCI-4/TCI-8
LINEARITY ERROR:	max 0.05% of the end scale	max 0.1% of the end scale
GAIN DRIFT:	max 0.02% °C of the end scale	max 0.04% °C of the end scale
OFFSET DRIFT:	max 0.02% °C of the end scale	max 0.01% °C of the end scale
POWER SUPPLY REJECTION RATIO (GAIN+OFFSET):	max 0.04% / V of the end scale (voltage: ±15V)	
OUTPUT RIPPLE (AF SPIKE EXCLUDED):	max 10 mV rms voltge output	
	20 µA rms current output	15 µA rms current output
TRANSDUCER FREQUENCY:	Typical 5.1 KHz	Typical 5.0 KHz
TRANSDUCER VOLTAGE SUPPLY:	Typical 3.3 Vrms	Typical 3.4 Vrms
TRANSDUCER CURRENT SUPPLY:	Max 30 mA	
BANDWIDTH:	Typical 500 Hz	

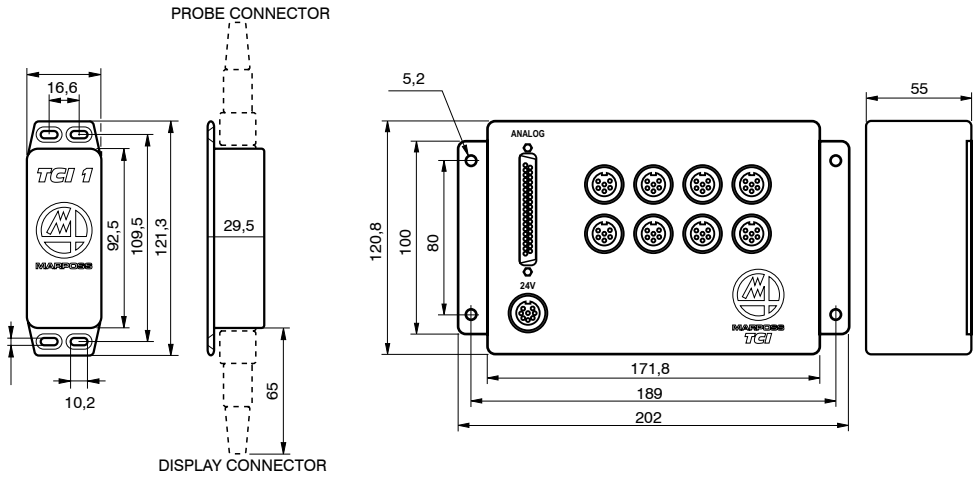
VOLTAGE SUPPLY

	TCI-1	TCI-4/TCI-8
±15 V	Dual filtered and stabilised ±15 Vdc ±5% Max. ripple allowed at 100/120 Hz: 50 mVpp	
Typical consume with transducer connected:	Voltage output: ± 20 mA Current output: ±40 mA	Voltage output: ± 270 mA max. Current output: ±450 mA max.
±12 V (IF CONFIGURED WITH A TENSION OUTPUT SIGNAL)	±12 Vdc ±5% Max. ripple allowed at 100/120 Hz: 50 mVpp	
Typical consume with transducer connected:	Voltage output: ± 20 mA Not available with current output	Voltage output: ± 270 mA max. Current output: ±450 mA max.
+24 V	Single 24 Vdc ±10% Max. ripple allowed at 100/120 Hz: 200 mVpp	
Typical consume with transducer connected:	Voltage output: 45 mA Current output: 65 mA	Voltage output: 300 mA max. Current output: 500 mA max.

OUTPUT SIGNAL

		TCI-1	TCI-4/TCI-8
TENSION MODE	±5V	Maximum output current ±1 mA	
	±10V	Maximum output current ±1 mA	
	0-10V	Maximum output current ±1 mA	
CURRENT MODE	4/20 mA	Load impedance max. 250 ohm, min. 100 ohm	

DIMENSIONS



PROCESS AND QUALITY CONTROL SOFTWARE

Quick SPC™ for Windows® is a suite of software products designed to comply with any requirement ranging from simple measurement acquisition to complex gauging applications. Framed in a simple, wizard driven, common user interface it is possible to complement the base product by means of software Add-ons purposely conceived for specialized industry fields.

