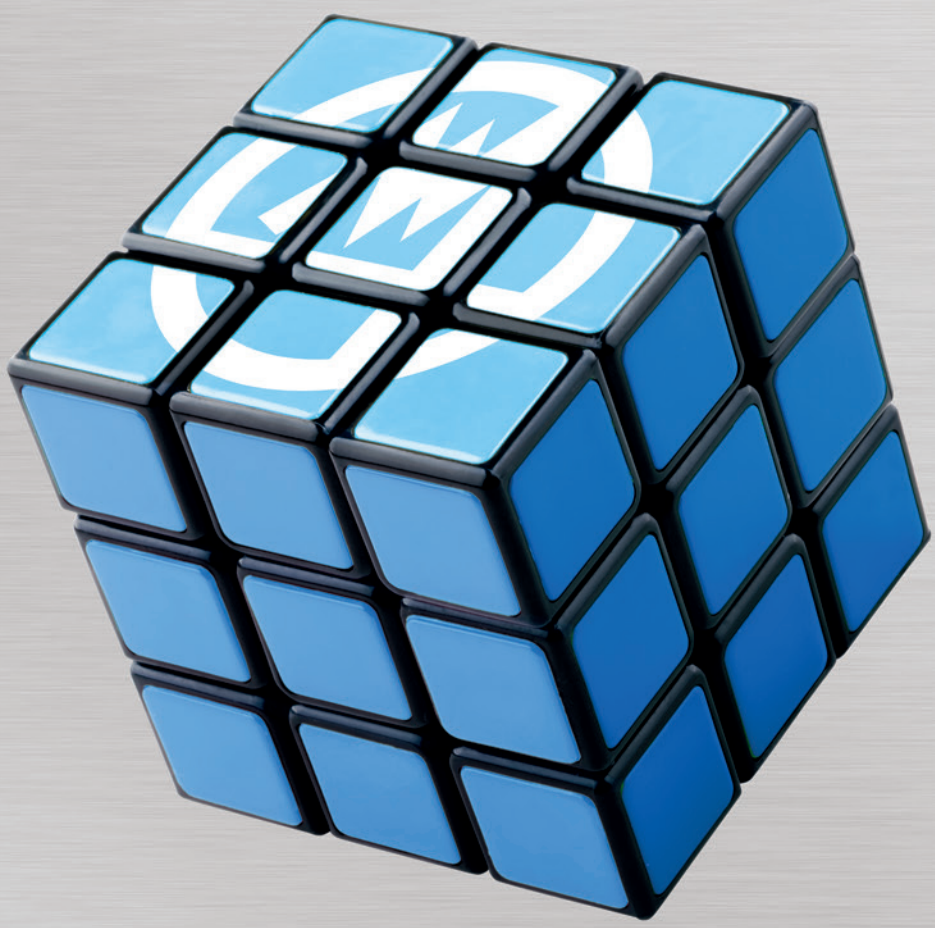
MARPOSS



MANUAL GAUGING

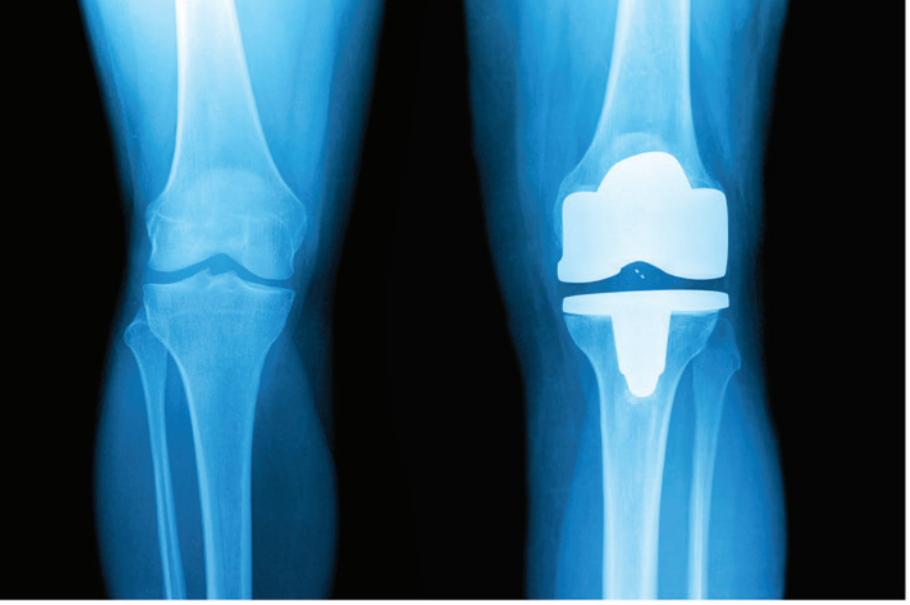
REFERENCE GUIDE

Mario Possati founded Marposs in 1952.
Since its inception, Marposs has been producing standard and custom systems for industrial applications to measure and control dimensions, geometries and surface quality of mechanical components and for control and monitoring of the machining process.
Marposs engineers work with both end users and machine tool makers, from the development stage of a project through implementation and long-term service support.
Application solutions are obtained with standard or engineered products and cover all requirements from the immediate control of the machine tool, to the final inspection of the finished pieces and to the collection and statistical interpretation of the measurement data.
Marposs is a world leader with global capabilities in Research & Development, Production, Marketing, Sales, Customer Training and After-Sales Service.
Marposs adheres to Quality principles and is committed to the continuous improvement of procedures and methods, as well as the adoption of new methods most suitable for the analysis, engineering, production, control and assistance of all its products and services.
Marposs' expertise allows its customers to reach their goals of product quality, efficiency, flexibility, productivity, reliability and maintainability of the manufacturing process, regardless of their company size.



Headquarters - Bentivoglio (BO) Italy





















... 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 is the division of Marposs whose mission is
to develop and offer innovative measuring component products
to end users and system integrators as well as fixture and
gauge makers, whose final products are used in
automotive, bearings, gears, compressors, electrical motors, aerospace,
glass, energy, biomedical, electronics and hi-tech consumer products.







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, all new product platforms use the latest production technologies available. Testar's manufacturing area operates with the most advanced equipment to assure the quality of its products is first class.
Testing of extreme environmental conditions, life test and material verifications are performed to ensure and improve the product quality. The electromagnetic compatibility (EMC) test lab can check the compliance with national and international Standards and legal requirements. All necessary calibration and component inspections are performed in a comprehensively equipped Metrology Laboratory, that is accredited by ACCREDIA DT (the Italian accreditation body) and compliant with the standard UNI CEI EN ISO/IEC 17025, as Calibration Center LAT N° 084 in relation to the calibration of smooth diameter samples as reported in the specific accreditation table.





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, ISO 14001 and OHSAS 18001 certifications; it has further been qualified EAQF 94 and has obtained the Q1 Preferred Quality Award. All of the worldwide sales organizations are ISO 9001 certified. These certifications are not only a proof of the capacity of the entire Marposs organization to assure the quality and reliability of its product and service, but also a guarantee that all the Marposs products are designed and manufactured in compliance with the strictest standards of work safety and environmental protection. TESTAR products, sales and service support are available through 24 direct sales and service organizations, and 9 exclusive distributors.

Displacement Sensors

RED CROWN 2 - AMA - QUICK BLOCK
A 124 - USB LINE - OPTO CROWN

Bore Gauges Line

M1 STAR MBG - I-WAVE 2 - I-WAVE - M1 STAR EBG
M1 WAVE - M1 MULTI
M1 STAR COUNTERSINK - M1 AIR

Forks and Ring Gauges

M3 STAR - M2 ELECTRON - M2 WAVE
QUICK SNAP - M4 STAR - M4

Bench Gauges

QUICK-SET LINE - QUICK-SET UNIVERSAL

Indicators and Electronic Display Units

TD - QUICK-DIGIT - E18 - QUICK-READ - E4N - DUO
NEMO - MERLIN FAMILY - E9066E - E9066T

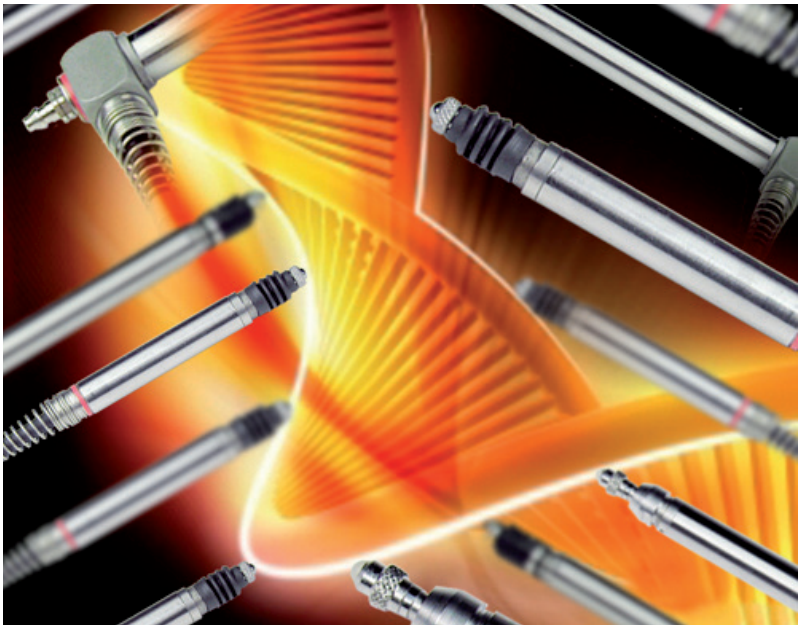
Interface Boxes for Data Acquisition

EASY BOX - USB INTERFACE
DIGI CROWN NETWORK SYSTEM - GAGE POD
TCI - ASC

Software

EASY ACQUISITION - MERLIN PLUS SOFTWARE
QUICK SPC





…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

REDCrown2

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

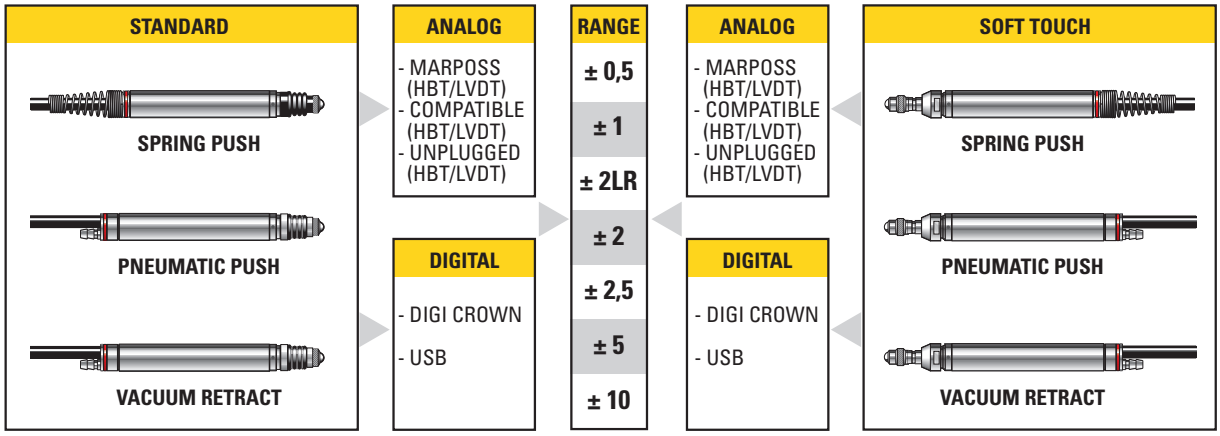
DIGICrown2

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



REDCrown2 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.



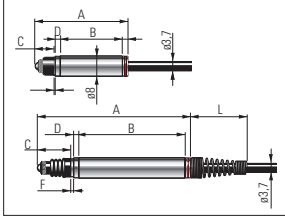
Red Crown2 is a line of pencil probes available in STANDARD (with gaiter –IP65) or SOFT TOUCH (without gaiter –IP54) configuration, with highly precise ball cage movements and various connection options according to the conditioning and display interfaces used.
The analogue version, with LVDT or HBT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

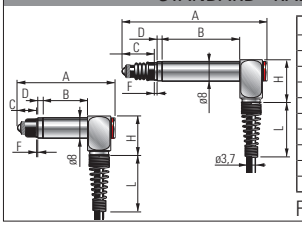
STANDARD - AXIAL - SPRING



	±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



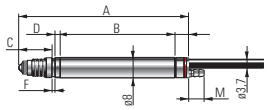
	±05	±1	±2LR	±2,5	±5	±10
A	37,50	57,78	107,85	84,85	115,95	163,95
B	17,20	31,20	88,58	54,10	79,65	112,50
C	7,10	12,80	25,30	16,75	22,30	39,45
D	2,00	2,00	2,00	2,00	2,00	-
E	1,50	-	-	-	-	-
F	0,70	1,30	1,50	1,50	1,50	-
G	-	-	-	-	-	-
H	15,20	-	15,20	15,20	15,20	15,20
L	-	-	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

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÷2,2		0,4				0,70		0,7 ÷ 2		0,4			
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 TESA compatible models 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)

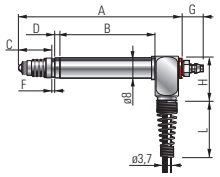
STANDARD - AXIAL - PNEUMATIC PUSH



	±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



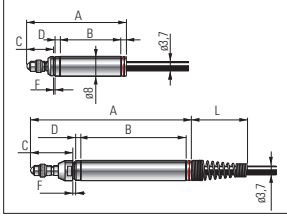
	±05	±1	±2LR	±2,5	±5	±10
A	-	71,75	107,85	84,85	115,95	163,95
B	-	36,10	68,55	52,60	78,15	112,50
C	-	12,80	25,30	16,75	22,30	39,45
D	-	2,00	2,00	2,00	2,00	-
E	-	-	-	-	-	-
F	-	1,30	1,50	1,50	1,50	-
G	-	7,50	7,50	7,50	7,50	7,50
H	-	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22,00	22,00	22,00	22,00
M	-	-	-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

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		0,5				0,70		0,7 ÷ 2		0,4				0,70		0,7 ÷ 2		-			
			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								-			
					≤0,9								≤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	-	-	-	-
	3PR05L0000	3PR05L1200	3PR05L0400	3PR05L1600	3PR05L0560	3PR05L1760	-	-	3PR10L0000	3PR10L1200	3PR10L0400	3PR10L1600	3PR10L0560	3PR10L1760	-	-	3PR20L0000	3PR20L1200	3PR20L0400	3PR20L1600	-	-	-	-
	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	-	-	-	-
	3PR05N0000	3PR05N1200	3PR05N0400	3PR05N1600	3PR05N0560	3PR05N1760	-	-	3PR10N0000	3PR10N1200	3PR10N0400	3PR10N1600	3PR10N0560	3PR10N1760	-	-	3PR20N0000	3PR20N1200	3PR20N0400	3PR20N1600	-	-	-	-
	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	-	-	-	-
	3PD05L0000	3PD05L1200	3PD05L0400	3PD05L1600	3PD05L0560	3PD05L1760	-	-	3PD10L0000	3PD10L1200	3PD10L0400	3PD10L1600	3PD10L0560	3PD10L1760	-	-	3PD20L0000	3PD20L1200	3PD20L0400	3PD20L1600	-	-	-	-
	±(0,6+K*2)								±(0,6+K*2)								±(1,2+K*2)							

SOFT TOUCH

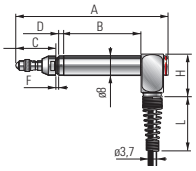
SOFT TOUCH - AXIAL - SPRING



	±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



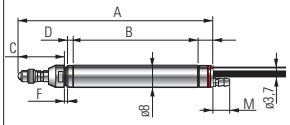
	±05	±1	±2LR	±2,5	±5	±10
A	-	61,43	107,85	88,50	115,95	163,95
B	-	31,20	68,55	54,10	79,65	112,50
C	-	16,40	28,80	20,40	16,90	39,45
D	-	2,00	-	2,00	-	-
E	-	-	-	-	-	-
F	-	1,30	-	1,50	-	-
G	-	-	-	-	-	-
H	-	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

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%)	0,3		0,30		0,18 ÷1,9				0,14 ÷ 2,3		0,30		0,18 ÷ 1,9				0,14 ÷ 2,3	
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)								IP50 (IP54 PP version)							
Contact type		Nylon (PA66)		Nylon (PA66)								Nylon (PA66)							
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	3PR02T6200	3PR02T5400	3PR02T6600	-	-	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%/13kHz							
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)

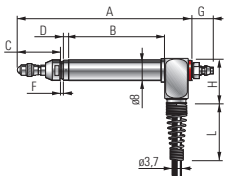
SOFT TOUCH - AXIAL - PNEUMATIC PUSH



	±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	-	7,50	7,50	7,50	7,50	7,50
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							
Overall range	6,6								11								21							
Mechanical travel	8								8								8							
Resolution	0,016		0,01						0,02		0,07						0,030		0,010					
Linearity	0,30		0,18 ÷ 1,9				0,14 ÷ 2,3		0,30		0,18 ÷ 1,9				0,14 ÷ 2,3		0,30		0,18 ÷ 1,9				0,14 ÷ 2,3	
Repeatability			0,5 ÷ 2				0,125 ÷ 2				0,5 ÷ 2				0,125 ÷ 2				0,5 ÷ 2				0,125 ÷ 2	
Hysteresis			7,3 ÷ 29				1,825 ÷ 29				7,3 ÷ 29				1,825 ÷ 29				7,3 ÷ 29				1,825 ÷ 29	
Temperature coefficient							≤0,6								≤0,6								≤0,6	
Thermal drift							≤0,9								≤0,9								≤0,9	
Supply voltage	2								2								2							
Current consumption	0,15								0,15								0,15							
Max. current consumption	0,25								0,25								0,25							
Operating temperature	(-10)+(+65)								(-10)+(+65)								(-10)+(+65)							
Storage temperature	(-20)+(+100)								(-20)+(+100)								(-20)+(+100)							
Protection rating	IP50(IP54 PP version)								IP50(IP54 PP version)								IP50(IP54 PP version)							
Body material	Nylon (PA66)								Nylon (PA66)								Nylon (PA66)							
Electrical connection	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
Max. mechanical speed	115								115								23							
Accuracy	± MAX(2,5+|2*K|;|7*K|)(***)								± MAX(5+|2*K|;|7*K|)(***)								± MAX(10+|2*K|;|7*K|)(***)							
Output signal	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
Max. mechanical speed	73,75								29,5								7,375							
Accuracy	± MAX(2,5+|2*K|;|7*K|)(***)								± MAX(5+|2*K|;|7*K|)(***)								± MAX(10+|2*K|;|7*K|)(***)							
Output signal	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	3PD05L6200	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)							

SPECIAL MODELS

Ultra-short probe
The probe model D01S has been designed to offer a total measuring range of 1 mm with a dimension of only 22,4 mm.
The high accuracy and the ease of use (same simple fixing as every probe with 8 mm body diameter) allows to extend the use of this model in all applications where compactness is a must.

Ultra-soft touch probe
The probe model PAD10UL has been designed to grant a measuring force of 0,12 N at 0,2 bar in horizontal position and 0,05 N at 0,2 bar in vertical position with contact upward. This model allows to measure parts with delicate surfaces that cannot be marked by the contact tip, or light components that could be bent by excessive measuring force.

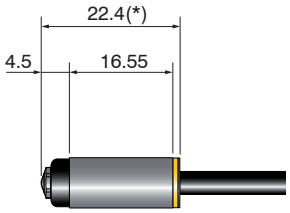
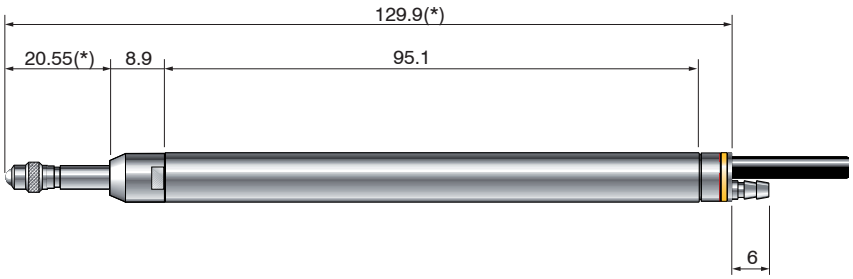
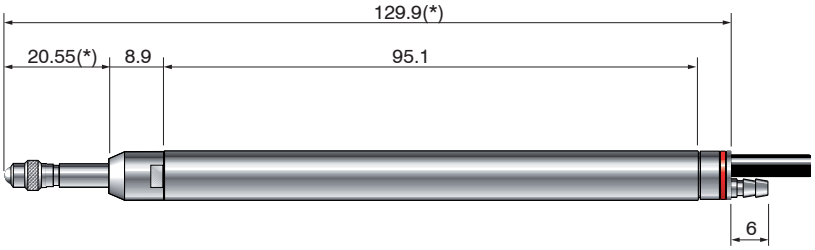
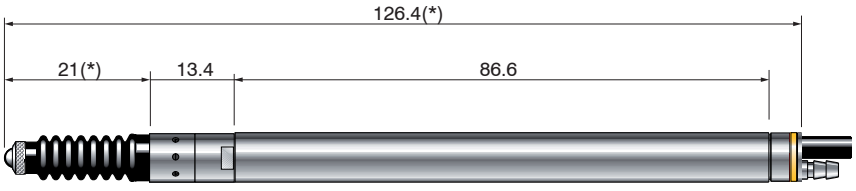
Soft touch & dust-proof probe
The PAD10J is a probe model that combines a low measuring force with the use of a front-gasket, to guarantee protection against dust and solid particles. The special design allows to blow air through radial holes located on the jacket, with no deformation of the gasket in operating conditions.

STANDARD		DIGITAL	DIGITAL	ANALOG	DIGITAL
		±0,5 mm	±5 mm	±5 mm	±5 mm
Cable (**A**=axial - **R**=radial)		A	A	A	A
Movement (*)		S	PP	PP	PP
Measuring range	(mm)	1	10	10	10
Mechanical travel	(mm)	1,5	11	11	11
Body Ø	(mm)	8	8	8	8
Spring strenght	(N/mm±15%)	0,17	0,003	0,003	0,007
Measuring force	(N±25%)	0,60	0,12	0,12	0,30
PP pressure	bar	-	0,20	0,20	0,5 ÷ 2
	psi	-	2,90	2,90	7,3 ÷ 29
Vacuum retract pressure	bar	-	-	-	-
	psi	-	-	-	-
Cable length	(m)	2	2	2	2
Gasket		Fluoroelastometer	-	-	Fluoroelastometer
Repeatability	(µm)	0,15	0,15	0,15	0,15
Thermal drift	(µm/°C)	<0,25	<0,25	<0,25	<0,25
Operating temperature	(°C)	(-10)÷(+65)	(-10)÷(+65)	(-10)÷(+65)	(-10)÷(+65)
Storage temperature	(°C)	(-20)÷(+100)	(-20)÷(+100)	(-20)÷(+100)	(-20)÷(+100)
Protection grade		IP65	IP54	IP54	IP54
Contact type		Carbide	Nylon (PA66)	Nylon (PA66)	Nylon (PA66)
Contact tread		M2,5	M2,5	M2,5	M2,5
TRADE NAME		D01S	PAD10UL	FPA50UL	PAD10J
ORDER CODE		3PD01S0000	3PD10L5410	3PR10L5410	3PD10L0558
Sensitivity	(mV/V/mm)	-	-	115	-
Linearity error	(µm)	+/-(0,2+K*1)	+/-(0,6+K*2)	+/-MAX(|5+2*K|;|7*K|)(**)	+/-(0,6+K*2)
Calibration spec.		-	-	3,5355V RMS with load 1Mohm//360pF/7,5kHz	-

* Movement S= spring - PP= pneumatic push - V= vacuum - PV= push/vacuum - ** K= Reading (mm)

DIMENSIONS

The clamping diameter of all versions is 8h6 mm.

±0,5 mm	**D01S**	
±5 mm	**PAD10UL**	
	FPA50UL	
	PAD10J	

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	3PR05T1399
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	FP10	FPA21	FP21	FPA20	FP20
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°
	H05L	HR05L	H10L	HR10L	H21L	HR21L	H20L	HR20L
TESA	3PR01T5000	3PR01T6200	3PR02T5000	3PR02T6200	3PR10T5199	3PR10T6399	3PR05T5199	-
METEM	3PR01S5000	3PR01S6200	3PR02S5000	3PR02S6200	-	-	-	-
	F05L	FR05L	F10L	FR10L	F21L	FR21L	F20L	FR20L
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	3PR02S5400	3PR02S6600	-	-	-	-
LVDT			FPA10L	FP10L	FPA21L	FP21L	FPA20L	FP20L
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	FV20L
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
	3PR05P0400	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	-	-
	3PR05R0560	3PR05R1760	3PR10R0560	3PR10R1760	-	-
	3PR05S0560	3PR05S1760	3PR10S0560	3PR10S1760	-	-
	3PR05P0560	3PR05P1760	3PR10P0560	3PR10P1760	-	-
	FVA25	FV25	FVA50	FV50	FVA100	FV100
	3PR05K0560	3PR05K1760	3PR10K0560	3PR10K1760	-	-

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

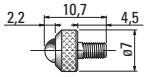
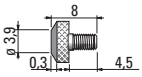
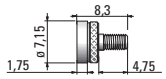
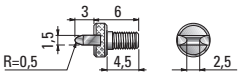
	±2,5 mm		±5 mm		±10 mm	
	AX	90°	AX	90°	AX	90°
	HVA25L	HV25L	HVA50L	HV50L	HVA100L	HV100L
	3PR05T5560	3PR05T6760	3PR10T5560	3PR10T6760	3PR20T5560	3PR20T6760
	3PR05S5560	3PR05S6760	3PR10S5560	3PR10S6760	3PR20S5560	3PR20S6760
	FVA25L	FV25L	FVA50L	FV50L	FVA100L	FV100L
	3PR05K5560	3PR05K6760	3PR10K5560	3PR10K6760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

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

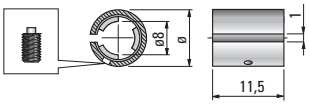
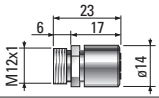
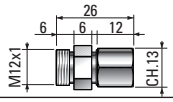
SPRINGS

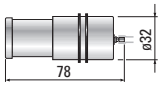
SPRING	FORCE	Measuring Range ±05	±1	±2LR	±2,5	±5	±10	ORDER CODE
	0,3 (N)	X						1024099751
	2 (N)	X						1024099753
	2,5 (N)	X						1024099754
	1 (N)		X					1042414237
	2 (N)		X					1042414236
	2,5 (N)		X					1042414235
	1 (N)				X			1042414435
	1,6 (N)				X			1042414441
	2 (N)				X			1042414436
	2,5 (N)				X			1042414437
	1 (N)					X		1042414537
	1,6 (N)					X		1042414561
	2 (N)					X		1042414536

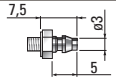
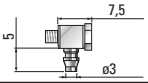
ACCESSORIES

CONTACTS	DESCRIPTION	ORDER CODE
	Contact ø5 mm / M2,5	3392409910
	Flat contact M2,5	3392409912
	Full-Flat contact M2,5	3394241401
	Cut contact M2,5	3392409914

EXTENSION CABLES	DESCRIPTION	ORDER CODE
 LVDT / HBT	Cable extension 1 m	6735932026
	Cable extension 2 m	6735932015
	Cable extension 5 m	6735932016
	Cable extension 10 m	6735932017
	Cable extension 15 m	6735932037

CLAMPING	DESCRIPTION	ORDER CODE
	Bushing outside ø 10 mm	1019826001
	Bushing outside ø 3/8"	1019826002
	Dowel M3x10	1024099760
	Dowel 4-40 UNC x .375"	1024099761
	Tongs bushing ø 8 - Compact version	2042414100
	Tongs bushing ø 8 - For standard wrench	2042414200

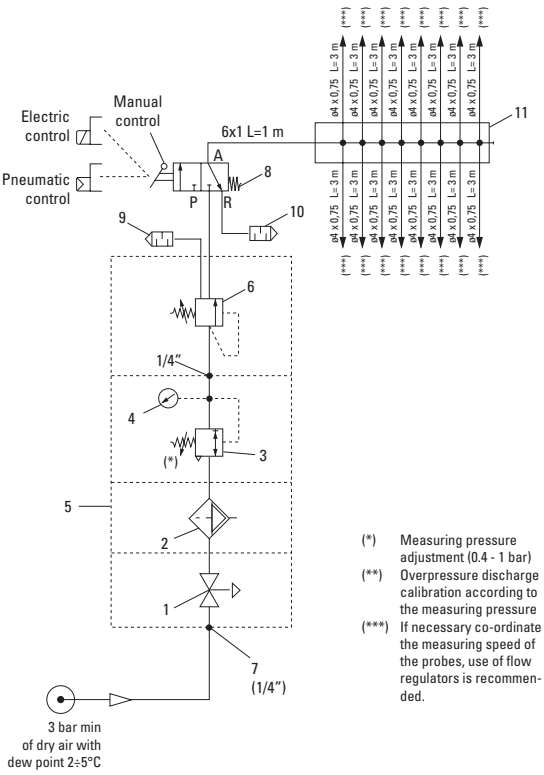
OTHER ACCESSORIES	DESCRIPTION	ORDER CODE
	Vacuum pump + L = 1 m tubing	4717008002
	Pre-travel regulator wrench	1346413200

AIR ADAPTORS	DESCRIPTION	ORDER CODE
	Axial air adaptor	**4430RSMV03**
	Radial air adaptor	**4430RSMVAB**

PNEUMATIC SYSTEM

For applications with pneumatic push and vacuum retraction probe type, the pneumatic system should be sized as shown in the below schemes.
Air supply: air must be dry and unoiled, with dew point in the range 2-5 °C and filtered to 5 µm.

PNEUMATIC SYSTEM FOR MEASURING PROBES

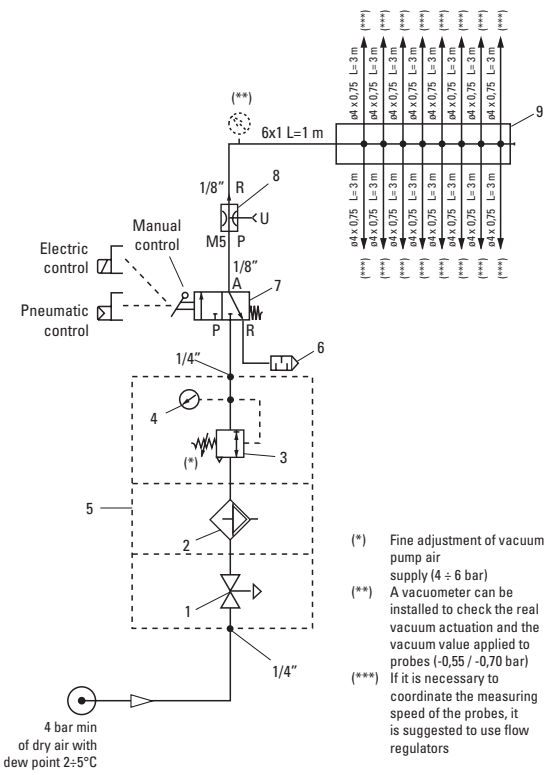


(*) Measuring pressure adjustment (0.4 - 1 bar)
(**) Overpressure discharge calibration according to the measuring pressure
(***) If necessary co-ordinate the measuring speed of the probes, use of flow regulators is recommended.

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	Monostable lever 3-way 2-position valve
9	1	Silencer 1/2"
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: Sensors - Interface Units - Display Units

A124	D124	QUICK BLOCK	DIGI BLOCK	HAND HELD GAUGES	RED CROWN 2	DIGI CROWN 2	RED CROWN 2 USB	INTERFACE TYPE	#CH	ACQUISTION TIME
		●		●	●			QUICK READ	1-2	2 ms
●		●		●	●	●(*)		E4N	1÷4	2 ms
		●	●	●	●	●		DUO	1-2	2 ms
●		●		●	●	●(*)		TCI1 - TCI4 - TCI8	1 4 8	2 ms
●	●	●	●	●	●	●(*)		GAGE POD	16	0,25 ms
●(****)		●		●	●	●(*)		EASY BOX	4	1 ms
	●	●(***)	●	●	●(**)	●		DIGI NET	1÷744	0,25 ms
									1÷31	0,25 ms
									1÷8	0,25 ms
									1÷744	0,25 ms
		●					●		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 Network System by dedicated programming.
*** Quick Block LVDT can be connected to Digi Crown Network System by dedicated programming.
**** A124 can be connected to Easy Box for LVDT and HBT TESA compatible transducers

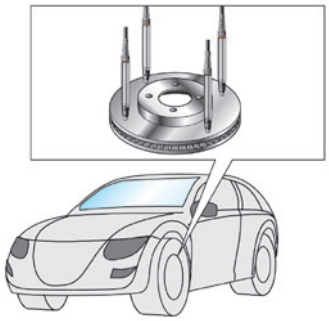
OUTPUT TYPE	ACQUISITION SW	DISPLAY UNIT	VISUALIZATION TYPE
SERIAL 232	EMBEDDED	QUICK READ	LED BARGRAPH + DIGITAL DISPLAY
SERIAL 232 / DIGIMATIC / BCD	EMBEDDED	E4N	LED BARGRAPH + DIGITAL DISPLAY
SERIAL 232 / FIELD BUS	EMBEDDED	DUO	4.3" LCD DISPLAY
ANALOGUE (VOLTAGE / CURRENT)	-		PLC/CNC
USB ETHERNET WIFI	MARPOSS ACQ. SW	E9066 INDUSTRIAL PC / COMMERCIAL PC	LCD DISPLAY
USB	MARPOSS ACQ. SW	E9066 INDUSTRIAL PC / COMMERCIAL PC	LCD DISPLAY
USB	EMBEDDED	MERLIN FAMILY	LCD DISPLAY
USB	EMBEDDED	NEMO	LCD DISPLAY
USB/232/PCI CARD/ISA CARD / ETHERNET	MARPOSS ACQ. SW	E9066 INDUSTRIAL PC / COMMERCIAL PC	LCD DISPLAY
USB/232	EMBEDDED	MERLIN FAMILY	LCD DISPLAY
DIRECT	EMBEDDED	NEMO	5,7" LCD DISPLAY
USB/232	MADE BY PROTOCOL COMMAND	PLC	PLC
USB	Marposs Acq. SW	NEMO/MERLIN FAMILY/ E9066/INDUSTRIAL PC/PLC/ COMMERCIAL PC/ANY HOST USB	DEPENDING ON THE DISPLAY UNIT

APPLICATION EXAMPLES

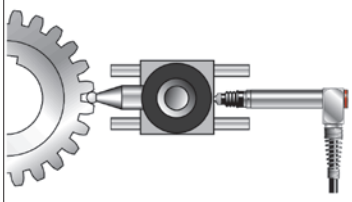
AUTOMOTIVE



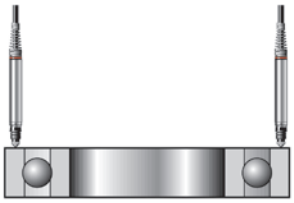
AUTOMOTIVE COMPONENTS



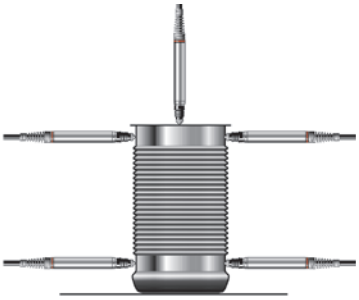
GEARS



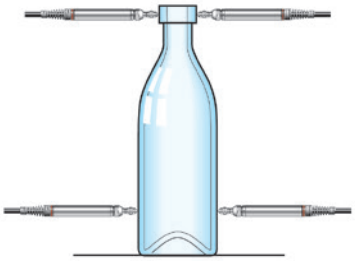
BEARING INDUSTRY



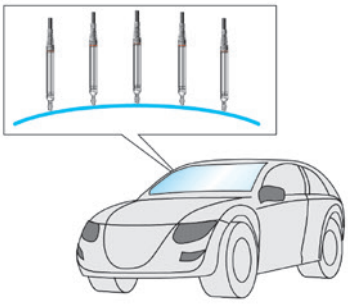
CONTAINERS & PACKAGING



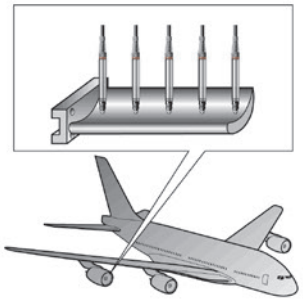
GLASS CONTAINERS



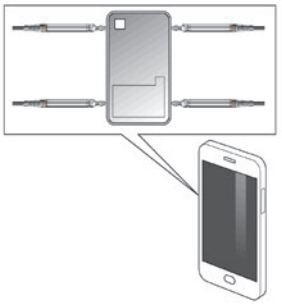
AUTOMOTIVE GLASS



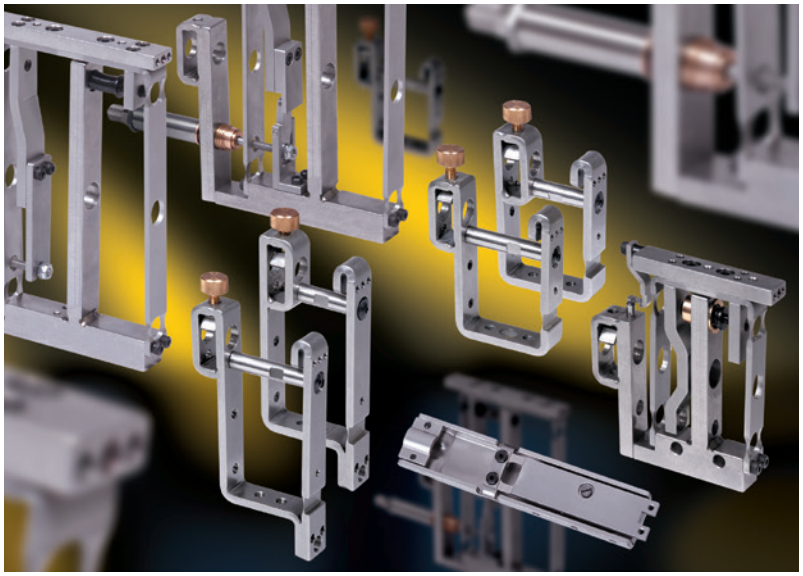
AEROSPACE



CONSUMER ELECTRONICS



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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:

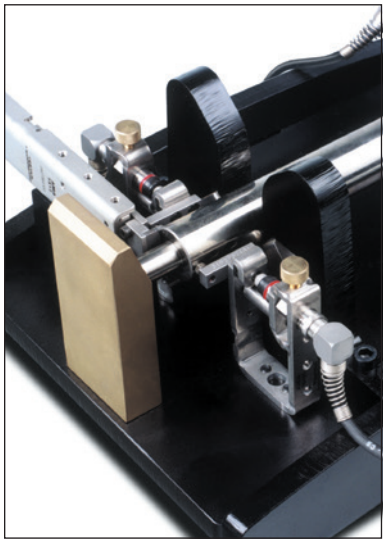
- 15 different designs
- 8 mm and 3/8" clamping diameter
- high precision and reliability
- compact design (12 mm thickness)
- variety of mounting options
- wide range of contact offsets

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.**







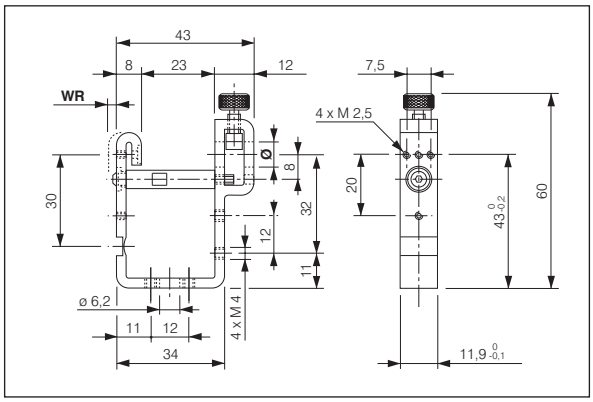
TB - Transmission Basic Device

TB10

Working Range (**WR**) 1.0 mm

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



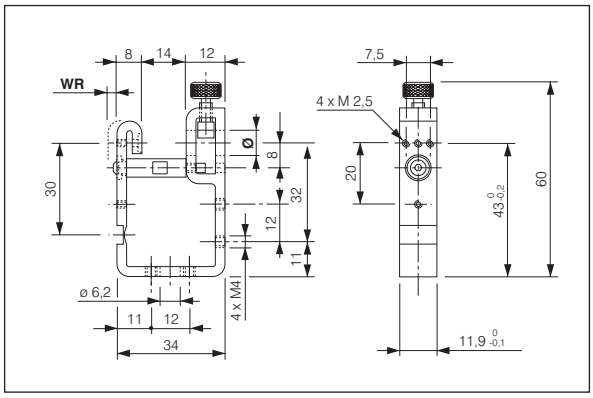


TB10C

Working Range (**WR**) 1.0 mm

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



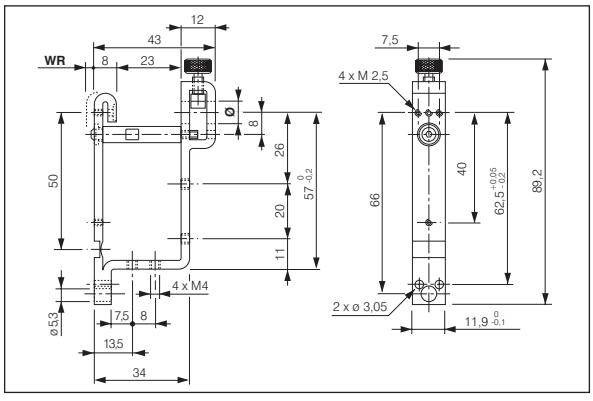


TB16

Working Range (**WR**) 1.6 mm

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



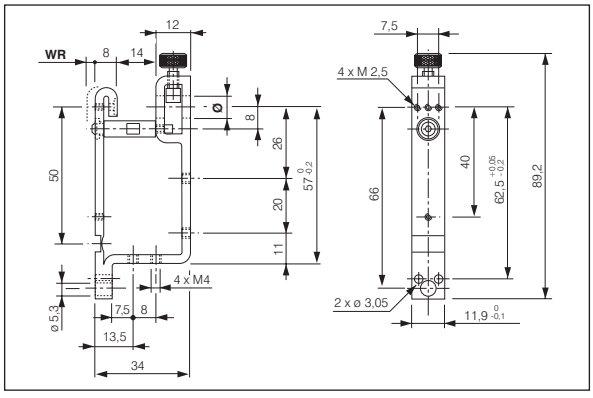


TB16C

Working Range (**WR**) 1.6 mm

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





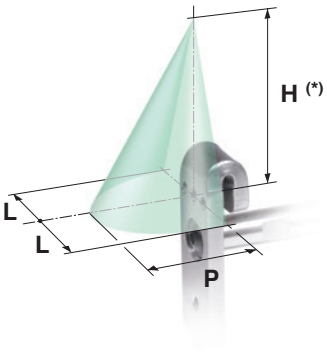
For ø 3/8” models: M2.5 → 4-48 UNF

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

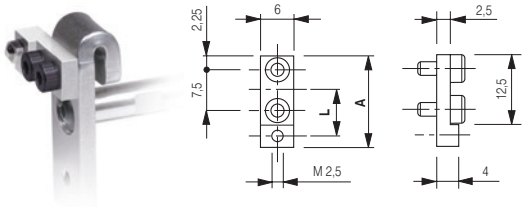
(*) With a vertical off-set the Arm Ratio changes:
mod. TB10 [30 / (30 + h)] mod. TB16 [50 / (50 + h)] with h = 0 ÷ H





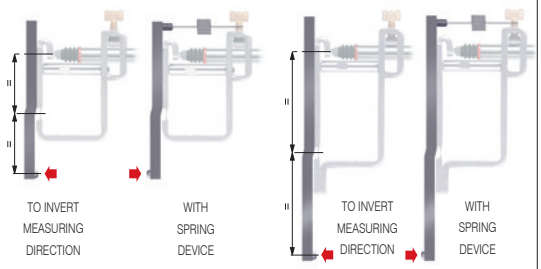
ACCESSORIES

OFF-SET ARMSET (ARM RATIO 1:1)



MODEL		A (mm)	OFF-SET L (mm)	ORDER CODE
TB10	M 2,5	16,5	8,5	2924017150
TB10C		18	10	2924017151
TB16	4-48 UNF	16,5	8,5	2924017152
TB16C		18	10	2924017153

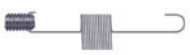
STRAIGHT ARMSET (ARM RATIO 1:1)



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

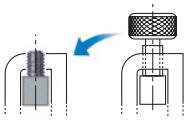
SPRING DEVICE

MODEL	
TB10 - TB16	2027364001
TB10C - TB16C	2027364002



ALTERNATIVE CLAMPING DEVICE
(alternative to standard clamping)

2027364000



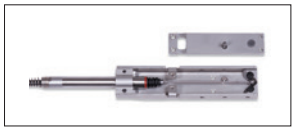
APPLICATION EXAMPLES



TS - TRANSMISSION SHOULDER DEVICE

TS12 - TS21



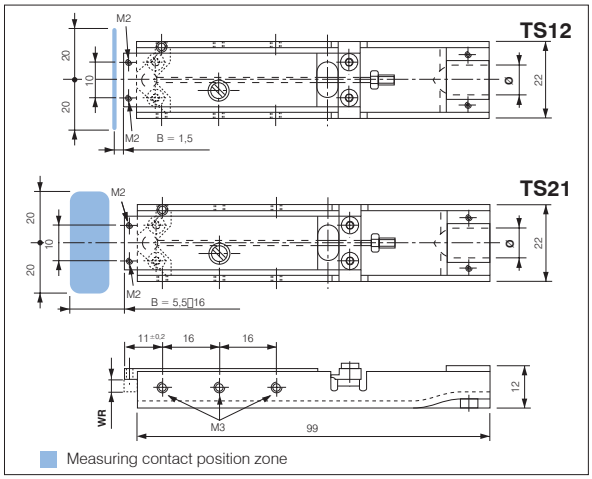


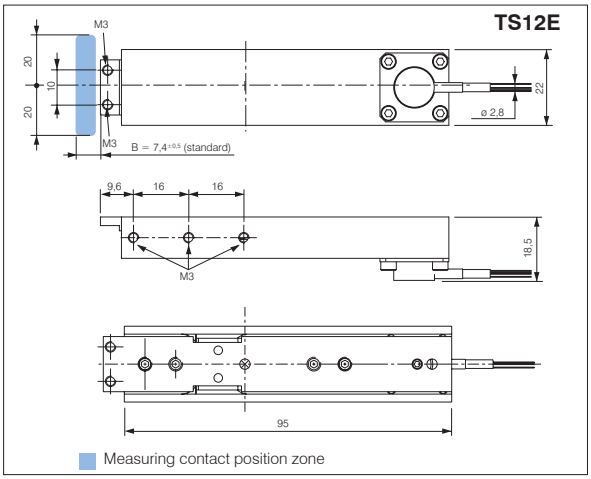


Note: with Red Crown probes featuring ± 0,5 mm range the contact extension must be mounted (with M 2,5 thread code 1024017105 or 1024017106; with 4-48 UNF thread code 1024017115 or 1024017116).

TS12E







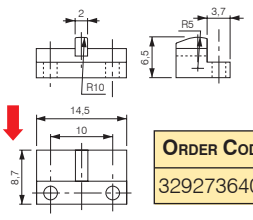
TECHNICAL DATA

WORKING RANGE	mm	1			1,2		1,8 ÷ 2,1	
Arm ratio		1			1		1,5 ÷ 1,75	
Transducer type		LVDT	HBT	HBT TESA	TRANSMISSION ONLY			
Clamping diameter	mm	-			8 mm	3/8 "	8 mm	3/8 "
Max sensitivity error		±0,5%			±2%			
Thermal drift	µm/°C	<0,25			<0,2			
Weight	g	80			80	82	80	82
Operating temperature	°C	-10/65			-10/65			
Repeatability (2,77σ)	µm	<=0,3			<=0,5			
Calibration specs.		(*)	(**)	(***)	-			
Sensitivity	mV/V/mm	230 ± 0,5	73,75 ± 0,5		-			
Protection degree		IP65			-			
Connector		Lumberg SV50/6			-			
ORDER CODE		3427364150	3427364050	3427364100	2927364100	2927364130	2927364101	2927364131

(*) 3,5355V RMS @7,5kHz with load 1MΩ//360pF (**) 3,5355V RMS @7,5kHz with load 2kΩ 0,1% (***) 3V RMS @13kHz with load 2kΩ 0,1%

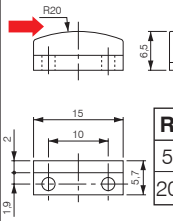
ACCESSORIES

CONTACT FOR **TS12** (AR 1:1)



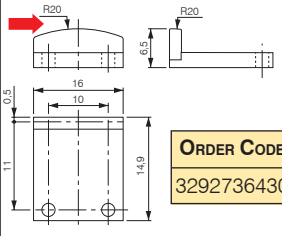
ORDER CODE
3292736401

CONTACT FOR **TS12** (AR 1:1)



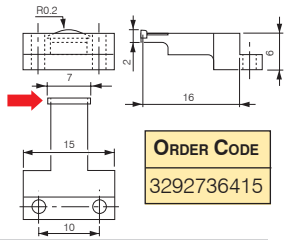
R	ORDER CODE
5	3292736405
20	3292736410

CONTACT FOR **TS12E** (AR 1:1)



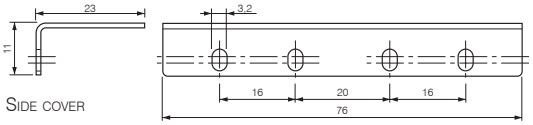
ORDER CODE
3292736430

ARMSET FOR GROOVES FOR **TS21** (AR 1:1.75)



ORDER CODE
3292736415

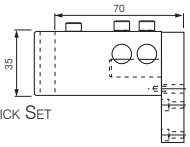
WORKPIECE LOADING DIRECTION



SIDE COVER

ORDER CODE
2927364145

ORDER CODE
2927364150



INTERFACE BLOCK FOR QUICK SET SUPPORT BRACKET

TP - Transmission Parallelogram Device

Working Range (WR) 1.2 mm

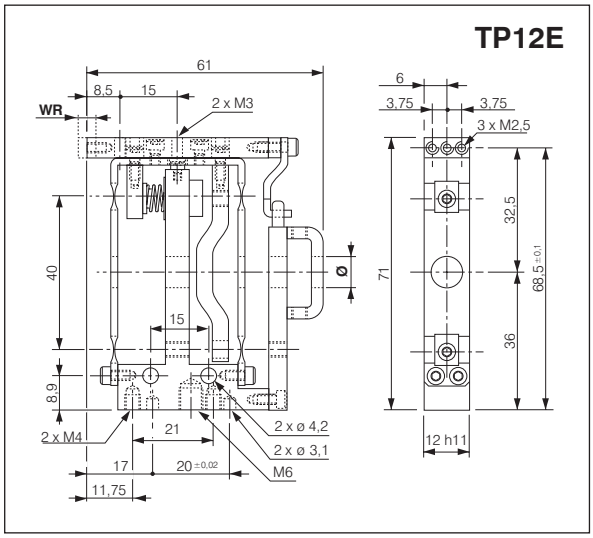
TP12E (external checks)

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





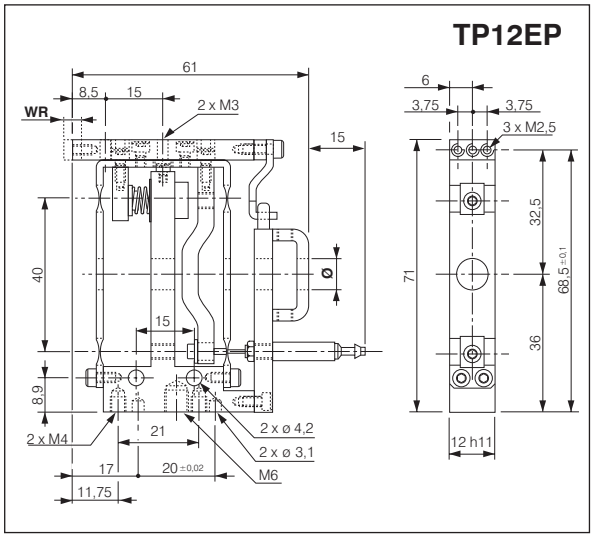
TP12EP
(external checks
with pneumatic retraction)

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

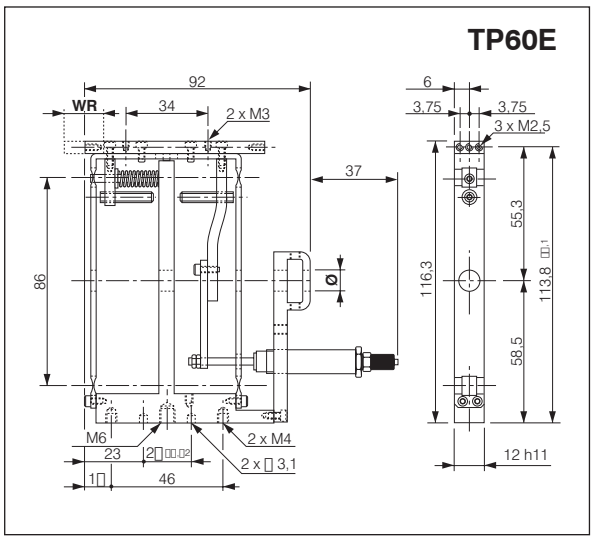




TP60E
(external checks
with pneumatic retraction)

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





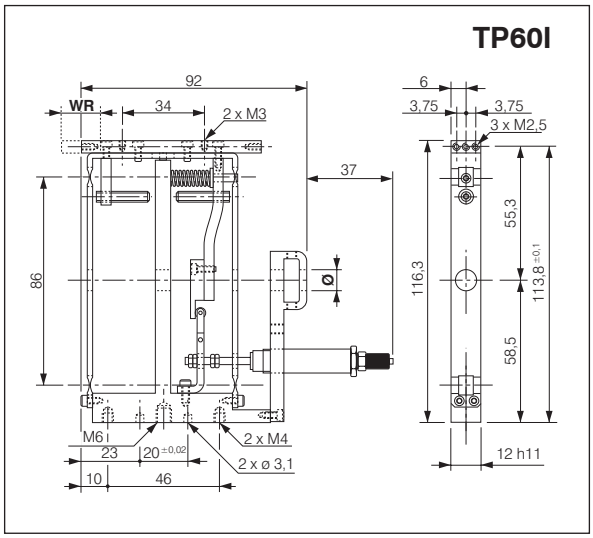
For ø 3/8" models: M2,5 → 4-48 UNF

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

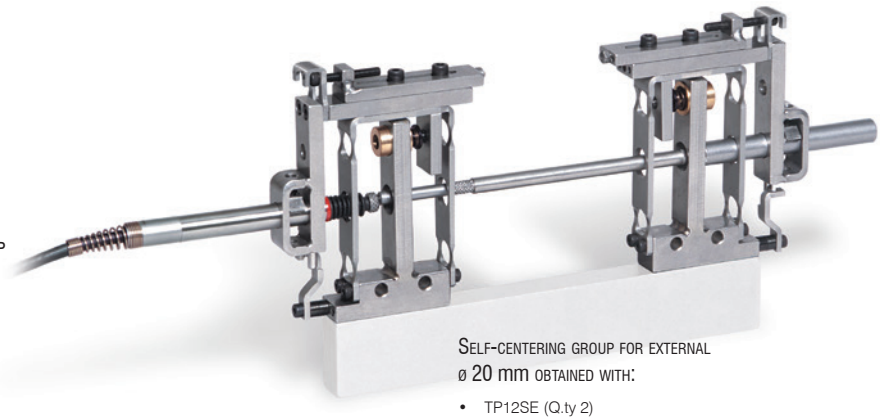
(ELEMENT FOR SELF-CENTERING GROUP FOR EXTERNAL CHECKS)

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

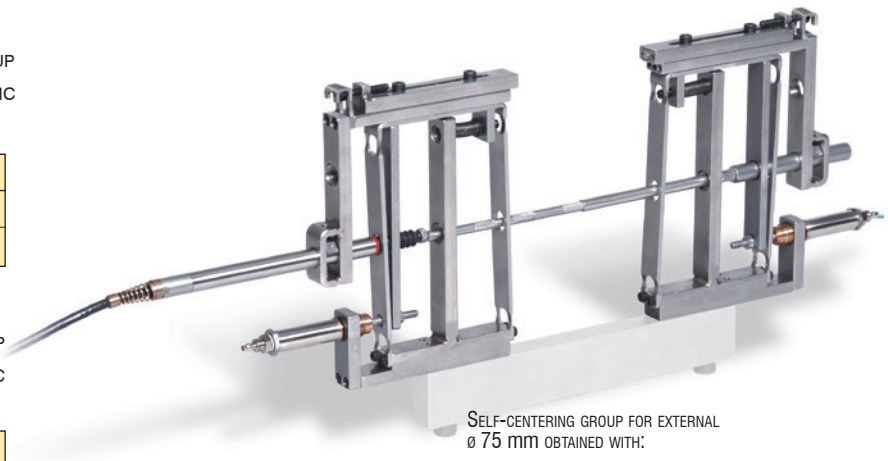
(ELEMENT FOR SELF-CENTERING GROUP FOR EXTERNAL CHECKS WITH PNEUMATIC RETRACTION)

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

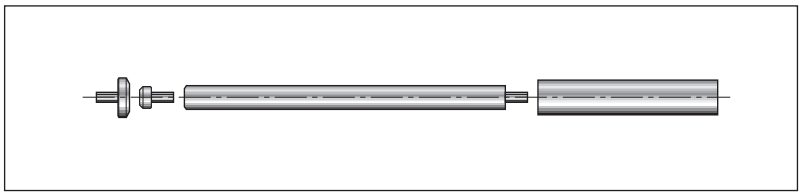


SELF-CENTERING GROUP FOR EXTERNAL ø 75 mm OBTAINED WITH:

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

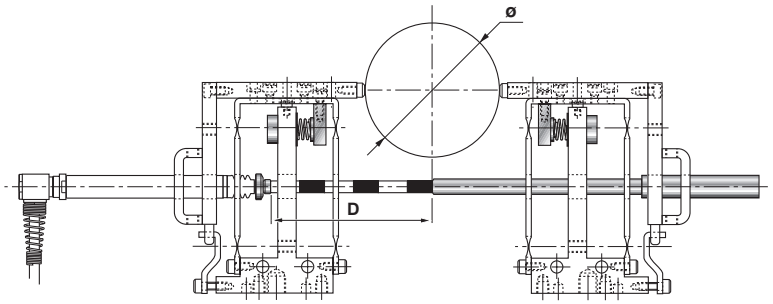
SELF-CENTERING KIT

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



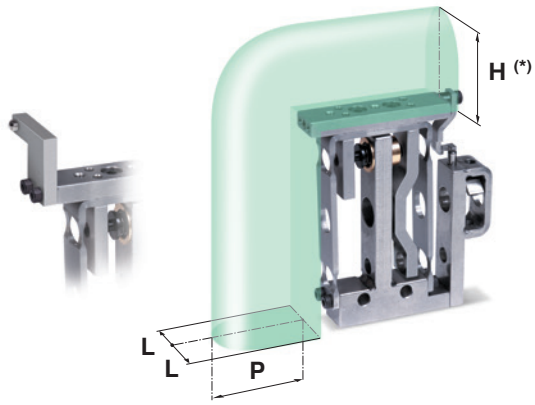
TP12	ø (mm)	0-3	3-8	8-13	13-18	18-23	23-28	28-33	33-38	38-43	43-48	48-53	53-58
	D (mm)	10	15	20	25	30	35	40	45	50	55	60	65
TP60	ø (mm)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-	-
	D (mm)	-	10	20	30	40	50	60	70	80	90		

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

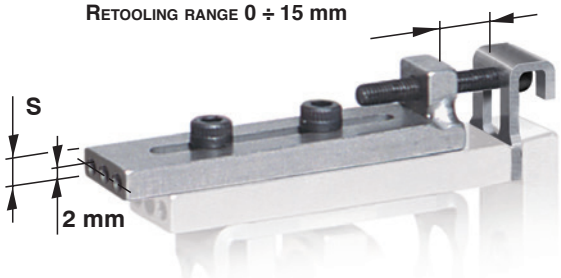
(*) The Arm Ratio is 1:1 for any contact position.



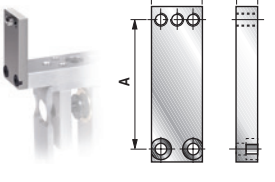
ACCESSORIES

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	(**A** = 30 mm)		3192405120
		4-48 UNF			3192405123
	TP60	M 2.5	(**A** = 60 mm)		3192405140
		4-48 UNF			3192405143
Off-set Armset	M 2,5		(8,5 mm)		2924017150
			(10 mm)		2924017151
	4-48 UNF		(8,5 mm)		2924017152
			(10 mm)		2924017153

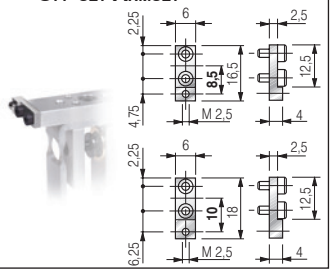
Retooling range 0 ÷ 15 mm

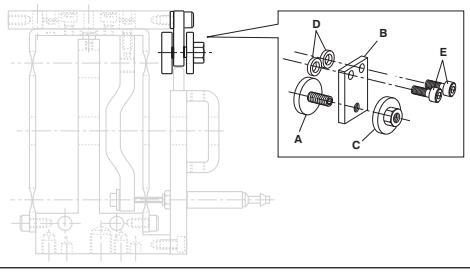


Armset



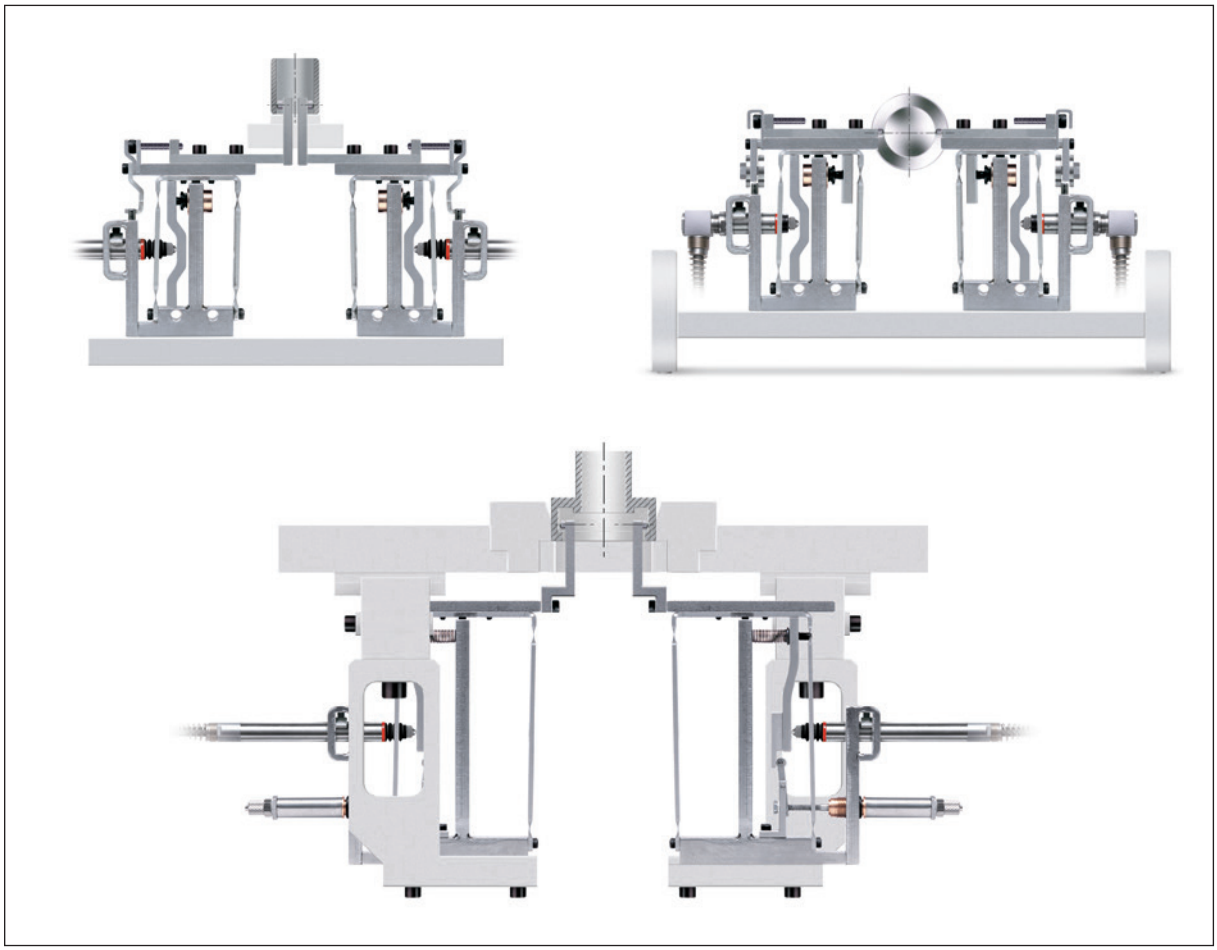
Off-set Armset



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

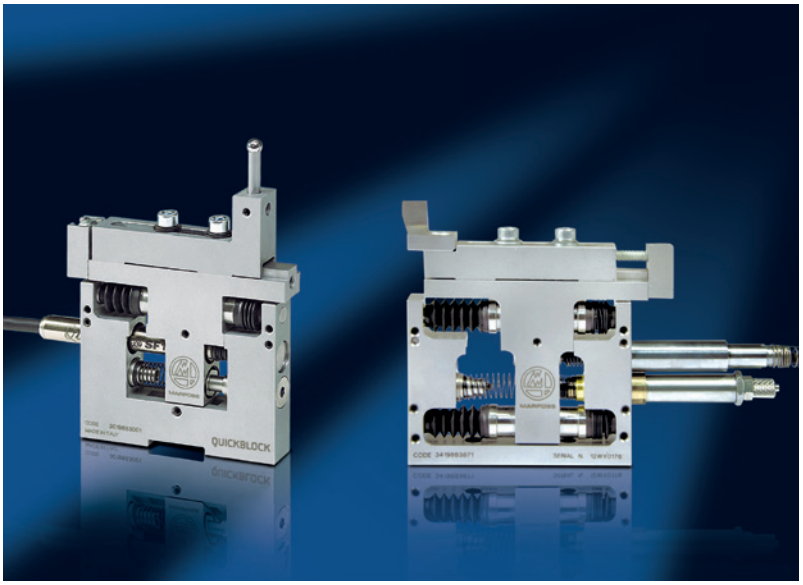


Documentation

Description	Order Code
Support CD Rom - with .DXF drawings collection	CD-020.02

Edition 04/2019 - Specifications are subject to modifications - © Copyright 2019 Marposs S.p.A. (Italy) - All rights reserved

QUICKBLOCK



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

Quick Block is a universal measuring element, equipped with high precision linear guides, for checking internal and external diameters and distances.
The product family has been enhanced with the 10 mm range version to meet the most demanding customers' application requirements.

PRODUCT FEATURES

- The product, IP65 certified, is available in two versions:
  – With built-in full-bridge (LVDT) or half-bridge (HBT) transducer featuring ±1 mm (±0.04") and ±5 mm (±0.2") measuring range, compatible with any third party electronic amplifiers;
  –as simple mechanical transmission featuring ±3 mm (±0.12") and ±5 mm (±0.2") measuring range, to be used with linear probes having clamping diameter 8mm or 3/8", such as Red Crown and Quick Digit.

- The built-in transducer model is also available in digitized version, to be connected to Marposs DigiCrown network, and in USB version for direct connection to electronic display units and industrial/commercial pc.

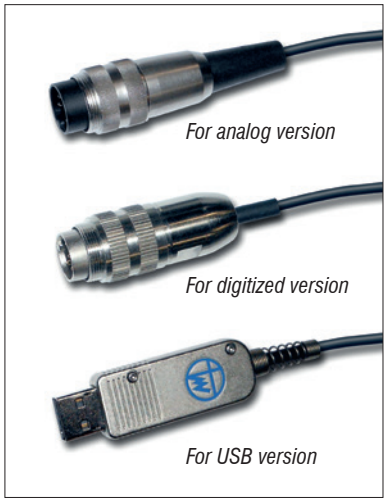
- Each version can be equipped with pneumatic actuation to facilitate part loading/unloading in the measuring station. A wide range of spring, measuring arms and contacts is also available, allowing to reach any measuring position keeping the arm ratio unchanged.

- Its measurement axis can be oriented in any spatial direction, while the contacts support has a retooling range of 20 mm.

- The ±5 mm version features a 5 mm diameter double guide and a ball cage anti-rotation system providing a repeatability range (max-min) lower than 0,5 μm with direct contact. This version can be supplied with axial or radial cable outlet for transducer and pneumatic cylinder.

- Particularly suitable as a Quick Set component for Post-Process applications with robot part loading and unloading. By means of specific interfaces it can be assembled on two different support brackets to measure diameters up to 40 mm and 90mm respectively.

- A special version with dovetail compatible with TESA supports and contacts is also available.



Connectors



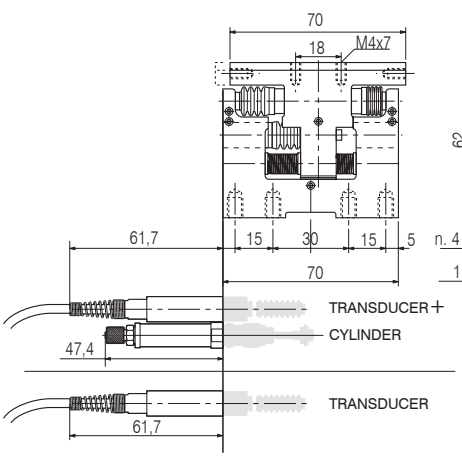
Quick Block used as Quick Set component

TECHNICAL SPECIFICATIONS

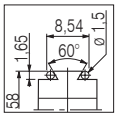
Total stroke	mm	6						10,6															
Measuring range	mm	2						10															
Transducer		**LVDT**		**HBT Std. Marposs**				**LVDT**						**HBT Std. Marposs**									
Pretravel	mm	1,1 ÷ 1,2						5,1 ÷ 5,2															
Contact support fixing system		Square guide				TESA Dovetail		Square guide															
Guiding system		Ball cage						Ball cage															
Antirotation system		Allen screw						Ball cage															
Repeatability	μm	<0,5						<0,5															
Tip Force	N	1 (±20%) with std. spring						1,7 (±20%) with std. spring															
Thermal drift	μm/°C	<0,25						<0,25															
Actuation*		S	PA	S	PA	S	PA	S	PA	PR	S	PA	PR	S	PA	PR	S	PA	PR	S	PA	PR
Cable outlet**		A	A	A	A	A	A	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Operating pressure	bar	3 ÷ 6						3 ÷ 6															
Total weight	g (N)	<260 (<2,548)						<260 (<2,548)															
Mobile parts weight	g (N)	100 (0,98)						110 (1,078)															
Operating temperature	°C	-10/65						-10/+65															
Protection degree	guides	IP65						IP40			IP65			IP40			IP65						
	transducer	IP65						IP65															
Cable lenght	m	2						2															
Connector		Lumberg SV50/6						Lumberg SV50/6															
Sensitivity	mV/V/mm	230		73,75				115			29,5												
Accuracy	μm	±MAX(1+|10·K|;|15·K|)***						±MAX(8+|3·K|;|8·K|)***															
Calibration specs.		3,5V RMS @7,5kHz with load 1MΩ//360pF		3,5V RMS @7,5kHz with load 2KΩ±0,1%				3,5V RMS @7,5kHz with load 1MΩ//360pF			3,5V RMS @7,5kHz with load 2KΩ±0,1%												
Order Code		3419883300	3419883305	3419883350	3419883355	3419883360	3419883365	3419883800	3419883801	3419883805	3419883806	3419883810	3419883811	3419883815	3419883816	3419883850	3419883851	3419883855	3419883856	3419883860	3419883861	3419883865	3419883866

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

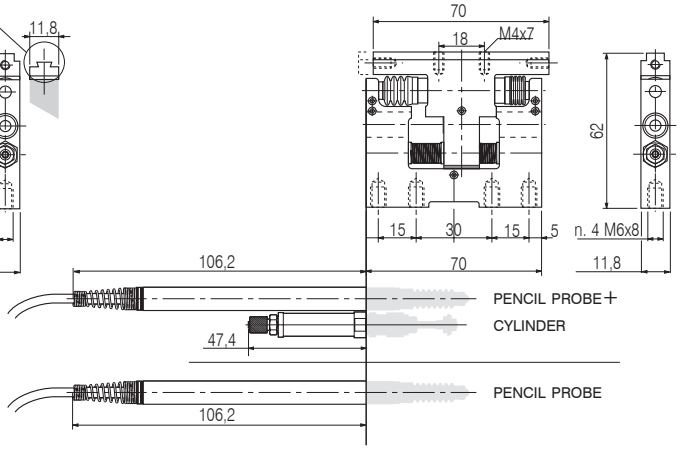
QBH100 - QBF100 Std. Marposs



X= QBH100 WITH STD. TESA DOVETAIL



QB 600

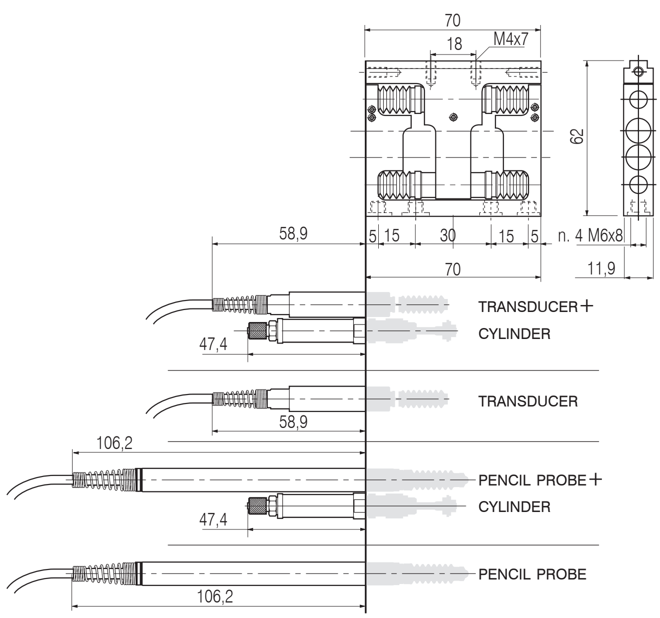


Dimension valid for Red Crown 2, different size according to pencil probe

10,6																								10,6						6	
10																								10						depends on the probe	
HBT Std. TESA								**DIGITIZED**								**USB**								**TRANSMISSION ONLY**							
5,1 ÷ 5,2																								depends on the probe							
Square guide																								Square guide							
Ball cage																								Ball cage							
Ball cage																								Ball cage						Allen screw	
<0,5																								<0,5							
1,7 (±20%) with std. spring																								1,7 (±20%) without pencil probe							
<0,25																								<0,25							
S		PA	PR	S		PA	PR	S		PA	PR	S		PA	PR	S		PA	PR	S		PA	PR	S	PA	PR	S	PA	PR	S	PA
A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R								
3÷6																								3÷6							
<260 (<2,548)																								<260 (<2,548)							
110 (1,078)																								100 (0,98)						95 (0,931)	
-10/+65																								-10/+65							
IP40				IP65				IP40				IP65				IP40				IP65				IP40			IP65			IP65	
IP65																								IP65							
2																								depends on the probe							
Lumberg SV50/6								Lumberg 0332/06								Standard USB								depends on the probe							
29,5								-								-								depends on the probe							
±MAX(8+|3·K|;|8·K|)***								±(1,2+K·2)***								±(1,2+K·2)***								depends on the probe							
3V RMS @13kHz with load 2KΩ±0,1%								-								-								-						-	
3419883900	3419883901	3419883905	3419883906	3419883910	3419883911	3419883915	3419883916	3419883970	3419883971	3419883975	3419883976	3419883980	3419883981	3419883985	3419883986	3419883972	3419883973	3419883977	3419883978	3419883982	3419883983	3419883987	3419883989	3019883711	3019883712	3019883714	3019883721	3019883722	3019883724	3019883001	3019883002

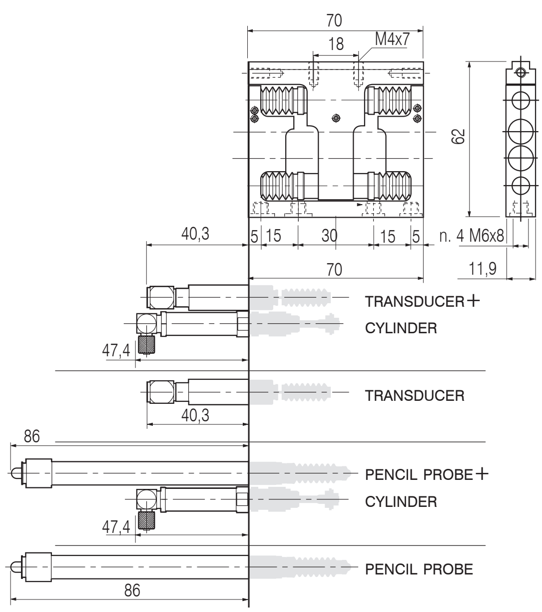
QB1000 • QBH1000 Std. Marposs - QBH1000 Std. Tesa - QBF1000 - DB1000 - UB1000

AXIAL TRANSDUCER/CYLINDER CABLE OUTLET



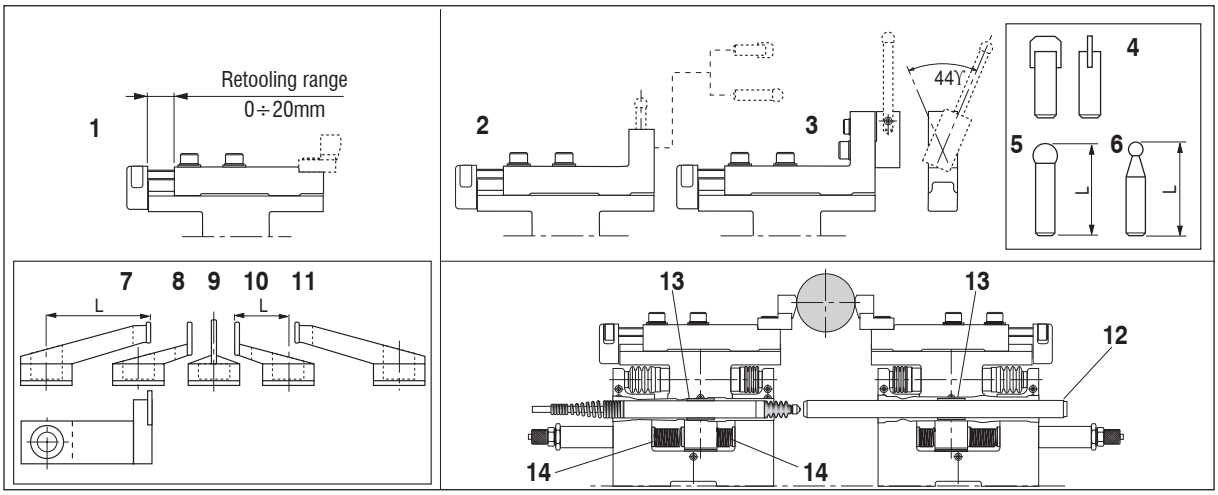
QB1000 • QBH1000 Std. Marposs - QBH1000 Std. Tesa - QBF1000 - DB1000 - UB1000

RADIAL TRANSDUCER/CYLINDER CABLE OUTLET



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

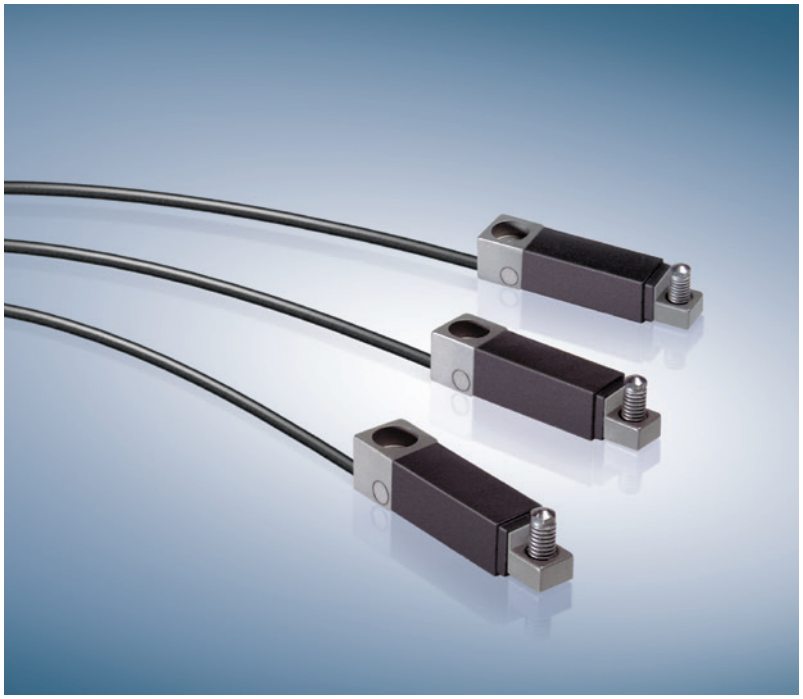
ACCESSORIES



REF.	DESCRIPTION		ORDER CODE
1	Support for off-set cut contact 7, 8, 9, 10, 11 M4 thread [retooling range 0-20 mm (0-,79")]		2019883060
2	Support for simple cut contact 4 or spherical contact 5, 6 [retooling range 0-20 mm (0-,79")]		2019883050
3	Contacts support with side rotation [retooling range 0-20 mm(0-,79")]		2019883550
4	Simple cut contact		3391988325
5	Spherical contact L 20mm, Diameter 5 mm		3391988301
	Spherical contact L 40mm, Diameter 5 mm		3391988302
	Spherical contact L 60mm, Diameter 5 mm		3391988303
6	Spherical contact L 20mm, Diameter 3 mm		3391988310
	Spherical contact L 40mm, Diameter 3 mm		3391988311
	Spherical contact L 60mm, Diameter 3 mm		3391988312
7	Left off-set cut contact L = 24 mm		3391988336
8	Left off-set cut contact L = 12 mm		3391988335
9	Off-set cut contact		3391988330
10	Right off-set cut contact L = 12 mm		3391988337
11	Right off-set cut contact L = 24 mm		3391988338
12	Mechanical reference shaft (external dia. 8 mm, L = 120 mm)		1119883071
13	Adapting bushing for pencil probes diameter 8 mm	*	1019826001
	Adapting bushing for pencil probes dia. 3/8"	*	1019883072
14	Spring 0,6 N (Blue)		1019883035
	Spring 1 N (Inox)		1019883030
	Spring 1,7 N (Black)		1019883034
	Spring 2 N (Green)		1019883031
	Spring 2,6 N (Red)		1019883032
	Spring 4 N (Yellow)		1019883036
Extension cables and user manuals	Extension cable LVDT/HBT L = 2 m		6735932015
	Extension cable LVDT/HBT L = 5 m		6735932016
	Extension cable LVDT/HBT L = 10 m		6735932017
	User manual QBF/QBH100	**	D4340013X1
	User manual QB600	**	D4340014X1
	User manual QBF/QBH/DB/UB/Q1000	**	D4340064XF
Quick Set	Support bracket L = 200 mm for diameters up to 40 mm, with interface for two Quick Block		3024017100
	Support bracket L = 250 mm for diameters up to 90 mm (without interface for Quick Block)		3024018100
	Mounting interface for one Quick Block for support bracket L = 250 mm		2924018110

* To be always used with QB600 and QB1000, to fix the pencil probe or the mechanical reference shaft
** X = I (Italian); U (English); D (German); F (French); E (Spanish)

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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.

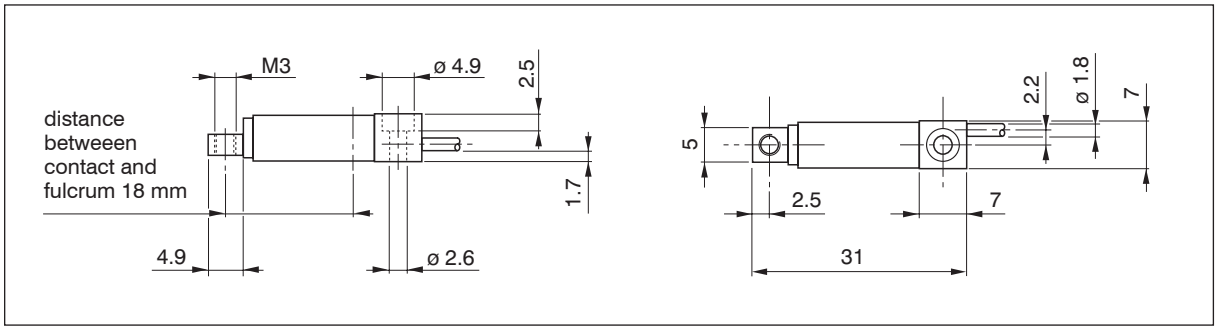
2. Despite these small dimensions A124 is provided with a replaceable contact, a feature normally available only in larger measuring devices. Therefore contact replacement would no longer require disassembly of the complete measuring cell resulting in time and cost savings. This design allows also use 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

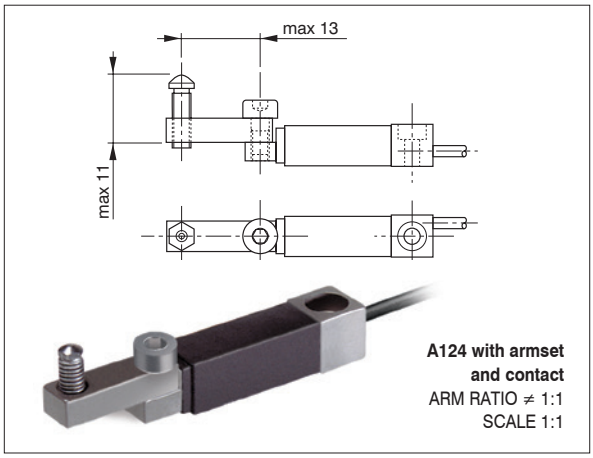
Type of transducer	LVDT compatible with TESTAR / MARPOSS amplifiers
Calibration frequency	7,5 KHz
Calibrated at	3,5 V RMS with load 1 MOhm/360 pF
Max. current	5 mA / V
I/O phase shift	≤ 8°
Sensitivity	230 mV/V/mm ±1%
Order Code	3419886153

Half-bridge (HBT) electrical specifications

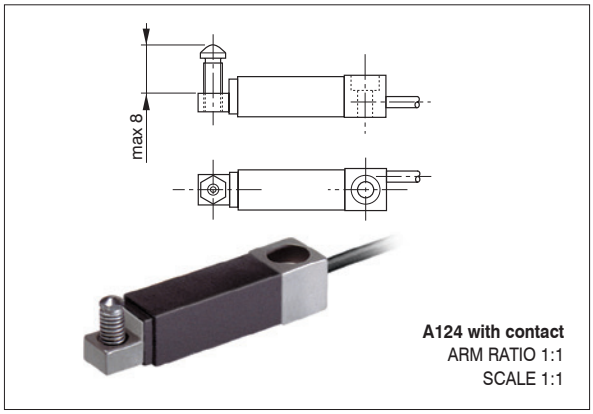
Type of transducer	HBT compatible with TESTAR / MARPOSS amplifiers
Calibration frequency	7,5 KHz
Calibrated at	3,5 V RMS with load 2 KOhm ±0,1%
Max. current	4 mA / V
I/O phase shift	≤ 10°
Sensitivity	73,75 mV/V/mm ±1%
Order Code	3419886154

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

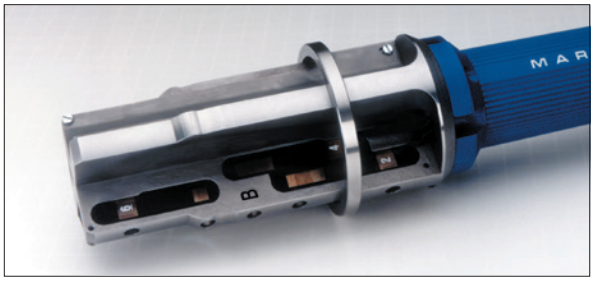
Type of transducer	HBT compatible with amplifiers of TESA
Calibration frequency	13 KHz
Calibrated at	3 V RMS with load 2 KOhm ±0,1%
Max. current	2,5 mA / V
I/O phase shift	≤ 8°
Sensitivity	73,75 mV/V/mm ±1%
Order Code	3419886155



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

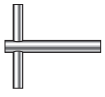
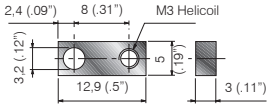


A124 with contact
ARM RATIO 1:1
SCALE 1:1



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

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...a wide range of measuring components with built-in direct USB connection, to combine high accuracy with immediate and intuitive ease of use...

The Marposs USB line includes pencil probes, transmissions and interfaces for encoders and I/O signals, for direct connection to electronic display units and industrial or commercial computers via standard virtual COM port. The high level of accuracy is guaranteed at factory level, by compensating the linearity and the sensitivity of each single unit. Individual certificates are provided to ensure complete traceability of the units.

THE PRODUCTS

Red Crown2 USB: the full range of Red Crown 2 pencil probes models are available with integrated USB connector.

Quick Block USB: the Quick Block models with built-in transducers are available in digitized version with USB connector.

USB Interfaces include 3 devices:

- U1-E The versatile and multi-function encoder interface
- U2-I/O Able to drive industrial digital I/O
- U1-FS Traditional switch that makes it easy to acquire measurement following a manual input.

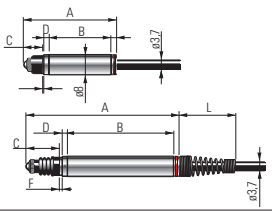
All of these devices can be interfaced to HOST with Windows or Linux operative system and managed as standard virtual COM port.

MAIN FEATURES

- PLUG&PLAY 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.

RED CROWN 2 USB

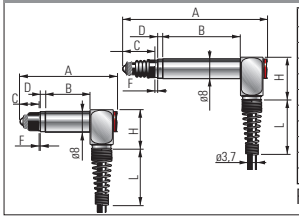
STANDARD - AXIAL - SPRING



	±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

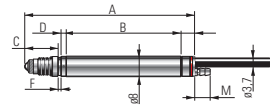


	±05	±1	±2LR	±2,5	±5	±10
A	37,50	57,78	107,85	84,85	115,95	163,95
B	17,20	31,20	88,58	54,10	79,65	112,50
C	7,10	12,80	25,30	16,75	22,30	39,45
D	2,00	2,00	2,00	2,00	2,00	-
E	1,50	-	-	-	-	-
F	0,70	1,30	1,50	1,50	1,50	-
G	-	-	-	-	-	-
H	15,20	-	15,20	15,20	15,20	15,20
L	-	-	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

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
Movement (*)		S		S		PP		V		S		PP		V	
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 thread		M2,5		M2,5						M2,5					
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)						-					

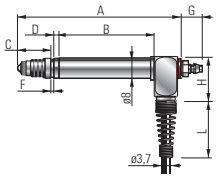
STANDARD - AXIAL - PNEUMATIC PUSH



	±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	-	7,50	7,50	7,50	7,50	7,50
H	-	15,20	15,20	15,20	15,20	15,20
L	-	22,00	22,00	22,00	22,00	22,00
M	-	-	-	-	-	-

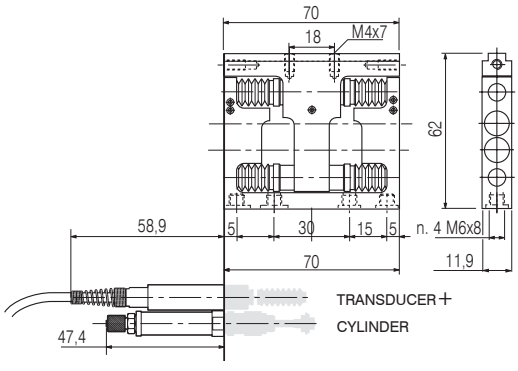
F= Max. pretravel adj. value

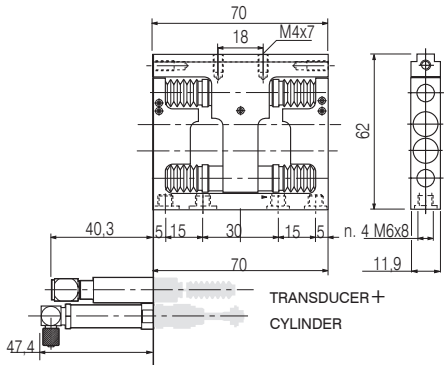
MECHANICAL SPECIFICATIONS		±2,5 mm						±5 mm						±10 mm					
Cable (**A**=axial - **R**=radial)		A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R
Movement (*)		S		PP		V		S		PP		V		S		PP		V	
Measuring range	(mm)	5						10						20					
Mechanical travel	(mm)	6,6						11						21					
Body Ø	(mm)	8						8						8					
Spring strenght	(N/mm±15%)	0,023		0,03		0,02		0,03		0,02		0,02		-		-		-	
Measuring force	(N±25%)	0,70		0,7 ÷ 2,3		0,70		0,70		0,7 ÷ 2,4		0,70		0,70		0,7 ÷ 2,4		0,70	
PP pressure	bar			0,5 ÷ 1						0,5 ÷ 1						0,5 ÷ 1			
	psi			7,5 ÷ 14,5						7,5 ÷ 14,5						7,5 ÷ 14,5			
Vacuum retract pressure	bar					≤0,6						≤0,6						≤0,6	
	psi					≤0,9						≤0,9						≤0,9	
Cable length	(m)	2						2						2					
Gasket		Fluoroelastometer						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 thread		M2,5						M2,5						M2,5					
RED CROWN 2 USB																			
TRADE NAME		U25	UR25	UPA25	UP25	UVA25	UV25	U50	UR50	UPA50	UP50	UVA50	UV50	U100	UR100	UPA100	UP100	UVA100	UV100
ORDER CODE		3PR05Y0000	3PR05Y1200	3PR05Y0400	3PR05Y1600	3PR05Y0560	3PR05Y1760	3PR10Y0000	3PR10Y1200	3PR10Y0400	3PR10Y1600	3PR10Y0560	3PR10Y1760	-	-	-	-	-	-
Accuracy error**	(µm)	±(0,6+K*2)						±(0,6+K*2)						±(1,2+K*2)					

* Movement S= spring - PP= pneumatic push - V= vacuum - **K= Reading (mm)

QUICK BLOCK USB

Total stroke	mm	10,6							
Measuring range	mm	10							
Transducer		**USB**							
Pretravel	mm	5,1 ÷ 5,2							
Contact support fixing system		Square guide							
Guiding system		Ball cage							
Antirotation system		Ball cage							
Repeatability	μm	<0,5							
Tip Force	N	1,7 (±20%) with std. spring							
Thermal drift	μm/°C	<0,25							
Actuation*		S		PA	PR	S		PA	PR
Cable outlet**		A	R	A	R	A	R	A	R
Operating pressure	bar	3÷6							
Total weight	g (N)	<260 (<2,548)							
Mobile parts weight	g (N)	110 (1,078)							
Operating temperature	°C	-10/+65							
Protection degree	guides	IP40				IP65			
	transducer	IP65							
Cable lenght	m	2							
Connector		Standard USB							
Sensitivity	mV/V/mm	-							
Accuracy	μm	±(1,2+K·2)***							
Calibration specs.		-							
Code number		3419883972	3419883973	3419883977	3419883778	3419883982	3419883983	3419883987	3419883989





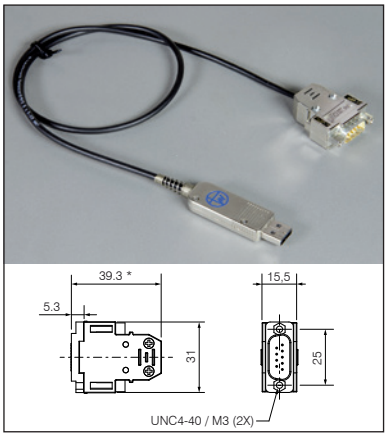
REF.	DESCRIPTION		ORDER CODE
1	Support for off-set cut contact 7, 8, 9, 10, 11 M4 thread [retooling range 0-20 mm (0-,79")]		2019883060
2	Support for simple cut contact 4 or spherical contact 5, 6 [retooling range 0-20 mm (0-,79")]		2019883050
3	Contacts support with side rotation [retooling range 0-20 mm(0-,79")]		2019883550
4	Simple cut contact		3391988325
5	Spherical contact L 20mm, Diameter 5 mm		3391988301
	Spherical contact L 40mm, Diameter 5 mm		3391988302
	Spherical contact L 60mm, Diameter 5 mm		3391988303
6	Spherical contact L 20mm, Diameter 3 mm		3391988310
	Spherical contact L 40mm, Diameter 3 mm		3391988311
	Spherical contact L 60mm, Diameter 3 mm		3391988312
7	Left off-set cut contact L = 24 mm		3391988336
8	Left off-set cut contact L = 12 mm		3391988335
9	Off-set cut contact		3391988330
10	Right off-set cut contact L = 12 mm		3391988337
11	Right off-set cut contact L = 24 mm		3391988338
12	Mechanical reference shaft (external dia. 8 mm, L = 120 mm)		1119883071
13	Adapting bushing for pencil probes diameter 8 mm	*	1019826001
	Adapting bushing for pencil probes dia. 3/8"	*	1019883072
14	Spring 0,6 N (Blue)		1019883035
	Spring 1 N (Inox)		1019883030
	Spring 1,7 N (Black)		1019883034
	Spring 2 N (Green)		1019883031
	Spring 2,6 N (Red)		1019883032
	Spring 4 N (Yellow)		1019883036
Extension cables and user manuals	Extension cable LVDT/HBT L = 2 m		6735932015
	Extension cable LVDT/HBT L = 5 m		6735932016
	Extension cable LVDT/HBT L = 10 m		6735932017
	User manual QBF/QBH100	**	D4340013X1
	User manual QB600	**	D4340014X1
	User manual QBF/QBH/DB/UB/Q1000	**	D4340064XF
Quick Set	Support bracket L = 200 mm for diameters up to 40 mm, with interface for two Quick Block		3024017100
	Support bracket L = 250 mm for diameters up to 90 mm (without interface for Quick Block)		3024018100
	Mounting interface for one Quick Block for support bracket L = 250 mm		2924018110

* To be always used with QB600 and QB1000, to fix the pencil probe or the mechanical reference shaft
** X = I (Italian); U (English); D (German); F (French); E (Spanish)

USB INTERFACES

U1-E *Encoder Interface*

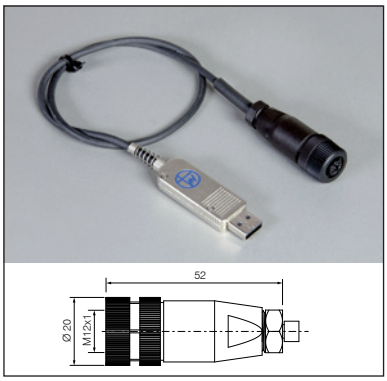
ORDER CODE	687126E000
USB CONNECTOR	TYPE 'A'
ENCODER CONNECTOR	MALE 9 POLES SUB D CONNECTOR
PROTECTION DEGREE	IP40
CURRENT ABSORPTION	< 500 mA < 2.5 mA IN SUSPEND MODE
USB INTERFACE	USB 2.0
POWER SUPPLY USB FACE	4,40 ÷ 5,25 Vdc FROM USB BUS
POWER SUPPLY ENCODER	5V FROM USB BUS WITH 400mA MAX AVAILABLE FOR THE ENCODER
RESOLUTION	DEPENDING ON CONNECTED DEVICE
BAND WIDTH	300KHz ANALOG ENCODER 4MHz DIGITAL ENCODER
INPUT	DIFFERENTIAL (A+, A-, B+, B-, Z+, Z-)
INPUT TYPE	RS422 (TTL) / INCREMENTAL SIGNAL 1Vpp ANALOG SIGNAL / 11µA WITH MARPOSS ADAPTER 6303540800
CABLE LENGTH	50cm / 20 inches*
STORAGE TEMPERATURE	-20°C / +70°C
OPERATIVE TEMPERATURE	0°C / +60°C



U1-E Encoder interface
* consider extra 40mm for cable exit and bending

U2-I/O *Input/Output Interface*

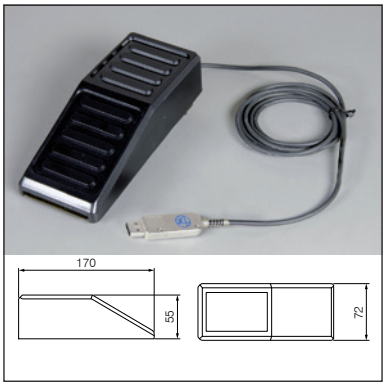
ORDER CODE	687126I000
USB CONNECTOR	TYPE 'A'
I/O CONNECTOR	M12 TYPE, FEMALE STRAIGHT CONNECTOR
PROTECTION DEGREE	IP40
CURRENT ABSORPTION	< 100 mA (MAX) < 500 µA (MAX, IN SUSPEND MODE)
USB INTERFACE	USB 2.0
POWER SUPPLY USB FACE	4,40 ÷ 5,25 Vdc FROM USB BUS
POWER SUPPLY I/O FACE (ISOLATED)	24 V NOMINAL VOLTAGE
CABLE LENGTH	50cm / 20 inches*
STORAGE TEMPERATURE	-20°C / +70°C
OPERATIVE TEMPERATURE	-10°C / +40°C



U2-I/O I/O interface
* consider extra 40mm for cable exit and bending

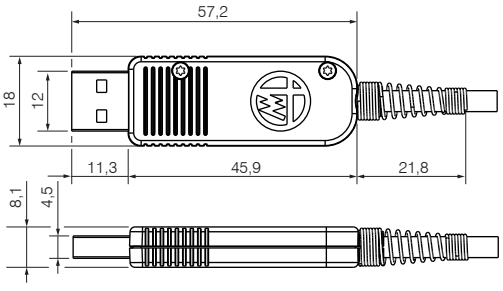
U1-FS *Footswitch Interface*

ORDER CODE	687126F000
USB CONNECTOR	TYPE 'A'
PROTECTION DEGREE	IP40
CURRENT ABSORPTION	< 100 mA (MAX) < 500 µA (MAX, IN SUSPEND MODE)
USB INTERFACE	USB 2.0
POWER SUPPLY USB FACE	4,40 ÷ 5,25 Vdc FROM USB BUS
CABLE LENGTH	3 m / 9 FEET
STORAGE TEMPERATURE	-20°C / +70°C
OPERATIVE TEMPERATURE	-10°C / +40°C



U1-FS Footswitch interface

USB connector



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...contactless gauging...

OptoCrown™ is an optical sensor, based on light reflection technology, for non-contact linear measurements. It uses fiber optics to transmit infrared light and receive the light reflected by the part to be measured.
The sensor, designed for standard ø=8 mm mounting, includes:
- a metallic body housing fiber optics
- a 1,5m long fiber optics cable
- an electronic interface box for direct connection to a DigiCrown™ network.

PRODUCT FEATURES

OPERATING PRINCIPLE: LIGHT REFLECTION

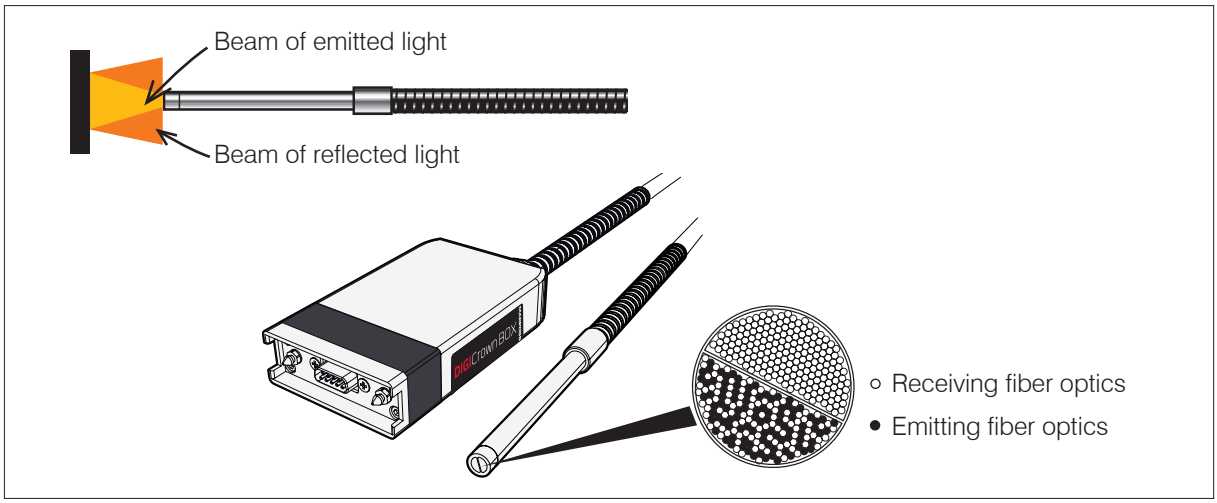
The sensor transmits a beam of light to the part through a fiber optics bundle and receives the light reflected back from the part through two separate fiber optics bundles, connected to two independent receivers.The distance between part surface and sensor is determined by the intensity of the reflected light.