READY TO RUN

Templates and wizard driven programming interfaces allow an easy, safe and ready to use software.

Self explanatory with its spreadsheet programming interface, Explorer-like navigation and on-line manuals

Mouse-free Interface

Safe and reliable with checks on programmed data consistency, data back-up and restore utility; multi-level user security access.

REDEFINING THE CONCEPT OF FLEXIBILITY

Fully customizable software environment matching current and future metrological and statistical needs: page layouts, short cuts, hot tabs, application templates, reports, customers' based statistical evaluations and more.

Powerful and versatile capable of connecting to a variety of analog and digital measuring devices and machine tool CNC's.

Native 32-bit Windows® software for shop floor applications: operator prompts with multimedia files (pictorials, drawings, photos, mov-ies).

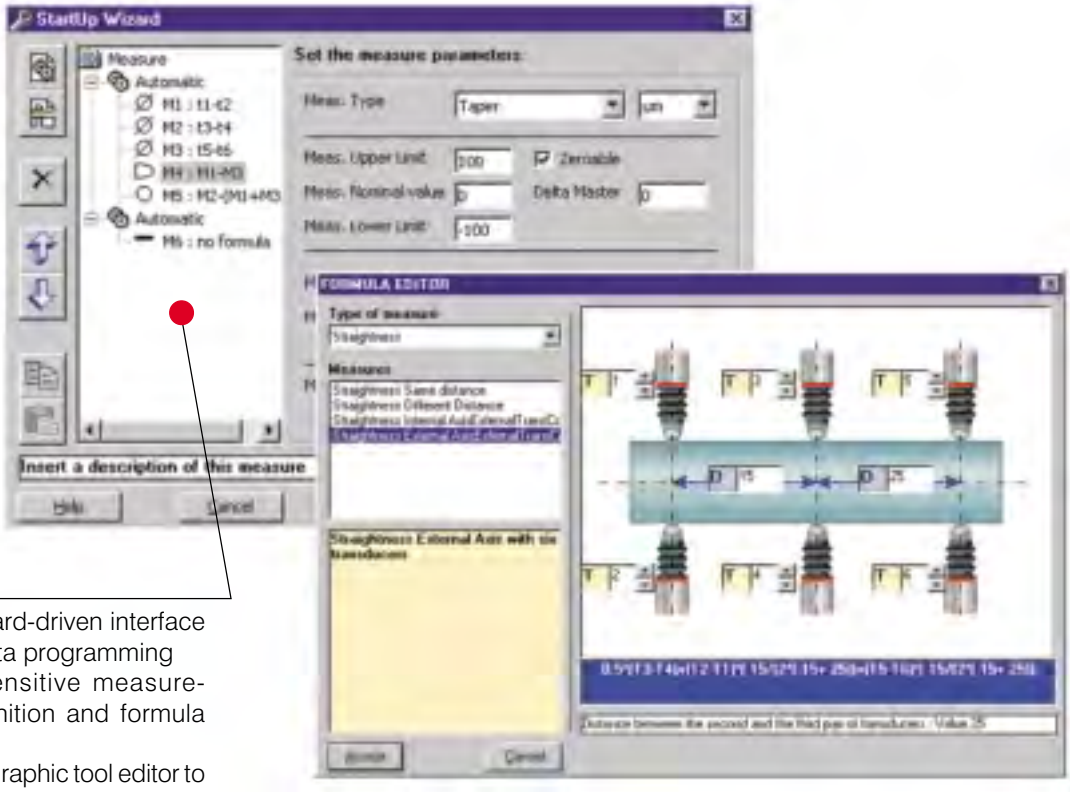
Comprehensive fully integrated software modules for data acquisition, measurement elaboration, statistical analysis, machine tool compensation, network integration and data storage.