CALIBRATION

With a specific calibration the sensor can work on almost any material.
Marposs can provide sensors already calibrated on the customer's material.

REFLECTANCE COMPENSATION

Thanks to the fiber optics layout, the sensor provides measurement values that are insensitive to variations in the reflectivity of the part surface.



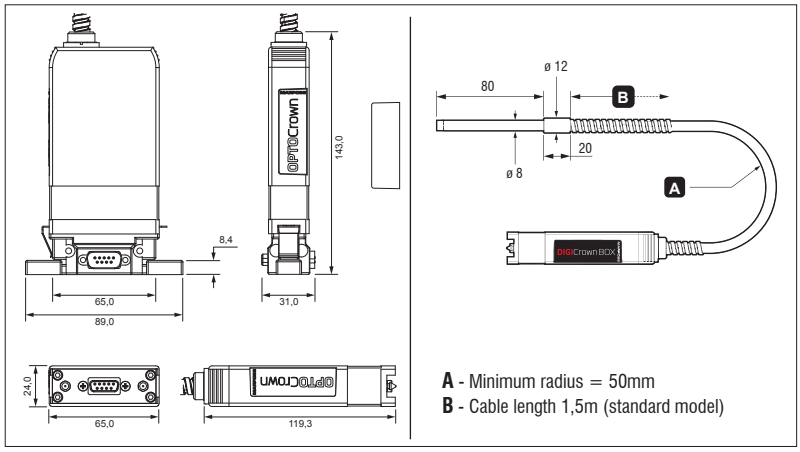
TECHNICAL SPECIFICATIONS

OptoCrown™ SENSOR SPECIFICATIONS (CODE 3PF0110000)	
Measuring range	10 mm
Standoff (central point of the measuring range)	6 mm
Resolution	1 μm
Repeatability (*) (**)	< 3 μm
Accuracy (**)	< 0,1% FS0
Protection rating	IP67 (tip) / IP43 (electronics)
Working temperature	0 - 100 °C (tip) / 0 - 50 °C (electronics)
Storage temperature	-20 - 70°C
Power supply voltage	+7,5 Vdc (-10% +30%)
Current absorption	190 mA
Warm-up time	5'
Ambient light compensation	Yes
Reflectance compensation	Yes
Calibration on material	Requested (each sensor can store up to 16 different calibrations)
Integration with Marposs data acquisition system	DigiCrown™
Integration with Marposs software	Quick SPC™, SDK™, Drivers Library™, Protocol Commands, Merlin™, Merlin Plus™

(*) 4σ
(**) These values are obtained under stable temperature conditions, measuring a flat, smooth and highly reflective surface, after calibration on it, and the sensor positioned perpendicular to this surface.

AMBIENT LIGHT COMPENSATION
With the optional ambient light compensation function, the sensor is not affected by variations in ambient light conditions.

APPLICATIONS
Non-contact measurement of substantially flat surfaces, such as glass, rubber and soft materials, that would be deformed or damaged using contact type sensors.



A - Minimum radius = 50mm
B - Cable length 1,5m (standard model)

HOW TO ORDER

DESCRIPTION	REFLECTANCE COMPENSATION	AMBIENT LIGHT COMPENSATION	ORDER CODE
Opto Crown with Digi Crown Interface	YES	YES	3PF0110000
	YES	NO	3PF0120000
	NO	YES	3PF0130000
	NO	NO	3PF0140000

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M1STAR MBG



MECHANICAL BORE GAGE

The M1 Star™ MBG (Mechanical Bore Gauge) is the ideal manual instrument for precision measuring of inside diameter, ovality and cylindricity.
It can be totally retooled or repaired by simply replacing the nosepiece and contacts.
A mechanical positioning system automatically ensures alignment between the nosepiece and the contacts.
The Mechanical Bore Gauge is accurate, robust, reliable and easy to use.
Maintenance free construction requires only periodic cleaning of the precision mechanism.
A wide range of modular components makes it possible to configure the bore gauge to meet all your measuring needs.

MAIN CHARACTERISTICS

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

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								

(*) BY UNSCREWING THE CONTACTS FASTENED TO THE MEASURING ARMSET BY MEANS OF A SCREW WITH HELI-COIL, THE MEASURING RANGES CAN BE EXTENDED UP TO THE VALUES INDICATED IN THE TABLE.

M1 STAR - MBG MECHANICAL BORE GAUGE

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

1 **PLUG HEAD**: formed by the nosepiece, the measuring armset and the contacts, it is the measuring element of the bore gauge. It can be interchanged by simply unscrewing it from the handle. The MBG plug head is available in four versions differing from each other in "C" distance between the contact axis and the top of the nosepiece.
See pages 4-7.

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

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

1c **MEASURING CONTACTS**: standard contacts are made of tungsten carbide and, in relation to the diameter range, come in two different radii that must be chosen on the basis of the bore surface roughness:
R1: standard radius for Ra ≤ 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.

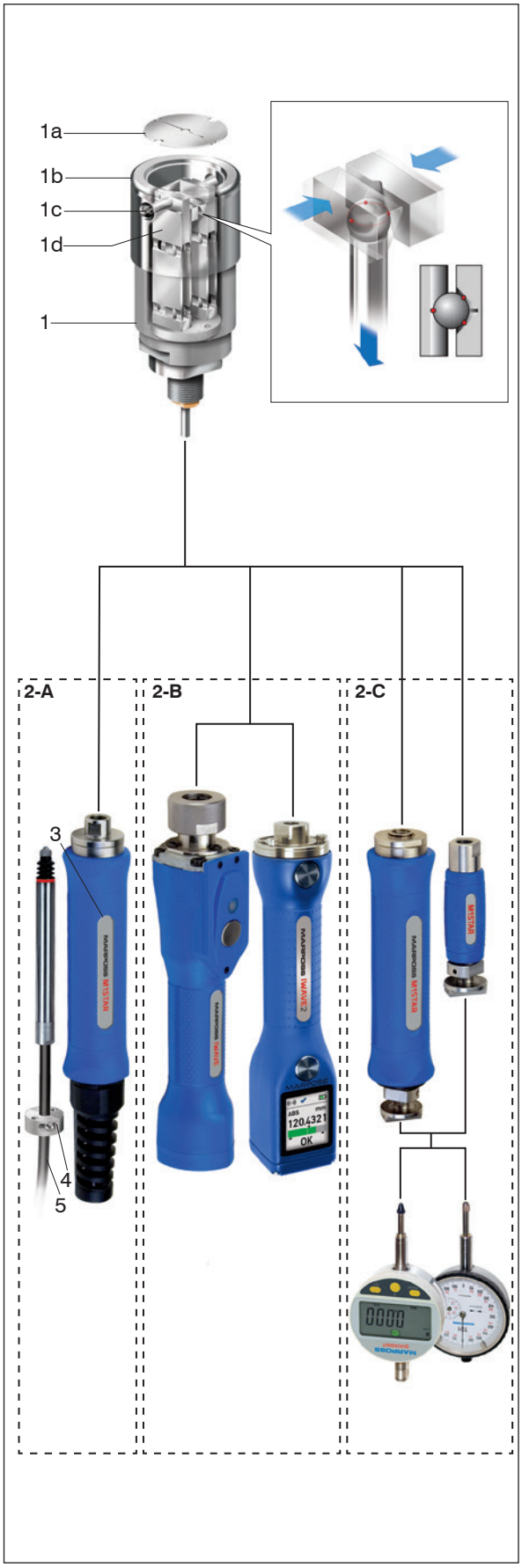
1d **MEASURING ARMSET**: it is made by either 2 or 4 fulcrum elements, depending on the diameter range. The measurement is transferred to the display device by a transfer rod with spherical head that slides on a cradle formed by a V-shaped guide and an inclinated plane.

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 a wireless transmission handle as I-Wave2, with color display and automatic orientation, or I-Wave (2B), or an indicator holder (for digital or dial indicators - 2-C). The latter can be selected in a suitable size: standard or mini.

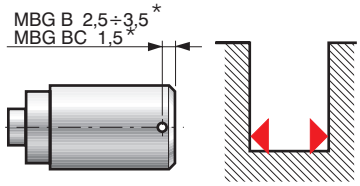
3 **NUMBER PLATE**: it can be marked with the bore gauge size or any other information required by the customer.

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.

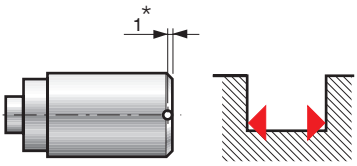
5 **CABLE**: it is a special reinforced cable (ø 4,7 mm) specifically developed for use in manual gauges, which considerably reduces the risk of damage and unintended torsion.



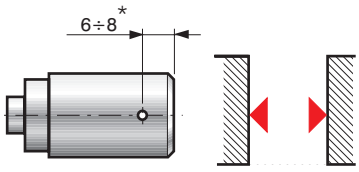
M1 STAR - Standard Versions



MBG-B/BC Plug Heads
For blind bores.



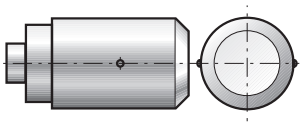
MBG-SB Plug Heads
For superblind bores.



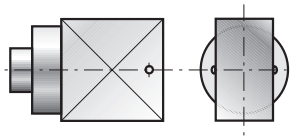
MBG-T Plug Heads
For through bores.

M1 STAR - Dedicated Solutions (Examples)

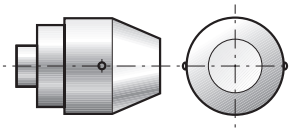
Dedicated Solutions complete the standard product line, and provide solutions for measuring conditions outside the capabilities of Standard Bore Gauges. A wide range of special measuring solutions are available, for your applications, with our series of dedicated plug-heads (on request). Please enclose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



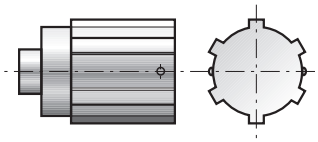
WITH LONG NOSEPIECE
Guides the plug head when measuring discontinuous/interrupted deep bores.
Example: cylinder block.



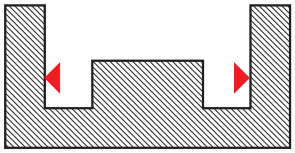
FOR PARALLEL WALLED BORES
To be used for gap measurements.
Example: keyways or splines



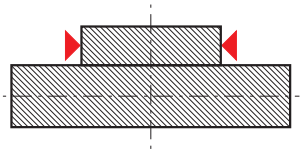
WITH PILOT CONE
For CNC automatic applications the cone helps the entry of the nosepiece into the workpiece, reducing the possibility of accidental damages.



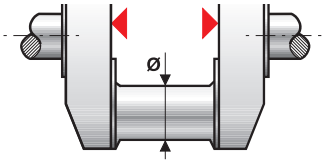
WITH CARBIDE BAR INSERTS
The carbide bars will increase the life of the gauge, reducing the wear on the nosepiece and preventing jamming caused by the presence of metal cinders swarf or debris.



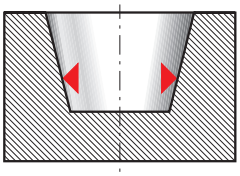
BORES WITH CENTRAL HUB
For the measuring of internal diameters where there is a central hub projection.
Example: automatic transmission components.



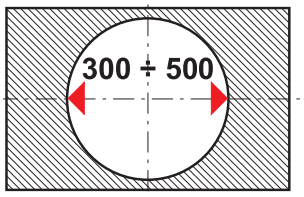
OUTSIDE DIAMETER
For the measuring of the ending section of flywheel shafts, or the short outside diameters often found on transmission & pump components and end caps on electric motors etc.



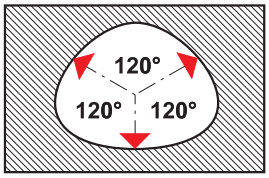
"V"-SHAPED PLUG HEAD
Designed for the measurement of straight sided gaps in crankshafts or similar components.



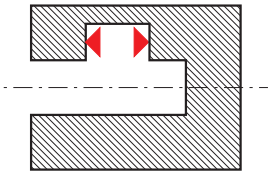
CONE SHAPED PLUG HEAD
For tapered bores.
Example: front or rear knuckles.



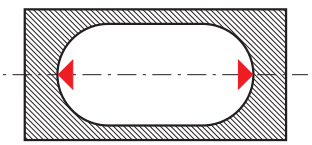
MACRO-LITE
Particularly light and easy to be used for diameters up to 500 mm.
Example: large pipes, oil & gas industries.



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

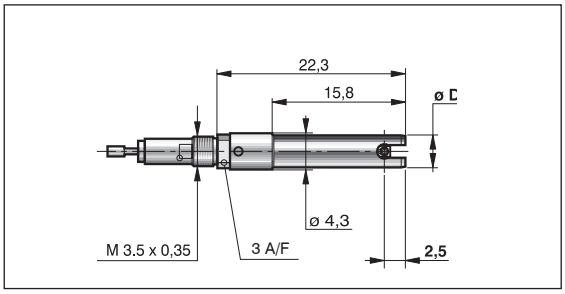
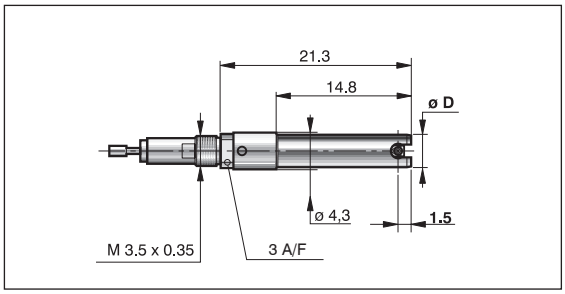
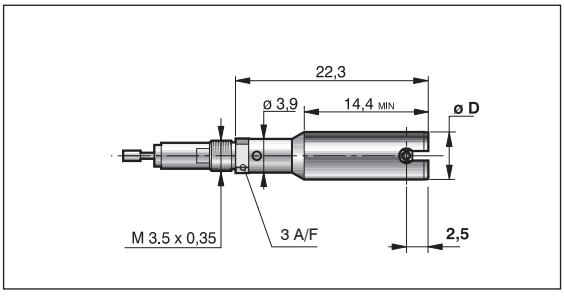
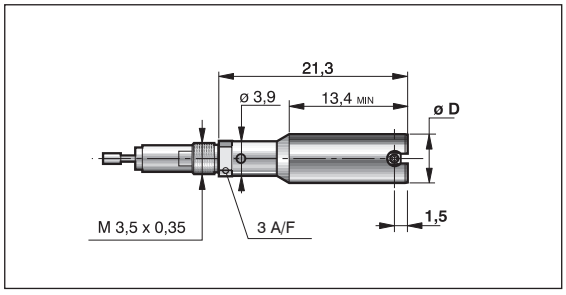
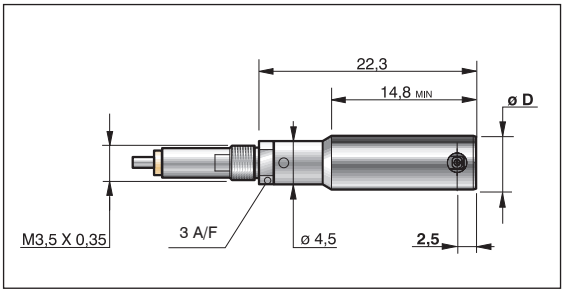
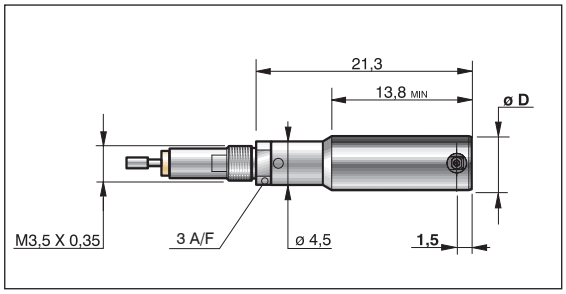
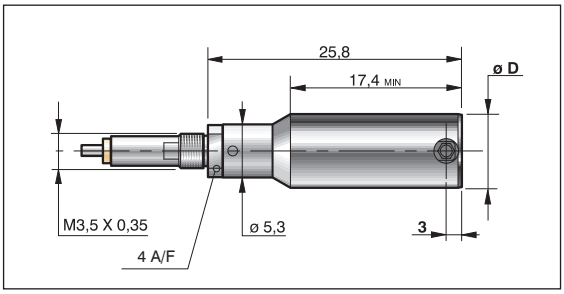
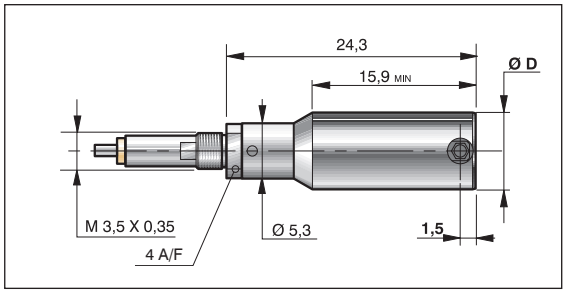
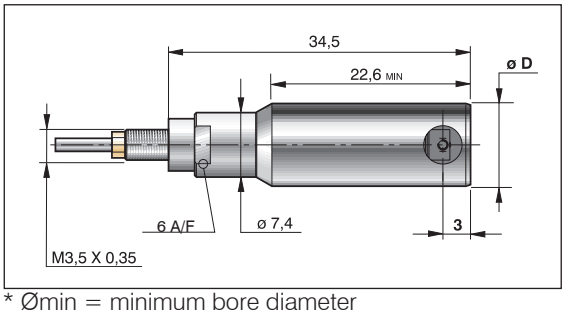
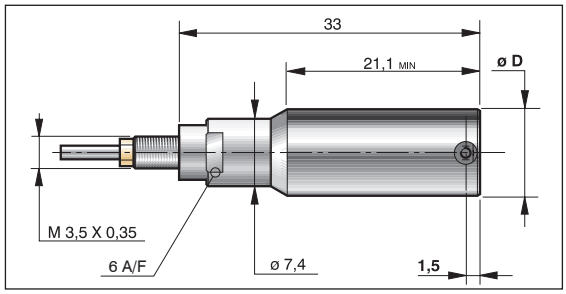


RIGHT ANGLE PLUG HEAD
For measuring bores with perpendicular axis to the direction of gage insertion, or for limited space applications.
Example: differential carrier.



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

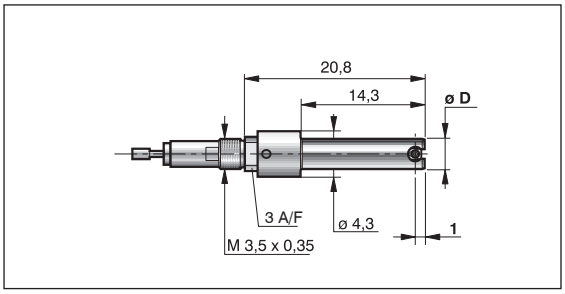
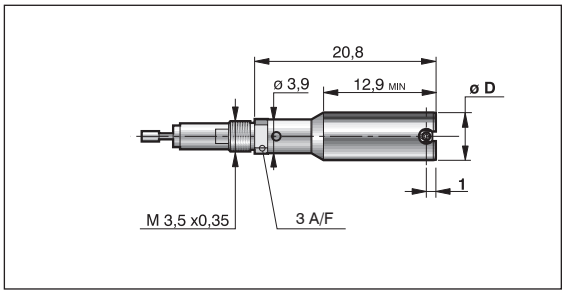
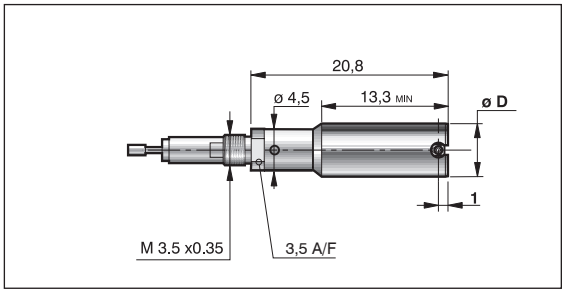
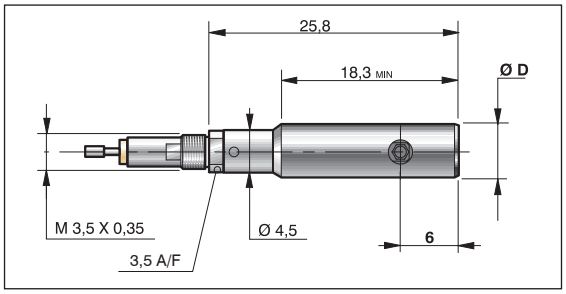
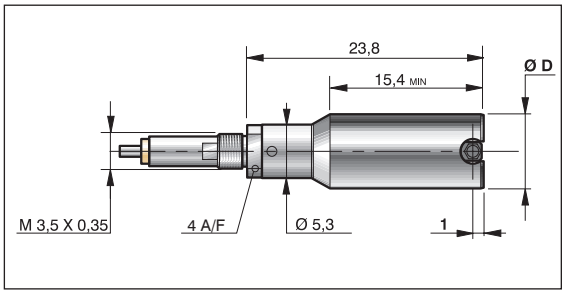
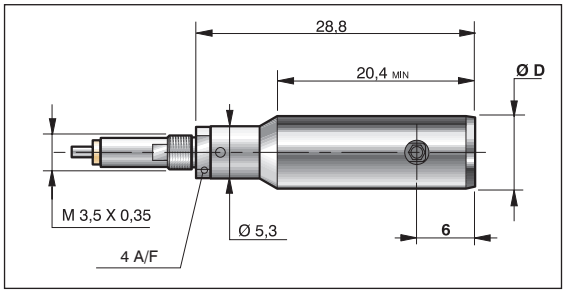
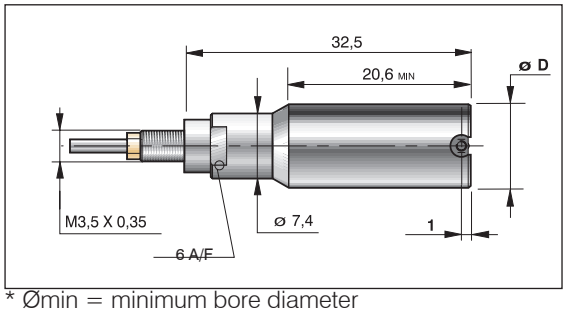
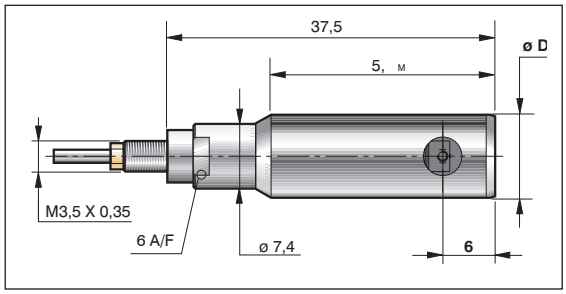
DIMENSIONAL SPECIFICATIONS OF STANDARD VERSIONS

	PLUG HEAD MBG-B	PLUG HEAD 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 HEADS 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 HEADS 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	-	-

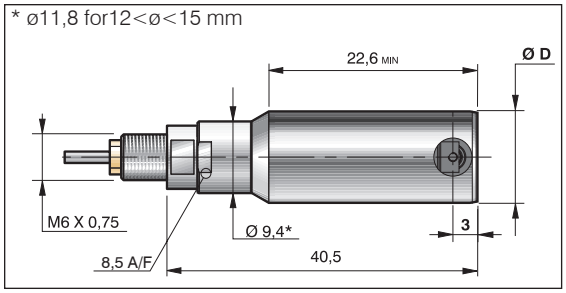
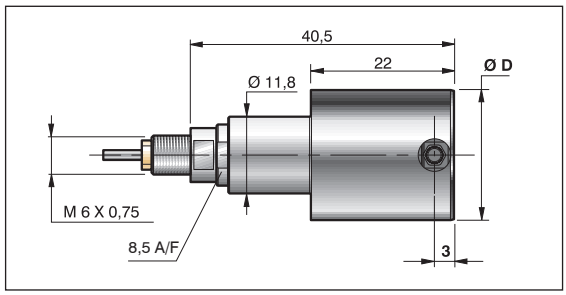
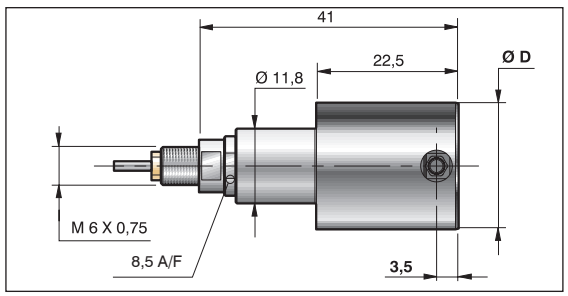
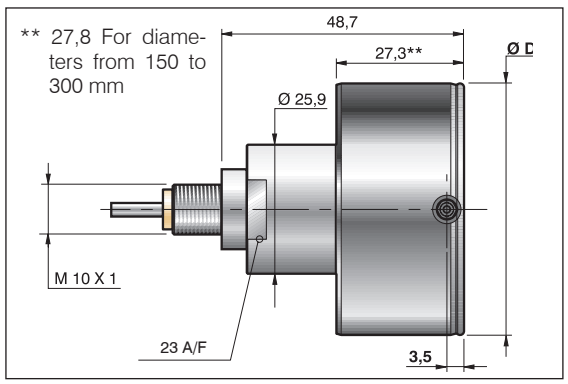
	PLUG HEAD MBG-SB	PLUG HEAD MBG-T	
		N.A.	Ømin* 3 to<4
		N.A.	Ømin* 4 to < 4,5
			Ømin* 4,5 to < 5,5
			Ømin* 5,5 to < 7,5
			Ømin* 7,5 to < 9,5

* Ømin = minimum bore diameter

MEASURING CONTACTS FOR PLUG HEADS 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 HEADS 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 HEAD MBG-B	PLUG HEAD 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.

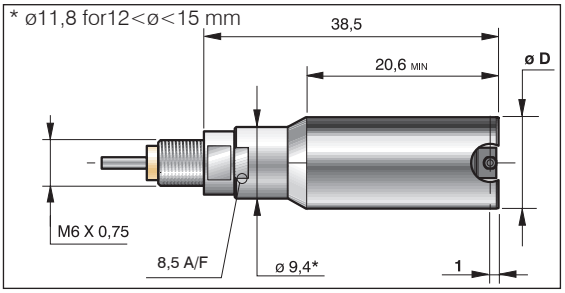
* Ømin = minimum bore diameter

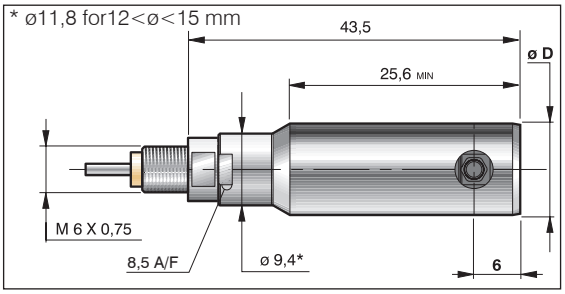
MEASURING CONTACTS FOR PLUG HEADS TYPE B				
	CARBIDE OR DLC - COATED		DIAMOND	
ø D	R1	R2	R1	R2
9,5 ÷ <15	2	3,5	0,75	-
15 ÷ <16	2	5	0,75	-
16 ÷ <20	2	5	2	-
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <300	4	10	4	10

PLUG HEAD MBG-SB

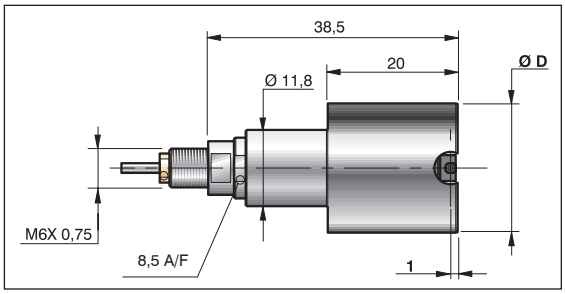
PLUG HEAD MBG-T

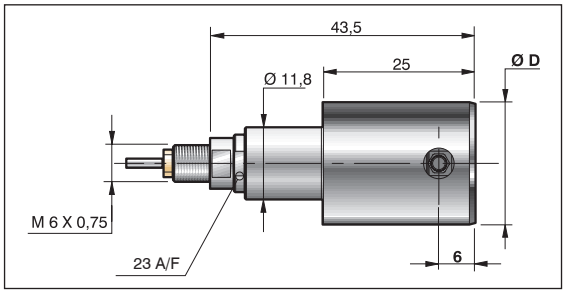
Ømin* 9,5 to < 15



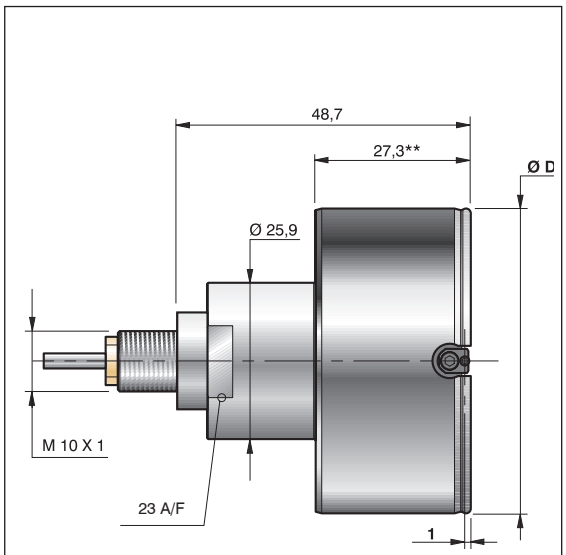


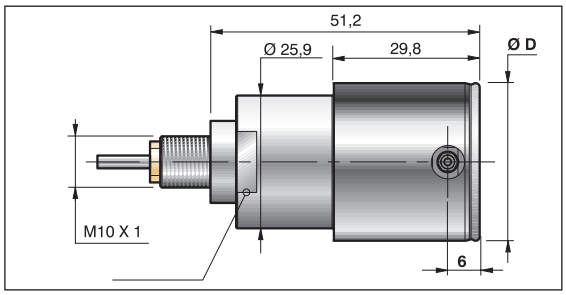
Ømin* 15 to < 26



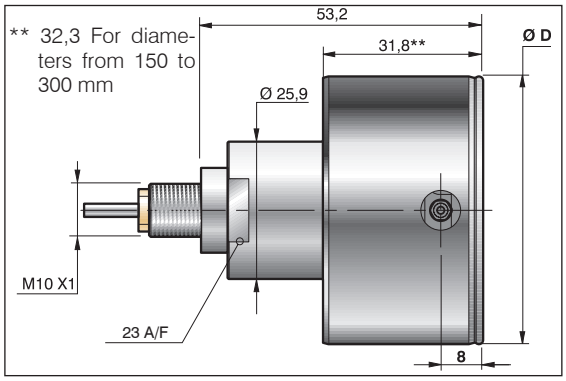


Ømin* 26 to < 40





Ømin* 40 to < 300



* Ømin = minimum bore diameter

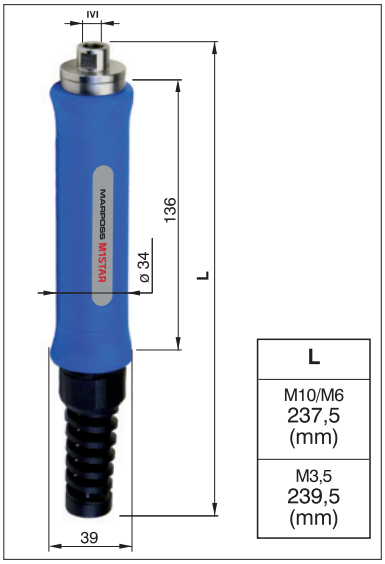
MEASURING CONTACTS FOR PLUG HEADS TYPE **SB**				
	CARBIDE OR DLC - COATED		DIAMOND	
ø D	**R1**	**R2**	**R1**	**R2**
9,5 ÷ <15	2	3,5	-	-
15 ÷ <26	2	5	-	-
-	-	-	-	-
26 ÷ <300	4	10	-	-

MEASURING CONTACTS FOR PLUG HEADS 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	-
32 ÷ <300	4	10	4	10

STANDARD HANDLES

PENCIL PROBE HANDLES

Thread M	Type	ORDER CODE
M3,5	Without Pencil Probe - 8 mm h6 Clamping Diameter	2TPL300000
	With RedCrown LVDT ±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

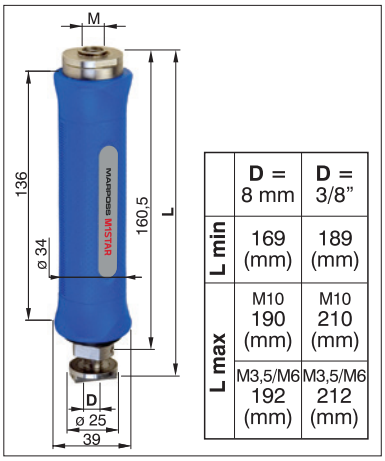


L
M10/M6 237,5 (mm)
M3,5 239,5 (mm)

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

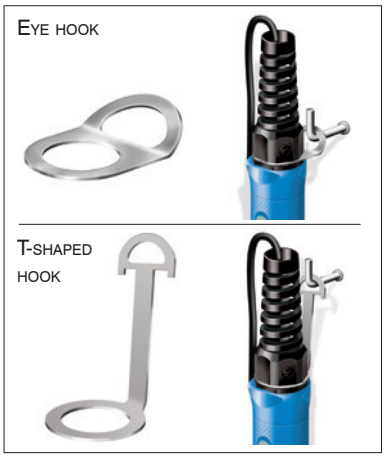
Thread M	CLAMPING DIAMETER	ORDER CODE
M3,5	8 mm h6	2TCS3S0000
	3/8"	2TCS4S0000
M6	8 mm h6	2TCS6S0000
	3/8"	2TCS7S0000
M10	8 mm h6	2TCSAS0000
	3/8"	2TCSBS0000



	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

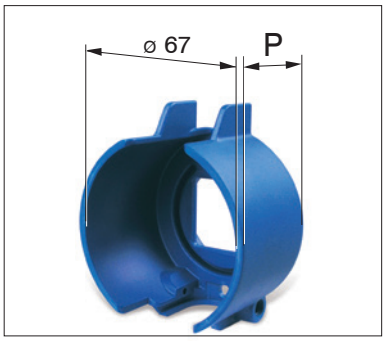
Hooks to hang up the M1 Star MBG bore gauges are available in two styles, for all handle types as shown (see the figures).



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

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

STAND

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



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

HANDLES WITH WIRELESS TRANSMISSION

	Description	ORDER CODE
	i-Wave2 Handle with Direct-Lock for plug heads with M10 thread	3TJ5SDI100
	i-Wave2 Handle with Direct-Lock for plug heads with M6 thread	3TJ5SDI060
	i-Wave2 Handle with Direct-Lock for plug heads with M3,5 thread	3TJ5SDI035
	i-Wave2 Handle with Starlock system for plug heads (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	3TJ6SDI000
	Stand with battery charger	2T0IRBS030
	Nose-Down stand with battery charger	2T0IRBS031
	Power supply unit for one stand with battery charger	2T0IRCS010
	Power supply unit and junction box for up to four stands with charger	2T0IRSS010

	Description	ORDER CODE
	i-Wave Handle with alkaline batteries (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	3TJ0SFB000
	i-Wave Handle with Li-Ion inductive batteries (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	3TJ0SFI000
	“Clip On” manual charger for i-Wave handle with Li-Ion batteries	2T0IRMS001
	Stand with battery charger for i-Wave handle with Li-Ion batteries	2T0IRBS001
	Power supply unit for one stand with battery charger	2T0IRCS010
	Power supply unit and junction box for up to four stands with charger	2T0IRSS010

(*) M3,5 and third party gauge heads adapters are available on request.

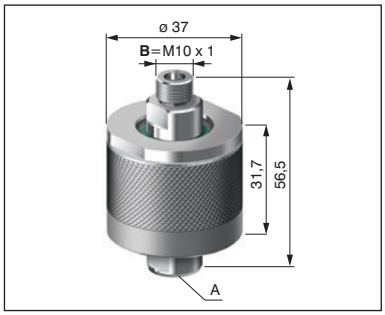
OTHER ACCESSORIES

ROTARY SPACERS

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

PLUG GAUGE THREAD A (*)	ORDER CODE
M6X0,75	2TR060S000
M10X1	2TR100S000

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

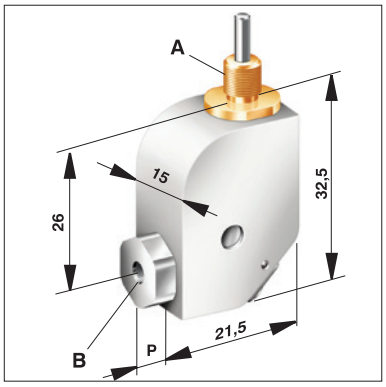


ANGLE ADAPTORS

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

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

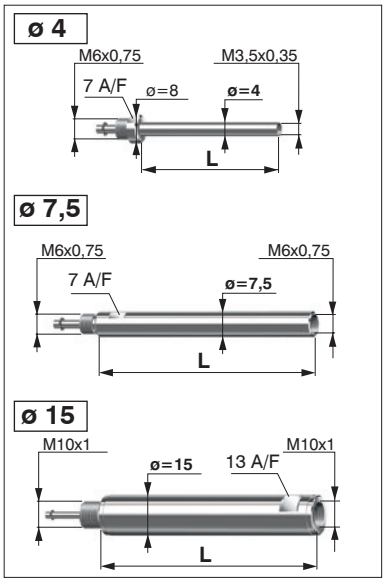
(*)NOTE: Thread **A**: handle-side thread - Thread **B**: plug gauge-side thread



DEPTH EXTENSIONS

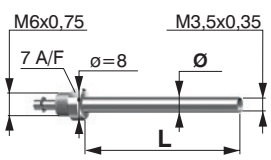
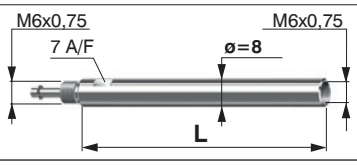
The extensions make it possible to reach the deeper measuring positions, when inserted between the plug head and the handle:

LENGTH	ORDER CODE		
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



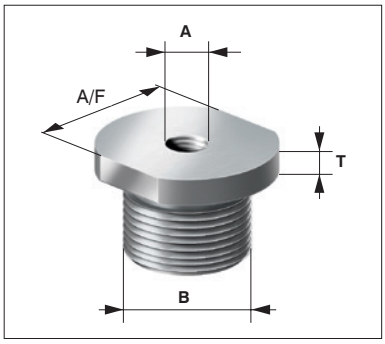
SPECIAL DEPTH EXTENSIONS

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

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

THREAD ADAPTORS

Thread adaptors improve applications capability and interchangeability of the accessories.

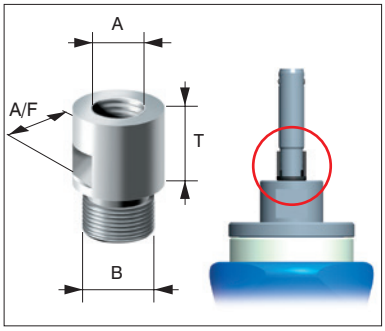


Standard thread adaptors:

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

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

RANGE	THREAD A (*)	THREAD B (*)	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



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

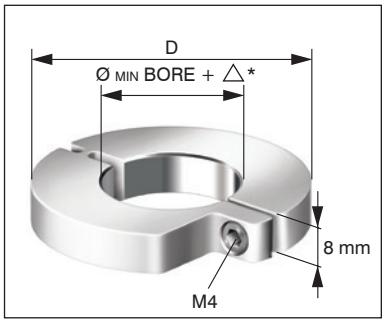
DEPTH STOPS

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

DEPTH STOPS FOR NOSEPIECE

ø min Bore (mm)	ø min Bore (*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")*

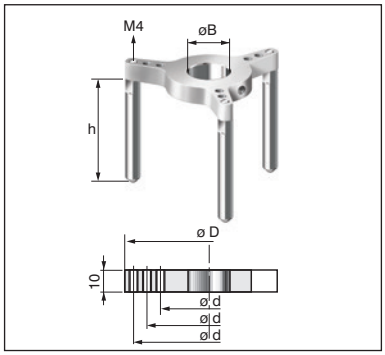
ø min Bore (mm)	ø min Bore (*inch*)	ø D (mm) (*inch*)
40 < 45	*(1.5748" < 1.7716")*	71 *(2.79")*
45 < 50	*(1.7716" < 1.9685")*	76 *(2.99")*
50 < 60	*(1.9685" < 2.3622")*	86 *(3.38")*
60 < 70	*(2.3622" < 2.7559")*	96 *(3.77")*
70 < 80	*(2.7559" < 3.1496")*	106 *(4.17")*
80 < 90	*(3,1496" < 3.5433")*	116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



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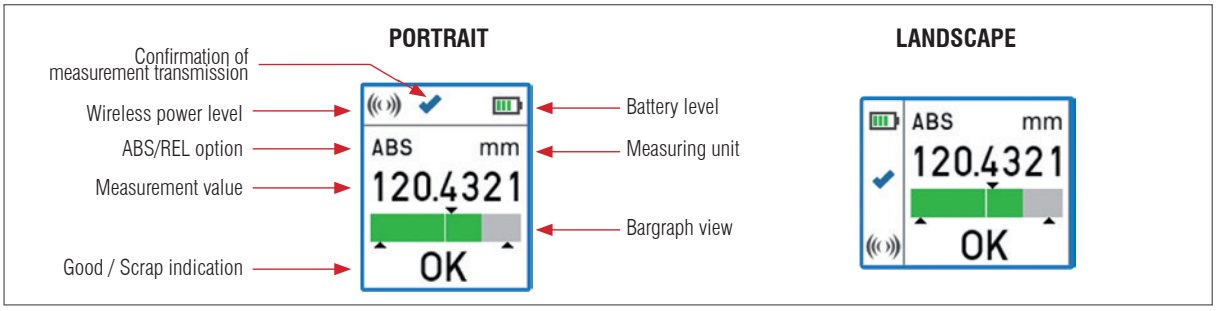


...the measurement value displayed directly in your hands!

I-Wave2™ is the innovative re-chargeable, wireless handle with integrated 1.8" TFT color screen. Ergonomic design, dual buttons, display orientation mode, a gauge stand with inductive charging and a high degree of coolants and dust protection, make the I-Wave2™ the ideal solution for dimensional inspection on the shop floor.

PRODUCT FEATURES

- Intuitive 1.8" TFT graphic color display with automatic orientation allows immediate visualization of the measurement value to the operator from any direction
- Any mechanical gauge head, with M10, M6 or M3,5 thread can be mounted very quickly by means of an adapter to convert the handle to a plug, snap or depth gauge. Customers can choose between two systems, Direct-Lock or Star-Lock for frequent gauge head changeover
- Live measurement is simultaneously displayed on the handle and the gauge computer via Bluetooth. By simply pressing one of the two buttons, it is automatically saved in the computer for statistical purpose
- Seamless synchronization with the gauge computer
- Possibility to operate in stand-alone mode
- IP67 protection rating for use even in severe shop floor environments
- The I-Wave2™ handle contains long-life, fast recharging Li-Ion battery, and is supplied with an inductive charging stand ensuring 24/7 use
- Wireless offers following advantages: no cable entanglement or breaks, ergonomic operations, measuring directly at the machine
- Software Drivers available to give the opportunity to connect the I-Wave2™ to any commercial and industrial computer



GENERAL CHARACTERISTICS	
Display	1.8'' full color
Wireless transmission technology	Bluetooth Smart
Ergonomic handle design	Dual buttons
Able to work stand alone	√
Able to work connected with gauge computers	√
Programming for stand alone use	by IOS or Android phone/tablet or PC
Auto switch on	by accelerometer
View display aspect	Portrait / Landscape-selectable
Programmable auto shut down time	√
Settable acoustic feedback	√
Battery type	Li-Ion rechargeable
Wireless charging system	Inductive
TECHNICAL SPECIFICATIONS	
Communication distance	10 m
IP rating	67
Weight	540 gr
Resolution	0,0001 mm
Linearity deviation	0,0003 mm over 5 mm travel



Charging station

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

How to Order

	Description	Order Code
	I-Wave2™ Handle with Direct-Lock for plug heads with M10 thread	3TJ5SDI100
	I-Wave2™ Handle with Direct-Lock for plug heads with M6 thread	3TJ5SDI060
	I-Wave2™ Handle with Direct-Lock for plug heads with M3,5 thread	3TJ5SDI035
	I-Wave2™ Handle with Starlock system for plug heads (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	3TJ6SDI000
	Stand with battery charger	2T0IRBS030
	Nose-Down stand with battery charger	2T0IRBS031
	Power supply unit for one stand with battery charger	2T0IRCS010
	Power supply unit and junction box for up to four stands with charger	2T0IRSS010

(*) M3,5 and third party gauge heads adapters are available on request.

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WIRELESS INTERFACE HANDLE

I-Wave™ is an 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: Nemo, Merlin, Merlin Plus, Merlin Plus Box, E9066. Communication software, developed by MARPOSS, is also available to allow connection of the I-Wave to commercial computers.

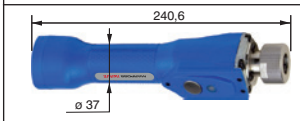


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TECHNICAL SPECIFICATIONS

BATTERIES		PROTECT. DEGREE	COMMUNIC. DISTANCE	WEIGHT
TYPE	MIN. DURATION	IP67	*Bluetooth*® Class 2 (10m)	730g
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 heads with M6 and M10 thread is included in the supply) (*)	3TJ0SFB000
	I-Wave Handle with Li-Ion inductive batteries (one adapter for plug heads with M6 and M10 thread is included in the supply) (*)	3TJ0SFI000
	"Clip On" manual charger for I-Wave handle with Li-Ion batteries	2T0IRMS001
	Stand with battery charger for I-Wave handle with Li-Ion batteries	2T0IRBS001
	Power supply unit for one stand with battery charger	2T0IRCS010
	Power supply unit and junction box for up to four stands with charger	2T0IRSS010

(*) M3,5 and third party gauge heads adapters are available on request.

BATTERY CHARGER APPLICATION EXAMPLES


"Clip on" charger


Charging station

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M1STAR EBG



ELECTRONIC BORE GAUGE

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

MAIN CHARACTERISTICS

- **Application range**
  Diameters from 3 to 375 mm, with a measurement section depth up to 500 mm.
- **Accuracy**
  Marposs' completely friction-free measurement reading system ensures repeatability within 0.5 microns, constant over the entire application range. Each plug is delivered with a certificate of individual testing of the product.
- **Electrical compatibility**
  The EBG plug heads are available with Marposs standard LVDT or HBT transducer. The compatibility to third party electronic units is obtained by means of special cables.
- **Versatility of application**
  The connection between plug head and cable is made with a connector allowing quick replacement of the plug head itself. The extensive linearity range of the transducers used in the M1 Star EBG requires only one zero-setting ring.
- **Sturdiness and resistance to environmental factors**
  The M1 Star EBG has been designed to be used in the harshest production environments. Guaranteed IP67 protection (waterproof, dirt and dust sealed) with excellent resistance to impacts and accidental falls, plus replaceable tear resistant cable make the EBG sturdy and reliable, thus reducing maintenance costs and down times to a minimum.
- **Supply conditions**
  The most advanced engineering and production processes allow Marposs to offer the EBG with extremely competitive pricing and fast delivery times. The M1 Star EBG is also available for customized OEM supplies.

TECHNICAL SPECIFICATIONS

DESCRIPTION	WORKING RANGE						
STANDARD MEASURING RANGE FOR TYPE B AND T (mm)	Ø 3 - 8		Ø 8 - 13	Ø 13 - 26	Ø 26 - 50	Ø 50 - 150	Ø 150 - 375
	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 - 375
	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 (mm)				Ø 13 - 26	Ø 26 - 50	Ø 50 - 150	Ø 150 - 375
				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 head to the cable, making retooling a simple operation and reducing the cost for repairs.

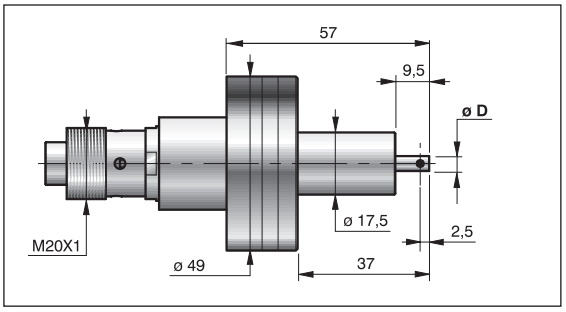
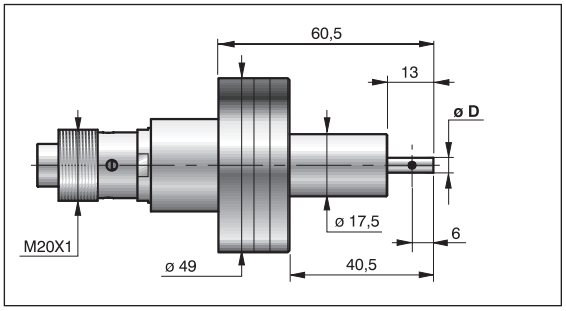
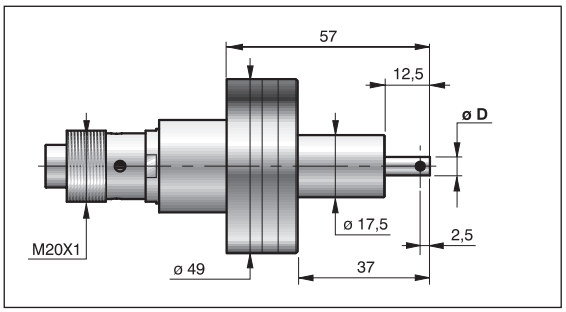
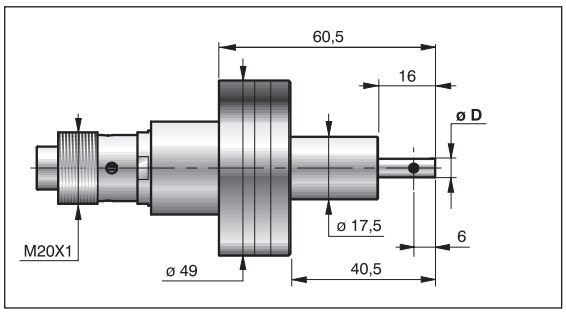
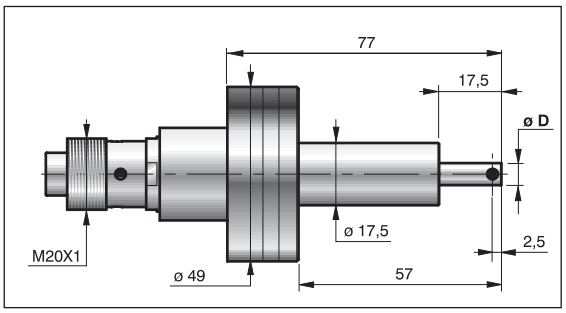
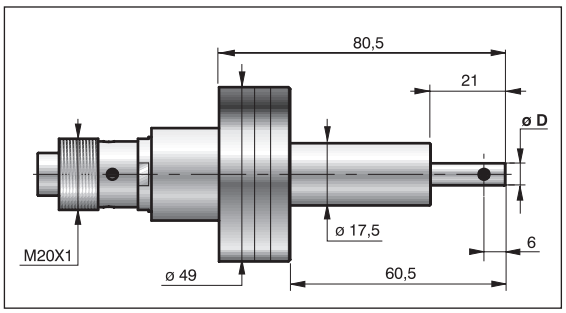
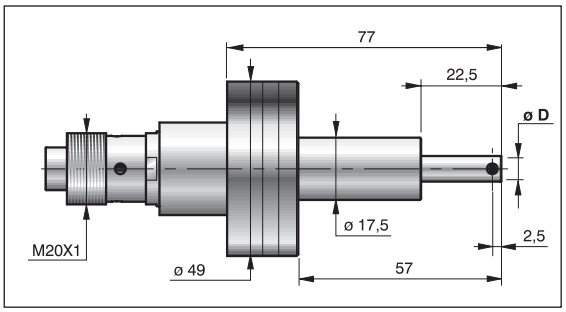
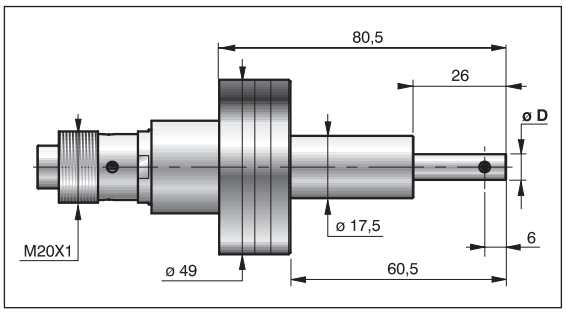
6 **HANDLE**: The ergonomic design and the antislip surface allow a safe handling of the bore gauge. Under the product label a plate is available, on which any information required by the customer can be marked.

7 **CABLE**: 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.



DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES

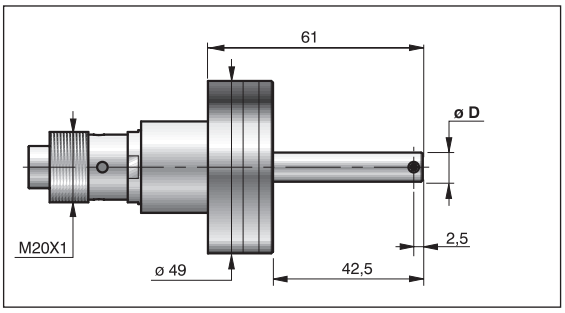
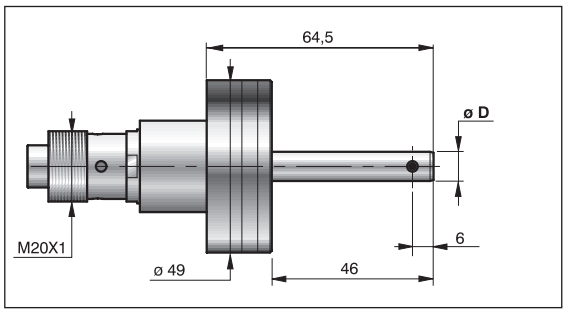
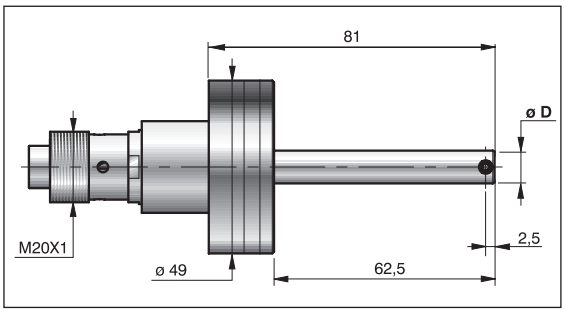
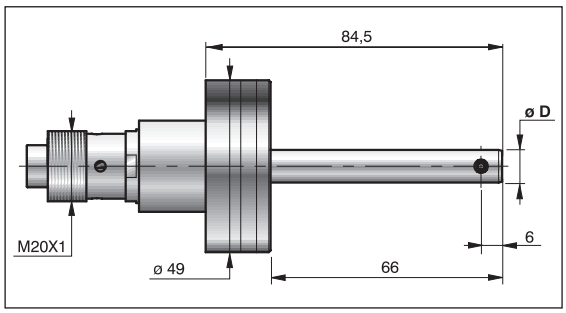
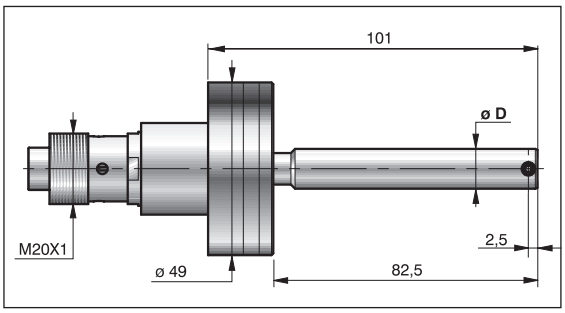
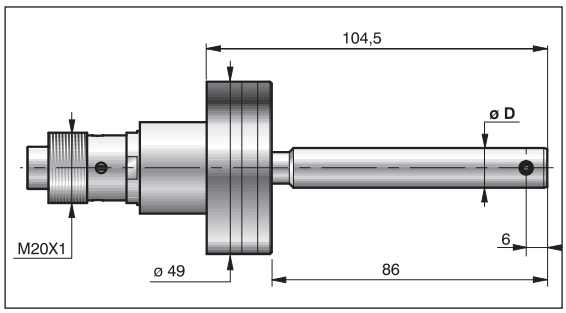
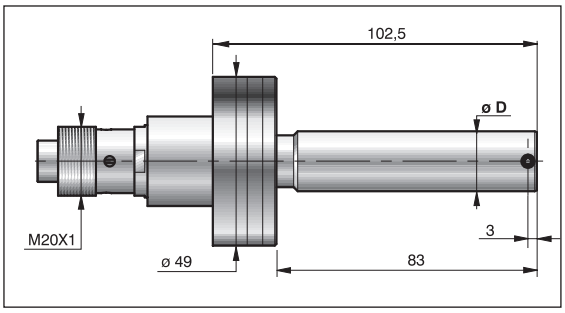
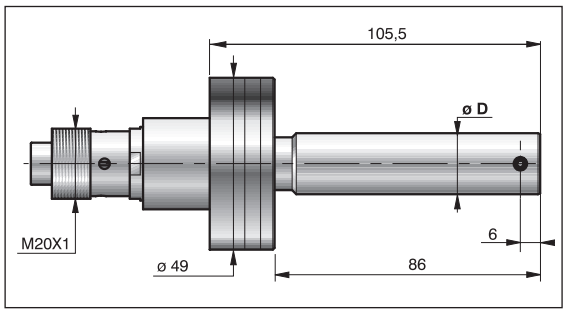
PLUG HEAD EBG-B	PLUG HEAD EBG-T	
		Ømin* 3 ÷ <4
		Ømin* 4 ÷ < 5
		Ømin* 5 ÷ < 6
		Ømin* 6 ÷ < 7

* Ømin = minimum bore diameter

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

CONTACTS FOR T-TYPE PLUG HEADS				
	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 HEAD EBG-B	PLUG HEAD EBG-T
Ømin* 7 ÷ <8		
Ømin* 8 ÷ < 9		
Ømin* 9 ÷ < 13		
Ømin* 13 ÷ < 20		

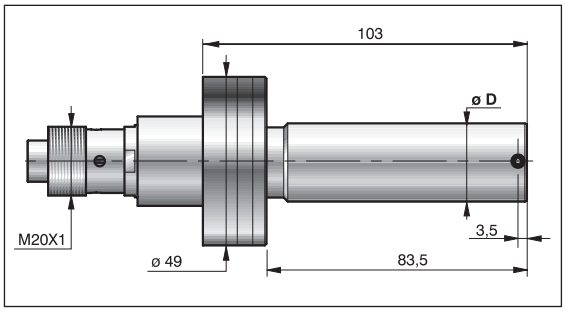
* Ømin = minimum bore diameter

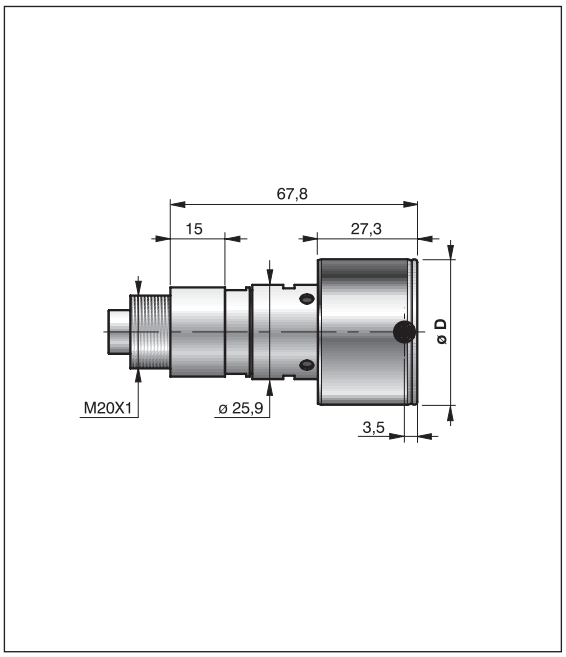
CONTACTS FOR B-TYPE PLUG HEADS				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
7 ÷ <8	0,5	1	0,4	-
8 ÷ <10,5	1,5	2,5	0,4	-
10,5 ÷ <13	1,5	2,5	0,75	-
13 ÷ <20	2	5	2	5

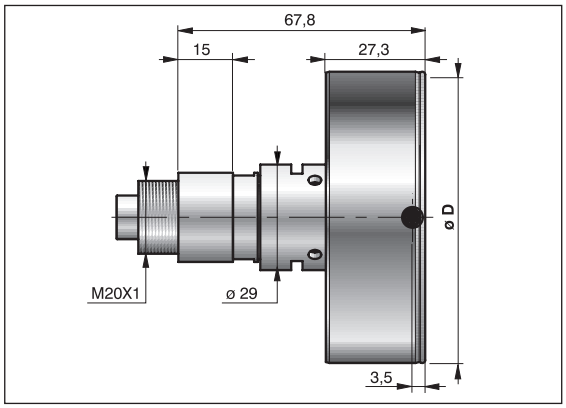
CONTACTS FOR T-TYPE PLUG HEADS				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
7 ÷ <8	0,5	1	0,4	-
8 ÷ <10,5	1,5	2,5	0,4	-
10,5 ÷ <13	1,5	2,5	0,75	-
13 ÷ <20	2	5	2	5

DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG GAUGES

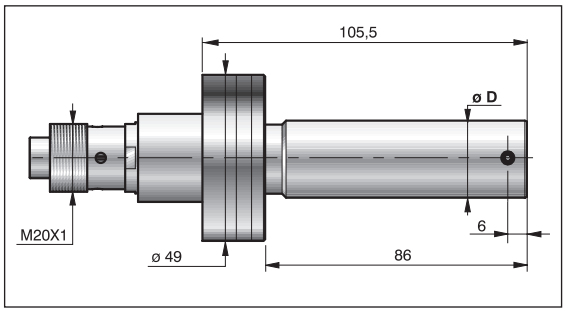
PLUG HEAD EBG-B

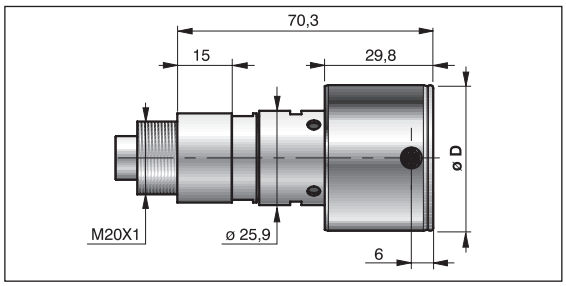


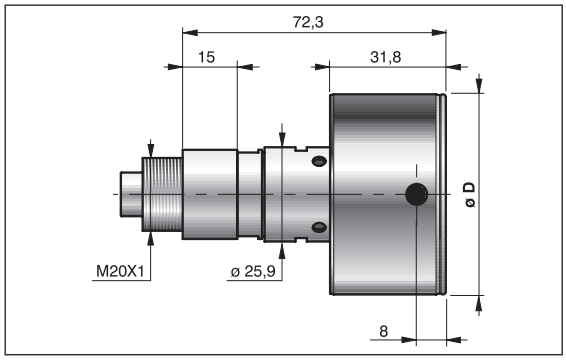


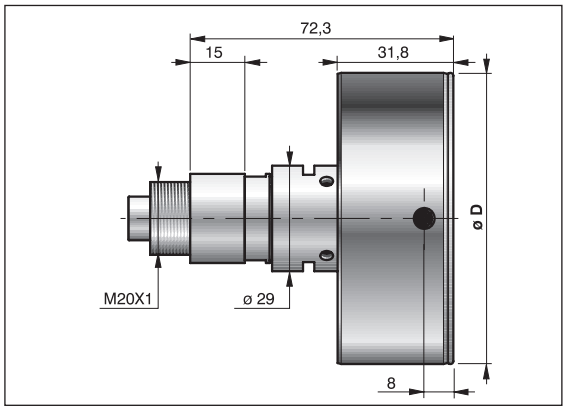


PLUG HEAD EBG-T









Ømin* 20 ÷ <26

Ømin* 26 ÷ <40

Ømin* 40 ÷ < 74

Ømin* 74 ÷ < 375

* Ømin = minimum bore diameter

"T" handles available from Ø>200mm

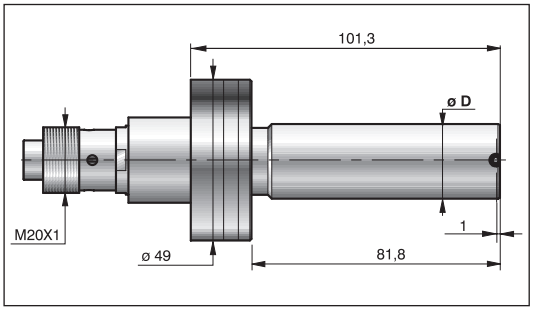
CONTACTS FOR B-TYPE PLUG HEADS				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <375	4	10	4	10

CONTACTS FOR T-TYPE PLUG HEADS				
	CARBIDE OR DLC		DIAMOND	
ø D	R1	R2	R1	R2
20 ÷ <26	2	5	2	5
26 ÷ <32	4	10	2	-
32 ÷ <375	4	10	4	10

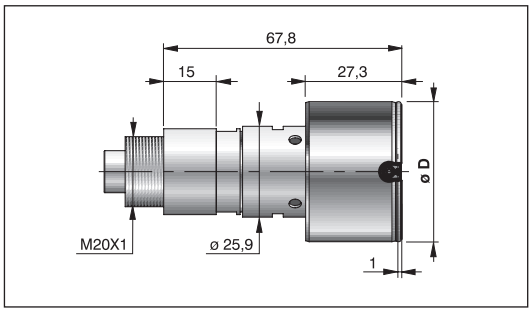
DIMENSIONAL SPECIFICATIONS OF STANDARD PLUG HEADS

PLUG HEAD EBG-SB

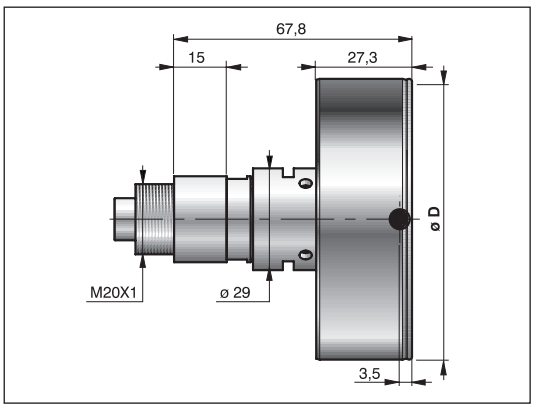
Ømin* 13 ÷ <26



Ømin* 26 ÷ < 74



Ømin* 74 ÷ < 375



* Ømin = minimum bore diameter

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

"T" handles available from Ø>200mm

STANDARD HANDLES

HANDLE FOR BORE GAUGE WITH CABLE

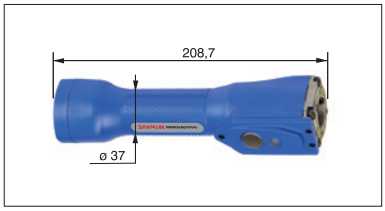
DESCRIPTION	ORDER CODE
Handle without cable	2THS000000
Cable 2 mt LVDT - connector SV50/6	2TG0000026
Cable 3,5 mt LVDT - connector SV50/6	2TG0000356
Cable 5 mt LVDT - connector SV50/6	2TG0000056
Cable 2 mt LVDT - connector S3	2TG0000023
Cable 2 mt TESA COMPATIBLE - connector SV50/6	2TG00TS026
Cable 2 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

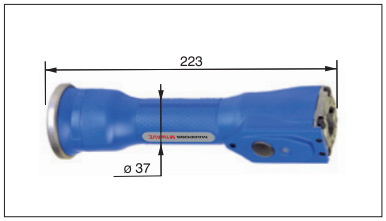
WAVE HANDLE WITH ALKALINE BATTERIES

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



Accessories

MECHANICAL INTERFACE FOR PLUG HEAD

Description	Order Code
Interface adapter to fix EBG plug heads to Wave handle	2TIESF0000



"CLIP ON" MANUAL CHARGER

Description	Order Code
"Clip On" manual charger for Wave handle with Li-Ion batteries	2T0IRMS001



STAND CHARGER WITH PLUG SUPPORT

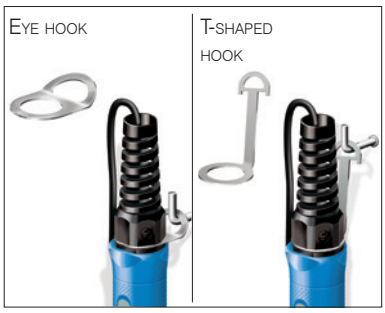
Description	Order Code
Stand with battery charger for Wave handle with Li-Ion batteries	2T0IRBS001
Power supply unit for one stand with battery charger	2T0IRCS000
Power supply unit and junction box for up to four stands with charger	2T0IRSS004



HOOKS

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

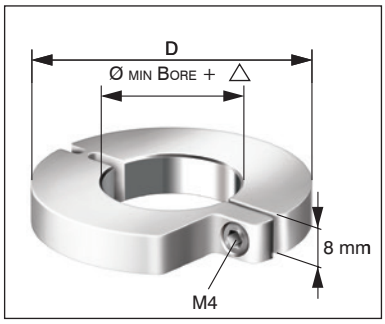
Description	Order Code
Eye hook for handle with cable	1T0JHS0810
T-shaped hook for handle with cable	1T0JHS0811



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

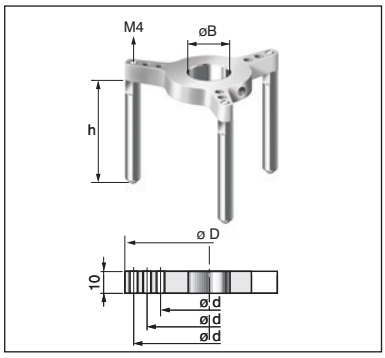
ø min Bore (mm)	ø D (mm)
40 ≤ ø < 45	71
45 ≤ ø < 50	76
50 ≤ ø < 60	86
60 ≤ ø < 70	96
70 ≤ ø < 80	106
80 ≤ ø < 90	116
90 ≤ ø ≤100	126



△ < 0,2 mm

DEPTH STOPS FOR EXTENSION

Ø B (mm)	Ø D (mm)	h (mm)	ø d (mm)				Order Code
22	45	63,3	38				2TDEE220A0
	75		44	56	68		2TDEE220B0
	110		79	91	103		2TDEE220C0
	160		117	129	141	153	2TDEE220D0
	220		177	189	201	213	2TDEE220E0



EXTENSIONS

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

Diameter Range (mm)	L (mm)	Order Code
26÷375	20	1TX0S00020
	30	1TX0S00030
	40	1TX0S00040
	50	1TX0S00050
	65	1TX0S00065
	80	1TX0S00080
	100	1TX0S00100
	125	1TX0S00125
	250	1TX0S00250
	500	1TX0S00500



STAND

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

Description	Order Code
Multiposition Stand for EBG and MBG	2TS0001111
Extra plug support kit for stand 2TS0001111	2TS0002222



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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: Nemo, Merlin, Merlin Plus, Merlin Plus Box, E9066. Communication software, developed by MARPOSS, is also available to allow connection of the M1 Wave to commercial computers.

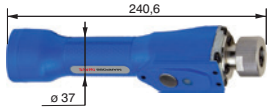


Bluetooth®luetooth®

TECHNICAL SPECIFICATIONS

BATTERIES		PROTECT. DEGREE	COMMUNIC. DISTANCE	WEIGHT
TYPE	MIN. DURATION	IP67	*Bluetooth*® Class 2 (10m)	580g
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	2T0IRMS001
	Stand with battery charger for Wave handle with Li-Ion batteries	2T0IRBS001
	Power supply unit for one stand with battery charger	2T0IRCS010
	Power supply unit and junction box for up to four stands with charger	2T0IRSS010

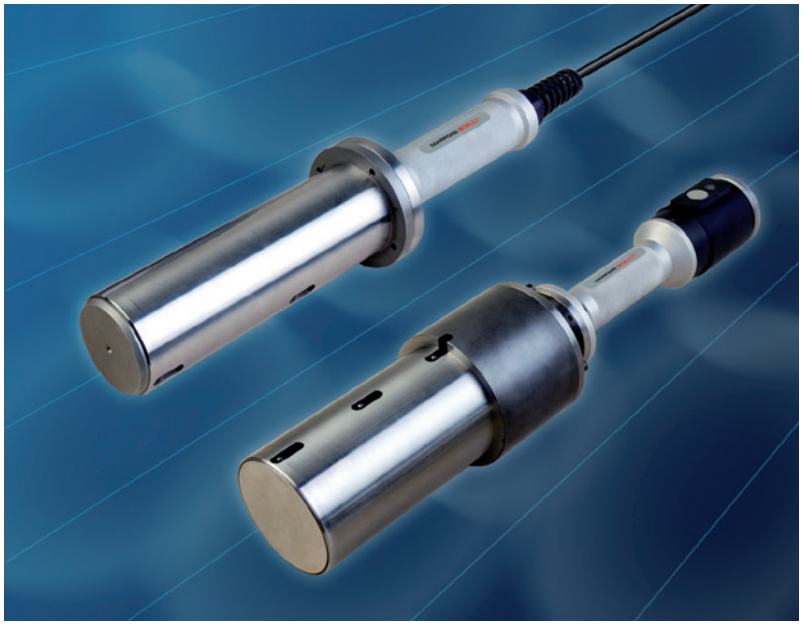
BATTERY CHARGER APPLICATION EXAMPLES


"Clip on" charger


Charging station

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M1MULTI



For the simultaneous measurement in multiple sections

The M1 Multi is a manual electronic plug-type gauge for measuring the diameter and geometry (ovality, taper, etc.) of a bore at multiple axial locations using two or four contacts at each location.

ELECTRONIC MULTIPLE BORE GAUGE

The M1 Multi gauge plug consists of a nosepiece that guides the gauge in the bore to eliminate operator-induced variations and one or more measuring armsets. Each nosepiece and complement of armsets is application specific to meet customer requirements. Designed for use in the harshest production environments, the M1 Multi transducer features water, dirt and dust protection meeting the IP67 standard.

AVAILABLE VERSIONS

M1 Multi is available in two versions:
- with cable, for connection to electronic interface units
- wireless, utilizing Marposs "Wave" transmission technology with Li-Ion batteries and inductive recharging system.

M1 Multi is available on request.

TECHNICAL SPECIFICATIONS

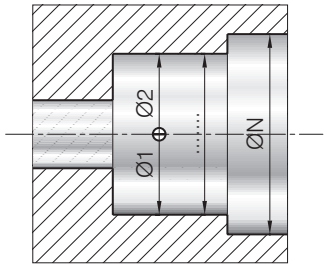
Protection degree	IP67
Repeatability error (range)*	Max. (10% of tolerance; 1,5 micron)

* to be confirmed for the specific application and technical solution.

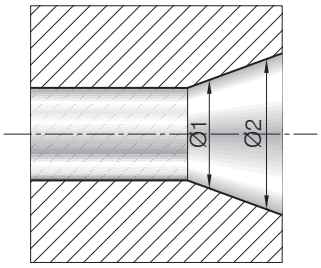
TECHNICAL SPECIFICATIONS OF THE WIRELESS VERSION

Transmission technology	Bluetooth® wireless technology
Transmission distance	10 m
Battery charge duration	up to 36 h in continuous operation
Recharging technology	Contactless recharging system with inductive technology
Recharging time	5-6 hours (80% in 2 hours)
Max. number of manageable signals	7 transducers

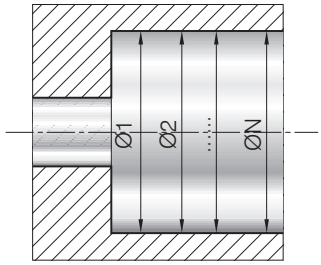
APPLICATION EXAMPLES













RECHARGEABLE STAND FOR MULTIWAVE

	DESCRIPTION	ORDER CODE
	Rechargeable Stand for Multiwave handle*	2T0IRBS005

* Compatibility to be verified for extra large dimension gauges.

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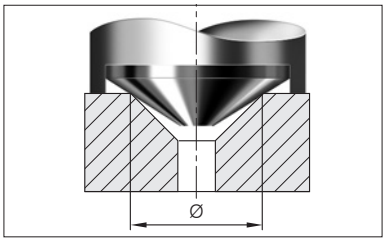


Not only for the Aerospace Industry…

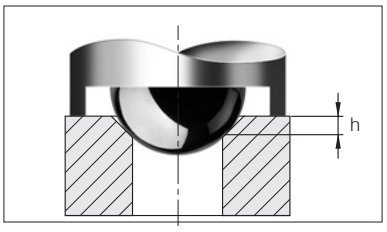
Based on the extensive experience in the Aerospace Industry, TESTAR has developed its line of hand gauges to measure Rivet & Fastener Bore Characteristics. Size, depth and angle can be measured. The line includes both Countersink Diameter Gauge and a Countersink Depth Gauge. These two gauges will measure the countersink maximum diameter and the depth of the countersink and when using Marposs Electronics, display the angle of the countersink.

PRINCIPLE

The countersink gauge with a conical plunger will measure the maximum diameter (the breakout diameter) of the countersink bore by locating on the surface edge.



The countersink depth gauge with spherical plunger will measure the depth of the taper (bottom of the countersink).

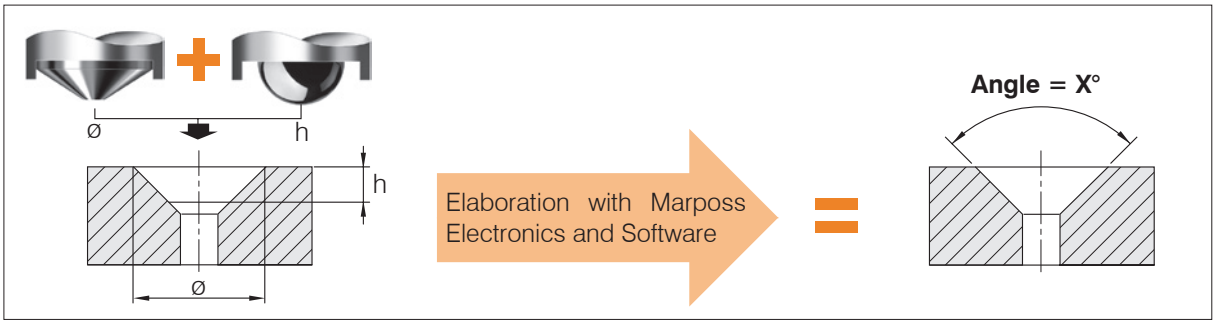


TECHNICAL DATA

A series of plungers and depth stops are available in order to guarantee:
- Measurement of standard rivets designs for Aero Structures.
- Simple, fast retooling

The Countersink Gauges are available in the following versions:
- With programmable standard Quick Digit for cable or Wireless transmission,
- with cable
- wireless

From these two measurements it is possible to obtain the angle of the countersink.



Technical Characteristics

Description	Value	Note
Application range	0,16"-1" / 4-25,4mm	Maximum Diameter of the tapered bore
Repeatability	≤1 μm	2,77 σ on master
Thermal Drift	≤0.25 μm/°C	

Kit for the measurement of the breakout diameter

Measuring kits are available. They're composed of:
- Countersink Diameter Gauge with conical plunger (Please refer to the following table);
- Special depth stop;
- Setting master;
- Quick Digit for cable or Wireless transmission;
- Case.

The Quick Digit for cable or Quick Digit for wireless transmission is zero set at the factory and ready to use. Master's and Quick Digit's certificates are included.

Countersink Taper	Measurable CSK Ø Range	Plunger Taper	Depth stop external diameter	Order Code Kit With Quick Digit for cable transmission	Order Code Kit With Quick Digit for wireless transmission	
100°	0,16" ÷ 1"	104°	33,5 mm	PSACD00900	PSACD01000	
100°	0,16" ÷ 0,36"	104°	25 mm	PSACD00901	PSACD01001	
100°	0,36" ÷ 0,56"	104°	25 mm	PSACD00902	PSACD01002	
100°	0,56" ÷ 0,76"	104°	27 mm	PSACD00903	PSACD01003	
100°	0,76" ÷ 1"	104°	33,5 mm	PSACD00904	PSACD01004	

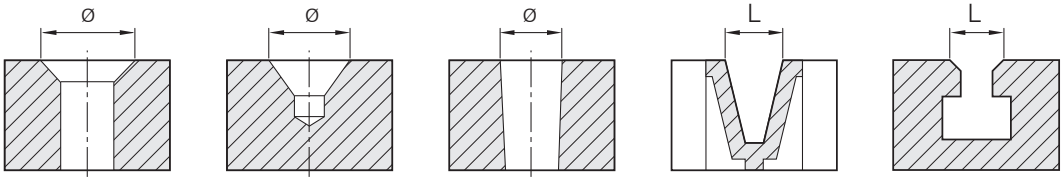
Dedicated Solutions

Similar kits are available on request:
- Countersink Diameter Gauge with customised taper
- Countersink Depth Gauge, with spherical plunger of a specific diameter
- Countersink Gauge with Mini I-Wave Handle

They are suitable for application in any industrial sector.



Application examples



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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.

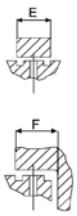
The signal is converted from analogue to digital through electronic converters.

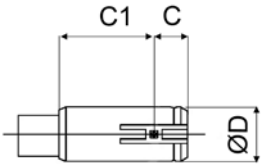
M1 Air bore gauges are entirely manufactured by:

OMG A MARPOSS COMPANY

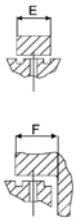
TPS - Pneumatic Plug Gauges

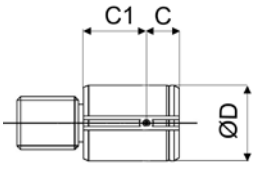
		Through bore				Blind bore			
→ D	range	C	C1	E	Type	C	C1	F	Type
3 - 4,15	0,03	6,5	31,5	1,8		3,5	34,5	4,4	
4,15 - 6,3	0,05	9,5	28,5	2,5	T	3,5	34,5	4,8	B
6,3 - 10	0,1	13	25	3		3,5	34,5	5	



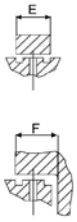


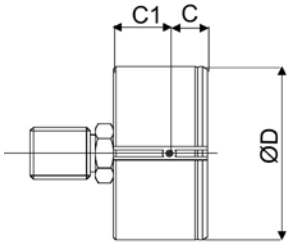
		Through bore				Blind bore			
→ D	range	C	C1	E	Type	C	C1	F	Type
10 - 20	0,1	13	25	3		4	34	5,5	
20 - 30	0,1	13	25	3	T	4	34	5,5	B
30 - 42	0,1	13	25	3		4	34	5,5	
42 - 55	0,1	13	25	3		4	34	5,5	





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





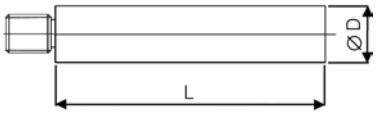
TPS - Technical Specifications

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		

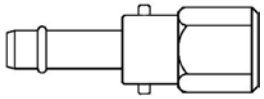
Accessories

EXTENSIONS

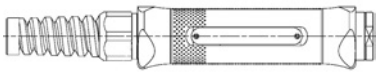
→ D	L	code
20	50	PLPM-50
20	100	PLPM-100
20	200	PLPM-200



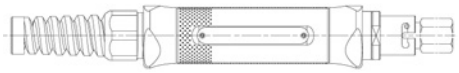
QUICK CONNECTION



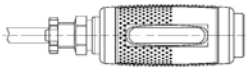
HANDLES



STANDARD



WITH QUICK CONNECTION



MINI

External Air / Electronic converters (type: sensor's pressure)



E4N Air

E4N Air column with analog and digital display for manual applications. It can connect one air gauge and elaborate both static and dynamic measurements, featuring also optionally a BCD Relais or an optoinsulated digital output.



Easy Box U1 Air



Easy Box U3 Air



Easy Box U4 Air

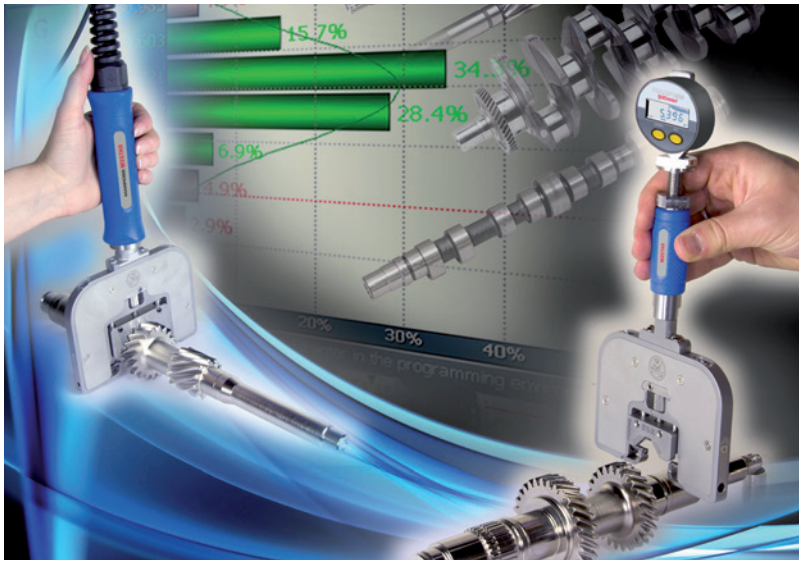
These interface boxes allow easy management via USB port of air gauges with one, three and four transducers respectively.

Air Converter



Air Converter for automatic applications. It is available in different layouts accomodating up to four units.

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To measure shafts between walls

M3 Star™ manual snap gauges are designed to measure outside diameters located between walls on shaft-like parts like crankshafts, transmission shafts and camshafts. They are easily re-tooled to measure different workpieces with the same gauge and are available in mechanical, wired and wireless configurations to meet a broad range of measurement needs.

M3 STAR

M3Star is an ergonomic, high-precision snap gauge that combines high technology and high quality in a compact body only 10mm wide. Two models are available to handle diameters from 5mm to 30mm and 30mm to 70 mm.
The advanced design is easily re-tooled using only one hex wrench to position both the contacts and V-block.
M3Star is supplied in the recommended configuration with the 20 mm thick "V" reference. 10mm and 14mm "V" references are also available for measurements in narrow spaces between shoulders.
The snap head can be combined with various handles and accessories.

MSG - ESG

• **M3Star MSG Mechanical Snap Gauge** is designed to be used with a dial or digital indicator in either a mini or standard holder.
The Snap Head is compatible with both the Marposs I-Wave wireless handle and pencil probe handle (8mm h6).
• The **M3 Star ESG Electronic Snap Gauge** is available in cable or wireless versions equipped with integrated HBT or LVDT transducers. The absence of friction in the measurement chain makes the M3 Star ESG exceptionally accurate.

Technical Specifications

	MSG	ESG
Thickness	10 mm	
Thickness of the "V" part reference	20 mm	
Measurable diameters and retooling range	5 - 15 mm	
	15 - 30 mm	
	30 - 50 mm	
	50 - 70 mm	
Working range	0,1 mm*	
Clamping diameter for indicator/probe	Clamping diameter for indicator/probe: 8 mm h6	Cable length 3.5m with SV50/6 connector
Repeatability error (2,77 σ)	≤1,5 μm	≤ 1 μm

* 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 0,4 mm accepting lower performance.

M3 STAR - SNAP GAUGE

1 CONTACT PROTECTIONS: protect the contacts from accidental damage.

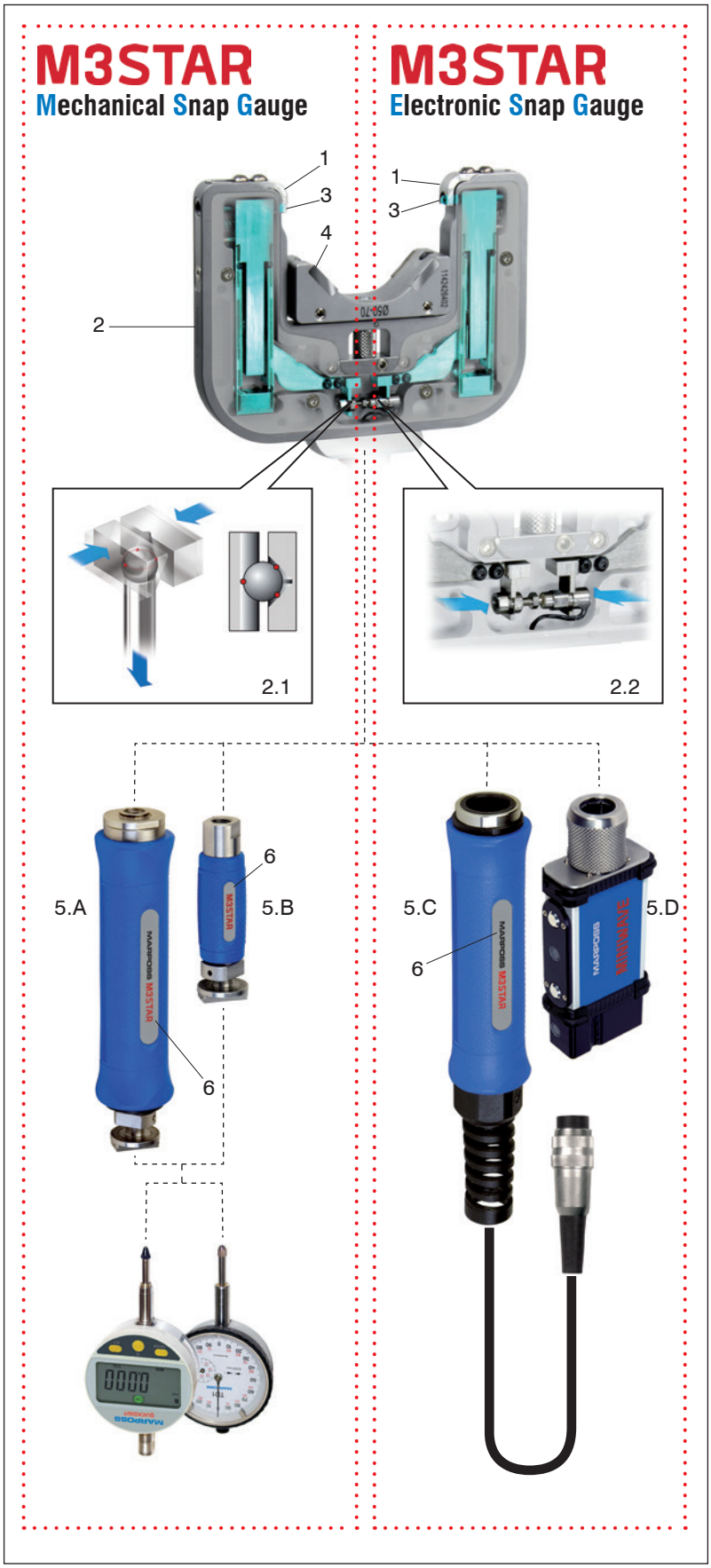
2 BODY: it is 10mm-thick designed to house and protect the measuring mechanism.
- **2.1** Mechanical measuring cells are housed in the M3Star MSG body and transfer the measurement to the dial indicator.
- **2.2** The electronic measuring cell with LVDT or HBT transducer is housed in M3Star ESG body and transfers the measurement to the display device.

3 MEASURING CONTACTS: The easily-replaced threaded tungsten carbide contacts facilitate rapid re-tooling. DLC covered or Diamond contacts are optionally available.

4 "V"-PART REFERENCE: Tungsten carbide planes in the support area reference the snap gauge to the workpiece cylindrical section to be measured. They are available in three versions with thicknesses of 20mm, 14mm or 10mm. A re-adjustment of the "V"-part with respect to the body allows the gauge center line to be changed to re-tool the gauge within the measuring range.

5 HANDLE: The ergonomically-designed handle is used to hold the snap gauge.
- **5.1** M3 Star MSG handle connects the Snap head to the dial indicator and is specifically designed for easy handling. it can be a Standard Indicator Holder (5.A) or a Mini Indicator Holder (5.B).
- **5.2** M3Star ESG is available with a standard handle with a 3,5m cable and SV/50 connector (5.C) or a Mini Wave handle (5.D).

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



M3STAR Mechanical Snap Gauge

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

Complete Snap Gauge

Complete M3 Star MSG Order Code

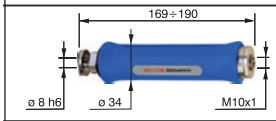
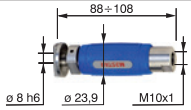
Snap Gauge	Range (mm)	 Mini Indicator Handle			 Standard Indicator Handle		
		20mm "V"	14mm "V"	10mm "V"	20mm "V"	14mm "V"	10mm "V"
	5 - 15	3TBAMISAWS	3TBAMITAWS	3TBAMIUAWS	3TBAIHSAWS	3TBAIHTAWS	3TBAIHUAWS
	15 - 30	3TBAMISBWS	3TBAMITBWS	3TBAMIUBWS	3TBAIHSBWS	3TBAIHTBWS	3TBAIHUBWS
	30 - 50	3TBAMISCWS	3TBAMITCWS	3TBAMIUCWS	3TBAIHSCWS	3TBAIHTCWS	3TBAIHUCWS
	50 - 70	3TBAMISDWS	3TBAMITDWS	3TBAMIUDWS	3TBAIHSDWS	3TBAIHTDWS	3TBAIHUDWS

The Snap Head

M3 Star Mechanical Snap Head Order Code

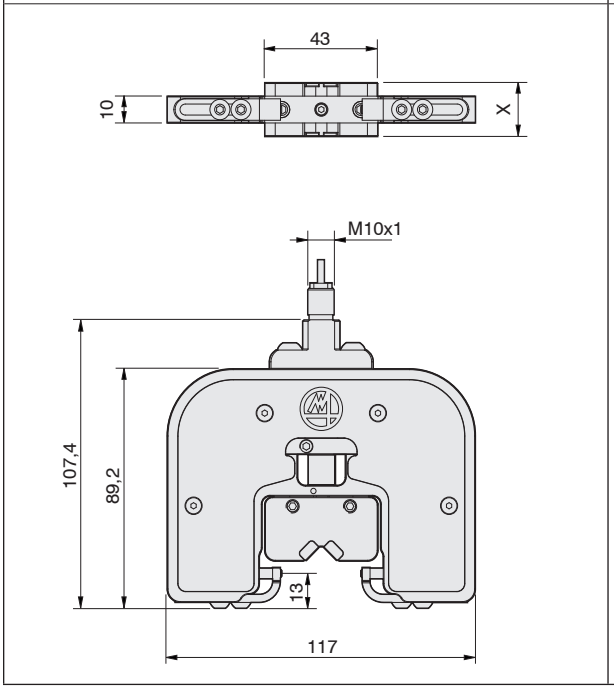
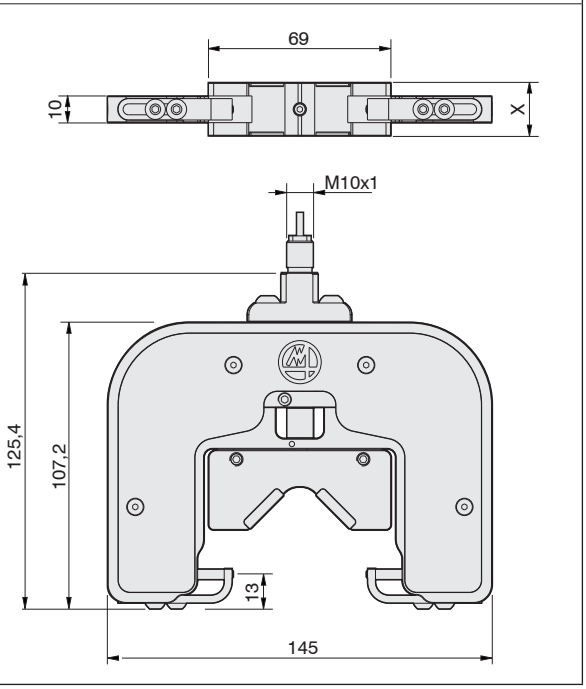
Snap Gauge	Range (mm)	With 20mm "V " part reference	With 14mm "V " part reference	With 10mm "V " part reference
	5 - 15	3TTASAWXXS	3TTATAWXXS	3TTAUAWXXS
	15 - 30	3TTASBWXXS	3TTATBWXXS	3TTAUBWXXS
	30 - 50	3TTASCWXXS	3TTATCWXXS	3TTAUCWXXS
	50 - 70	3TTASDWXXS	3TTATDWXXS	3TTAUDWXXS

Handles

	Description	Order Code
	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

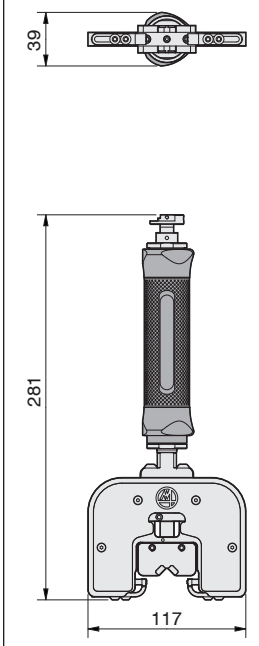
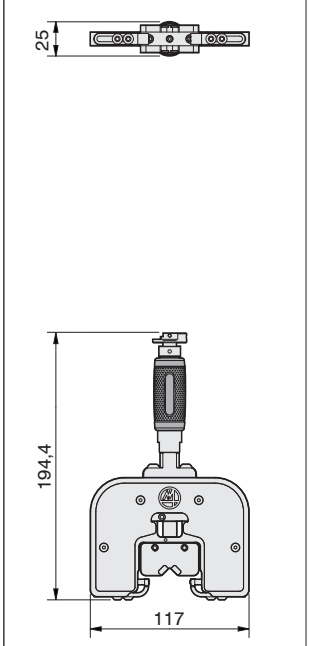
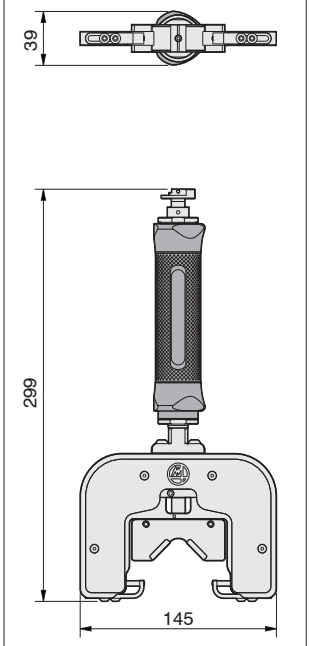
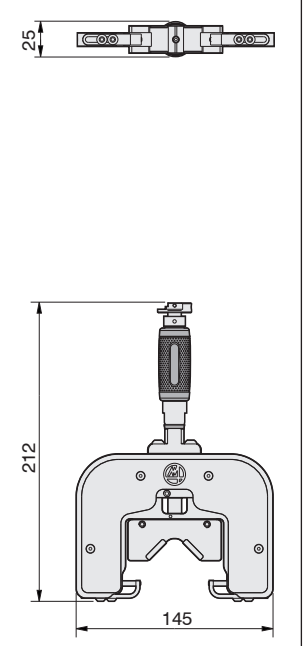
MSG DIMENSIONS

MSG Snap Head

MEASURING RANGE 5÷30	MEASURING RANGE 30÷70
	

X= V REFERENCE PART THICKNESS	20mm	14mm	10mm

Complete snap gauge

MEASURING RANGE 5÷30		MEASURING RANGE 30÷70	
			

M3STAR Electronic Snap Gauge

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

Complete Snap Gauge

Complete M3 Star ESG LVDT Order Code

Snap Gauge	Range (mm)	 Standard Handle with 3,5m cable			 Mini Wave handle		
		20mm "V"	14mm "V"	10mm "V"	20mm "V"	14mm "V"	10mm "V"
	5 - 15	3TBFE3SAWS	3TBFE3TAWS	3TBFE3UAWS	3TBFEWSAWS	3TBFEWTAWS	3TBFEWUAWS
	15 - 30	3TBFE3SBWS	3TBFE3TBWS	3TBFE3UBWS	3TBFEWSBWS	3TBFEWTBWS	3TBFEWUBWS
	30 - 50	3TBFE3SCWS	3TBFE3TCWS	3TBFE3UCWS	3TBFEWSCWS	3TBFEWTCWS	3TBFEWUCWS
	50 - 70	3TBFE3SDWS	3TBFE3TDWS	3TBFE3UDWS	3TBFEWSDWS	3TBFEWTDWS	3TBFEWUDWS

Complete M3 Star ESG HBT Order Code

Snap Gauge	Range (mm)	 Standard Handle with 3,5m cable			 Mini Wave handle		
		20mm "V"	14mm "V"	10mm "V"	20mm "V"	14mm "V"	10mm "V"
	5 - 15	3TBHE3SAWS	3TBHE3TAWS	3TBHE3UAWS	3TBHEWSAWS	3TBHEWTAWS	3TBHEWUAWS
	15 - 30	3TBHE3SBWS	3TBHE3TBWS	3TBHE3UBWS	3TBHEWSBWS	3TBHEWTBWS	3TBHEWUBWS
	30 - 50	3TBHE3SCWS	3TBHE3TCWS	3TBHE3UCWS	3TBHEWSCWS	3TBHEWTCWS	3TBHEWUCWS
	50 - 70	3TBHE3SDWS	3TBHE3TDWS	3TBHE3UDWS	3TBHEWSDWS	3TBHEWTDWS	3TBHEWUDWS

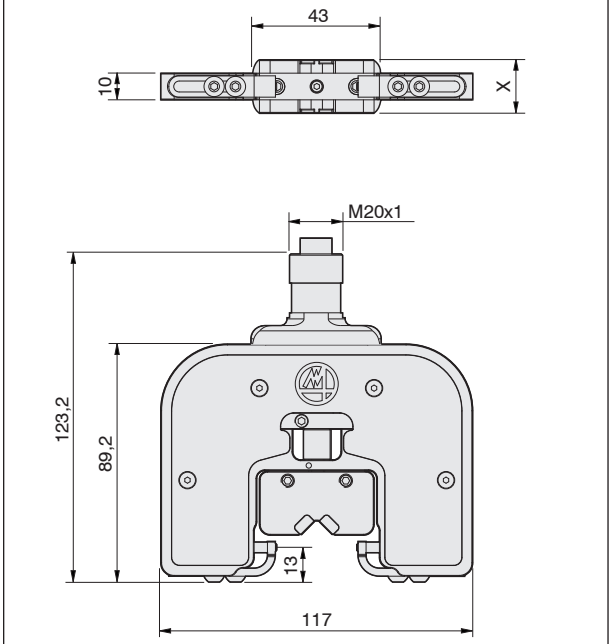
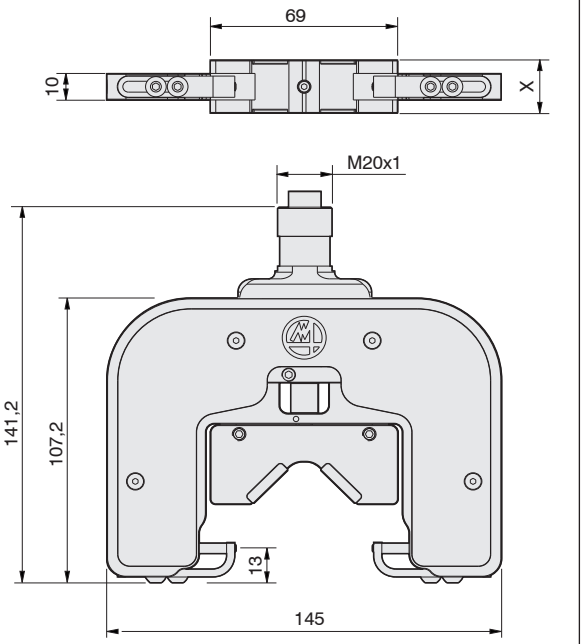
The Snap Head

M3 Star Electronic Snap Head Order Code

Snap Gauge	Range (mm)	LVDT transducer			HBT transducer		
		With 20mm "V" part reference	With 14mm "V" part reference	With 10mm "V" part reference	With 20mm "V" part reference	With 14mm "V" part reference	With 10mm "V" part reference
	5 - 15	3TTFSAWXXS	3TTFTAWXXS	3TTFUAWXXS	3TTHSAWXXS	3TTHTAWXXS	3TTHUAWXXS
	15 - 30	3TTFSBWXXS	3TTFTBWXXS	3TTFUBWXXS	3TTHSBWXXS	3TTHTBWXXS	3TTHUBWXXS
	30 - 50	3TTFSCWXXS	3TTFTCWXXS	3TTFUCWXXS	3TTHSCWXXS	3TTHTCWXXS	3TTHUCWXXS
	50 - 70	3TTFSDWXXS	3TTFTDWXXS	3TTFUDWXXS	3TTHSDWXXS	3TTHTDWXXS	3TTHUDWXXS

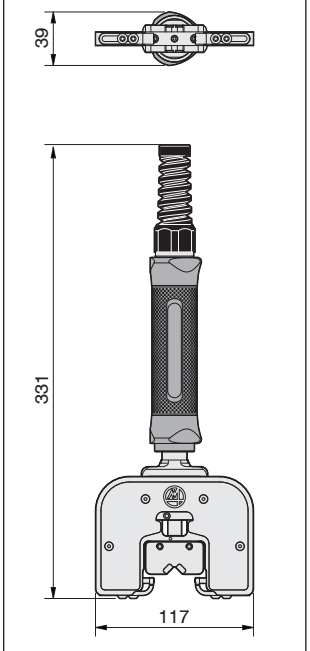
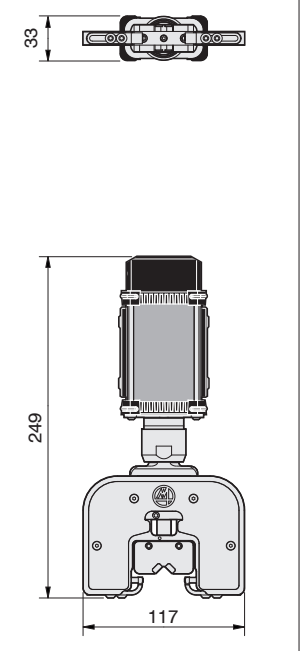
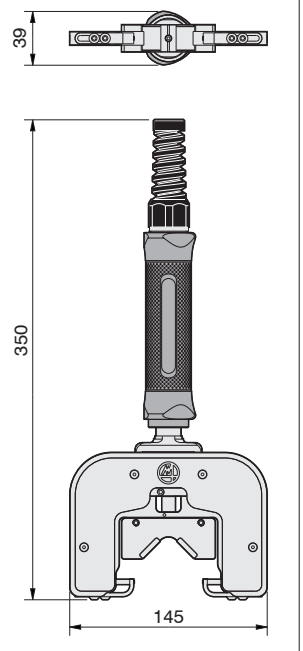
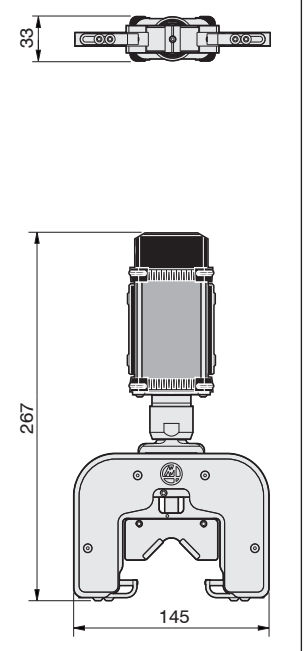
ESG DIMENSIONS

ESG Snap Head

MEASURING RANGE 5÷30	MEASURING RANGE 30÷70
	

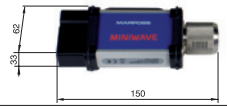
X= V REFERENCE PART THICKNESS	20mm	14mm	10mm

Complete snap gauge

MEASURING RANGE 5÷30		MEASURING RANGE 30÷70	
			

HANDLES

HANDLES AND CABLES FOR ESG SNAP GAUGE

	Description	Order Code
	Mini Wave Handle for wireless transmission	Available on request
	M3Star handle (without cable)	2TH3000001
	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

SPARES AND ACCESSORISES

BODIES (V part, contacts and contact protections not included)

	M3 star MSG		M3 star ESG		
				LVDT	HBT
5-30mm		2942426421		2942426422	2942426423
30-70mm		2942426411		2942426412	2942426413

V-PART REFERENCES

Range	20mm "V"	Order Code	14mm "V"	Order Code	10mm "V"	Order Code
5 - 15 mm		2942426459		2942426463		2942426457
15 - 30 mm		2942426458		2942426462		2942426456
30 - 50 mm		2942426455		2942426465		2942426453
50 - 70 mm		2942426454		2942426464		2942426452

COMPONENTS

Contact (Carbide 1 piece)		Contact Protections (Carbide)		
Description	Order Code	Description		Order Code
	3TXCX00026		M3Star 5÷30 mm	2942426434
			M3Star 30÷50 mm	2942426435
			M3Star 50÷70 mm	2942426436

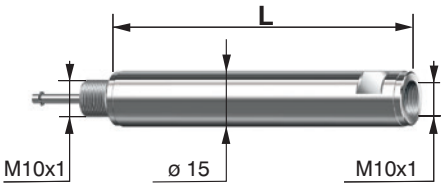
TOOLS

	Description	Order Code
	2 mm Hex wrench	4413675303
	2,5 mm Hex wrench	4413675304

SPARES

	Description	Order Code
	Protections kit for 5-30mm body	2042426432
	Protections kit for 30-70mm body	2042426406
	Spring – 1 piece	1042426287
	Screw for spring limitation - 1 piece	1042426286
	Transfer Rod	2042433015
	Rod Bushing	1042433204

DEPTH EXTENSIONS available only for M3star MSG



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

STAND available only for M3star ESG Mini Wave

	Description	Order Code
	Stand charger for M3 Star ESG with Mini Wave handle (power supply unit included).	Available on request

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M2ELECTRON



... for crankshaft journals and pin bearings ...