Minimum Hardware Requirements

Quick SPC™ requires a Marposs Industrial Computer (E9066s™ family) or any Windows® compatible PC with:

- Pentium® III class processor (or equivalent) with at least 256 MB RAM (512 MB recommended)
- 800x600 SVGA / 65.536 colours (or greater) display resolution
- At least 600 MB free hard disk space

Supported Operating Systems: Windows® NT 4.0 SP6, Windows® 2000 SP4, Windows® XP SP2



WIZARDS

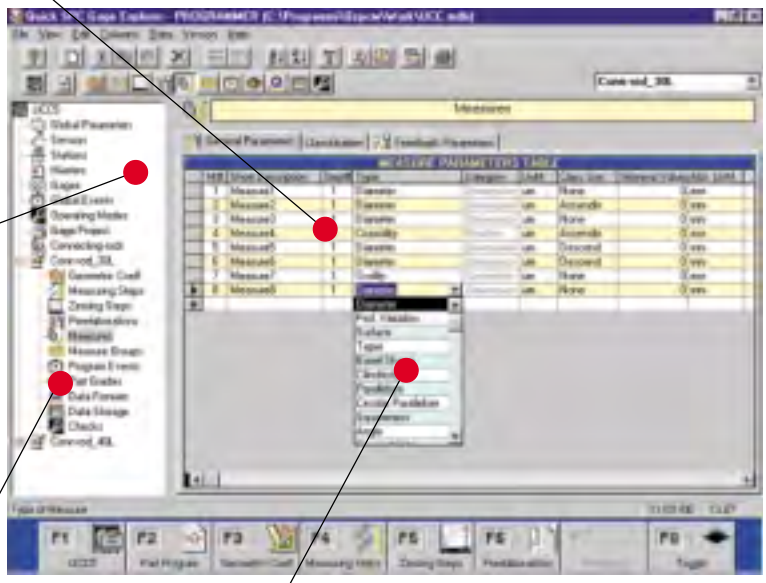
- Simple wizard-driven interface for easy data programming
- Context sensitive measurements definition and formula creation
- Integrated graphic tool editor to create operator prompts and instructions

WORKING GRID

- Spreadsheet programming interface
- Completely customizable visualization
- Quick and safe template-based programming
- MS-ACCESS® database environment

PROGRAMMABLE TOPICS

- MS-Windows® Explorer-style structure
- Intuitive organization of all arguments
- Direct access to all topics



STATISTICAL ANALYSIS

- Embedded Q-DAS® statistical software for on-line control charts, machine and process capability analysis
- Q-DAS® qs-STAT® compliant data storage

GUIDED PROGRAMMING

Guided programming using Online help, tooltips, pick-up lists, Wizards, etc.

GROUPS & USERS

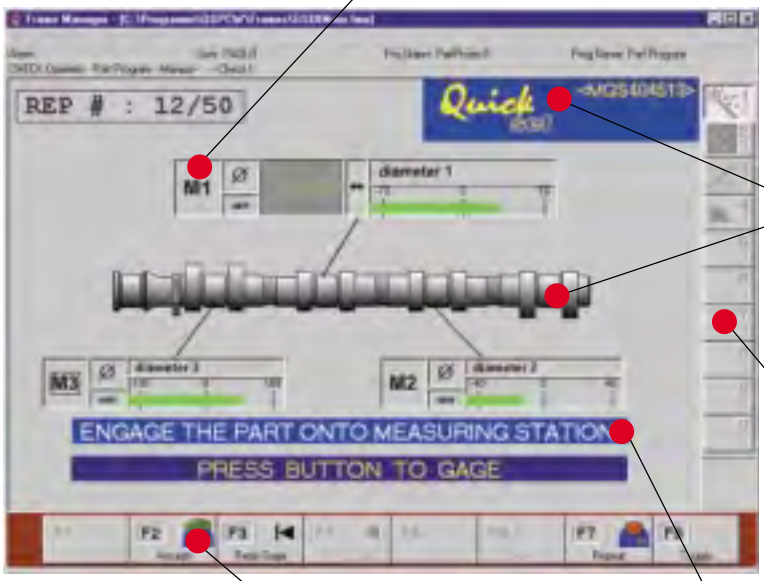
Assignable groups/users rights, functions, hot tabs, function keys and accelerators.