M2 Electron is an extremely precise electronic snap gauge, specifically engineered for the automotive market, that guarantees excellent repeatability and accuracy.

PRODUCT FEATURES

Due to its accuracy and ease in handling, the M2 Electron provides the automotive market with an essential product, suitable for any type of measurement performed on main bearings and pin bearings (from 1 to 3 diametrical measurements, ovality, barrel-shape and taper).

Particular attention has been paid to following specific areas of concern:
- Gauge sturdiness, by designing a single-piece body
- Ease of use, through a rigid handle
- Interchangeability of wearable parts

This product can be provided with 1 to 3 measuring sections for inspecting:
- Diameters ranging from 18 to 120 mm
- Ovality
- Barrel-shape
- Taper

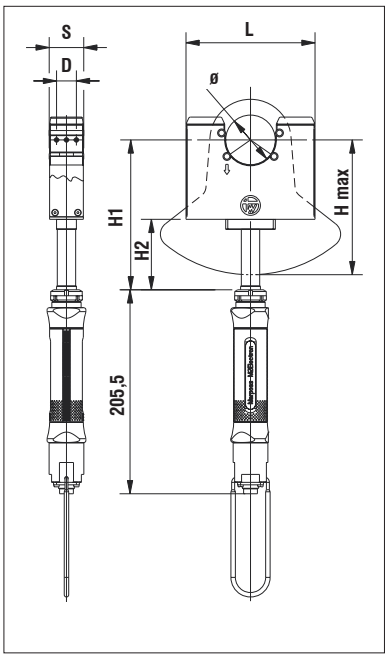
It can be used in association with the compact embedded gauge computers Nemo and Merlin or with the E9066T and E9066E industrial PC's.

NON-STOP GAUGE

Designed for industrial production, with no retooling and minimal maintenance required, the M2 Electron fully deserves the title of "Non-stop gauge".

Application Ranges

Part diameter **ø**	from 18 to 120 mm (from 0.71" to 4.72")
Width **L**	from 98 to 200 mm (from 3.86" to 7.87")
Thickness **S**	from 17.5 to 75 mm (from 0.70" to 2.95")
Minimum distance **D** between external measuring sections	5.4 mm (0.21") with 2 sections 10.8 mm (0.43") with 3 sections
H1	short version: 103 mm if ø ≤ 70 mm and Hmax ≤ 98 mm 103 mm + (ø-70)/37.5*20 if ø > 70 and Hmax ≤ 98 + (ø-70)/37.5*20 long version: 151 mm if ø ≤ 70 mm and Hmax > 98 151 mm + (ø-70)/37.5*20 if ø > 70 and Hmax > 98 + (ø-70)/37.5*20
H2	short version: 23 long version: 71



Technical Specifications

Pretravel of each cell	from 150 to 200 μm
Measuring force of each cell	from 0.4 to 0.7 N
Linearity range of each cell	± 300 μm
Sensitivity error	± 2%
Repeatability error (2.776)	< MAX (10% of tolerance; 1 μm as absolute limit)
Weight	from 1.9 to 5.4 Kg
Cable length	3.95 m

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M2WAVE



… wireless, for crankshaft journals and pin bearings…

M2 Wave is an extremely precise wireless electronic snap gauge, specifically engineered for the automotive market, that guarantees excellent repeatability and accuracy.

PRODUCT FEATURES

The M2 Wave is designed to offer maximum flexibility and operating freedom during the execution of the measurements. It eliminates operating problems related to cable length limits, entanglement or cable breaks, leaving the operator the freedom to work without limitations in moving during the measurement process, while guaranteeing the same excellent performance you find in the M2 Electron wired version.

The M2 Wave is composed of a standard snap gauge head connected directly to a special handle featuring the Marposs "Wave" transmission technology with Li-Ion batteries and inductive recharging system.
By simply pressing the button on the top of the handle, real time measurement values are displayed on the receiving electronic unit. With the same button it is possible to store data in order to perform statistical elaborations and to control advanced cycles or guided sequences.

This product can be provided with 1 to 3 measuring sections for inspecting:
- Diameters ranging from 18 to 120 mm
- Ovality
- Barrel-shape
- Taper

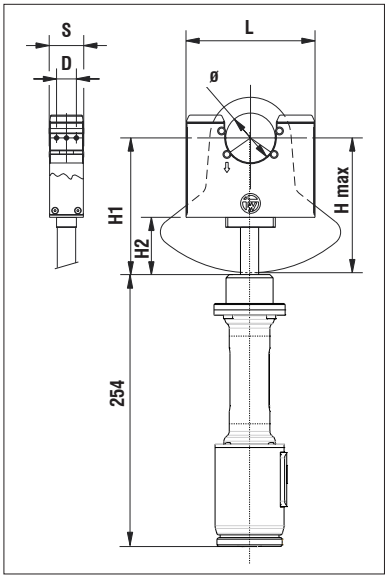
It can be used in association with the compact embedded gauge computers Nemo and Merlin or with the E9066T and E9066E industrial PC's. Communication software, developed by Marposs, is also available to allow connection of the M2 Wave to commercial computers.

NON-STOP GAUGE

Designed for industrial production, with no retooling and minimal maintenance required, the M2 Wave fully deserves the title of "Non-stop gauge".

Application Ranges

Part diameter **ø**	from 18 to 120 mm (from 0.71" to 4.72")
Width **L**	from 98 to 200 mm (from 3.86" to 7.87")
Thickness **S**	from 17.5 to 75 mm (from 0.70" to 2.95")
Minimum distance **D** between external measuring sections	5.4 mm (0.21") with 2 sections 10.8 mm (0.43") with 3 sections
H1	short version: 103 mm if ø ≤ 70 mm and Hmax ≤ 98 mm 103 mm + (ø-70)/37.5*20 if ø > 70 and Hmax ≤ 98 + (ø-70)/37.5*20 long version: 151 mm if ø ≤ 70 mm and Hmax > 98 151 mm + (ø-70)/37.5*20 if ø > 70 and Hmax > 98 + (ø-70)/37.5*20
H2	short version: 23 long version: 71



Technical Specifications

Pretravel of each cell	from 150 to 200 μm
Measuring force of each cell	from 0.4 to 0.7 N
Linearity range of each cell	± 300 μm
Repeatability error (2.77σ)	< MAX (10% of tolerance; 1 μm as absolute limit)
Weight	from 1.9 to 5.4 Kg
Transmission technology	Bluetooth® wireless technology
Transmission distance	10 m
Battery charge duration	up to 36 h in continuous operation
Recharging technology	Contactless recharging system with inductive technology
Recharging time	5-6 hours (80% in 2 hours)

Battery Charger Application Examples



Recharging stand



"Clip on" charger

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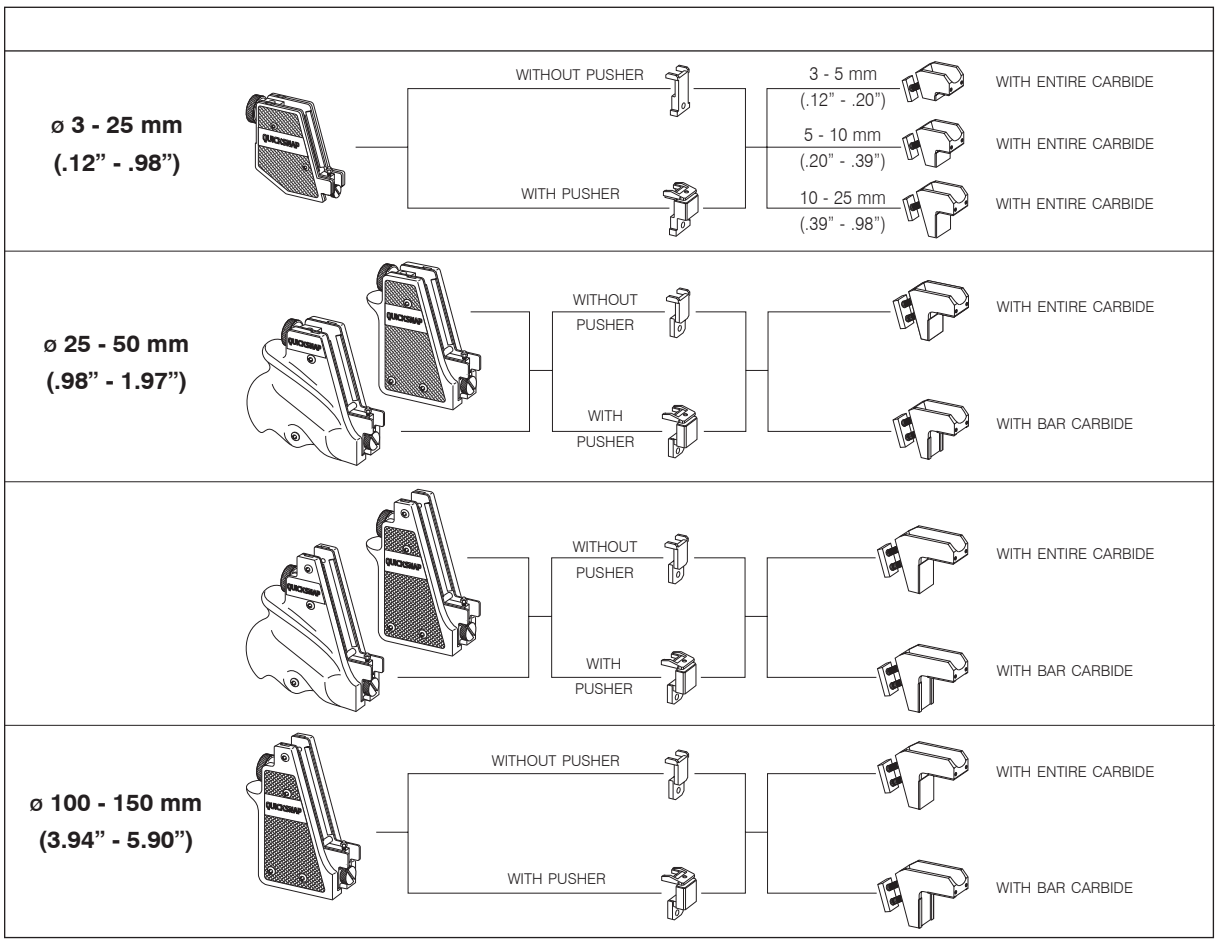
QUICKSNAP



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 ref-erence 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

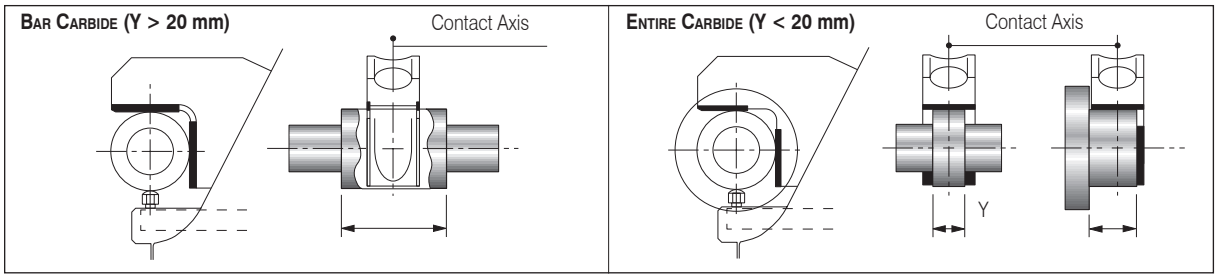


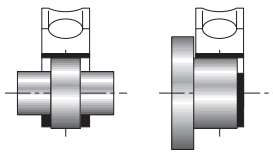
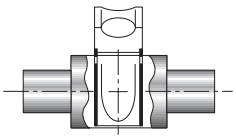
Technical Specifications

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.

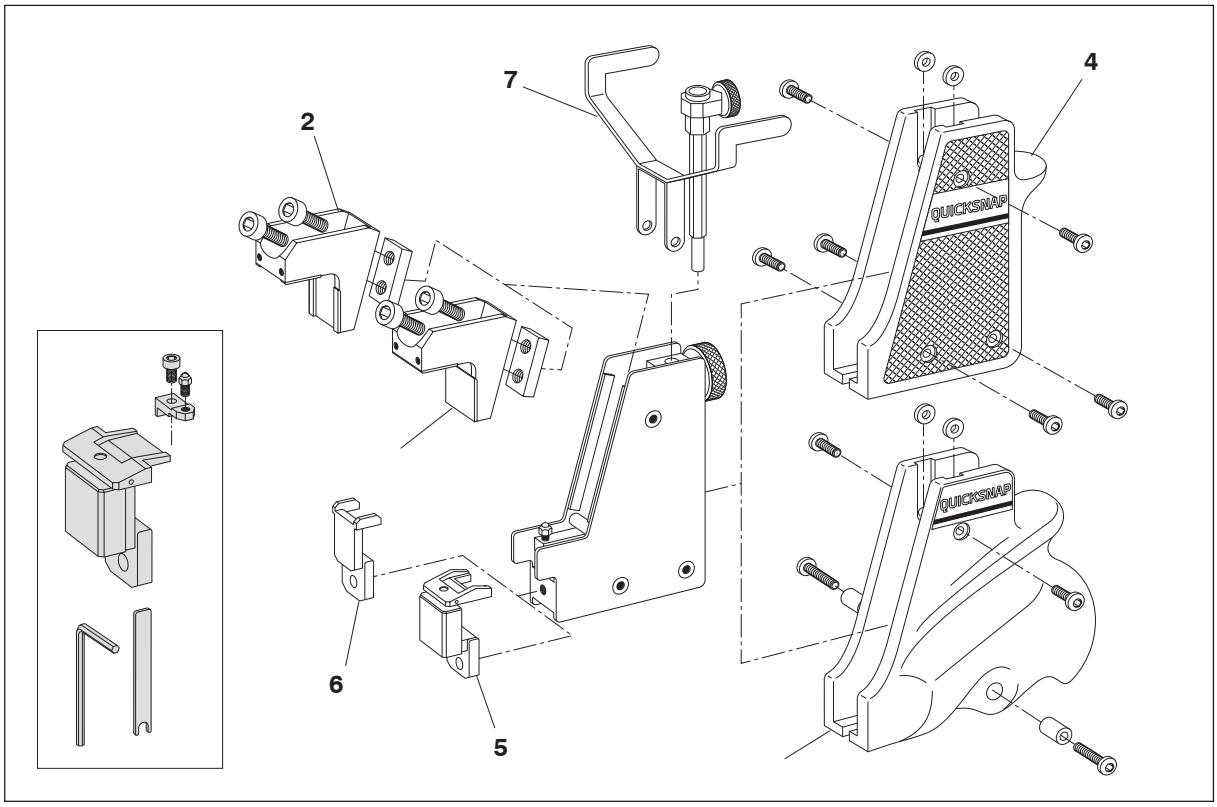


TYPE OF SNAP GAUGE			ANATOMIC HANDLE		SLIM HANDLE	
Reference Prism Unit	Retooling Range	Pretravel Adjuster	Diameter 8 mm Order Code	Diameter 3/8" Order Code	Diameter 8 mm Order Code	Diameter 3/8" Order Code
 With Entire Carbide	3 - 5 mm (.12" - .20")	WITH PUSHER	N/A	N/A	3519750282	3519750287
		W/O PUSHER	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)

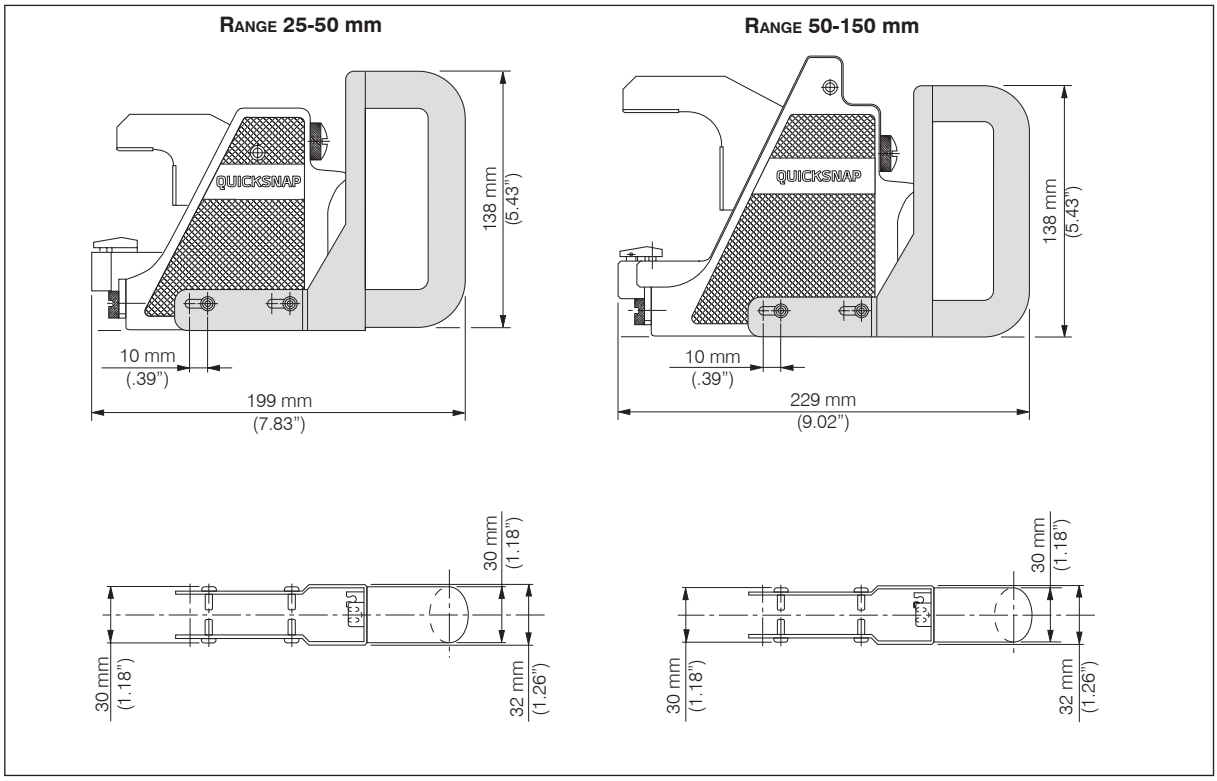
Components and Accessories



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

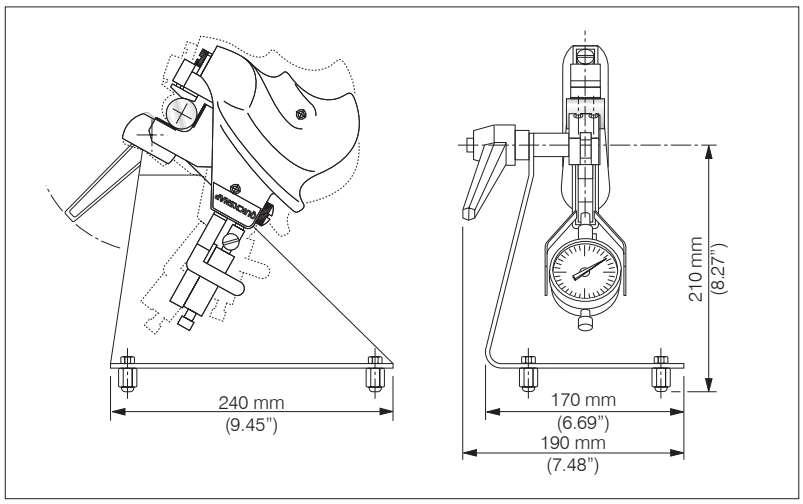
(*) It allows measurements to be performed at a minimum distance of 3 mm from a shoulder by means of a contact extension (with the standard contact the minimum distance is 10 mm).

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

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… the easy way to measure shafts

M4 Star is a family of high performance gauges for measuring parts such as shafts or pins. The highly customizable M4 Star family includes dial/digital indicators and electronic LVDT and HBT models with wired and wireless connectivity.
M4 Star is available on request.

M4 Star MRG – The mechanical ring gauge

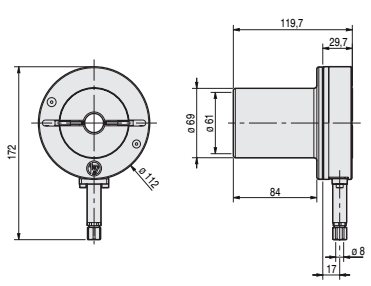
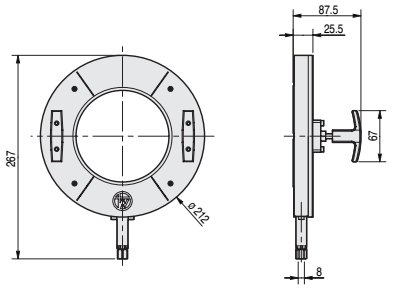
The M4 Star MRG mechanical ring gauge models are for measuring shaft and pin-type parts with diameters from 5 to 125mm with a dial indicator. The C-dimension is customizable from 1 to 6mm which allows measurements to be taken very close to the flange.
M4 Star MRG gauges are easy to use with a single comfortable handle for the smaller sizes and two small handles in the larger models. They also can be stand mounted.

Reliability

The M4 Star MRG's mechanical transmission is housed in a rugged protective body. Its robust construction is rated for more than 10.000.000 measuring cycles.

Technical Specifications

	M4Star MRG
C quote	1÷ 6mm
Thermal Drift	<0,3 μm/°C/mm
Repeatability (2,77σ)	≤1 μm
Working Range	0,1mm

	Measurable diameter 5-60mm	Measurable diameter 60-125mm
Overall dimensions		

M4 STAR ERG - *Electronic Ring Gauge*

The M4 Star ERG Electronic Ring Gauges complete the family with dedicated designs that include the following characteristics:

- integrated LVDT or HBT transducer
- Ability to measure diameters from 5mm to larger than 125mm
- Axial or radial exit cables or wireless connectivity
- Optional stand-mounted solutions with or without integrating setting pin slots
- Dedicated design: flexible and customizable



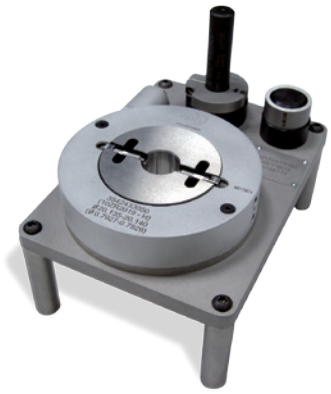
M4Star ERG Cable version



M4Star ERG Wireless solution with remote acquisition button



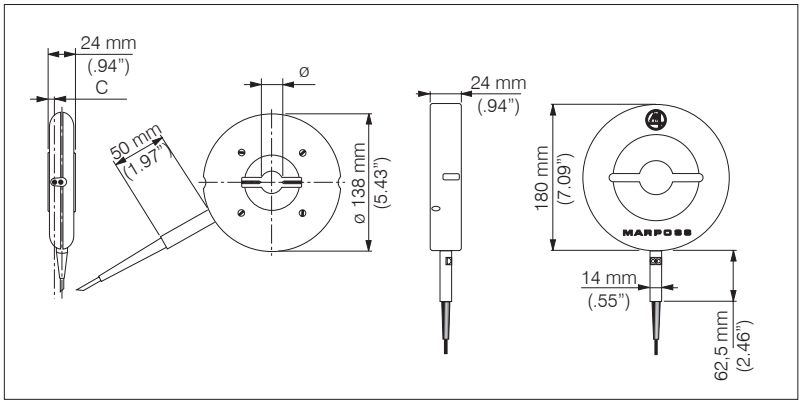
M4 Star ERG with lightened structure for extra large diameters



M4Star ERG stand mounted

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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*

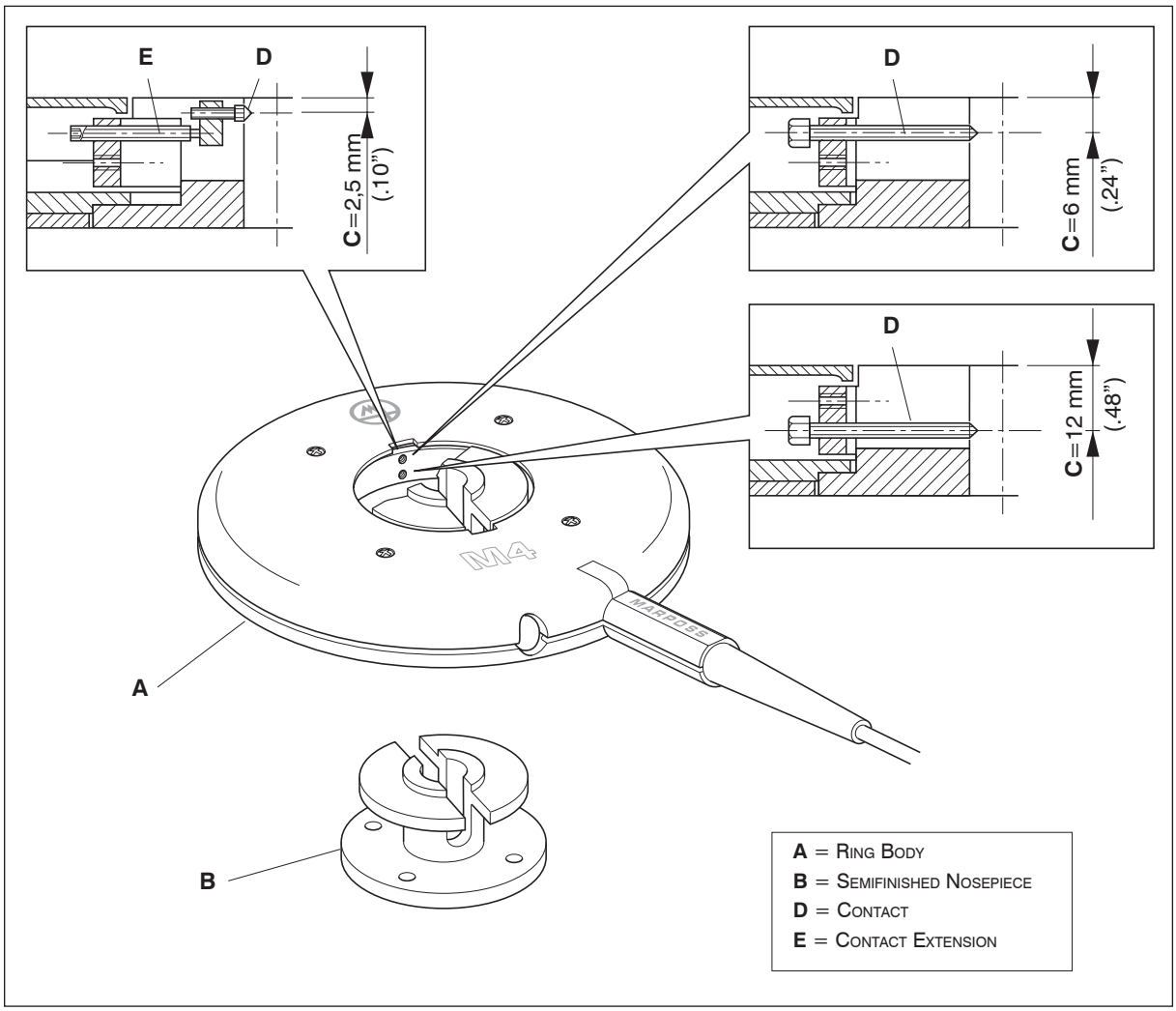
Measurement unit:
M *= Millimeter*
I *= Inch*

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).

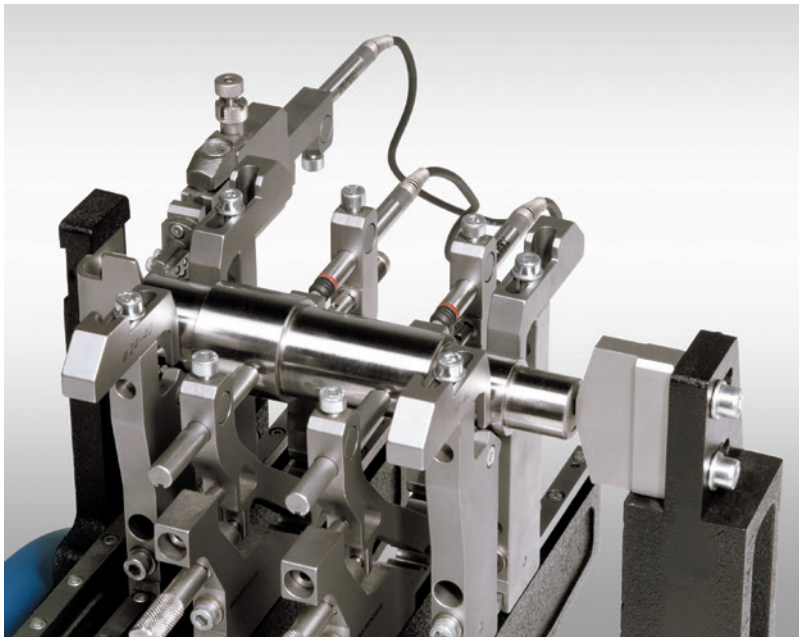


Stand

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.

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QUICKSET



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

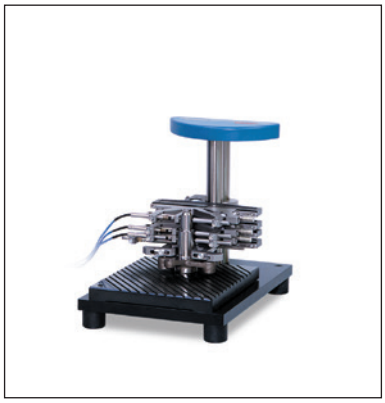
Gauge Configuration	Measurable Diameter	Max. Non-measurable Diameter	Max. Measurable Length	Weight
Quick Set-Horizontal	5 – 160 mm (.02" – 6.30")	260 mm (10.24")	700 mm (27.56")	up to 14 kg
Quick Set-Vertical	5 – 160 mm (.02" – 6.30")	260 mm (10.24")	520 mm (20.47")	up to 8 kg
Quick Set-Chuck	5 – 160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



Quick Set - Horizontal

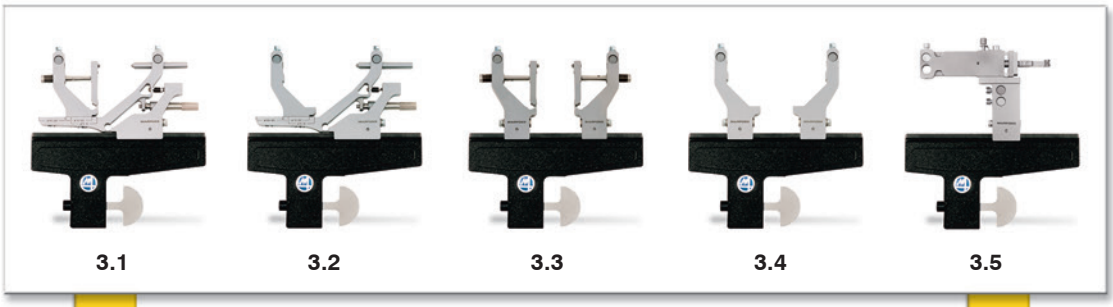


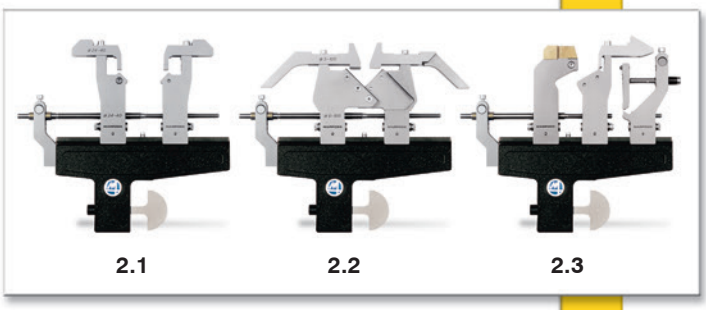
Quick Set - Vertical



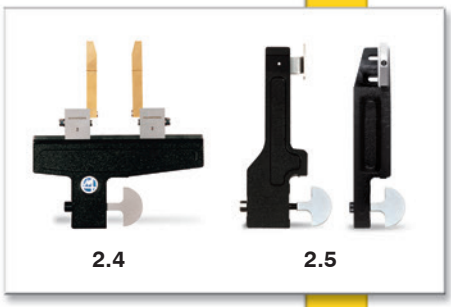
Quick Set - Chuck

QUICK SET - HORIZONTAL



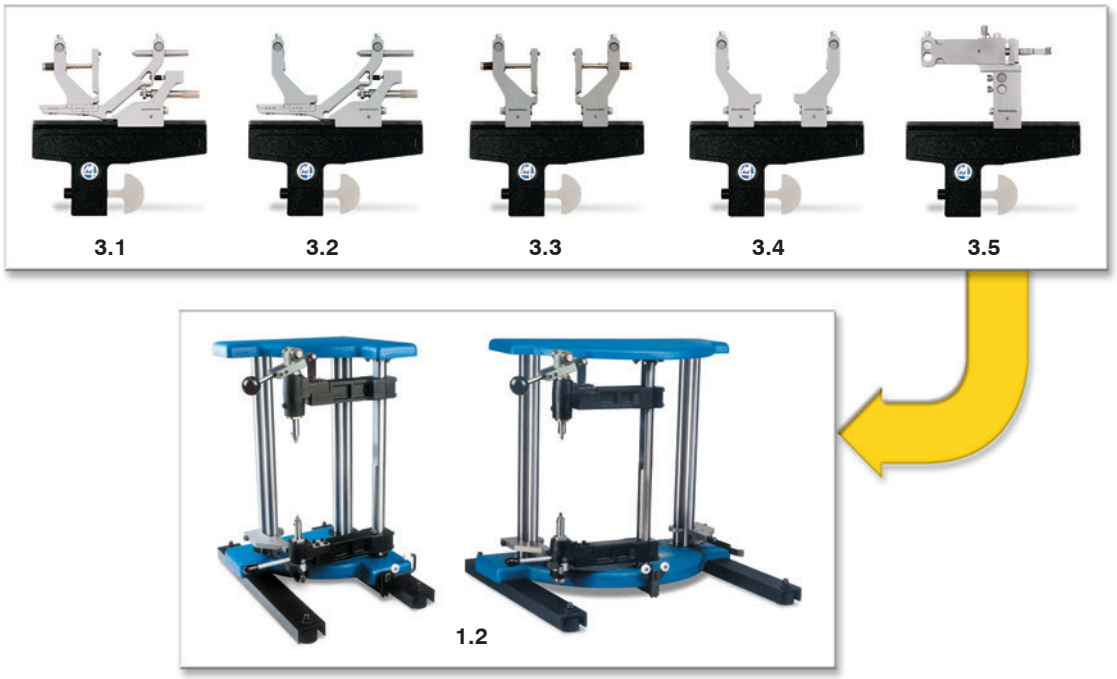




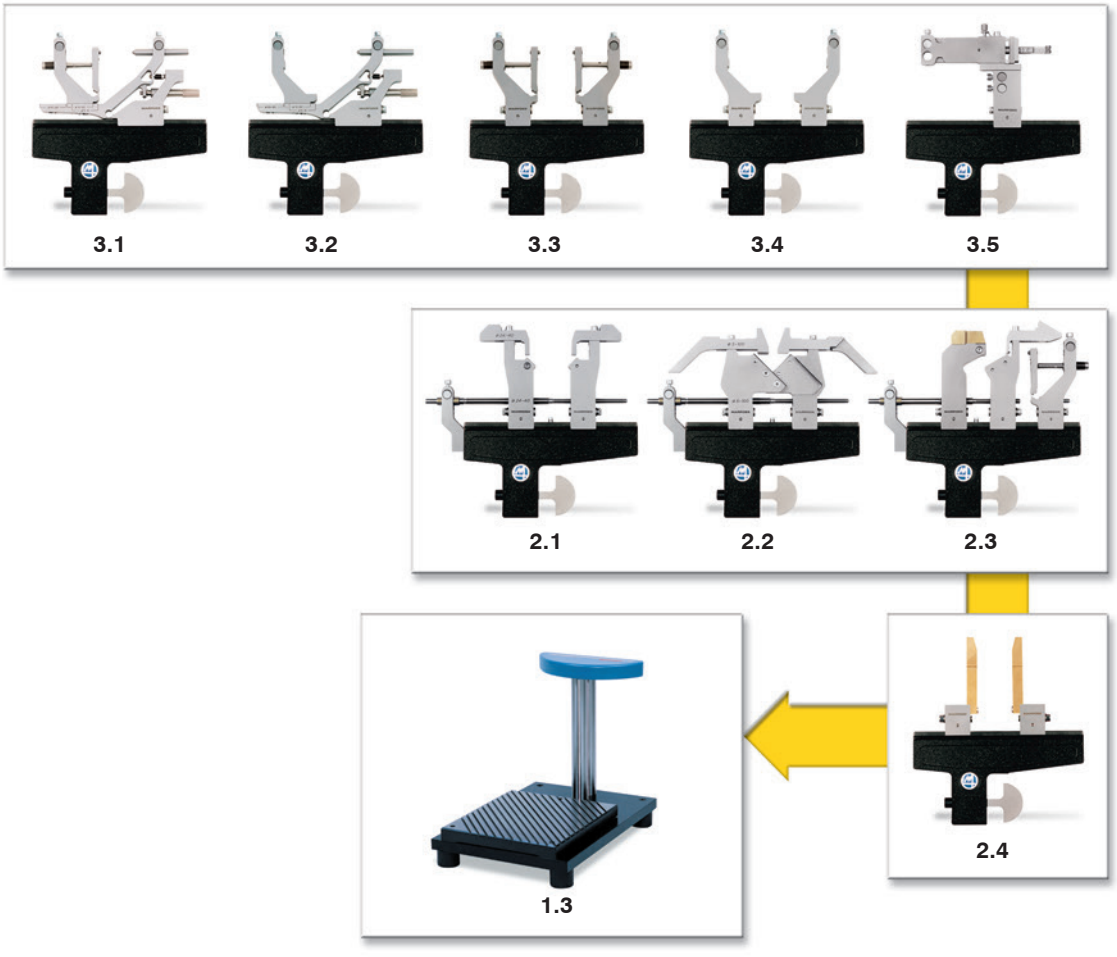




Quick Set - Vertical



Quick Set - Chuck



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1.2 Base structure assembly for Quick Set-Vertical
1.3 Base structure assembly for Quick Set-Chuck

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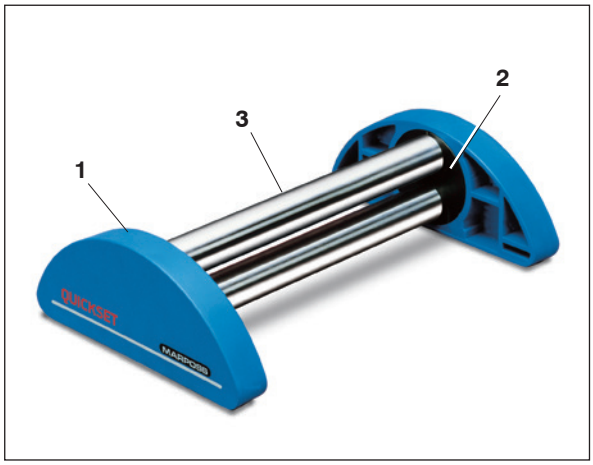
6. INSTRUCTION MANUAL

7. QUICK SET CONFIGURATOR PROGRAM

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

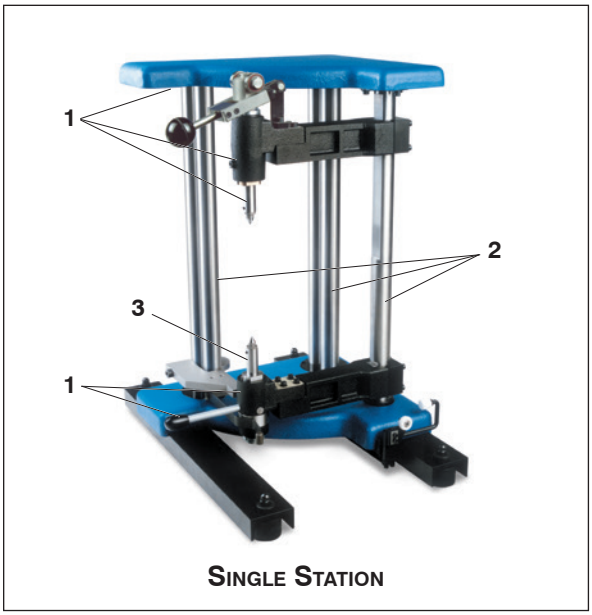


Bars Length		Bench with "V"				Bench with Pivoting centers	
		Max. part length with 2 introducing axial limiters		*Max. part length with 1 introducing axial limiter and 1 measuring axial limiter*		*Max. part length*	
(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)
200	7.87"	100	3.94"	70	2.76"	80	3.15"
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

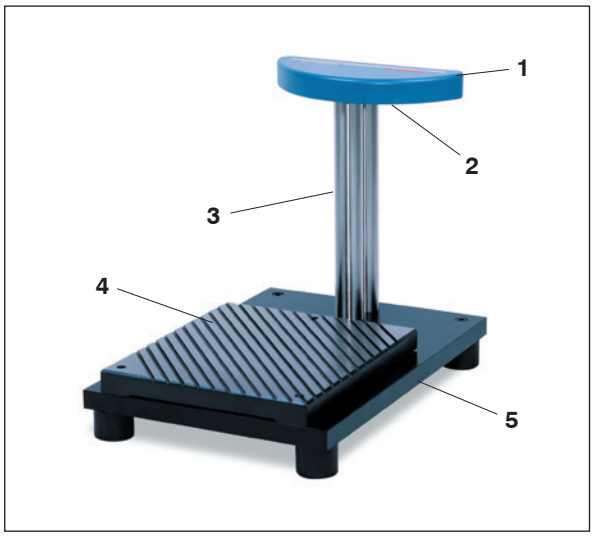
Bars Length		Quick set-Vertical							
		Part length with lower center support L=12 mm				*Part length with lower center support L=37 mm*			
		Min.		Max.		Min.		Max.	
(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)	(mm)	(Inch)
500	19.69”	24	0.94”	220	8.66”	5	0.20”	200	7.87”
600	23.62”	24	0.94”	320	12.60”	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	3024025501
	DUAL STATION BASE	3024025001
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

1.3 Base structure assembly for Quick Set-Chuck

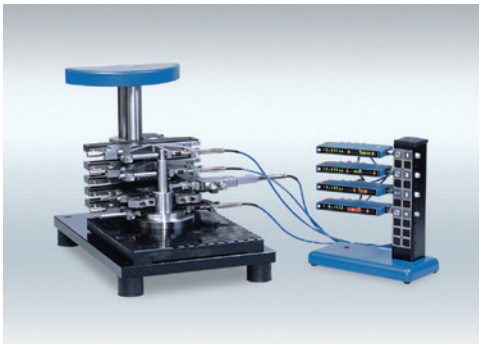


The base structure assembly is composed of bars, support feet, clamping devices, serrated referencing surface and support plate.

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
	CHROMED SERRATED REFERENCING PLATE (220 x 250 mm, HRC 68)	2924017886
5	SUPPORT PLATE (INCLUSIVE OF RUBBER FEET)	2924017890

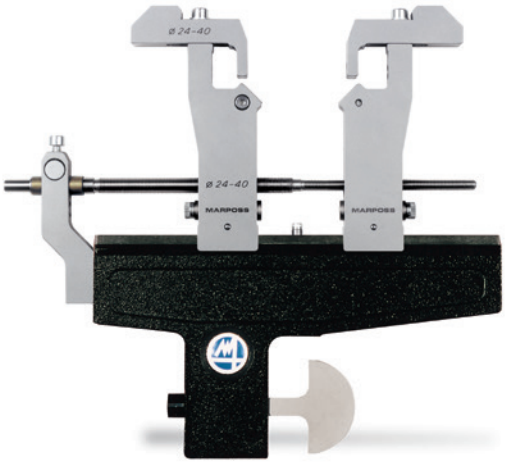




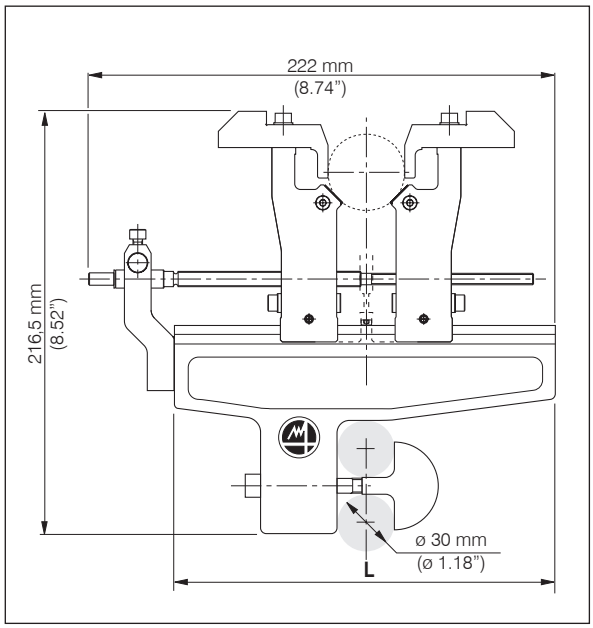


2 - Part Support and Reference

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.

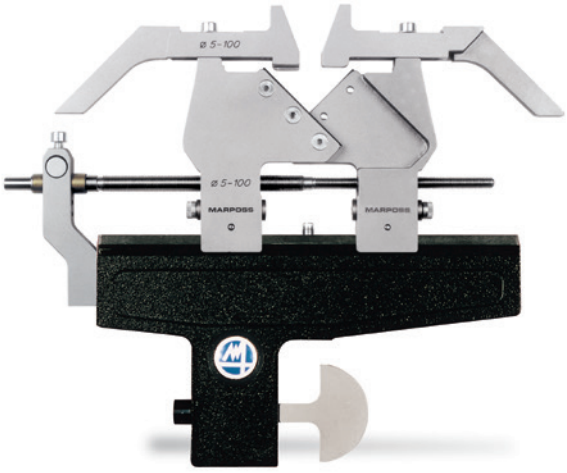
Two assemblies are normally required to support the part.

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

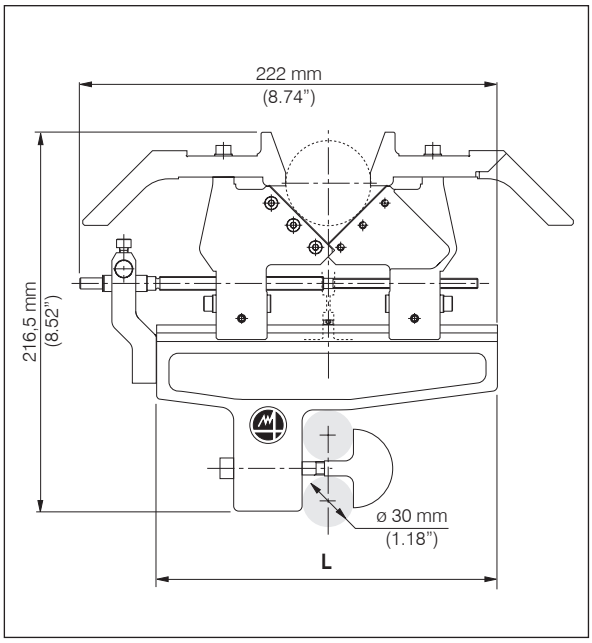
	Support Bracket			Frontal "V"		
	Length L (mm)	(inch)	Order Code	Range (mm)	(inch)	Order Code
Assembly with self-centering screw	200	7.87"	3024017540	5 - 10	.19" - .39"	3024017633
				10 - 15	.39" - .59"	3024017643
				15 - 24	.59" - .94"	3024017653
				24 - 40	.94" - 1.57"	3024017663
				40 - 70	1.57" - 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:

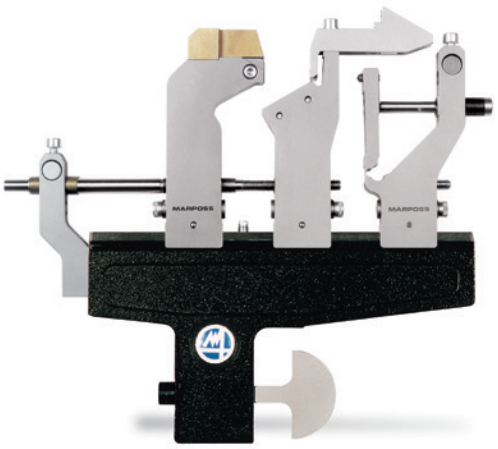
- with self-centering screw, for fast and frequent retooling;
- without self-centering screw, for economical part positioning.

Two assemblies are normally required to support the part.

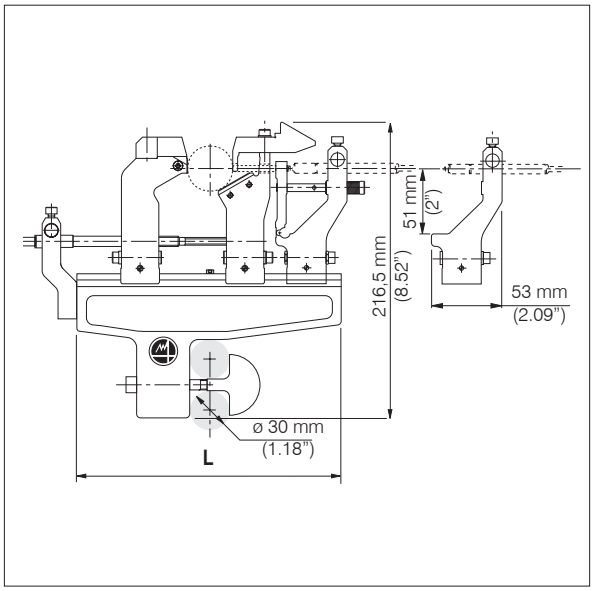
The assembly is composed of one support bracket and one crossed "V".

	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).

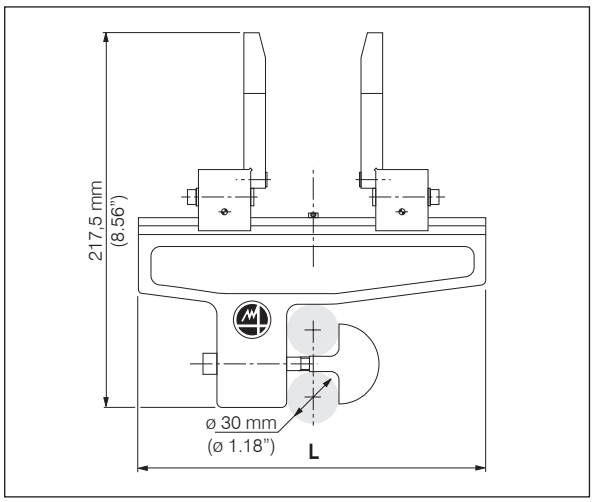
	Support Bracket			Measuring "V"		
	Length L (mm)	Length L (inch)	Order Code	Range (mm)	Range (inch)	Order Code
Assembly with self-centering screw and single transmission or direct probe unit	200	7.87"	3024017540	5 - 35	.19" - 1.38"	3024017524
				35 - 65	1.38" - 2.56"	3024017526
Assembly without self-centering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

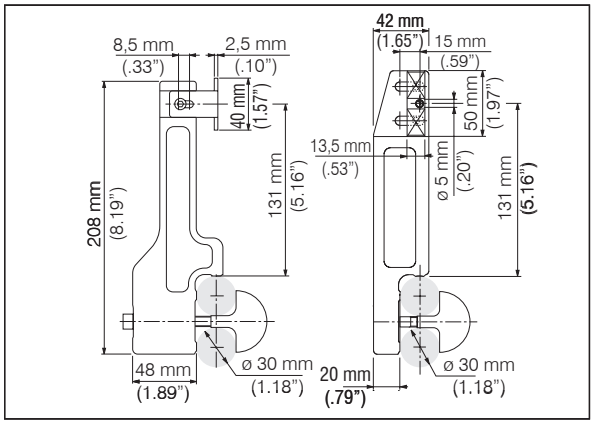
The assembly is composed of one support bracket and one pair of radial limiters.

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

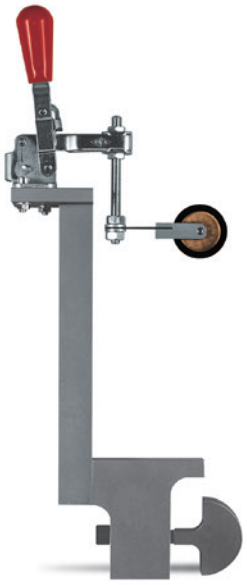


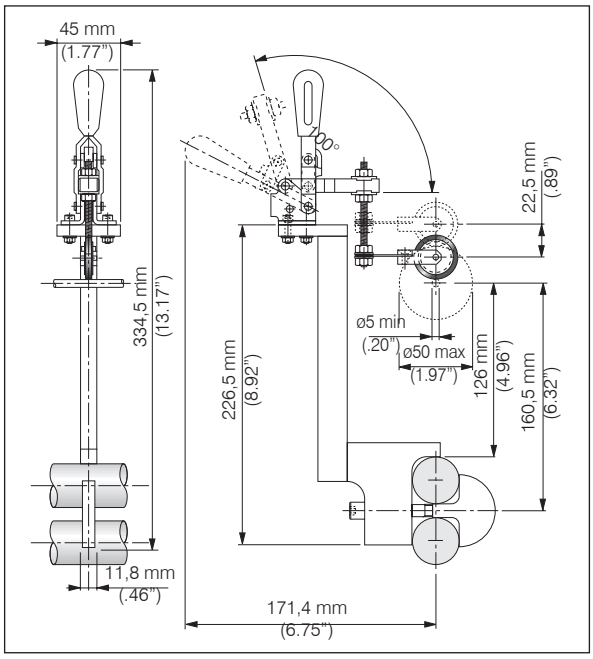


The part axial limiter limits the part axial movement and allows correct part positioning in the bench.
Two versions are available:
- Introducing axial limiter to limit part position;
- Measuring axial limiter used both to limit part position and as mechanical reference for a distance measurement carried 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





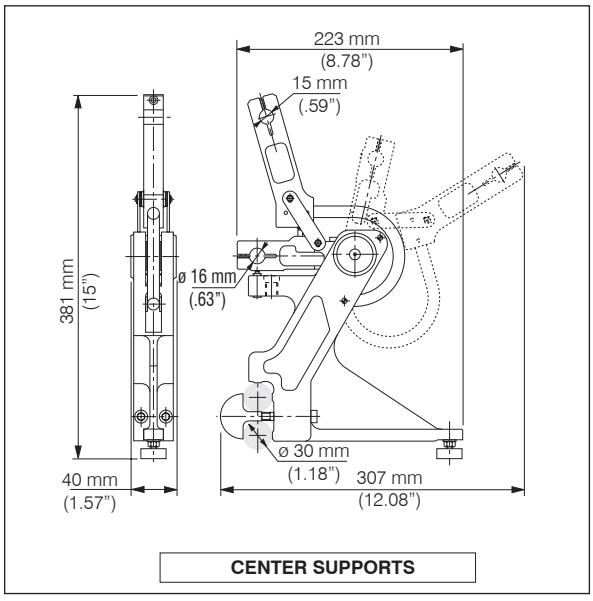
The part pusher guarantees the contact between the part and the "V" supports. It is particularly suitable for parts with weight lower than 200 gr.

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

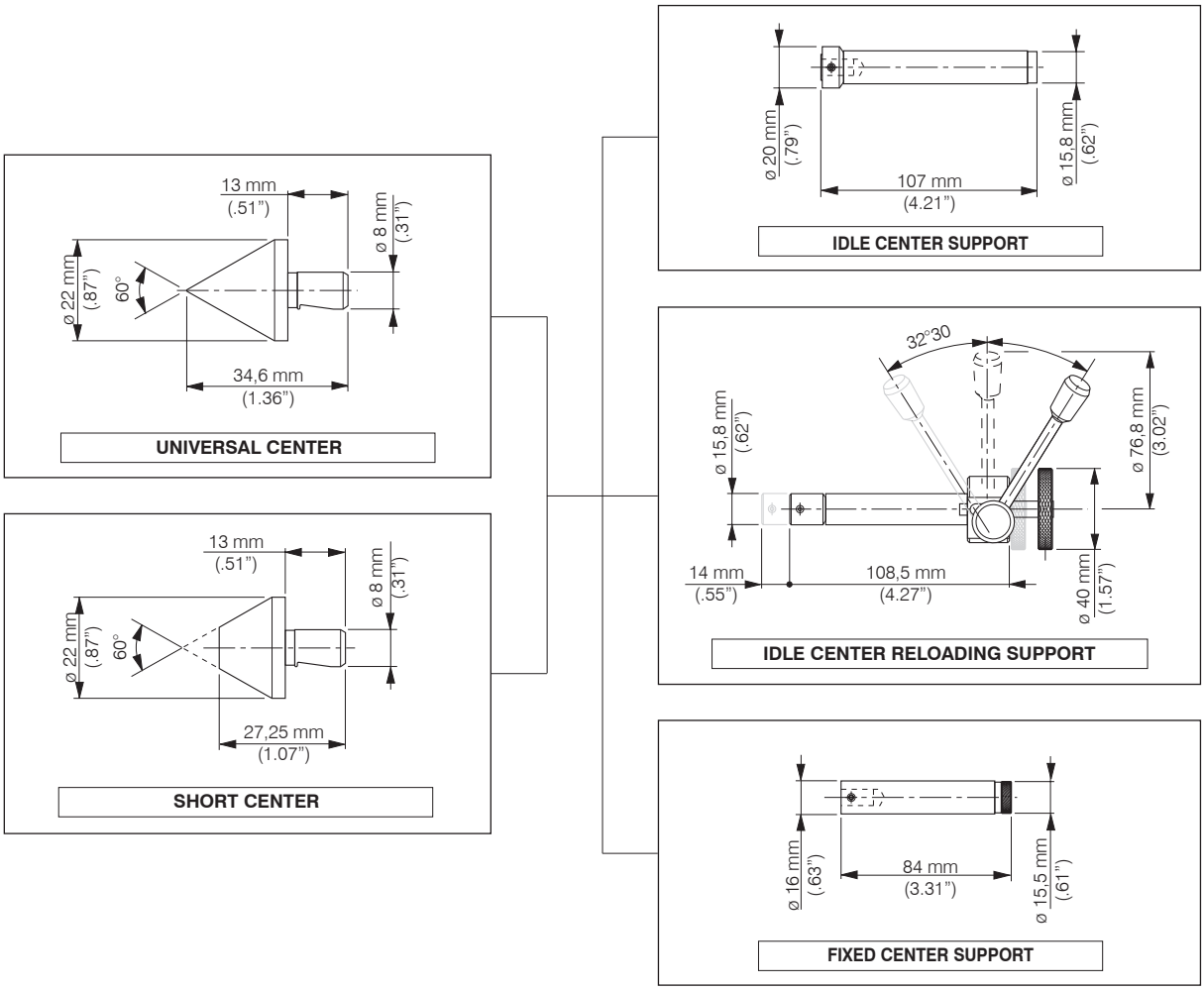
Description	Order Code
PART PUSHER	3024017980

2.7 Pivoting Centers Unit





This unit is needed when the part to be measured is provided with centers holes. The part is loaded on 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 3 kg)	44331AC108

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.

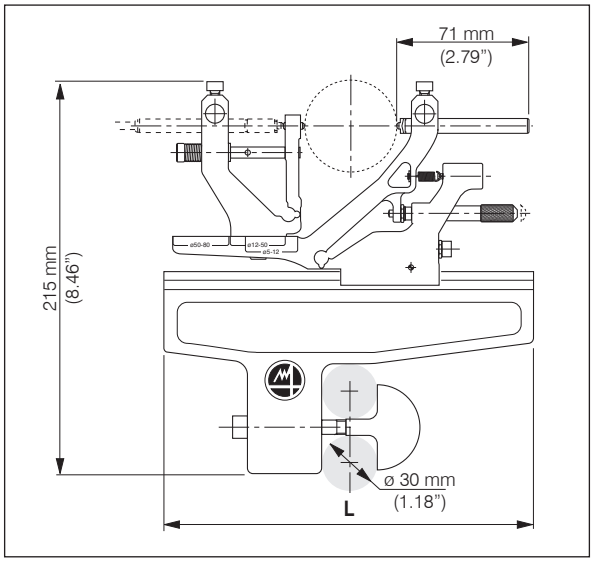
3 - Part Measuring Assembly

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.

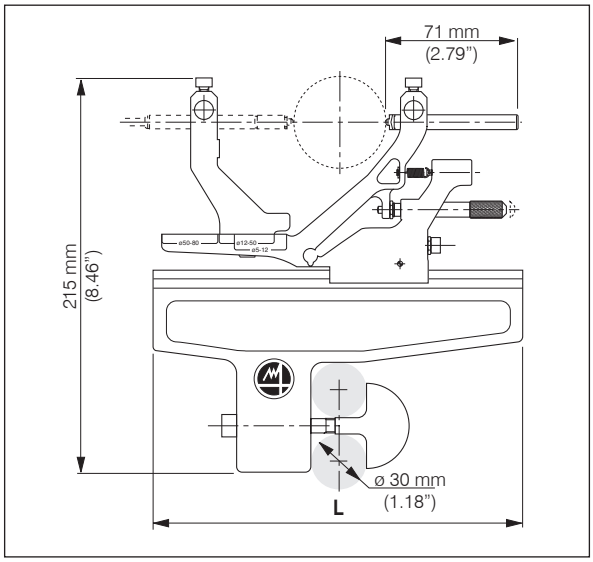
The assembly is composed of one support bracket and one self-centering unit with transmission. The probe and the two contacts to be mounted on the unit must be ordered separately (see 4. Contacts and Armsets and section Transducers and measurement transmissions).

Support Bracket			Self-Centering Unit with Transmission			
Length L (mm)	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	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).

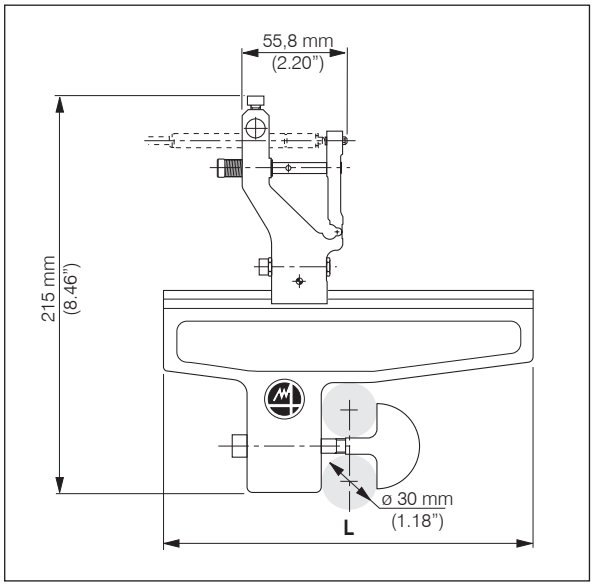
Support Bracket			Self-Centering Unit with Direct Probe			
Length L (mm)	Length L (inch)	Order Code	Range (mm)	Range (inch)	Clamping ø for Probe	Order Code
200	7.87"	3024017000	5 - 80	.20" - 3.15"	8 mm	3024017470
					3/8"	3024017472

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).

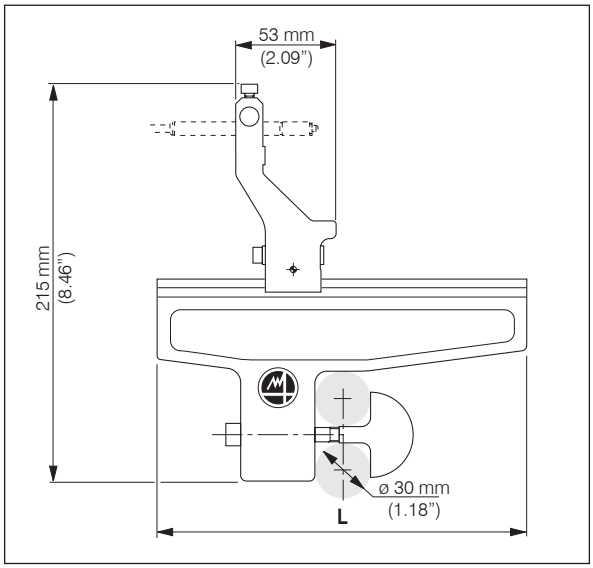
Support Bracket				
Length L (mm)	Length L (inch)	Range (mm)	Range (inch)	Order Code
200	7.87"	3 - 118	.12" - 4.64"	3024017000
250	9.84"	3 - 160	.12" - 6.30"	3024017050

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)	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

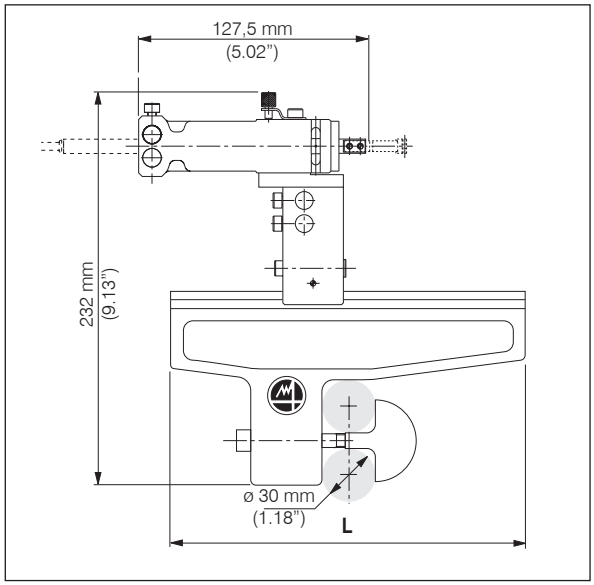
Probe Support	Clamping ø for Probe	Order Code
DIRECT PROBE UNIT	8 mm	3024017145
	3/8"	3024017147

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).

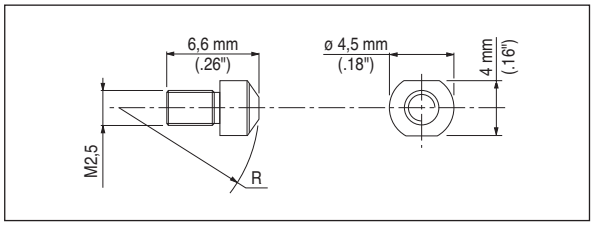
Support Bracket		
Length L (mm)	(inch)	Order Code
200	7.87"	3024017000
250	9.84"	3024017050

	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

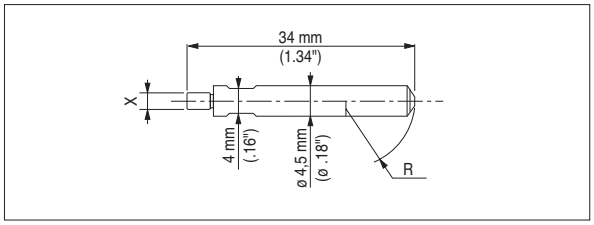


To be used with:

- 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

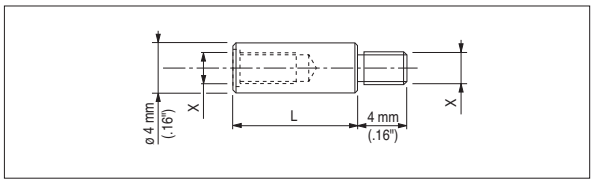
4.2 Contacts for Measuring "V"



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:

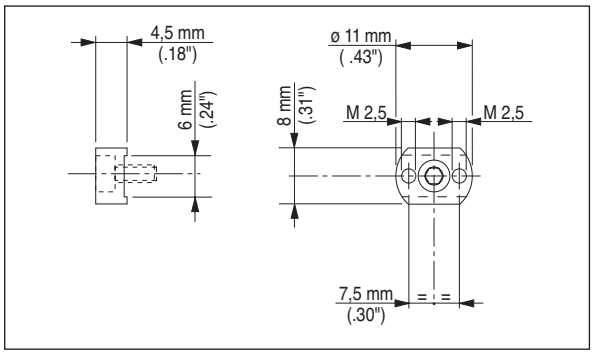
- With self-centering unit
- With single transmission unit
- With direct probe unit
- With dial indicators

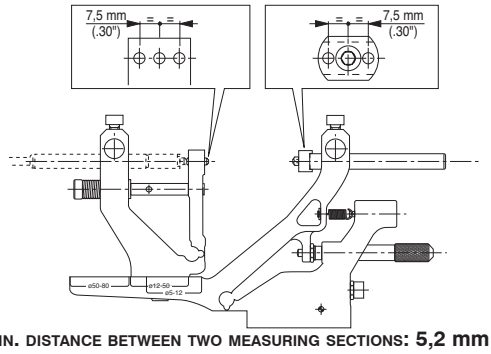
L (mm)	L (inch)	Thread X	Order Code
10	.39"	M 2.5	1024017105
15	.59"	M 2.5	1024017106
20	.79"	M 2.5	1024017107
25	.98"	M 2.5	1024017108
30	1.18"	M 2.5	1024017109
10	.39"	4 - 48 UNF	1024017115
15	.59"	4 - 48 UNF	1024017116
20	.79"	4 - 48 UNF	1024017117
25	.98"	4 - 48 UNF	1024017118
30	1.18"	4 - 48 UNF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



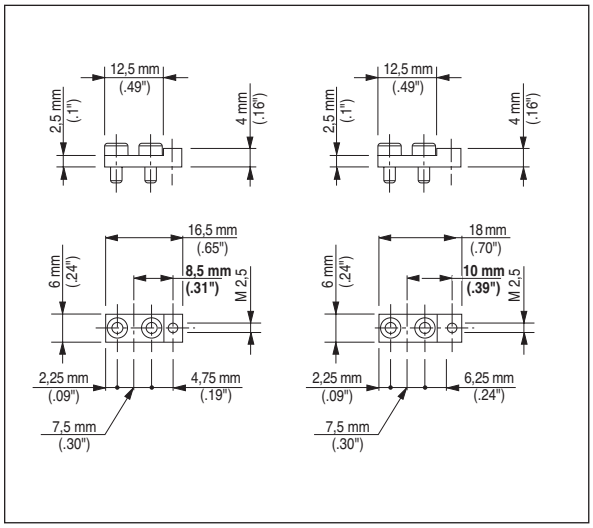


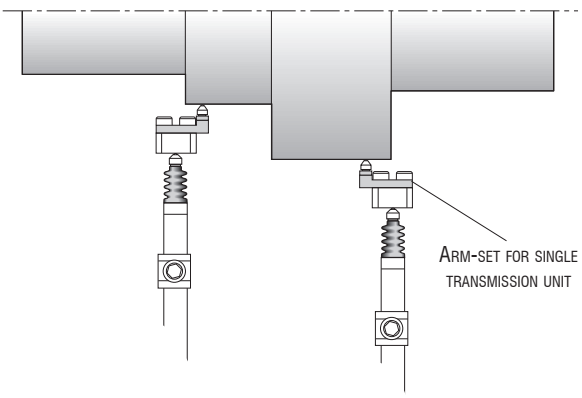
Min. distance between two measuring sections: 5,2 mm

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.

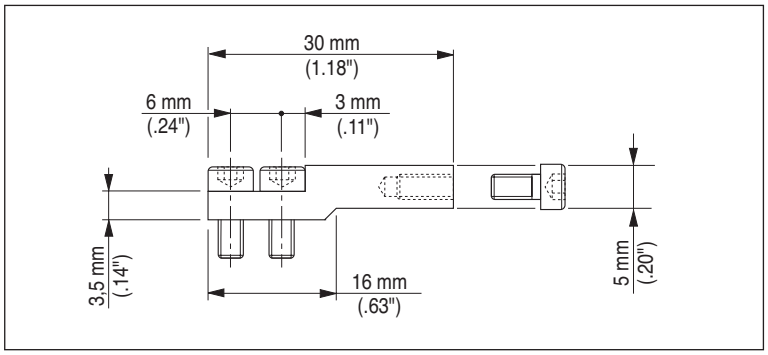




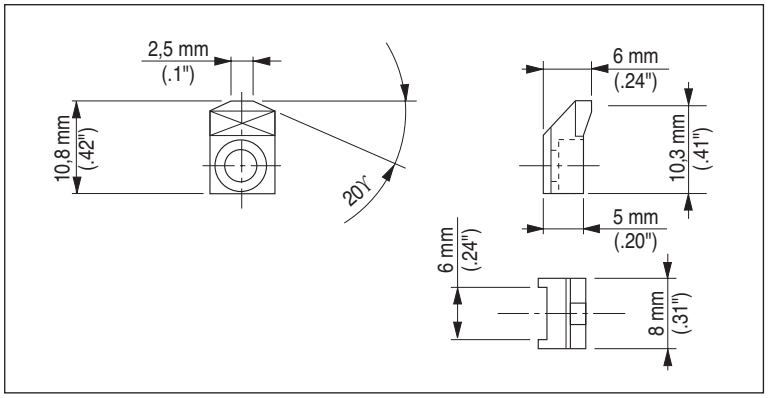
Min. distance between two measuring sections: 5,2 mm

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

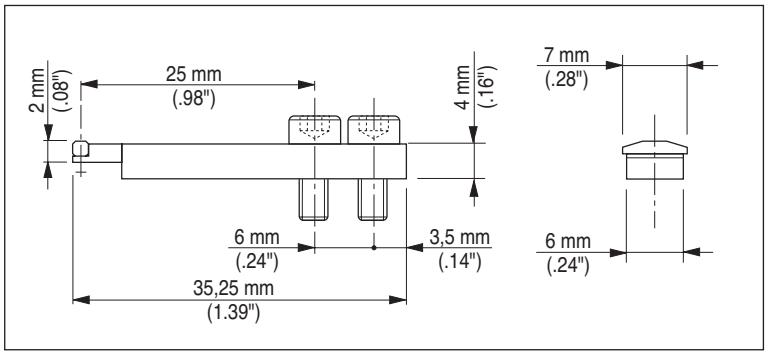
4.5 CONTACTS AND ARMSETS FOR SHOULDER TRANSMISSION UNIT



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

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QUICKSET 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.

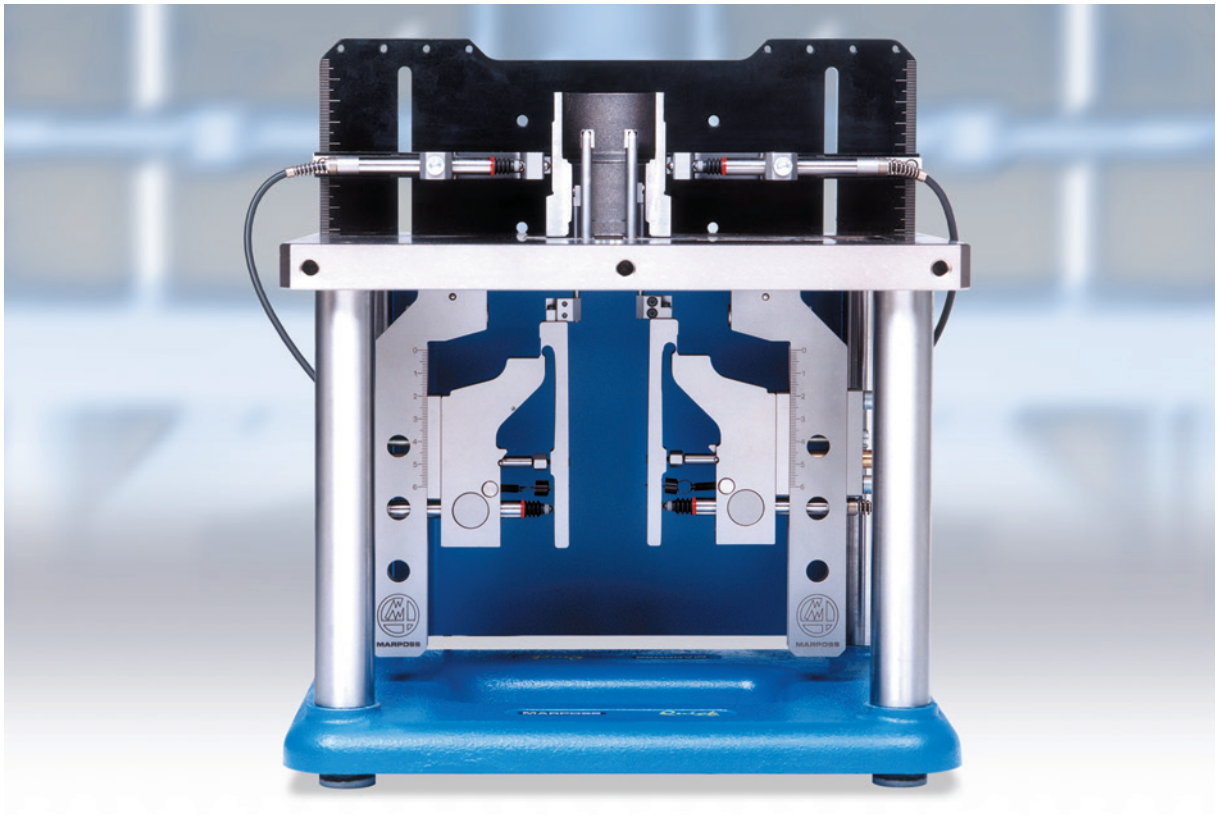
Parts with:

- 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



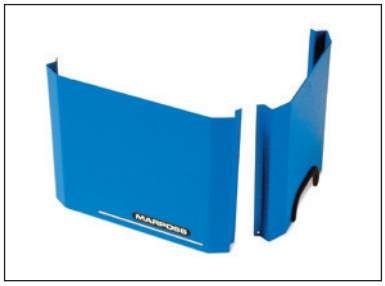
2. BASE PLATE

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

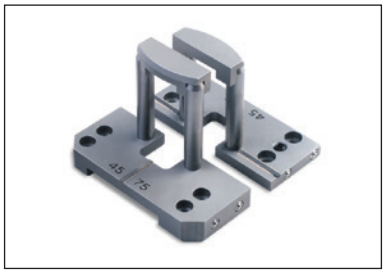


4. RETOOLABLE NOSEPIECE

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.

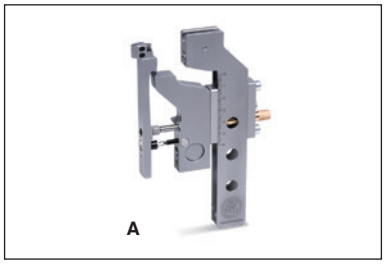
GUIDE
ORDER CODE
2924070040



6. TRANSMISSION UNIT FOR CHECKING INTERNAL DIAMETERS

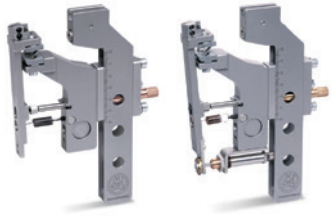
Internal diameters in the range 10 to 100 mm can be measured using two of this components. When the size is between 25 and 100 mm, up to 3 inside diameters can be measured. Transmissions with integral fulcrum have ±1 mm measuring range, transmissions with cross fulcrum have ±5 mm measuring range.

(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



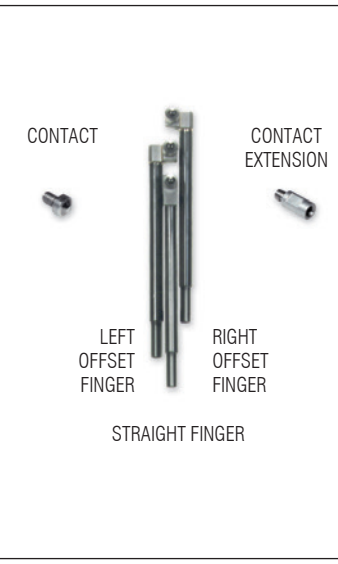
7. FINGERS AND CONTACTS

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

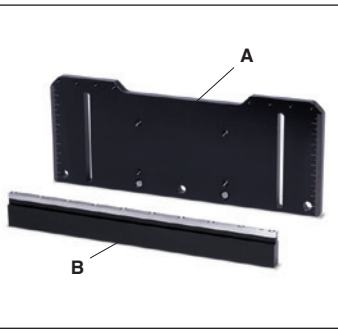
CONTACT EXTENSION	
LENGTH (mm)	ORDER CODE
6.2	1024070014



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

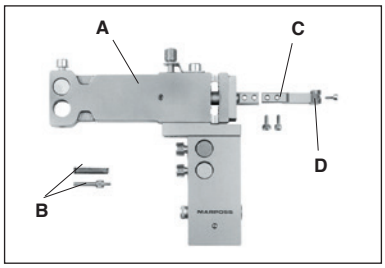


11. TRANSMISSION UNIT FOR THICKNESS MEASUREMENTS

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

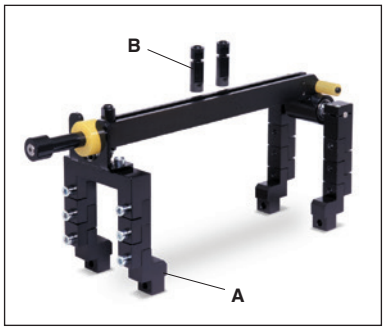


12. PIVOTING ARM FOR THICKNESS MEASUREMENTS

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)

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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

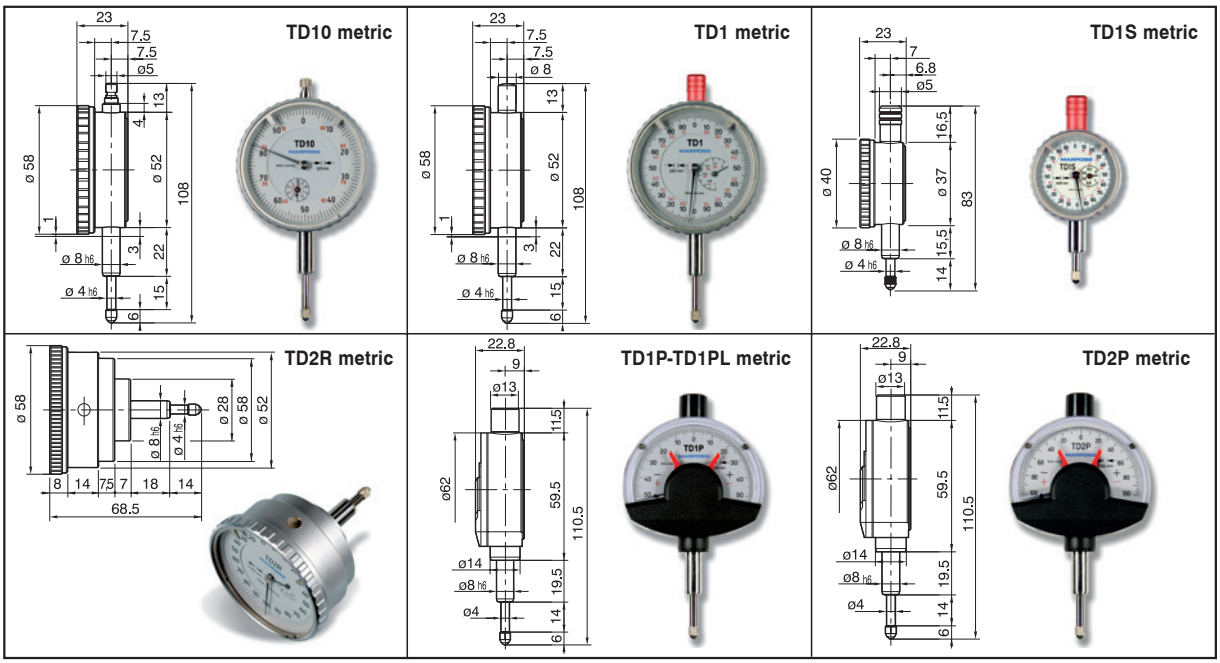
- High magnification gear train and high-resolution dials allow a very precise reading of the measuring value
- Precisely matched measuring spindles and stems minimise lateral play
- All gear pivots run in high class ceramic bearings
- Bezel rotates fully 360° to set zero in any position

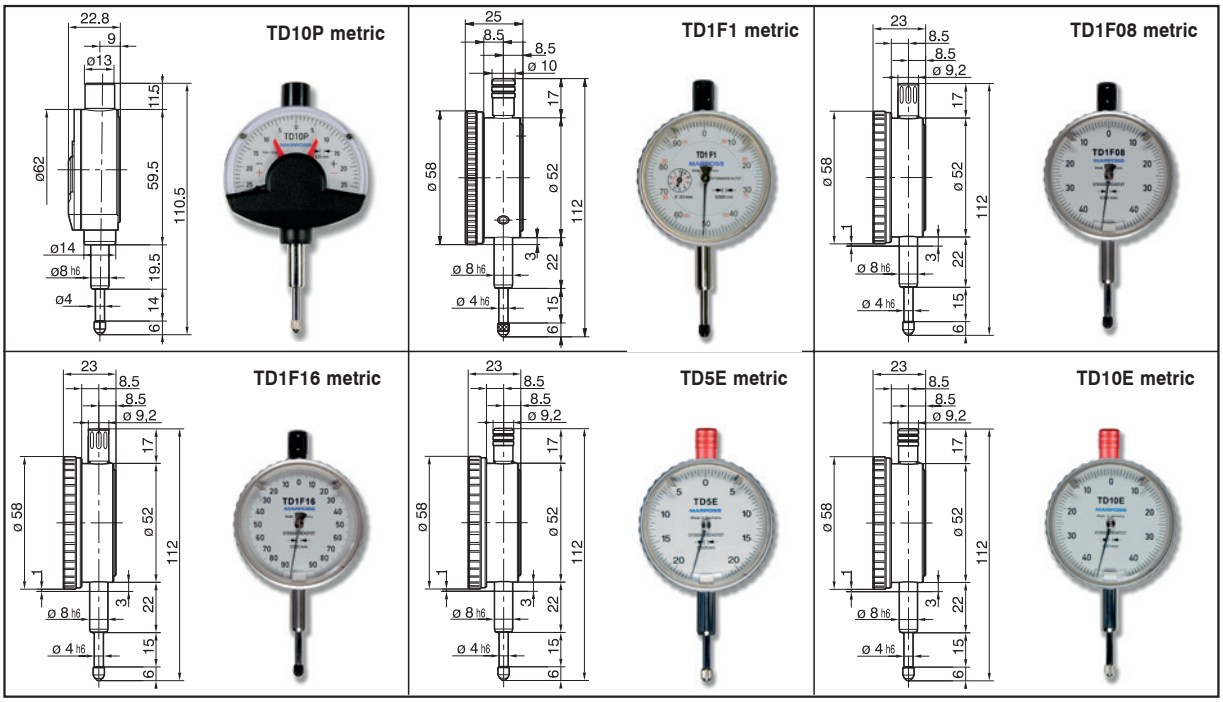
Dial comparator gauge TD1P/TD1PL/TD2P/TD10P/TD1F1

- 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
TD2R metric	0,400 mm	0,2 mm	0,002 mm	0 - 100 - 0	200	0E31040300
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
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
TD1F1 metric	1 mm	0,1 mm	0,001 mm	0 - 100	100	0E31020210
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

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
TD2R metric	58 mm	8 h6 mm	M 2,5	0,005 mm	0,005 mm	2 - 2,2
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
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
TD1F1 metric	58 mm	8 h6 mm	M 2,5	0,0005 mm	0,003 mm	1,5
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

(*) Span of error being the plunger pressed in

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TESTAR A MARPOSS DIVISION — QUICKDIGIT



DIGITAL INDICATOR

- Aluminium case, polyamide front cover
- Highly accurate capacitive measuring system
- Available measuring range: 5 mm/0.2",12,5 mm/0.5" (25 mm/1.0", 50 mm/2.0", 100 mm/4.0" only on request)
- 0,001 mm/0,0001 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: 5000 h for 5 S model, 8000 h for standard 12,5 S Advanced models, 3300 h for Bluetooth® models (1).
- Working temperature range: 5 °C to 40 °C
- Storage temperature range: - 10 ° C to 60 °C
- M 2,5 interchangeable contact

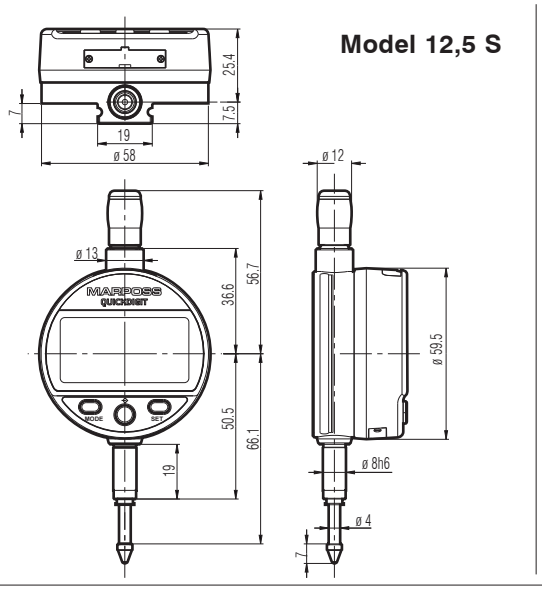
FUNCTIONS

- 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 into standby mode without loss of the origin value.
- Data transmission by cable
- 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)
- Sending of the measuring value by Bluetooth® transmission technology (*)
- Analog display of the measuring value

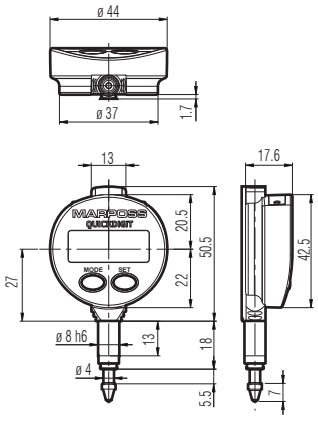
(*) not available for 5S model

(1) Battery life can be lower according to the operating mode and to the transmission mode.

Model 12,5 S



Model 5 S

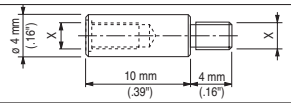


TECHNICAL SPECIFICATIONS - HOW TO ORDER

MODEL	MEAS. RANGE		RESOLUTION		ACCURACY	REPEATABILITY (± 2σ)	PROT. DEGREE	MEAS. FORCE (± 20%)	WEIGHT	ORDER CODE
	(mm)	(inch)	(mm)	(inch)	(μm)	(μm)		(N)	(gr)	
5 S	5	.20"	0,001	.00005"	4	2	IP65	0,50 - 0,65	70	0E20501000
12,5 S Advanced	12,5	.49"	0,001	.00005"	3	2	IP51	0,65 - 0,90	120	0E21201012
12,5 S Advanced HR	12,5	.49"	0,0001	.000004"	1,8	0,5	IP51	0,65 - 0,90	120	0E21200000
12,5 S Advanced Bluetooth®	12,5	.49"	0,001	.00005"	3	2	IP51	0,65 - 0,90	120	0E21201020
12,5 S Advanced HR Bluetooth®	12,5	.49"	0,0001	.000004"	1,8	0,5	IP51	0,65 - 0,90	120	0E21200001
12,5 S Advanced HRA Bluetooth® with digital and analog display	12,5	.49"	0,0001	.000004"	1,8	0,5	IP51	0,65 - 0,90	120	0E21200002

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

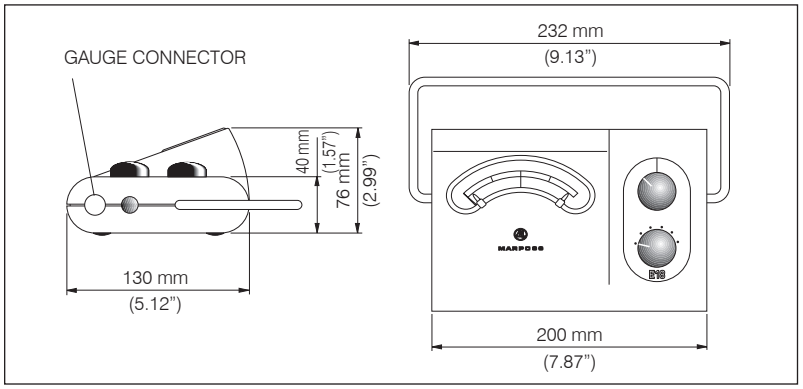
ACCESSORIES

DESCRIPTION			ORDER CODE
	CONTACT EXTENSION FOR USING 5S MODEL WITH M1 STAR MBG MINI INDICATOR HANDLE	X= M2,5 THREAD	1024017105
		X= 4-48 UNF THREAD	1024017115
	POWER – RS232 CABLE FOR BIDIRECTIONAL DATA TRANSMISSION (L = 3 m)		4420240001
	PROXIMITY – RS232 CABLE FOR BIDIRECTIONAL DATA TRANSMISSION (L = 3 m)		4420240002
	POWER – USB CABLE FOR BIDIRECTIONAL DATA TRANSMISSION (L = 3 m)		4420240003
	PROXIMITY – USB CABLE FOR BIDIRECTIONAL DATA TRANSMISSION (L = 3 m)		4420240004
	POWER – DIGIMATIC CABLE FOR BIDIRECTIONAL DATA TRANSMISSION (L = 3 m)		4420240005
	PROXIMITY – DIGIMATIC CABLE FOR BIDIRECTIONAL DATA TRANSMISSION (L = 3 m)		4420240006

If Power cables are used, the battery removal is required and the power supply to the Quick Digit is given by the external display unit.

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COMPACT ANALOG DISPLAY UNIT

- Compact, portable electronic analog display unit for Marposs single full-bridge (LVDT) manual gauges, such as bore gauges M1 Electron and M1 Star, snap gauges M3 Star, ring gauges M4 and M4 Star, and Red Crown/ Red Crown2 pencil probes with measuring range up to ± 1 mm.
- Adjustable tolerance markers, a knob to select the scale and a zero-setting potentiometer allow easy set up and immediate use of the unit.
- Equipped with rechargeable battery for maximum use flexibility throughout the factory, this version features Lithium-Ion battery lasting approximately 36 hours, with minimized recharging times (3 hours for a full charge), and low-battery sound alarm.
- One external power supply unit is always supplied along with the product; measurement operations can be carried out even when E18 is connected to the mains.

TECHNICAL SPECIFICATIONS

METRIC SCALE	10 µm, 30 µm, 100 µm, 300 µm, 1000 µm
INCH SCALE	.0004", .0012", .004", .012", .04"
MAGNIFICATION CHANGE	A six position selector switch (off plus five settings) located on the front panel
ZERO SETTING	Potentiometer with setting range of 100 µm (.004")
WEIGH	1 kg (2,2 lbs)
POWER	Lithium-Ion rechargeable, 3,7 V 1050 mAh Full recharging time: 3 hours
CONNECTOR TYPE	6 pin Lumberg KFR60

How to Order

Description	Order Code	
	Metric Scale	Inch Scale
E18	8447000010	8447100010

Accessories

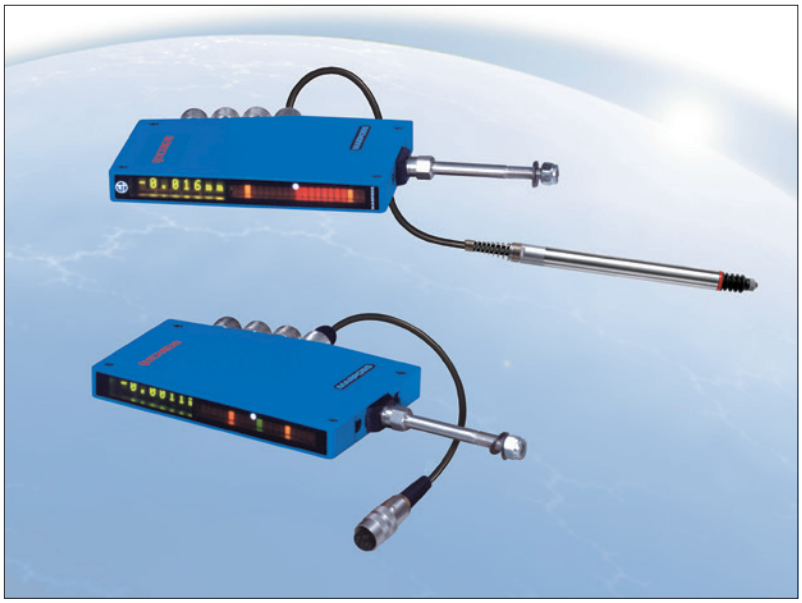
Description	Order Code
POWER SUPPLY UNIT FOR E18 BATTERY VERSION, WITHOUT PLUG	4147102541
USB CABLE FOR POWER SUPPLY UNIT (L = 3 m)	4701300230
EU PLUG	4147000027
US/JP PLUG	4147000028
IEC ADAPTER FOR MAINS CABLE	4147000031
MAINS CABLE WITH EU PLUG	4147000016
MAINS CABLE WITH U.S. PLUG	4147000017

Note: one power supply kit including items code 4147102541, 4701300230, 4147000027 and 4147000028 is always supplied with the product.

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TESTAR A MARPOSS DIVISION

QUICKREAD



COMPACT ELECTRONIC DISPLAY UNIT

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

UNIQUE CLEAR DISPLAY

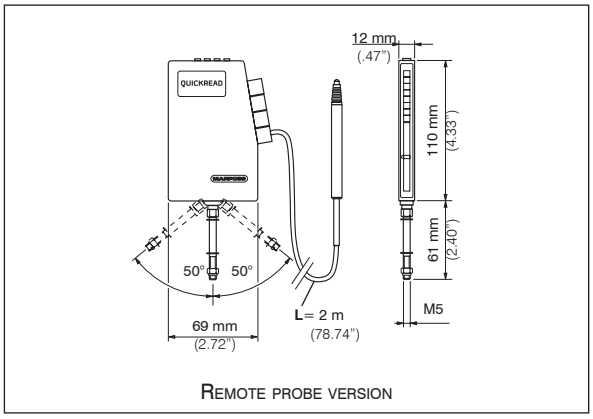
The 3-colour (green, yellow and red) analog display and 8-digit alphanumeric display provide clear definition and easy reading of the measurement results.