SECURITY

Separate groups/users profile management guaranteed by password validation.

ON LINE

- Customizable display
- Clear and readable information
- Measurement bargraph, numeric and color code displays



MULTIMEDIA

Static and dynamic files (picture, drawings, videos, etc.)

HOT TABS

- Freely programmable
- Direct selection view
- Mouse free

FUNCTION KEYS

- Customizable
- Pictorial helps
- Application dependent
- Mouse free

OPERATOR PROMPTS

- Instructions
- Data acquisition
- Capability studies (gage, machine, process)

TECHNICAL CHARACTERISTICS

QUICK SPC™ FOR MICROSOFT WINDOWS® - STANDARD SOFTWARE CHARACTERISTICS

CONFIGURATION AND PROGRAMMING

Configurable display lay-out for content, color, position, size, text, fonts, menus.
Mouse-free interface for operators unfamiliar with Windows, plus fully compliant Microsoft Windows® display functionalities.

Spreadsheet programming interface, Explorer-style user interface, integrated MS-ACCESS® database. Consistency control routine for all configuration and programming phases.

MEASUREMENTS AND ZERO SETTING

Static and digital dynamic measuring cycles. Unlimited number of measuring steps and part programs. Manages analog sensors (LVDT, Half-Bridge), strain gage, linear and rotary encoders, digital probes, serial input devices and manual data input.
Live measurement display and fully guided operator prompted acquisition sequences using multimedia files (bmp, pcx, jpg, avi, mpg, etc.). Fully automatic machine tool control (Feedback) and multiple stations control for assembly applications.
Zero setting and Min-Max mastering with consecutive, cumulative drift controls and non-zero-band controls.

STATISTICAL PROCESS CONTROL

Configurable and programmable data evaluation complying with International (ISO), National (DIN, AIAG, CNOMO) and customers guidelines.
Embedded Q-DAS® statistical package for on-line, variable data analysis (control chart, machine and process capability). Certified qs-STAT® compliant data storage.

MEASURING SYSTEM ANALYSIS

Accuracy, Repeatability, Reproducibility, Linearity, Stability studies complying with International (ISO), National (DIN, AIAG, CNOMO) and customers guidelines.
Fully programmable prompted acquisition sequences in both blind and full details measure mode.
Measuring System Analysis traceability by storing each study separately together with all necessary references. Data evaluation is run through Marposs Measuring System Analysis (MSA) software module. Analysis can be seamlessly run through Q-DAS® MSA software package (option) as well.

NETWORK

An ODBC-compliant data structure allows seamless integration to virtually any network client and data base architecture, including Industrial Networks (Profibus, Interbus-S, etc.).

UTILITIES

Step Sequencer Designer to create multi-level operator prompts, instruction and data acquisition pages.
Serial Driver Programmer connects to virtually any serial device using ASCII-based protocols. Analog Probes Tuner (APT) to set-up sensors assembly when more than one sensor is used to create a measurement.
Groups and Users to define multi-level password access, operator based software modules, displays, short cuts, hot tabs, icons, soft-keys.
Customizable reporting and printing.

LANGUAGE VERSIONS

Change Language module allows to select among the following languages: Chinese, English, French, German, Italian, Japanese, Portuguese and Spanish. Other language versions available upon request.

SUPPLY TERMS AND CONDITIONS

Quick SPC™ is supplied on CDROM either bundled with the E9066s™ Industrial Computer product family or as a stand-alone software package. On-line manuals in Adobe® Acrobat® format are supplied in every available language.

HOW TO ORDER

DESCRIPTION	ORDER CODE
QUICK SPC™ FOR WINDOWS® OPERATING SYSTEMS	CM2A30MA00

For a full list of address locations, please consult the Marposs official website

D6W00203G0 - *Edition ,02/2013 - Specifications are subject to modifications*

Marposs has an integrated system to manage the Company quality, the environment and safety, attested by ISO 9001, ISO 14001 and OHSAS 18001 certifications. Marposs has further been qualified EAQF 94 and has obtained the Q1-Award.