PROGRAMMABLE PARAMETERS

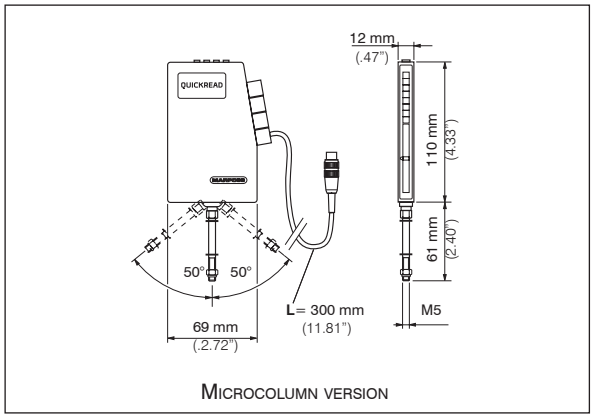
Using the local keypad, the Quick Read™ can be easily programmed to set the digital display resolution, measuring unit, tolerance limits, master deviation, full scale, measurement multiplying coefficient, absolute or comparative reading of the measurement result and the data format for serial transmission.

SERIAL OUTPUT

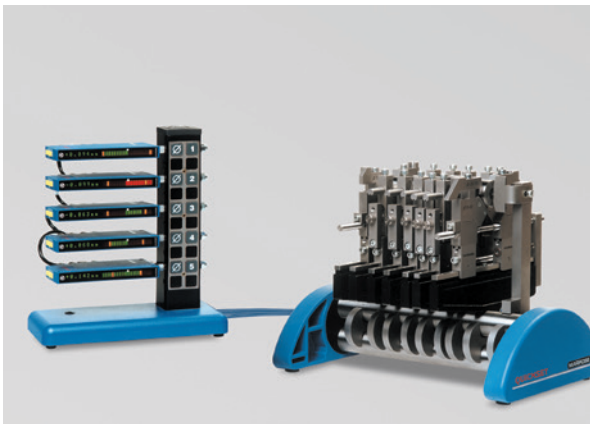
The RS232 output port allows for connection to a PC, statistical printer or data collector for SPC purposes, and to a PLC (data can be sent in ASCII or binary format).

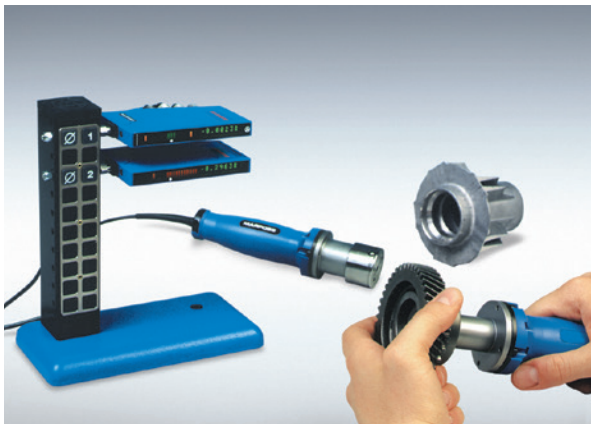


REMOTE PROBE VERSION



MICROCOLUMN VERSION





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 measuring 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
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 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)

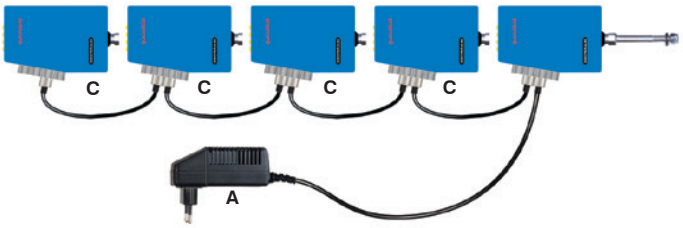
Manageable transducer
1 or 2 half-bridge (*) with Lumberg SV50/6 connector

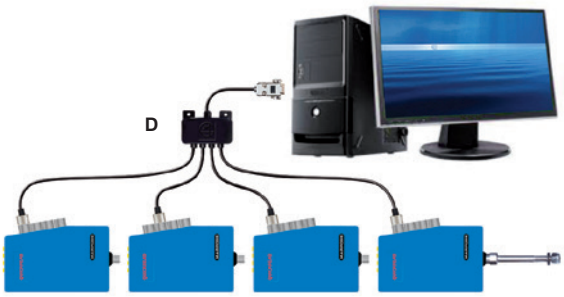
(*) HBT standard MARPOSS. For third parties transducer compatibility please contact the nearest MARPOSS office.

Description	Order Code
Microcolumn Version for one sensor (one static measurement)	0E01991650
Microcolumn Version for one or two sensors (one static or dynamic measurement)	0E01991660
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

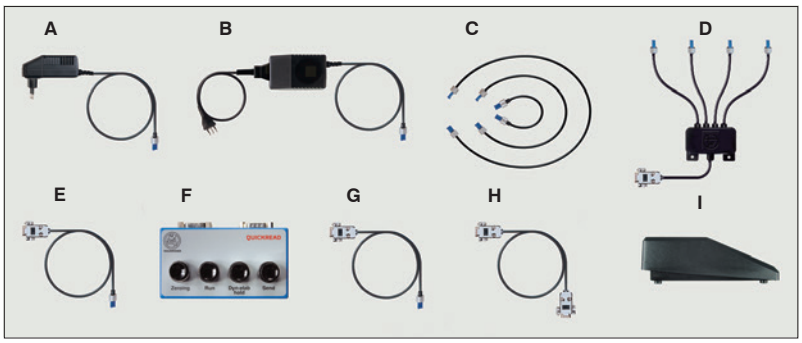
Note: One User manual is supplied with each Quick Read.

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
D	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 = 1m	6739696396
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

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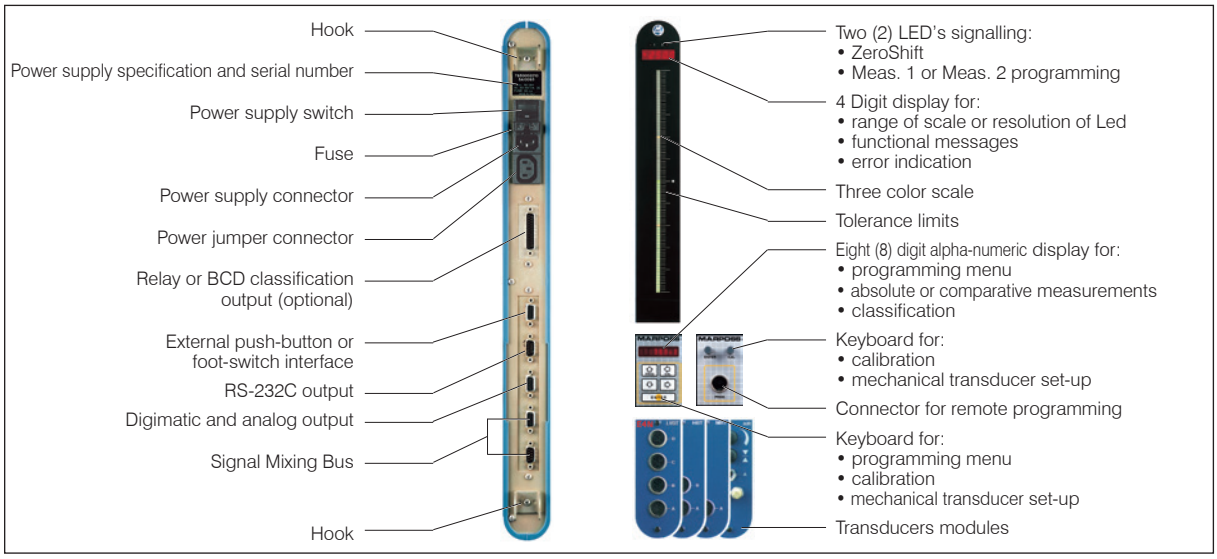


MICROPROCESSOR COLUMN

- 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.

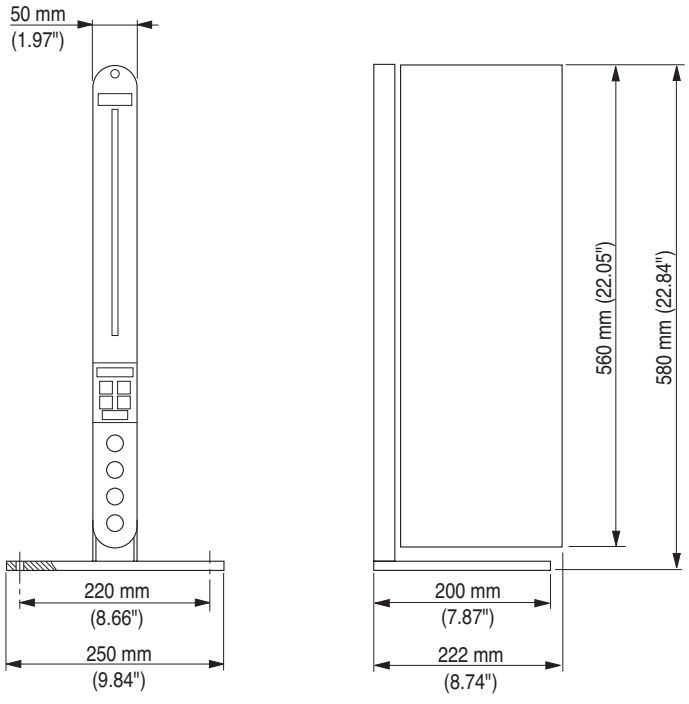
These modules can be either:
- Full-bridge (LVDT), half-bridge (HBT) with 1, 2 or 4 inputs.
- MRT (Marposs Resistance Transducer) with 1, 2 or 4 inputs.
- AIR, pneumo-electronic converter with 1 input. When supplied with this module, the E4N can easily and conveniently retrofit and upgrade a wide variety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

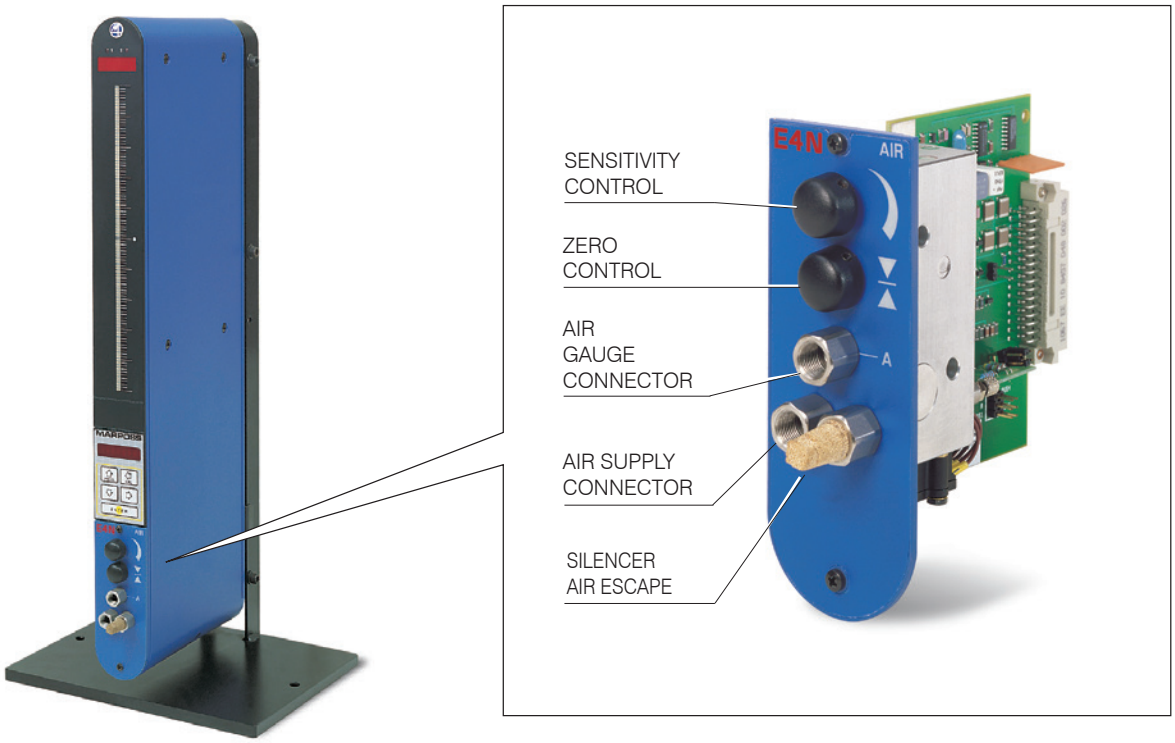


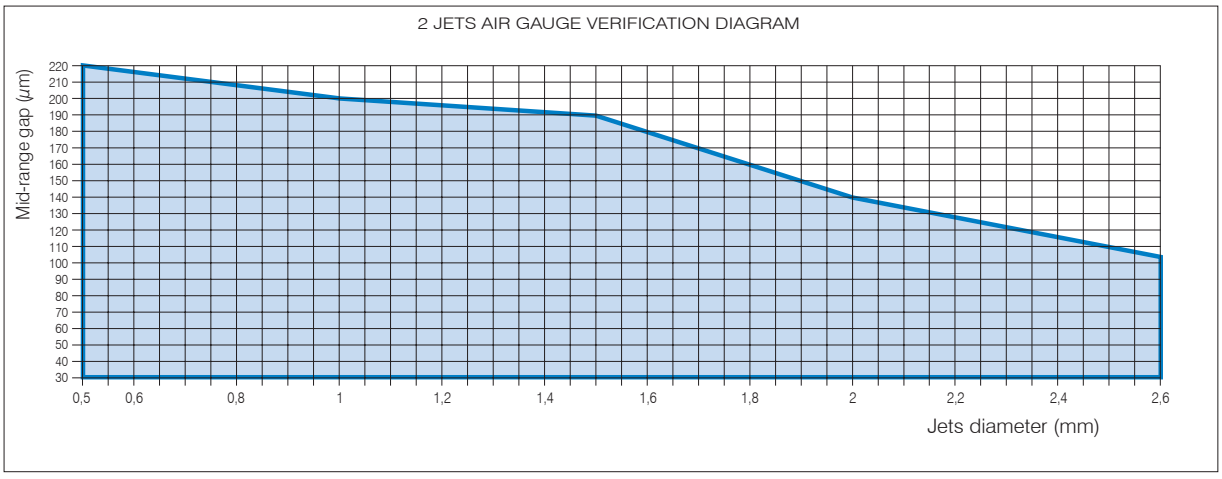
TECHNICAL SPECIFICATIONS

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



E4N Air / Electronic Converter



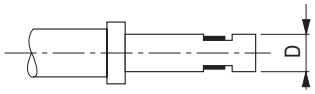


The MARPOSS and/or non-MARPOSS air gauges, with specifications inside the blue area of the diagrams, can be easily and immediately connected to the E4N column and take benefit by its power. The parameters to be considered are the following:

- 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:

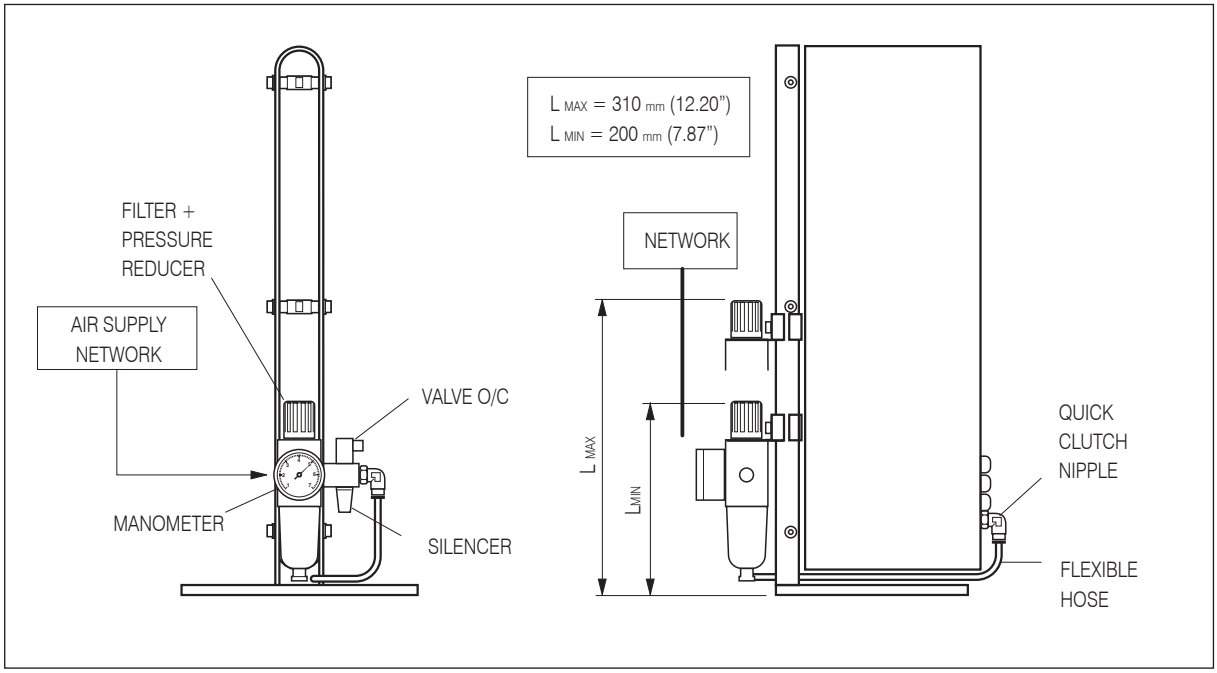
- "mid tolerance gap": (10 - 9.90) = 0.10 mm = 100 μm
  As shown in the diagram no.1 the intersection between the value of the "mid-range gap", 100 μm (.0039"), and the diameter of the jet, 2 mm (.0787"), stays inside the blue area: the application can be therefore realized.

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 m³/h
AIR MUST BE DRY AND UNOILED	

ACCESSORIES



How to Order

Transd. Type	Transd. Input	Column with local Programmer			Column with remote programmer (E4N pc-link)		
		Basic Version	BCD Relais	Optoinsulated digital output	Basic Version	BCD Relais	Optoinsulated digital output
LVDT	1	76510020X0	76510021X0	7651002232	76510040X0	76510041X0	7651004232
	2	76510120X0	76510121X0	7651012232	76510140X0	76510141X0	7651014232
	4	76510220X0	76510221X0	7651022232	76510240X0	76510241X0	7651024232
HBT	1	76513020X0	76513021X0	7651302232	76513040X0	76513041X0	7651304232
	2	76513120X0	76513121X0	7651312232	76513140X0	76513141X0	7651314232
	4	76513220X0	76513221X0	7651322232	76513240X0	76513241X0	7651324232
MRT	1	76516020X0	76516021X0	-	76516040X0	76516041X0	-
	2	76516120X0	76516121X0	-	76516140X0	76516141X0	-
	4	76516220X0	76516221X0	-	76516240X0	76516241X0	-
AIR	1	76519020X0	76519020X0	7651902232	76519040X0	76519041X0	7651904232

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
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 local programmer (optoinsulated digital output)			7651992232
3 - colour meter module with remote programmer (basic version)			76519940X0
3 - colour meter module with remote programmer (BCD relais)			76519941X0
3 - colour meter module with remote programmer (optoinsulated digital output)			7651994232
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 local programmer (optoinsulated digital output)			7651912232
E4N AIR USA with remote programmer (basic version)			76519140X0
E4N AIR USA with remote programmer (BCD relais)			76519141X0
E4N AIR USA with remote programmer (optoinsulated digital output)			7651914232
BCD relais interface card			6344360100
Optoinsulated digital output card			6344360200
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

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
6 SW release 6.3 allowing elaboration and visualization of up to four measurements.

Description		Order Code
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
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
Power supply cables (L= 2 m)	USA	4709009003
	WITHOUT PIN	6739696566
	ITALY	4709009002
	F/D	4709009001
Power jumper cable from E4N to E4N		4709009004
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

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	≤ 2 µm	
Linearity error in the range ± 50 µm	≤ 5 µm	
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	3072486110	3072486210	3072486115	3072486215
Group with 2 air/ electronic converters	3072486120	3072486220	3072486125	3072486225
Group with 3 air/ electronic converters	3072486130	3072486230	3072486135	3072486235
Group with 4 air/ electronic converters	3072486140	3072486240	3072486145	3072486245

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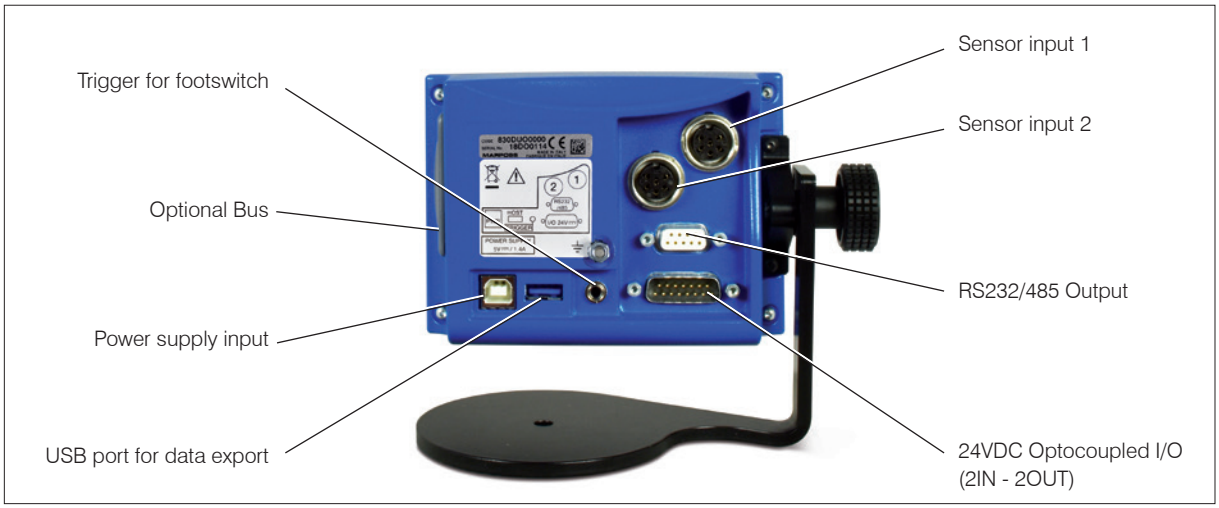
... the premium affordable display unit....

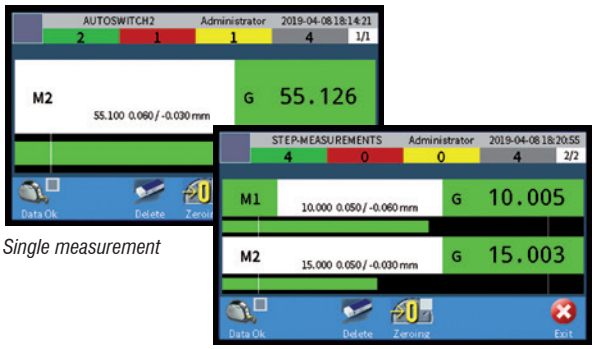
Duo is a premium 4.3'' electronic display unit allowing to perform simple measurement applications intuitively and rapidly.
As small as a smart phone, Duo is extremely compact and powerful. Designed in response to customer needs, it is a "something in-between" display unit that provides premium features at an affordable price.

PRODUCT FEATURES

- Duo is well-suited for simple manual applications when only a few measurements are needed on the shop floor at any given time. Featuring two sensor input channels, it can simultaneously display two measurements. The system is easy to configure and provides clear visualization of measurement status.
- Duo is designed to work with Marposs LVDT and HBT manual gauges, such as bore gauges M1 and M1 Star, snap gauges M3 Star, ring gauges M4 and M4 Star, and RedCrown/RedCrown2 displacement sensors with a measuring range up to ± 10 mm. It can also connect HBT sensors from Tesa.
- Data collected can be stored internally in the flash memory providing powerful memory capacity, exported through the USB port or the optional Fieldbus port.
- Duo software guarantees a friendly and easy to use operator interface. The true flat touch-screen allows to program and acquire measures without any additional input/command device.
- Easier cycle management through 2 IN (Start/Stop, zeroing), 2 OUT (part good or scrap) and one separate input for a footswitch.
- Designed also for portable use, it can be powered by an external battery (at least 16000 mAh to guarantee one working shift).

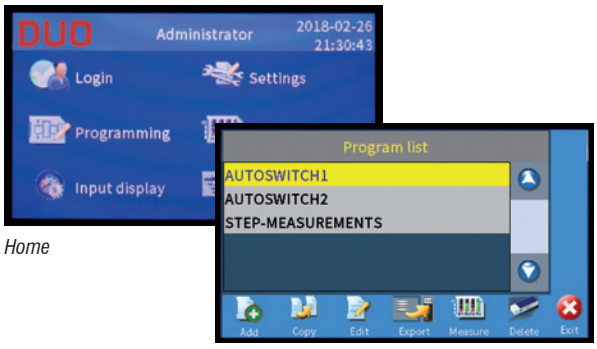
MAIN HARDWARE CHARACTERISTICS	
Case	Robust industrial Aluminum case
Protection	IP54 on front panel; IP40 on rear panel
Touch Screen	Capacitive, true flat
Storage Media	Internal flash memory or removable USB memory device
Lcd Display Type	4.3'' color TFT
Ethernet/Fieldbus	Option
Usb Ports	1 x type B (only for power supply) + 1 x type A
Serial Port	1 x RS232C + 1 x RS485
Bench-Top Support	Reclinable
Power Supply	5V 1,2A
Dimensions	130 x 95 x 50 mm (5.12'' x 3.74'' x 1.97'')
Weight	1 kg
Operating Temperature	5 ÷ 45 °C (41 ÷ 113 °F)
Storage Temperature	-20 ÷ 70 °C (-4 ÷ 158 °F)





Single measurement

Multiple measurement



Home

Part programs list

MEASUREMENTS

- Measurement capability up to 2 characteristics
- Dynamic acquisitions [Max, min, Range, Average, (Max-min/2)]
- Multiple measurement display with numeric and graphical layout
- Acquisition command through external signal (footswitch) or touch-screen
- Measurement data transmission through Fieldbus (option) or serial port.
- Part counters
- Remote data storage and export through removable USB memory device.
- Data storage format: .CSV (Microsoft® Excel Comma Separated Values).

CONFIGURATION AND PROGRAMMING

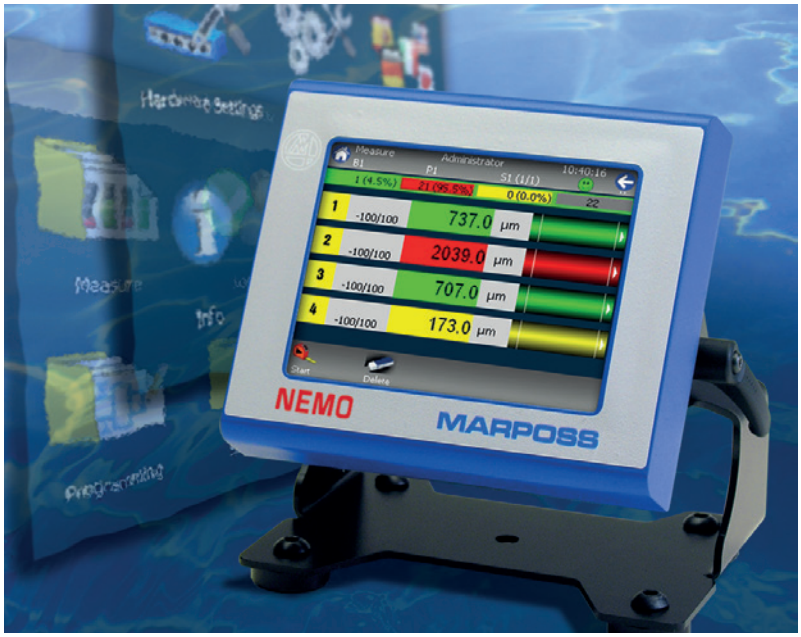
- Multi-language support for European and Asian languages: English, Italian, German, French, Spanish, Portuguese, Swedish, Romanian, Dutch, Polish, Magyar, Czech, Russian, Finnish, Turkish, Japanese, Chinese, Korean.
- Programming interface designed to be used with touch-screen
- Configuration Backup-Restore-Update by USB memory devices
- Password protected multi-user management

How to Order

DESCRIPTION	ORDER CODE
Duo for LVDT/HBT sensors	830DU00000

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NEMO



SUBCOMPACT EMBEDDED GAUGE COMPUTER

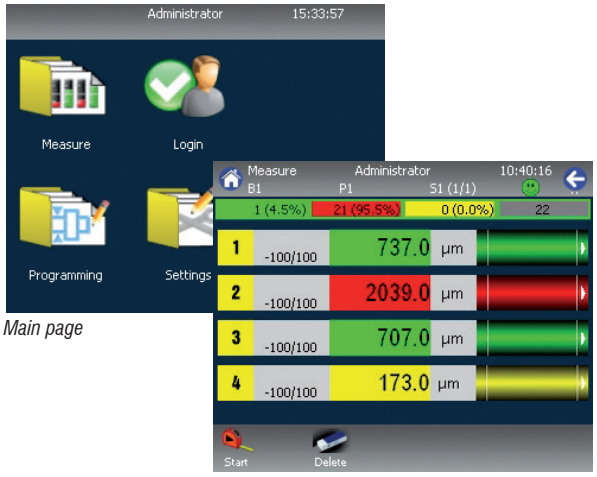
Nemo, compact, robust and reliable professional computer has been designed for simple measuring applications up to 16 sensors and 8 measures and offers innovative features that enable to perform simple measurement applications intuitively and rapidly. Nemo is capable of acquiring data from traditional 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.


NEMO DIGI BOX + 2 USB


NEMO 2 USB


NEMO 8 USB

CASE	Robust industrial-grade plastic case
PROTECTION	IP 54 on front panel; IP 40 on rear panel
TOUCH SCREEN	4 wire analog-resistive
STORAGE MEDIA	Internal SD Micro card 4 GB
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
OPERATING TEMPERATURE	5 ÷ 45 °C (41 ÷113 °F)
STORAGE TEMPERATURE	-10 ÷ 55 °C (14 ÷131 °F)

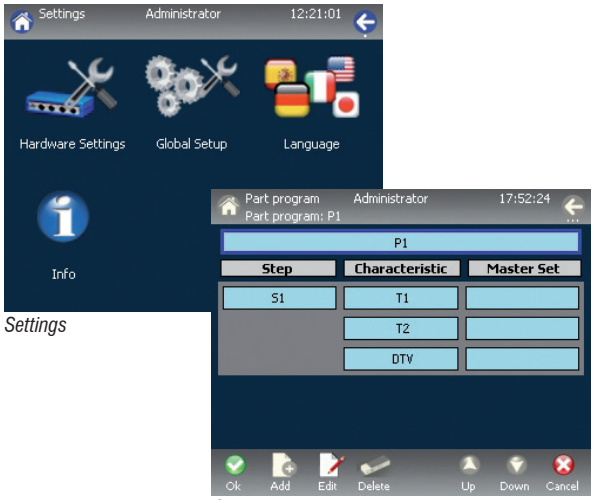


Main page

Multiple bargraph display

MEASUREMENTS

- Up to 16 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 8 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, Dutch, Polish, Magyar, Czech, Korean, Turkish, Finnish. 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 DIGI BOX + 2 USB	830NA00002
NEMO 2 USB	830NA00011
NEMO 8 USB	830NA00031
FOOTSWITCH with 2 m cable for data triggering function	6738099035

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TESTAR A MARPOSS DIVISION

MERLIN FAMILY



... intuitive and user friendly solutions....

The Merlin family, specifically designed for measuring applications in the shop floor environment, has defined an entirely new generation of Gauge Computers, based on the concept of an intuitive and user friendly interface with basic statistical analysis.

PRODUCT FEATURES

Merlin™, Merlin Plus™ and Merlin Plus Box™ share the capability of:

- collecting data from a wide range of measurement devices, made by Marposs or third-parties, via USB, RS232, Ethernet or Bluetooth;
- multiple measurement display with numeric and graphic layout;
- choosing between a wide number of predefined I/O layouts;
- data traceability;
- multi-language support for European and Asian languages;
- managing batches, data segregations, part counters and data storage in QDAS® (DFQ) or CSV format (on internal memory, USB memory devices or remote through Ethernet LAN);
- multi-user password-protected management.
- statistical analysis with graphic display and numeric summary;
- providing Gage Capability and R&R studies facilities;



Merlin™ comes with the Merlin software and offers data collection and basic statistical analysis from traditional or wireless measuring devices. It has been designed for simple measuring applications up to 16 measurements and is available with Microsoft® Windows® CE7 operating system.



Merlin Plus™ comes with the Merlin Plus software and has been designed for enterprise applications up to 250 measurements, adding printing capabilities and dynamic acquisition management. It is available with Microsoft® Windows® 7P operating system to best fit network connectivity.



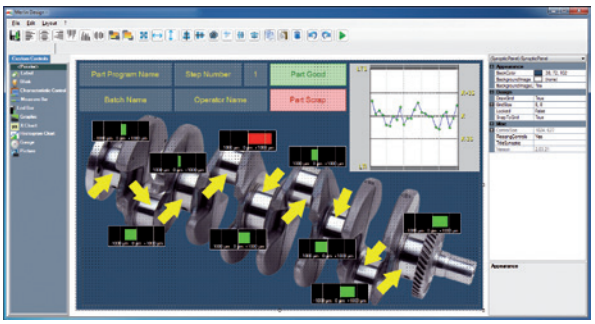
Merlin Plus Box™ comes with the Merlin Plus software and is provided in a sealed enclosure, specifically designed for the shop floor environment. It is connectable to any external DVI or VGA-compatible display, with or without an integrated touch-screen.

Merlin Plus Software™ adds the possibility of running on customer PC and it is Microsoft® Windows® 7 and Microsoft® Windows® 10 compliant.

Technical Specifications

MAIN HARDWARE CHARACTERISTICS			
	MERLIN	**MERLIN PLUS**	**MERLIN PLUS BOX**
Case	Plastic	Aluminium	Plastic
Protection (front panel)	IP65		IP54
Touch screen	4 wire analog-resistive	5 wire anti-reflection	External DVI connection
LCD Display Type	8.4" 4:3 SVGA	12.1" 4:3 XGA True Flat	-
Storage media	eMMC 4GB	mSATA 32GB	SATA 2 32GB
Ethernet LAN	10/100 Mbps RJ45 connector	2 x 10/100/1000Mbps RJ45 connector	
USB ports	4 Host + 1 internal	5 Host + 1 internal	6 Host
Serial ports	1xRS232C		
Bench-top support	Reclinable - VESA75 compliant		Fixed – DIN rail
Power supply	24Vdc (18 ÷ 36Vdc)		
Relative humidity	5 ÷ 80 % (non-condensing)		
Operating temperature	0 ÷ 50 °C		
Dimensions LxHxD	230x180x45 mm (9''x7''x 1.8'')	324x323x200 mm (12.8''x12.7''x 7.9'')	200x185x86 mm (7.9''x7.3''x 3.4'')

Programming Tool



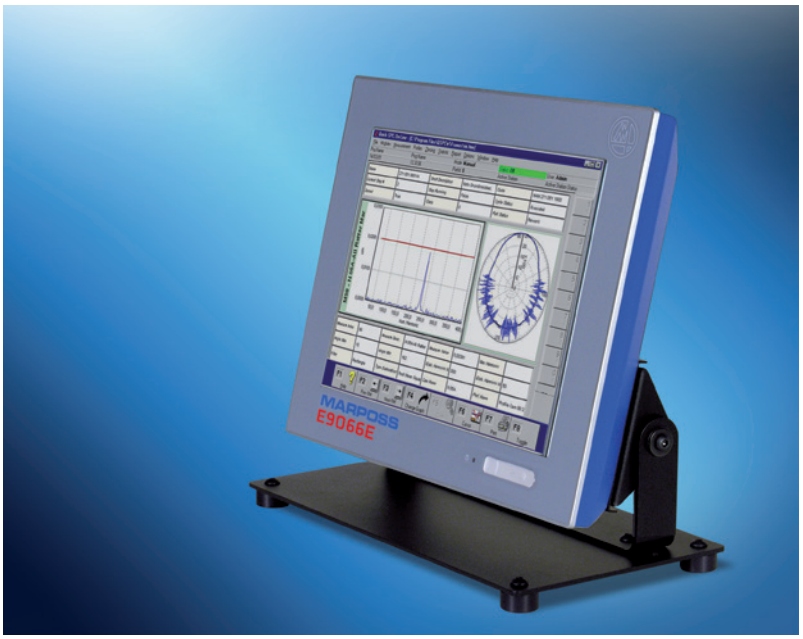
Merlin Plus Designer™ works in association with the Merlin Plus software and is a stand-alone software that allows to create customized measure pages using various objects, such as dedicated measuring bars, images and statistical graphics. Customizing each part program, with a dedicated page, will help to guide the operator through the measurement procedure, avoiding errors and easily keeping the production under control. On the same page, the measurements result, statistical graphs or the next measurement step, can be shown.

How to Order

DESCRIPTION	ORDER CODE
MERLIN with East/Western European operating system	830MEADD00
MERLIN with Japanese operating system	830MECDD00
MERLIN with Korean operating system	830MEEDD00
MERLIN with Chinese operating system	830MEFDD00
MERLIN PLUS - Windows 7P multi-language	830MPMEHB0
MERLIN PLUS - Windows 10 IoT Embedded multi-language	830MPMFIC0
MERLIN PLUS BOX - Windows 7P multi-language	830MBAAAA0
Merlin Plus Software Kit	CM7000000E
Merlin Plus Designer Kit	CM7000001E

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E9066E



...fanless...
...diskless...
...embedded...

The E9066E is a fanless and diskless industrial computer providing a compact, economic and no compromise solution for any shop-floor environment.

MAIN FEATURES

PERFORMANCE AND CONNECTIVITY

The E9066E uses an industry-grade quad-core processor, providing high throughput for complex calculations and graphical applications alike, without impacting system performance.
Connectivity is the best in its class: 5 USB ports, 2 Ethernet Gigabit ports, 1 RS232 port, up to two solid-state storage devices (Compact Flash or SSD).
Industrial fieldbus is also supported using specific fieldbus modules.
Complementing connectivity are 2 standard mini PCI slots.

INDUSTRIAL DESIGN AND RELIABILITY

Fanless industrial computers dissipate a fraction of the power of a standard office PC. The absence of moving parts assures extra endurance and long-lasting reliability: no fans or bulky and expensive heat exchange devices needed.
Diskless technology and the use of solid-state, industrial-grade memory storage, extends the system's robustness even more, eliminating hard disk failures, and allowing for working temperatures up to 45°C.
Embedded operating systems guarantee the absence of system failures due to file corruption. Fast start-ups, no more downtimes for system re-installation and setup, and no fear of abrupt power failures!

The E9066E™ is provided in a sealed, compact, shop-floor proof enclosure, and readily adapted for bench-mount or swing-arm solutions using industry standard, VESA-compliant supports.

STATE OF THE ART

Designed on leading edge, embedded PC technology, it features state of the art 64 bit industrial-grade platform and Microsoft® Windows® 7-64 Embedded operating system.
Ultra low-power processors are providing high performance with the lowest possible power dissipation.

TECHNICAL SPECIFICATIONS

FRONT PANEL SPECIFICATIONS	
LCD display type	15" Active matrix TFT
Resolution	XGA
Contrast ratio	600:1
Brightness	400 cd/m^2 (400 nit)
Lamps	LED backlight
Screen	impact resistant / anti-glare
Protection (panel mount)	IP65
COMPUTER SPECIFICATIONS	
CPU	All-in-one motherboard
Processor	INTEL® J1900 Quad Core 2.0GHz - 64 bit
RAM (min - max)	2GB - 8GB (1 x SODIMM DDR3 socket)
Operating System	Windows™ IoT Enterprise / Windows 7-64 Ultimate / Windows 7P-64 (embedded)
HDD/SSD interface	1 x mSata (SATA-II). 32GB min
Serial ports	1 x RS232C (DBSUB9)
USB ports	2 x 2.0 on front;, 2 x 2.0 on rear; 1 x 3.0 on rear
Ethernet LAN	2 x 1Gbps. 2 x RJ45 connectors
Video output	1 x DVI-I (DVI-D + VGA)
Bus expansions	2 x miniPCI
Power supply	24Vdc (18Vdc ÷ 36Vdc)
Front Panel Dimensions	400 x 335 x 60 mm (15.75" x 13.19" x 2.36")
Power consumption	52W
OPTIONS	
Touch screen	5 wire analog-resistive
Fieldbus	plug-in miniPCI cards
UPS (Uninterruptible Power Supply) & battery pack	Integrated on board. Detacheable battery pack
3rd Ethernet LAN	1 x 1Gbps. RJ45 connector. In alternative to fieldbus
MOUNTING SOLUTIONS	
Panel mount	standard
Cabinet & free-standing pedestal	option
Swing-arm	option
WEIGHT	
E9066E	10 kg
Benchmount stand	4 kg
ENVIRONMENTAL	
Relative humidity	5 ÷ 80 % (non condensing)
Operating temperature	0 ÷ 45 °C (32 ÷ 113 °F)
Storage temperature	- 20 ÷ 60 °C (-4 ÷ 140 °F)

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TESTAR A MARPOSS DIVISION

E9066T



...industrial design and innovation...

E9066T™ is a maintenance-free Industrial PC that eliminates wear & tear parts like computer fans and traditional hard disks.

MAIN FEATURES

INDUSTRIAL DESIGN

The Trueflat front panel with its integrated touchscreen and IP66 protection delivers the best and most reliable user-interface experience. LED backlight technology supplies long-lasting display performance, reduces heat dissipation and eliminates the substitution of worn-out backlight lamps.
An exclusive, on-board UPS (Uninterruptible Power Supply) and industrial grade battery pack provide battery backup upon power failure.

INNOVATION

Fanless E9066T features full-power Intel® Core™-i processors, and is certified for continuous use, up to 50°C (122 °F), thanks to a specifically-designed, integrated heatsink.
Full-power processors provide “no compromise” performance, even for the most mission-critical, demanding application.
Bulky and expensive heat exchange devices, together with their programmed maintenance activities, are now no longer needed.
Diskless Solid-state, industrial-grade memory storage (SSD) eliminates traditional hard disk failures, significantly boosts system performance, extends system reliability and increases working temperatures as well.
Universal deployement The E9066T can be panel-mounted or provided in a Marposs-standard IP54 shop-proof cabinet, for bench-mount or swing-arm solutions using industry standard supports. The E9066T-BB, a blind-panel version without display, provides wall-mount and DIN-rail mounting solutions as well.

STATE OF THE ART

The absence of moving parts assures extended endurance & reliability, dramatically reducing typical computer failures or system downtime affecting ‘traditional’ computer technology.

TECHNICAL SPECIFICATIONS

FRONT PANEL SPECIFICATIONS	
LCD display type	15" & 17" LCD TFT
Contrast ratio	700:1 / 1000:1
Brightness & backlight	450 / 350 cd/m² (nit). LED backlight
Screen / Touch	True-flat. Impact resistant & anti-glare. / 5-wire resistive
Protection (panel mount)	IP66 / NEMA 4
COMPUTER SPECIFICATIONS	
Processors	INTEL® Core™ - i7 / i5 / i3 (64bit)
RAM	up to 16GB DDR3 1600Mhz (2xSODIMM)
Operating System	Windows™10 IoT Enterprise / Windows 7-64 Ultimate
PS/2 interface	1 x PS/2 Keyboard/Mouse
HDD/SSD interface	1 x SATA III, 6Gbps, 1 x mSATA III, 6Gbps
Serial port	1 x RS232C (DBSUB9)
USB ports	2xUSB 3.0 (rear); 2xUSB 2.0 (rear); 1xUSB 2.0 (front)
Ethernet LAN	3 x Gbps. RJ45
Video out	DVI-I (DVI-D + VGA)
Bus expansion	2 x miniPCI
Power supply	18 - 32Vdc (terminal block Vdc-IN) Overvoltage & Reverse polarity protection
OPTIONS	
Industrial Fieldbus	plug-in miniPCI cards
Ethernet LAN (additional)	1 x Gbps or 4 x Gbps (integrated Hub)
Serial port (additional)	1 x RS-232/422/485 (DBSUB15)
UPS	integrated on-board
UPS battery pack	Pb, 12V/13A max, 2500mA/h. Charge time 3h@25°C. Typ Discharge time 5'@10A & 25°C Float Lifetime 10 years @25°C
MOUNTING SOLUTIONS	
Panel mount	standard
Wall-mount & DIN-rail	E9066T-BB PC box (no display)
Cabinet IP54 (option)	benchmount / Swing-arm
WEIGHT	
E9066T	6 kg
Cabinet	12 kg
ENVIRONMENTAL	
Relative humidity	5 ÷ 80 % (non condensing)
Operating temperature	0÷50°C (32÷122°F) SSD/HDD 24x7 5÷45°C (41÷113°F) HDD standard
Storage temperature	- 20 ÷ 60°C (-4÷140°F)

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TESTAR A MARPOSS DIVISION — EASYBOX



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. The U4E, U4D and U8I/O models may require an external additional power feed according to the type of application.

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

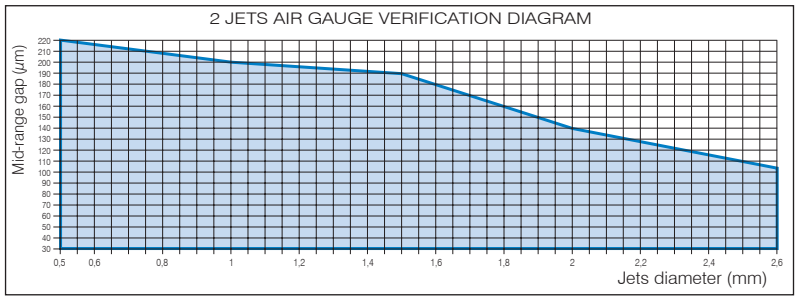
	U4F	U4F-HR	U4H	U4T	U4E	U4D
						
NUMBER OF INPUT CHANNELS	4	4	4	4	3	4
TYPE OF INPUT CHANNELS	MARPOSS standard Full-Bridge (LVDT)	MARPOSS standard Full-Bridge (LVDT)	MARPOSS standard Half-Bridge (HBT)	Half Bridge (HBT) compatible with Tesa amplifiers	Digital and analog incremental transducers (*)	Mitutoyo Digimatic compatible
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	depending on the Digimatic gauge used
OUTPUT TYPE	1 x USB 1.1 (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)	max. 40 samples /s (depending on the Digimatic gauge used)
ACCURACY AT 20° C	± 0,5% of the measuring value ± resolution				depending on the transducer used	depending on the Digimatic gauge used
POWER SUPPLY SOURCE	from USB port				from USB port or external power supply	from USB port or external power supply (**)
CURRENT REQUIREMENT	<350 mA (§§)	<350 mA (§§)	<100 mA (§)	<350 mA (§§)	<300 mA (§§)	<100 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	external footswitch / host command / Data send button on gauge
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)					IP30 (on both front and 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.
(***) Common with data control (9-pin D-Sub connector on the rear side).
(#) 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 these models.. The parameters to be considered are the following:

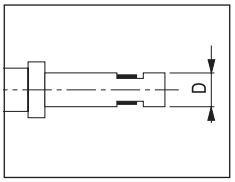
- air supply pressure
- number of air gauge jets
- diameter of air gauge jets
- "mid-range gap", as to the difference between the mid-tolerance diameter of the part to be measured and the distance between the air gauge jets.



	U4S	U1AIR(#)	U3AIR	U4AIR	U4TP-E	U4TP-J	U4TP-K
							
	4	1	3	4	4	4	4
	RS232	Air	Air	Air	Thermocouples Type E	Thermocouples Type J	Thermocouples Type K
	depending on the serial gauge used	±500 µm (0.02") ------ ------	±500 µm (0.02") ------ ------	±500 µm (0.02") ------ ------	0 - 100 °C	0 - 100 °C	0 - 100 °C
	1 x USB (connector type B)						
	12 MBit / sec.						
	max. 40 samples /s (depending on the serial gauge used)	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 (up to 1000 samples/s if used with Quick SPC)	max. 40 samples /s	max. 40 samples /s	max. 40 samples /s
	depending on the serial gauge used	±0,5% of the measuring value ±resolution	±0,5% of the measuring value ±resolution	±0,5% of the measuring value ±resolution	±[0,6° + 0,2% (Tmeas.-T amb.)]	±[0,6° + 0,2% (Tmeas.-T amb.)]	±[0,6° + 0,2% (Tmeas.-T amb.)]
	from USB port						
	<150 mA (§§)	<350 mA (§§)	<350 mA (§§)	<350 mA (§§)	<200 mA (§§)	<200 mA (§§)	<200 mA (§§)
	Max. 16						
	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)						
	-40 / +70° C						
	0 / +50° C						
	157 x 90 x 65 mm (6,2" x 3,5" x 2,6")	157 x 103 x 65 mm (6,2" x 4,05" x 2,6")	224 x 159 x 150 mm (8,82" x 6,26" x 5,90")	224 x 159 x 150 mm (8,82" x 6,26" x 5,90")	157 x 90 x 45 mm (6,2" x 3,5" x 1,8")		
	ca. 0.6 kg	ca. 1 kg	ca. 2,8 kg	ca. 3,8 kg	ca. 0.5 kg		

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.

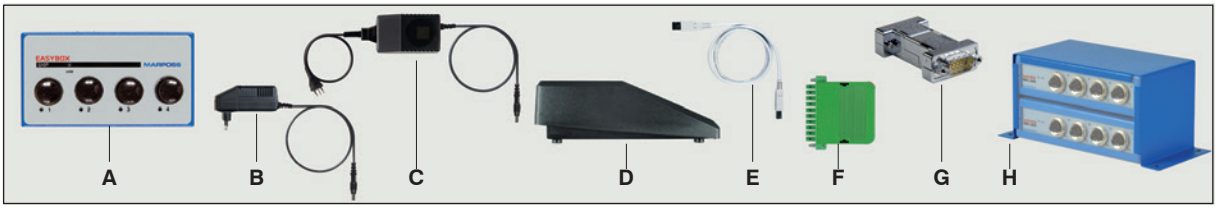
U8 I/O



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 inputs	6871250111
Easy Box U4AIR with 4 air transducer inputs	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 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
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 U4E, with EU mains cable	6871140170
	Power supply unit for Easy Box U4E, with U.S.A. mains cable	6871140171
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
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
G	Interface adapter for connecting analog current transducers feat. 11 μA output to Easy Box U4E	6303540800
H	Protective and fixing case for 1 Easy Box type U4F, U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-J, U4TP-K, U8I/O	1502050600
	Protective and fixing case for 1 Easy Box type U1AIR or U4S	1502050601
	Protective and fixing case for 2 Easy Box type U4F, U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-J, U4TP-K, U8I/O	1502050610
	Protective and fixing case for 3 Easy Box type U4F, U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-J, U4TP-K, U8I/O or 2 Easy Box type U1AIR or U4S	1502050620

(*) For any gauge other than Mitutoyo requiring an external power supply.
(**) This power supply is required if the Easy Box U8I/O is not connected to an alternative 24V power supply.

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USB Interface



Plug&Play becomes reality for I/O and Encoders

The Marposs USB interface family includes three devices that simplify the integration of Input/Output signals and incremental type sensors, used in measuring applications.

EASY CONFIGURATION | PLUG & PLAY | ACCURATE

The U2-I/O, U1-E and U1-FS are fast, compact interfaces to acquire measurements and drive digital I/O easily. Designed to permit a wide range of applications, they can be directly connected to any USB host device and appear as virtual serial ports via the RS232 standard COM protocol. All the interface electronics are integrated in the standard USB connector. Just plug into to any personal computer or industrial PC, with USB interface, make a few key strokes and you'll be able to use your devices immediately.
The U2-I/O, U1-E and U1-FS are plug and play for Marposs data acquisition systems, such as Nemo, Merlin and Merlin Plus.
For Windows based personal or industrial computers, users can choose from following application solutions:

- UCOM Demo application from the Marposs website (free download available).
- Marposs DLL drivers library for Windows operating systems, allowing to interface to any compatible application program.
- Marposs Quality Control software, as Quick SPC or Easy Acquisition, to perform any application, from data collection to complex statistical analysis.
- Develop their own software through ASCII protocol commands, to perform simple measurement acquisitions as well as complex gauging applications.

PRODUCT FEATURES

U1-E *Encoder Interface*

The U1-E is a versatile, multi function encoder interface for the management of incremental transducers such as linear probes, linear and rotary encoders, etc. Digital and voltage analogue encoders can be directly connected, while for current analogue encoders a specific Marposs adapter is required.
All parameters are easily programmed from a specific menu. It is easy to obtain static and / or dynamic measurements in your application.
Measurements can be presented as single values or continuous values with 1ms sampling time.
Electrical supply is directly provided by the USB bus.

U2-I/O *Input/Output Interface*

The U2-I/O interface is a device able to drive two industrial digital I/O with galvanic isolation according to CEI EN 61131-2 specification.
The two channels can be set up to work independently as input or output. The PWM (pulse-width modulation) output can be implemented too, and they can also work together in a trigger mode.
With the new U2-I/O it is possible to interface to source or sink devices.
Set up is done with dedicated commands directly on the terminal. The selection between source or sink behaviour can be saved.

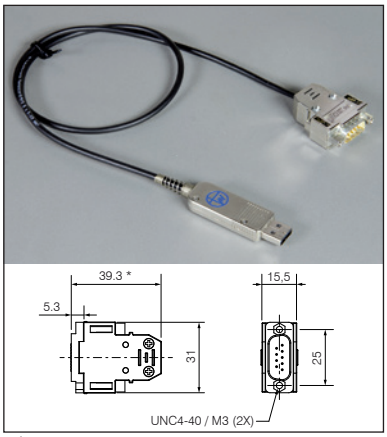
U1-FS *Footswitch Interface*

The U1-FS interface provides a manual input, from a footswitch, making it easy to acquire measurements for the user's application.

TECHNICAL SPECIFICATIONS

U1-E *Encoder Interface*

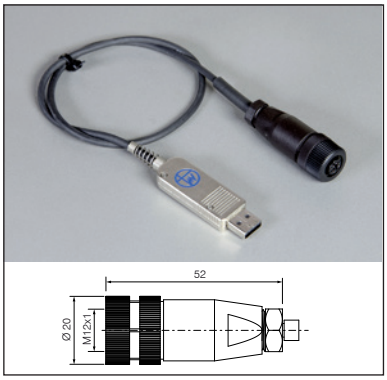
ORDER CODE	687126E000
USB CONNECTOR	TYPE 'A'
ENCODER CONNECTOR	MALE 9 POLES SUB D CONNECTOR
PROTECTION DEGREE	IP40
CURRENT ABSORPTION	< 500 mA < 2.5 mA IN SUSPEND MODE
USB INTERFACE	USB 2.0
POWER SUPPLY USB SIDE	4,40 ÷ 5,25 VDC FROM USB BUS
POWER SUPPLY ENCODER	5V FROM USB BUS WITH 400mA MAX AVAILABLE FOR THE ENCODER
RESOLUTION	DEPENDING ON CONNECTED DEVICE
BAND WIDTH	300KHZ ANALOG ENCODER 4MHZ DIGITAL ENCODER
INPUT	DIFFERENTIAL (A+, A-, B+, B-, Z+, Z-)
INPUT TYPE	RS422 (TTL) / INCREMENTAL SIGNAL 1VPP ANALOG SIGNAL / 11µA WITH MARPOSS ADAPTER 6303540800
CABLE LENGTH	50cm / 20 inches*
STORAGE TEMPERATURE	-20°C / +70°C
OPERATIVE TEMPERATURE	0°C / +60°C



U1-E Encoder interface
* consider extra 40mm for cable exit and bending

U2-I/O *Input/Output Interface*

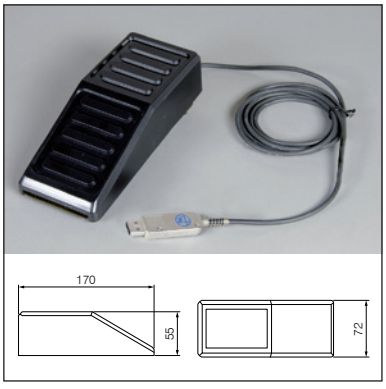
ORDER CODE	687126I000
USB CONNECTOR	TYPE 'A'
I/O CONNECTOR	M12 TYPE, FEMALE STRAIGHT CONNECTOR
PROTECTION DEGREE	IP40
CURRENT ABSORPTION	< 100 mA (MAX) < 500 µA (MAX, IN SUSPEND MODE)
USB INTERFACE	USB 2.0
POWER SUPPLY USB SIDE	4,40 ÷ 5,25 VDC FROM USB BUS
POWER SUPPLY I/O SIDE (ISOLATED)	24 V NOMINAL VOLTAGE
CABLE LENGTH	50cm / 20 inches*
STORAGE TEMPERATURE	-20°C / +70°C
OPERATIVE TEMPERATURE	-10°C / +40°C



U2-I/O I/O interface
* consider extra 40mm for cable exit and bending

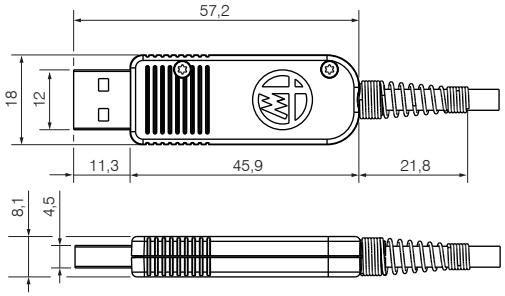
U1-FS *Footswitch Interface*

ORDER CODE	687126F000
USB CONNECTOR	TYPE 'A'
PROTECTION DEGREE	IP40
CURRENT ABSORPTION	< 100 mA (MAX) < 500 µA (MAX, IN SUSPEND MODE)
USB INTERFACE	USB 2.0
POWER SUPPLY USB SIDE	4,40 ÷ 5,25 VDC FROM USB BUS
CABLE LENGTH	3 m / 9 feet
STORAGE TEMPERATURE	-20°C / +70°C
OPERATIVE TEMPERATURE	-10°C / +40°C



U1-FS Footswitch interface

USB connector



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TESTAR A MARPOSS DIVISION

DIGICrown NETWORK SYSTEM



…the most flexible digital network for your gauging solutions

Digi Crown is a digital network system for the acquisition of dimensional measurements using high precision sensors.
The modular system offers a high degree of standardization to the wide range of available interfaces for different input signals. This gives the product and end user an optimal ratio between performance and price.

PRODUCT FEATURES

Digi Crown system is a network that you can build with Marposs interface modules with one or two sensor inputs.
In combination with Digi Crown 2, a line of pencil probes with high linearity performance, measurement applications with characteristics requiring superior accuracy can be achieved.
Sensors are available in standard and “soft touch” versions with spring or pneumatic push actuation and with measurement ranges from 1mm up to 20mm.
The main features of this network are:

- **Automatic recognition** of any Digi Crown 2 model sensor makes the installation process easier and avoids possible programming errors when a sensor is changed for a different type or replaced.
- **Mix of models.** Each sensor is equipped with identification data within the connector, that the system recognizes, for a quick and easy connection to the relevant interface modules without any programming
- **Modularity.** The same network includes interface modules to integrate various types of sensors such as LVDT, incremental linear scales, analog signals and manage INPUTS/OUTPUTS to PLCs.
- **Flexibility.** The network can be deployed with the optimal logistics to satisfy the application requirements on benches or measuring machines. The cost of the application is always directly proportional to the number of measurement points used.
  Digi Crown network system is based on a bus communication RS485, providing safe and effective serial protocol suitable for industrial environments.
  Digi Crown network system can also be interfaced to Windows based PC (32bit or 64bit) or PLC via interfaces such as RS232, USB or Ethernet.

CAPACITY

Marposs Digi Crown network system is a network designed to comply with the market standards such as:
- EN61010 - 1 (Safety)
- EN61326 - 1 (EMC)

The network supports up to 744 sensors and can be interfaced with either a PC (commercial or industrial) or with a PLC.

This product is suitable for applications where 32bit or 64bit Windows operating systems are installed and employed.

Dedicated SW packages can solve measurement problems statically and dynamically using a mix of sensors types, while performing at acquisition speeds of 4000 samples/sec with a synchronized Digi Crown network system.

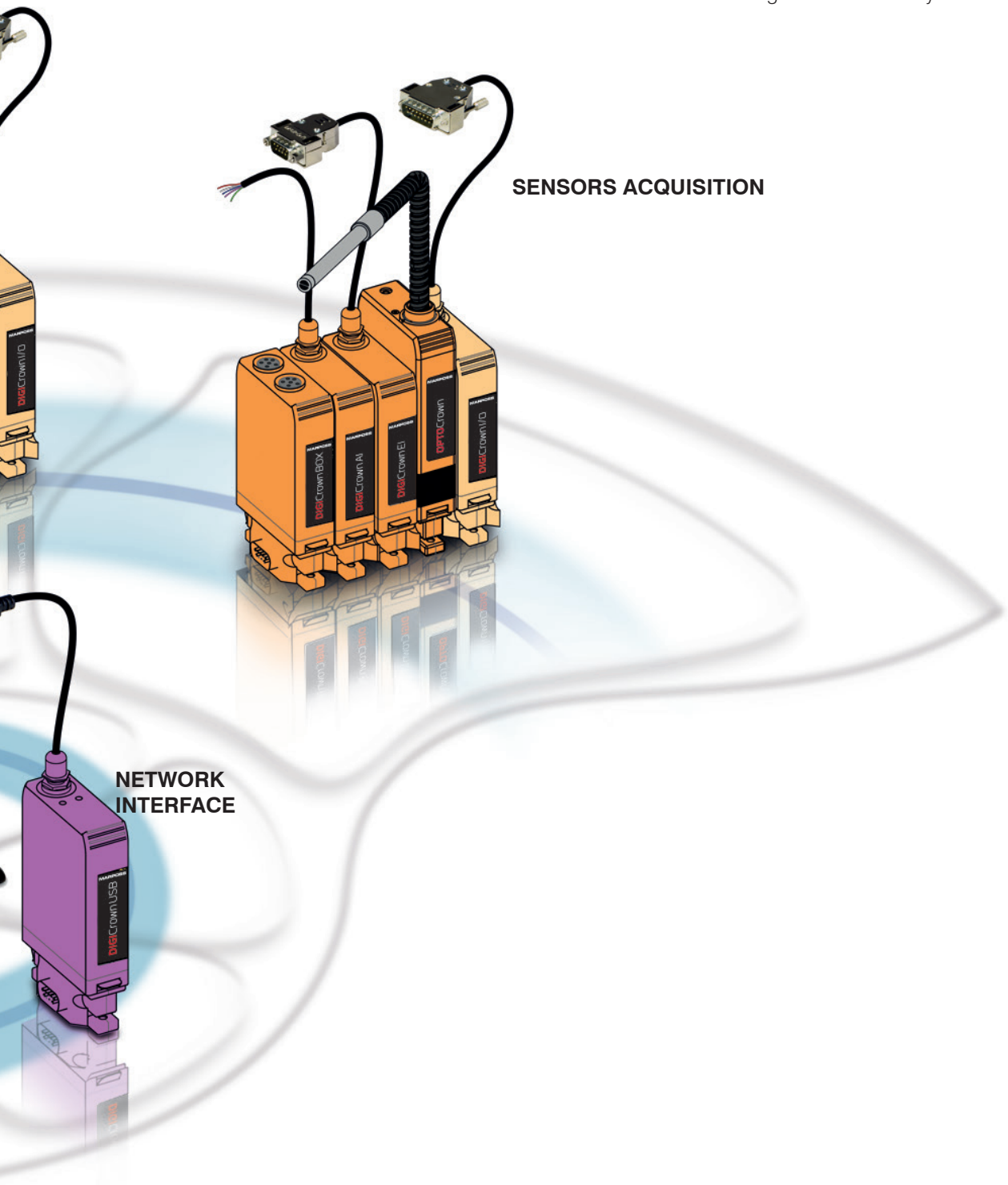
THE PRODUCT

Digi Crown system is a flexible modular system that can be configured depending on the layout of the application. The network must always start with the power supply module in the first position (to supply all interfaces) and the communication interface (to the PC or PLC), in second place.
Starting from the third position up to the last (33rd), every interface can be used in the preferred order. Through the automatic-configuration (feature available in the Digi Crown SW driver) it is possible to easily build the network and save the configuration file.
The network is now ready to be controlled from the Marposs acquisition software or to be integrated into third-party systems via dedicated software (SDK) or through the use of ASCII serial protocol commands.



THE APPLICATION

The Digi Crown interface box allows the system to interface with contact sensors (LVDT or HBT) and non contact sensors (OptoCrown).
The complete line of Marposs sensors (the standard LVDT or HBT and the non contact ones) are all provided individually calibrated and linearized to ensure high measure accuracy.
For third-party sensors, interfacing can be provided by way of an analog input box interface (Voltage or Current).
Finally, in order to integrate the network in automatic measurement applications, INPUT/OUTPUT boxes in either SOURCE or SINK format are available. The maximum number of interfaces that can be configured for the network is 31, so in case of networks with Dual Input boxes (LVDT 2CH) it is possible to handle up to 62 sensors.
The maximum number of networks that a Digi Crown Network system can handle is 12.



DIGI CROWN NETWORK

Digi Crown Network system can be represented by 3 main sections, as:

Net Power Supply. The Power Supply units are available in 3 models, two of them for Vac net (100-240 Vac) and one for 24 Vdc voltage (machine voltage)

PC / PLC interfaces. The Net interfacing towards PC / PLC can be done by dedicated board inserted into the PC bus (PCI or ISA, the latter on request) or by external device RS232, USB or Ethernet.

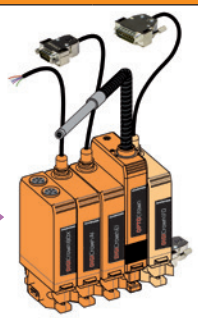
	POWER SUPPLY UNITS		
	PSU (100-240 VAC)	PSU (100-240 VAC)	PSU (24 Vdc)
Ordering code	767W000001	767W000011	767W010000
			
Max number of interface x net	31		31
	-		
Current consumption	-	-	0,8 A
Power supply	-	-	-
Power absorbtion	-	-	-
Input	100-240 Vac		24 Vdc
Output	7,5 Vdc / 3 A		7,5 Vdc / 1,7 A
Communication	-	-	-
Bus type	-	-	-
Baud rate (kbaud)	-	-	-
Operating temperature	0 ÷ +40 °C	0 ÷ +40 °C	0 ÷ +40 °C
Storage temperature	-20 ÷ +70 °C	-20 ÷ +70 °C	-20 ÷ +70 °C
Dimensions	please refer to page 8		
Grade of protection	IP41		IP41
Connection	plug or cable	plug or cable	wires
Connection to the digi crown net	by psc connector code 6872030021	direct to interface bus	by psc connector code 6872030021

	NET INTERFACE			
	PCI CARD	RS 232	USB HIGH SPEED	ETHERNET
Ordering code	6355321100	767Y000100	767Y010500	767Y020500
				
Max. number of interface	6	12	12	12
Number of net x interface	2	1	1	1
PC operative system	WINDOWS 2000, NT, XP	WINDOWS XP / VISTA / WINDOWS7 / WINDOWS8		
Power supply	from standard pci bus 5v	+7,5 Vdc (-10 / +30%) external by Digi Crown PSU		
Current consumption	-	40 mA	90 mA	90 mA
Power required	25W (*)			
	-	-	-	-
Communication (toward pc)	internal com	1 RS232 channel, full duplex hardware handshake (RTS/CTS)	1 virtual com with usb interface (USB 1.1 / 2.0 compatible)	ETH (10/100)
Bus type	serial RS485 interface half duplex (see Digi Crown protocoll&communication)			
Baud rate (Kbaud)	625	625	2.083	2.083
Operating temperature	0 ÷ 50°C	0 ÷ +60 °C	0 ÷ +60 °C	0 ÷ +60 °C
Storage temperature	0 ÷ 50°C	-20 ÷ +70 °C	-20 ÷ +70 °C	-20 ÷ +70 °C
Dimensions	standard short pci slot	please refer to page 8		
Grade of protection	depend on PC	IP43		
Connection	to pc bus	9 pin D-Sub female connector	type "A" USB connector	RJ45
Connection to the Digi Crown net	cable	by bus connector code 6872030020		



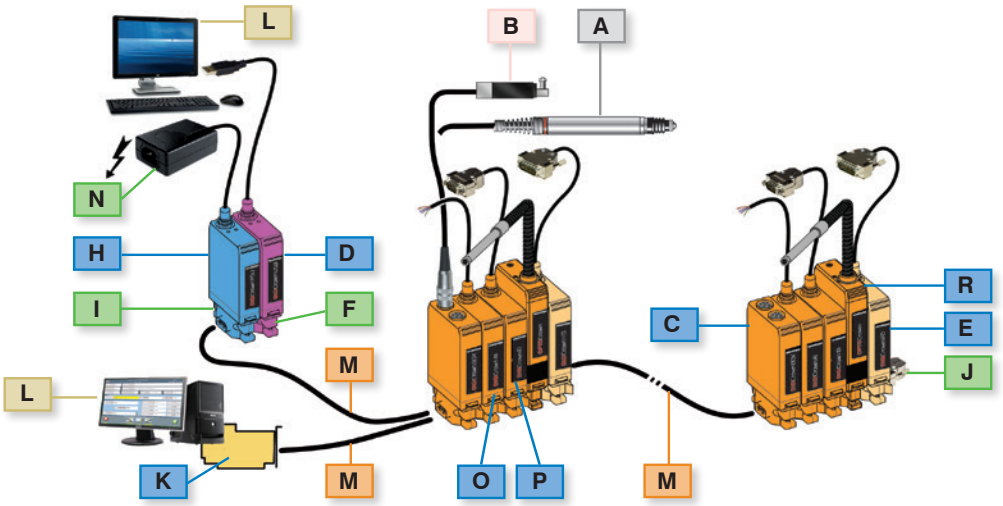
Sensors Interface The management of the acquisition sensors and I/O signals can be done by dedicated interface boxes, as:
-LVDT 2CH box - Encoder Input box - Analogue Input bo - I/O interface box - Contactless box

	SENSOR INTERFACE							INPUT OUTPUT INTERFACE		
	BOX 2 CH LVDT	OPTO CROWN	ANALOGUE INPUT			ENCODER INPUT DIGITAL	ENCODER INPUT ANALOGUE	INPUT / OUTPUT SINK TYPE	INPUT / OUTPUT SOURCE TYPE	INPUT / OUTPUT ONLY INPUT
Ordering code	767X200400	3PF0110000	767A000400			767E010500	767E100500	767I000500	767I010500	767I020500
										
Max number of interface per net	15	31	31			31	31	31	31	31
Power supply	+7,5Vdc (-10/+30%) - from bus							-	-	-
Current consumption	90 mA	190 mA	100 ÷ 150 ma depending on input type			115 mA (without encoder connected)	115 mA (without encoder connected)	+7,5Vdc (-10/+30%) - from bus (***)		+7,5Vdc (-10/+30%) - from bus
Input	digi crown probes (**)	Contactless sensor probe	voltage / current input			single ended (A,B,Z, ER) or differential (A+,A-,B+,B-,Z+,Z-,ER+, ER-)	phases A, B, M and error	70 mA	70 mA	80 mA
Output	serial communication toward bus, by Digi Crown protocol							8 in/out optoisolated Voff (min)= (Vio-5V) Von (max)= (Vio-15V)	8 in/out optoisolated Voff (max)= (5V) Von (min)= (15V)	8 IN for switch box Off: Rswitch > 500 kohm On: Rswitch < 3300 ohm
Input type	1 / 2 / 5 / 10 / 20 mm	integrated sensor 10mm range	voltage (±10V / ±5V / 0-10V)	current (±20mA / 4..20 mA)	resistance	TTL, HTL, RS422 push pull or open-collector	1Vpp or 11µApp	serial communication toward bus, by Digi Crown protocol		
Resolution	0,05µm (1-2mm) / 0,2µm (4-10mm) / 0,5µm (20mm)	1µm	0,02mV (±5V range) or 0,05mV(±10V)	0,0001 mA	0,1 Ω (range 50÷3.000 W) 0,01 Ω (range 50÷500 Ω)	depend on device connected	depend on device connected	200mA for out (700mA max total)	200mA for out (700mA max total)	-
Bus type	serial RS485 interface half duplex (see Digi Crown protocol & communication)							serial RS485 interface half duplex (see Digi Crown protocol & communication)		
Net sampling rate	4000 read/sec.	4000 read/sec.	4000 read/sec.			4000 read/sec.		4000 read/sec.	4000 read/sec.	4000 read/sec.
Operating temperature	0 ÷ +60 °C	PROBE 0°÷100° BOX 0°÷50°C	0 ÷ +60 °C			0 ÷ +60 °C	0 ÷ +60 °C	0 ÷ +60 °C	0 ÷ +60 °C	0 ÷ +60 °C
Storage temperature	-20 ÷ +70 °C	-20 ÷ +70 °C	-20 ÷ +70 °C			-20 ÷ +70 °C	-20 ÷ +70 °C	-20 ÷ +70 °C	-20 ÷ +70 °C	-20 ÷ +70 °C
Dimensions	please refer to page 8							please refer to page 8		
Grade of protection	IP43	IP43	IP43	IP43	IP43	IP43	IP43	IP43	IP43	IP43
Connection	lumberg female connector	-	wires			9 pin D-sub male connector		15 pin D-SUB male connector		
Connection to the digi crown net	by bus connector code 6872030020							by bus connector code 6872030020		



SENSORS and INPUT/OUTPUT Interfaces

How to order



Interfaces

	Description	Order code
C	DIGI CROWN BOX TWO TRANSDUCERS HIGH SPEED	767X200400
D	DIGI CROWN 232	767Y000100
D	DIGI CROWN USB HIGH SPEED SYNC INT	767Y010500
D	DIGI CROWN USB HIGH SPEED SYNC INT + EXT	767Y010505
D	DIGI CROWN ETH HIGH SPEED SYNC INT	767Y020500
D	DIGI CROWN ETH HIGH SPEED SYNC INT + EXT	767Y020505
R	OPTOCROWN CONTACTLESS BOX	3PF0110000
H	DIGI CROWN DNG BOX ALIM. 100-240 Vac 7,5 Vdc 3A	767W000001
H	DIGI CROWN DNG BOX ALIM. 100-240 Vac 7,5 Vdc 3A DSUB9	767W000011
H	DIGI CROWN PSU (24 Vdc / 7,5 Vdc)	767W010000
E	DIGI CROWN I/O SINK HIGH SPEED SYNC	767I000500
E	DIGI CROWN I/O SOURCE HIGH SPEED SYNC	767I010500
E	DIGI CROWN ONLY INPUT HIGH SPEED SYNC	767I020500
K	DIGI CROWN PCI	6355321100
O	DIGI CROWN AI HIGH SPEED	767A000400
P	DIGI CROWN EI HIGH SPEED	767E010500
P	DIGI CROWN ANALOG ENCODER HSS	767E100500

Accessories

	Description	Order code
G	DIGI CROWN PBB	6139013200
J	END LINE CONNECTOR	6355200000
F	DIGI CROWN BUS (FOR DIGI CROWN BOX, 232, I/O)	6872030020
I	DIGI CROWN PSC (FOR DIGI CROWN PSU)	6872030021
N	EU CABLE	4147000016
N	USA CABLE	4147000017

Sw packages

	Description	Order code
L	CORREDO EASY ACQUISITION SPC V.3.3 VAR1	CM6303MA01
L	DIGI CROWN PROBING LINE DRIVER V3.6	CM2E36MA12
L	CORR. QUICK SPCW 3.6 VAR1 + G. CAPABIL.	CM2Z36MA01
L	DIGI CROWN SDK (Software Development Kit)	D8680003M6

Connection cable

	Description	Order code
M	CONNECTION CABLE 2 mt.	6738057027
M	CONNECTION CABLE 3,5 mt.	6738057029
M	CONNECTION CABLE 6 mt.	6738057031
M	CONNECTION CABLE 10 mt.	6738057033
M	CONNECTION CABLE 15 mt.	6738057035

Digi Crown pencil probe heads - Standard

	Description	Range (mm)	Trade name	Order code
A	AXIAL - SPRING	1	D01	3PD01L0000
A	AXIAL - SPRING	2	D02	3PD02L0000
A	AXIAL - SPRING	5	D05	3PD05L0000
A	AXIAL - SPRING	10	D10	3PD10L0000
A	AXIAL - SPRING	20	D20	3PD20L0000
A	RADIAL - SPRING	1	RD01	3PD01L1200
A	RADIAL - SPRING	2	RD02	3PD02L1200
A	RADIAL - SPRING	5	RD05	3PD05L1200
A	RADIAL - SPRING	10	RD10	3PD10L1200
A	RADIAL - SPRING	20	RD20	3PD20L1200
A	AXIAL PNEUM.	2	PAD02	3PD02L0400
A	AXIAL PNEUM.	5	PAD05	3PD05L0400
A	AXIAL PNEUM.	10	PAD10	3PD10L0400
A	AXIAL PNEUM	20	PAD20	3PD20L0400
A	RADIAL PNEUM.	2	PD02	3PD02L1600
A	RADIAL PNEUM.	5	PD05	3PD05L1600
A	RADIAL PNEUM.	10	PD10	3PD10L1600
A	RADIAL PNEUM.	20	PD20	3PD20L1600
A	AXIAL PUSH/VACUUM	2	VAD02	3PD02L0560
A	AXIAL PUSH/VACUUM	5	VAD05L	3PD05L0560
A	AXIAL PUSH/VACUUM	10	VAD10	3PD10L0560
A	AXIAL PUSH/VACUUM	20	VAD20	3PD20L0560
A	RADIAL PUSH/VACUUM	2	VD02	3PD02L1760
A	RADIAL PUSH/VACUUM	5	VD05	3PD05L1760
A	RADIAL PUSH/VACUUM	10	VD10	3PD10L1760
A	RADIAL PUSH/VACUUM	20	VD20	3PD20L1760

Digi Crown pencil probe heads - Soft touch

	Description	Range (mm)	Trade name	Order code
A	AXIAL - SPRING	1	D01L	3PD01L5000
A	AXIAL - SPRING	2	D02L	3PD02L5000
A	AXIAL - SPRING	5	D05L	3PD05L5000
A	AXIAL - SPRING	10	D10L	3PD10L5000
A	AXIAL - SPRING	20	D20L	3PD20L5000
A	RADIAL - SPRING	2	RD02L	3PD02L6200
A	RADIAL - SPRING	5	RD05L	3PD05L6200
A	RADIAL - SPRING	10	RD10L	3PD10L6200
A	RADIAL - SPRING	20	RD20L	3PD20L6200
A	AXIAL PNEUM.	2	PAD02L	3PD02L5400
A	AXIAL PNEUM.	5	PAD05L	3PD05L5400
A	AXIAL PNEUM.	10	PAD10L	3PD10L5400
A	AXIAL PNEUM.	20	PAD20L	3PD02L5400
A	RADIAL PNEUM.	2	PD02L	3PD02L6600
A	RADIAL PNEUM.	5	PD05L	3PD05L6600
A	RADIAL PNEUM.	10	PD10L	3PD10L6600
A	RADIAL PNEUM.	20	PD20L	3PD20L6600
A	AXIAL PUSH/VACUUM	2	PVAD02L	3PD02L5800
A	AXIAL PUSH/VACUUM	5	PVAD05L	3PD05L5800
A	AXIAL PUSH/VACUUM	10	PVAD10L	3PD10L5800
A	AXIAL PUSH/VACUUM	20	PVAD20L	3PD20L5800
A	RADIAL PUSH/VACUUM	2	PVD02L	3PD02L7000
A	RADIAL PUSH/VACUUM	5	PVD05L	3PD05L7000
A	RADIAL PUSH/VACUUM	10	PVD10L	3PD10L7000
A	RADIAL PUSH/VACUUM	20	PVD20L	3PD20L7000

Mini cell - D124

	Description	Range (mm)	Trade name	Order code
B	CONTACT UP	0,4	D124	3419886400

DESCRIPTION

Digi Crown system is built around interfaces and acquisition boxes to allow the most suitable configuration for any measuring solution.



Power Supply Unit. It is always in 1st position to supply voltage to the complete Net, from PC/ PLC interface, up to all acquisition boxes. A second power supply unit is recommended to be inserted (mid position) in to a full net (62 inputs-Dual Channel Box) to ensure ample power is available in the system at all times.
It is available in 3 models, 2 types for 100-240Vac and 1 type for 24Vdc.



RS232 Interface. It is always in 2nd position, after power supply unit. It allows to interface Digi Crown network System towards PC and PLC. The COM port baud rate is programmable up to 115.2 Kbps and the BUS network baud rate is 625 Kbps.
This allows for Static or Buffered dynamic measurements.



ETHERNET Interface. It is always in 2nd position, after power supply unit. It allows to interface Digi Crown network System towards PC or PLC. The BUS network baud rate is 2083 Kbps.
This allows for Static or Dynamic measurement acquisitions with synchronization, with the maximum performance of 4000 samples/s. In case of configuration with more than one Network, the synchronization signal can be extended to other Networks.



USB High Speed Interface. In the NET it is always in 2nd position. It allows to interface DigiCrown network System towards PC and PLC. The interface creates a virtual COM Port. The BUS network baud rate is 2083 Kbps. This allows for Static or Dynamic measurement acquisitions with synchronization, with the maximum performance of 4000 samples/s. In case of configuration with more than one Network, the synchronization signal can be extended to other Networks through an additional cable.



Dual Channel Box. It allows the management of the entire Marposs Digi Crown probing line and all Marposs digitized sensors (A/E converter, D124, etc..). The box can sample up to 4000 samples/s.
It can be assembled in any position, from the 3rd to 33rd.



Encoder Input Box. It is available in 2 models for analogue or digital, linear or rotary type encoders. The box can sample up to 4.000 samples/s. It can be used in combination with all others acquisition boxes.
It can be assembled in any position, from the 3rd to the 33rd.



Analogue Input Box. It allows to interface any third party sensor with analogue input in voltage or in current. The box can sample up to 4000 samples/s. It can be used in combination with all other acquisition boxes.
It can be assembled in any position, from the 3rd to the 33rd.



OptoCrown box. It is an interface with integrated contactless sensors (infrared light). It allows to make static measures with a measuring range of 10mm with target positioned from 1 to 11mm. It can be used in combination with all other acquisition boxes. It can be assembled in any position, from the 3rd to the 33rd.



Digi Crown I/O interface is available in 3 versions with 8 Input/Output (SINK or SOURCE) and only input (8 inputs).
The INPUTS/OUTPUTS are opto-coupled, they can be singularly selectable as IN or OUT. With this box it is possible to manage: solenoid valves (through power relays), acquisition of input signals by local cycle START/STOP push-button panels, or acquisition of limit switch signals.

SOFTWARE

Quick SPC



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.

Marposs DLL



Marposs Driver Library is a COM object SW that allow to easily build the configuration by the use of the Marposs Digi Crown driver and, in addition with a COM object component, it is possible to solve the application measure requirments.

Easy Acquisition



Easy Acquisition™ software package runs on an Excel platform and allows the use of a typical Excel worksheet to perform the following functions:
- Acquisition of the value of the sensors
- Creation and display of measurements with tolerance values and status
- Calibration
- Data collection
- Statistical Analysis (SPC)
- Print-out of the data collection and SPC values (reporting)

SDK



SDK is a COM object software tool that allows OEMs to integrate Digi Net in third party application sw.
The users is completely free to build his dedicated SW interface managing configurations and application too.

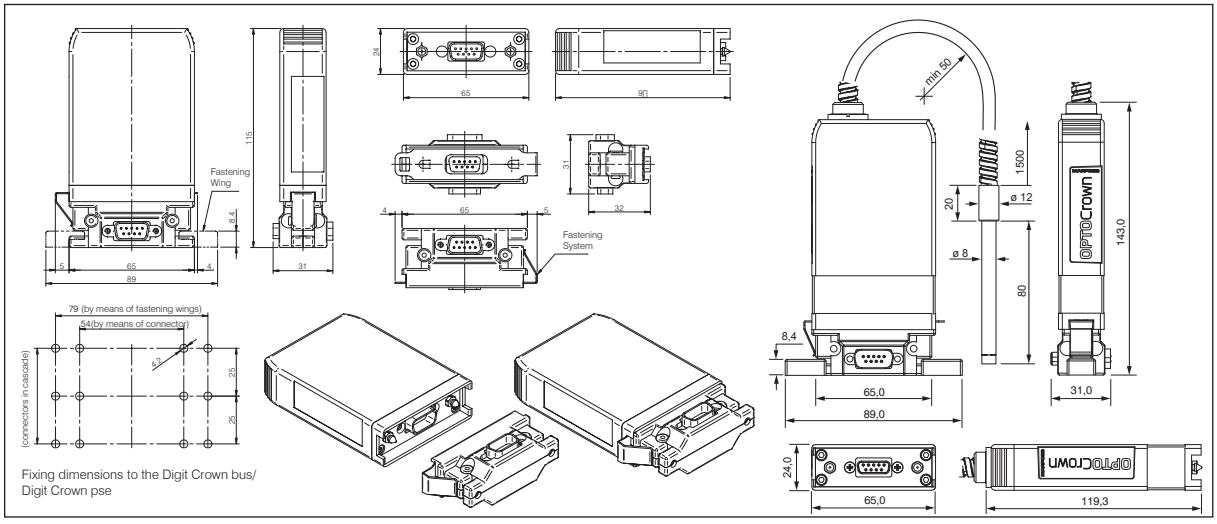
Protocol Command



Digi Net can be managed directly by ASCII protocol command trough RS232 COM port. This means that Digi Net is suitable not only for PC but also for PLC connection. The documentation supplied includes:
- manuals
- tools to practice the protocol command
- examples

INTERFACES OVERALL DIMENSIONS

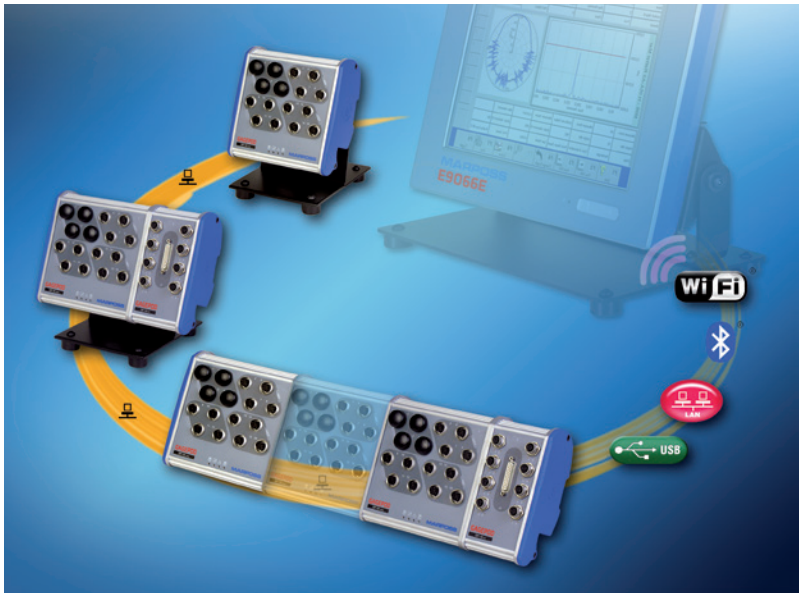
Overall dimensions in mm of Digi Crown box, Digi Crown 232, Digi Crown psu, Digi Crown i/o, Digi Crown bus, Digi Crown psc interfaces and OptoCrown.



Fixing dimensions to the Digit Crown bus/ Digit Crown pse

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GAGEPOD



...distributed data acquisition system...

The GagePod™ is a modular and distributed data acquisition system, that can be used for a wide range of applications, from simple manual gauging to fully automatic measurement and inspection systems.

PRODUCT FEATURES

The GagePod system connects to the computer via a single USB or Ethernet cable, or wirelessly through either a Bluetooth® or WiFi® connection.
The system can be provided with a benchmount pedestal, and also integrates DIN-rail mounting for industrial cabinets or custom-made solutions.

Main technical characteristics and features are:

- ARM9™ RISC technology
- 24-bit resolution for high speed data acquisition and sampling
- All modules are synchronized, for even the most demanding dynamic measurements, including management of linear and rotary encoders
- Connectivity to E9066T™ / E9066E™ or any available commercial PC, using industry standard interfaces: USB, Ethernet, Bluetooth, WiFi.

GagePod modules include:

- 16 channel DAQ
- Digital I/O type 16I/O and 32I/O
- Linear/rotary encoder module
- Fieldbus module
- Motor Driver Module

CONNECTIVITY

It connects to any Marposs E9066™ industrial computer or commercial PC running Marposs Quick SPC™ Measurement, SPC and Quality Control software suite. GagePod modules, based on ARM9™ RISC technology, snap together without interconnecting cables, and can be easily combined and tailored to any application.

TECHNICAL SPECIFICATIONS

TECHNOLOGY	
Processor	ARM9™ 32 BIT - 400MHz
A/D converter	24bit A/D converter
Data synchronization	Synchronization for all modules
Sampling	Parallel sampling on all 16 channels
	Programmable sampling frequency per channel
	Separate sampling frequency module by module
	Manages TEDS (Transducer Electronic Data Sheet
CONNECTIVITY	
Ethernet Ports	2 x Ethernet 100Mbps / RJ45 connectors
USB ports	2 x USB host; 1 x USB device
Serial port	RS232/422/485 (multistandard) / D-SUB9
Power supply	24Vdc (IEC 61131-2) / M12 connector
MODULES	
DAQ	16 Channel (LVDT, HBT, Digicrown, HBT-13KHz)
Input / Output	16 I/O and 32 I/O modules (24 Vdc, opto-insulated)I
Encoder	9 x rotary/linear; D-SUB9 + synchronization
Fieldbus	Profibus DP, ProfiNet and others upon request
MOUNTING SOLUTIONS AND OPTIONS	
DIN rail mount	integrated
Benchmount pedestal	option
Power supply	24Vdc AC/DC adapter (option)
ENVIRONMENTAL	
Relative humidity	5 ÷ 80 % relative humidity
Operating temperature	5 ÷ 45 °C
Storage temperature	-20 ÷ 60 °C
Protection	IP 54

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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	

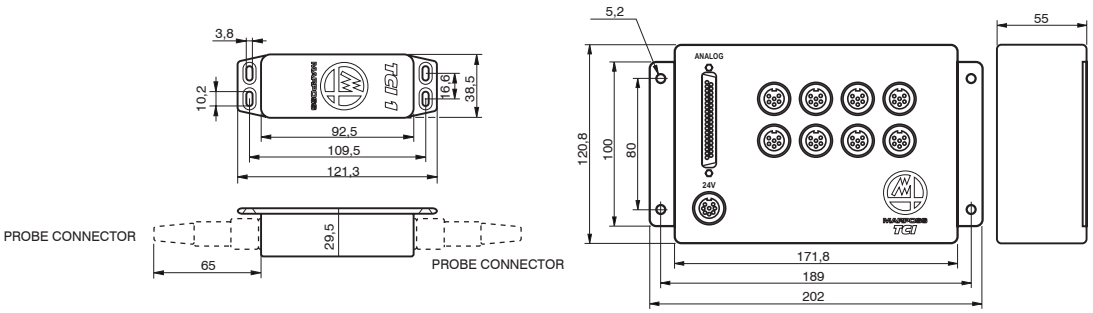
VOLTAGE SUPPLY

	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



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...the easiest solution to integrate measures into a PLC...

ASC (Automation Signal Controller) is a family of interface boxes designed to integrate transducers via RS232 into PLC and keep your production continuously under control.

PRODUCT FEATURES

ASC family is perfect for the automation needs; it can interface 2 or 4 sensors to PC or PLC. Available in many different models, depending on the number and the type of transducers, it's ready to be connected as a plug and play device.
The measure can be collected through the RS232 port using simple ASCII serial protocol commands.
Compact, robust and equipped with DIN rail mounting accessories, it is suitable for cabinet and automation applications layout in general.

SENSORS COMPATIBILITY

Both LVDT (full bridge) and HBT (half bridge with LVDT pinout) sensors can be connected to ASC. Analog (RedCrown 2) or digital (DigiCrown 2) pencil probes with ±0,5mm, ±1mm, ±2mm, ±2,5mm, ±5mm and ±10mm measuring range can be managed.

OUTPUT SIGNAL

Transducer values are continuously available through the RS232 interface using simple protocol commands.

POWER SUPPLY

ASC requires +24 Vdc nominal value with an input range of 18÷36 Vdc.

How to Order

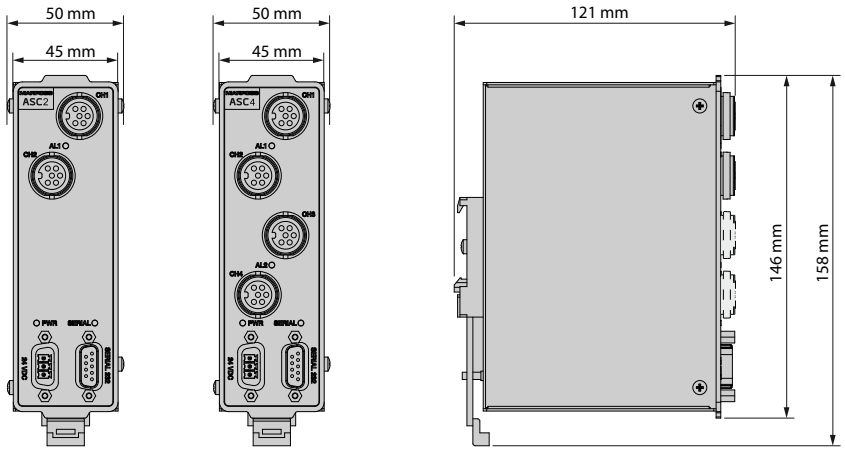
DESCRIPTION		ORDER CODE					
MEASURING RANGE (mm)		±0,5	±1	±2	±2,5	±5	±10
ANALOG LVDT	2 CHANNELS	768231AL00	768231AL20		768231AL40	768231AL60	768231AL80
	4 CHANNELS	768232AL00	768232AL20		768232AL40	768232AL60	768232AL80
DIGITAL LVDT/HBT	2 CHANNELS	768231DL00					
	4 CHANNELS	768232DL00					

TECHNICAL SPECIFICATIONS

Nunber of input channels		**2 or 4**					
Type	analog	LVDT (Marposs Standard)					
	digital	LVDT/HBT (pinout LVDT)					
Measuring range	mm	**±0,5**	**±1**	**±2**	**±2,5**	**±5**	**±10**
Resolution	µm	0,05		0,2	0,2	0,2	0,5
Sensitivity	mV/V/mm	230			115		23
Accuracy pencil probes (*)	analog - µm	±MAX(0,5+|2•K|;|7•K|)	±MAX(1+|2•K|;|7•K|)	±MAX(2+|2•K|;|7•K|)	±MAX(2,5+|2•K|;|7•K|)	±MAX(5+|2•K|;|7•K|)	±MAX(10+|2•K|;|7•K|)
	digital - µm	±(0,2+K•1)	±(0,2+K•1)	-	±(0,6+K•1)	±(0,6+K•1)	±(1,2+K•1)
Accuracy - ASC (*)	µm	±[0,1+0,2•K]	±[0,2+0,2•K]	±[0,4+0,2•K]	±[0,5+0,2•K]	±[1+0,2•K]	±[2+0,2•K]
Input/Output Communication		**Serial RS232**					
Output type	-	1 RS-232 channel, full duplex; hardware handshake (RTS/CTS)					
Baudrate	bit/s	9600 (default) / 19200 / 38400 / 57600 / 115200					
Data bit	nr.	8					
Stop bit	nr.	1					
Parity	type	even					
Sampling rate	sample/s	up to 400 (depending on Net configuration)					
Power supply	Volt	Nominal value +24 Vdc ; Input range 18÷36 Vdc					
Electrical absorption	mA	ASC2: 90					
		ASC4: 200					
Protection degree	-	IP40					
Storage temperature	°C	-20 ÷ 70					
Operating temperature	°C	0 ÷ 55					
Dimensions W x D x H	mm	45 x 138 x 100 (excluded DIN rail mounting)					
Weight	g	555					

(*) K= Reading (mm)

DIMENSIONS



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EASY Acquisition SOFTWARE



…easy to use and easy to learn basic SPC software

PRODUCT FEATURES

Easy Acquisition™ software package is the Marposs basic measuring and SPC software. Its main characteristic is the flexibility: users can develop their own Excel macros in VBA language in order to perform different functions depending on the application. The easy to use and easy to learn approach.

This software was developed specifically for simple manual applications with static acquisition or manually driven dynamic acquisition with a limited sampling rate (40 samples/s).

Easy Acquisition™ runs on an Excel platform and allows the use of a typical Excel worksheet to perform the following functions:

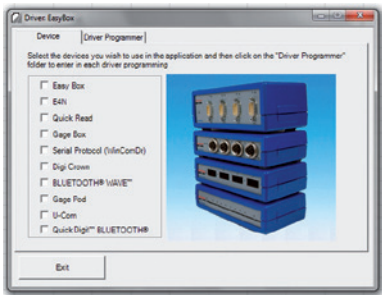
- Acquisition of the measurement value from the Marposs display units E4N and Quick Read, interface units Easy Box™, DigiCrown, GagePod, U-Com, wireless gauges of the Wave family, Quick Digit Bluetooth wireless indicators, third party serial devices.
- Creation and display of measurements with tolerance values and status
- Handling of measurement calibration (if required)
- Data collection of the measurement values
- Basic statistical analysis (SPC) of the collected measurement values (Histogram, Sample Value Chart, X&R Chart)
- Print-out of data collection and SPC values (reporting)
- management of input/output signals to command the acquisition (start/stop, delete, zeroing, etc.) in order to conveniently replace the PC mice and give feedback to the user.

SYSTEM REQUIREMENTS:
- Operating System: Windows® XP SP3 / Windows 7 32 bit and 64 bit version
- Microsoft Excel® 2010 or higher 32 bit standard edition license

The Easy Acquisition software package includes a CD-Rom with software and drivers and a USB dongle to be associated to the PC running the software.

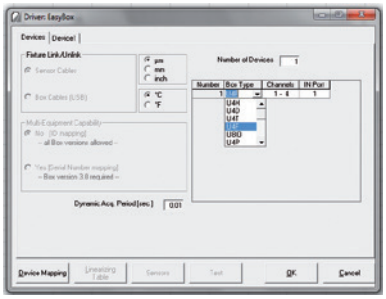
How to Program

A simple programming sequence allows, through a limited number of steps, to configure the driver of the product in use and to prepare the Excel worksheet for the measurement acquisition.



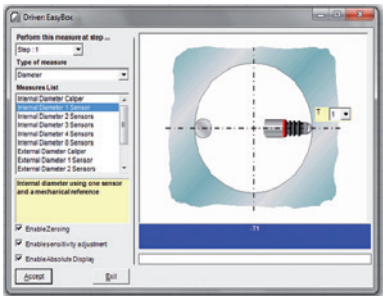
1

1 - Selection of the product driver



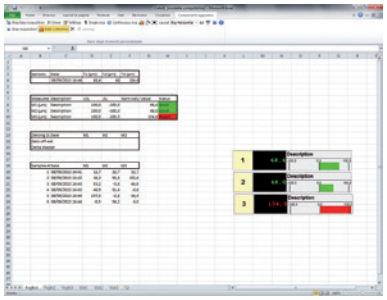
2

2 - Driver configuration: programming the hardware in use in order to insert the number and the type of transducers. It is also possible to configure an application with more than one driver and then with different devices



3

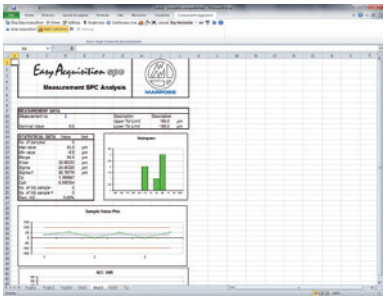
3 - Defining measuring step, type of measurement to be carried out and related sensors by means of the Formula Wizard, which simplifies the measurement formula programming



4

4 - Choose the layout of your working page placing the items (measurements bargraph, steps, data collection of the acquired measurement values) in the Excel worksheet

5 - Start working ! Easy Acquisition™ software will provide you automatically the SPC elaboration; statistical data are displayed in both numeric and graphical form (Histogram, Sample Value Chart, X&R Chart)



5

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MERLIN Plus SW



…intuitive and user friendly measuring software…

Merlin Plus Software™ combines the ease of use and the abilities of the Merlin Plus™ gauge computer with the capability of running on customer PC with various display formats.
A high degree of customization is possible thanks to Merlin Designer™, a Marposs utility expressly created to produce dedicated measuring pages.

PRODUCT FEATURES

Merlin Plus Software™, running on the Microsoft® Windows® operating system, guarantees a friendly and easy-to-use operator interface.
The human-machine interface offers touch-screen operation or traditional mouse / keyboard commands to acquire measurements without any additional input devices.

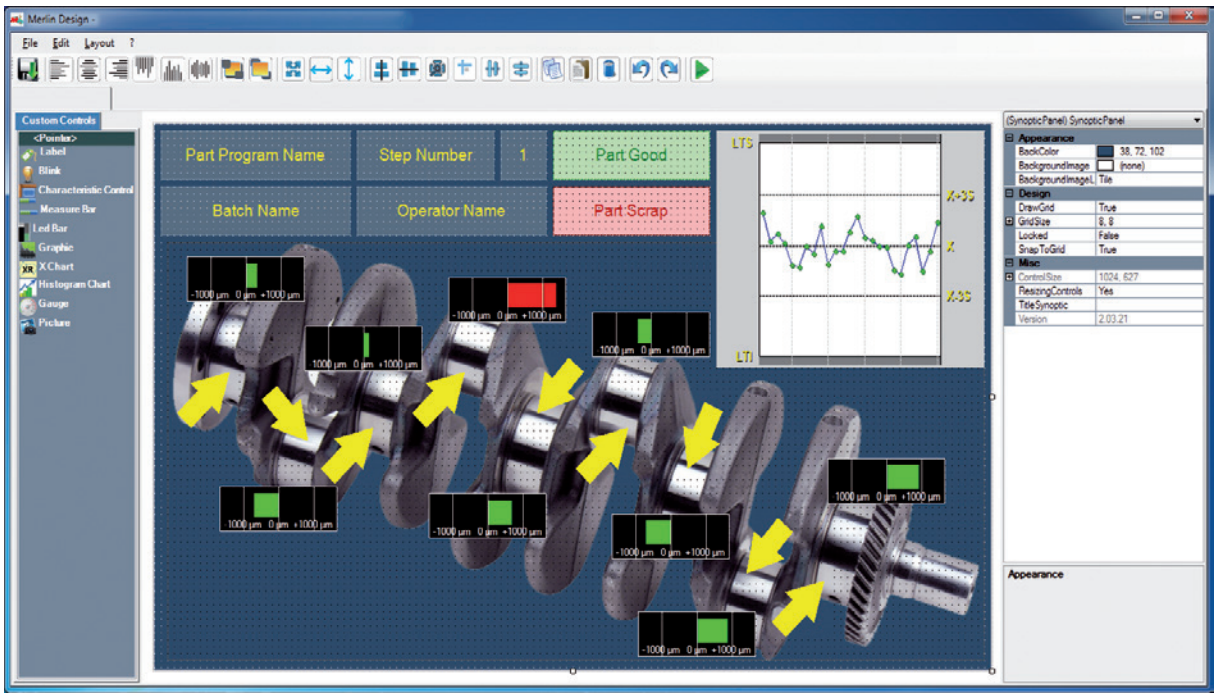
Merlin Plus Software™ is capable of:
- collecting data acquired by measurement devices, made by Marposs or third-parties
- delivering innovative software features capable of acquiring data from wired and wireless measurement devices
- providing a basic statistical control software (SPC) and an easy-to-use user interface supporting both multi-language and multi-user management.

SPECIFICATIONS

Measurements
- Multiple devices connectable via USB, RS232, Ethernet or Bluetooth® wireless.
- Synchronous Transducers Acquisition (using Easy Box™ or Digi Crown™).
- Up to 250 characteristics
- Multiple measurement display with numeric and graphic layout.
- I/O management.
- Management of tracing data.
- Multi-language support for European and Asian languages.

Statistical process control
- Statistical Analysis with graphic display and numeric summary.
- Gage Capability and R&R studies facilities.
- Data segregation (by machine, product batch, analysis purposes).
- Part counters.
- Data storage: internal memory, USB memory devices or remote through Ethernet LAN in DFQ or CSV format.
- Printable charts.

Programming Tool



Merlin Designer™ is a stand-alone software that allows to create customized measure pages using various objects, such as dedicated measuring bars, images and statistical graphics.
Customizing each part program, with a dedicated page, will help to guide the operator through the measurement procedure, avoiding errors and easily keeping the production under control.
On the same page, the measurements result, statistical graphs or the next measurement step, can be shown.

How to Order

DESCRIPTION	ORDER CODE
MERLIN PLUS SOFTWARE	CM7000000E

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TESTAR A MARPOSS DIVISION QUICKSPC



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.

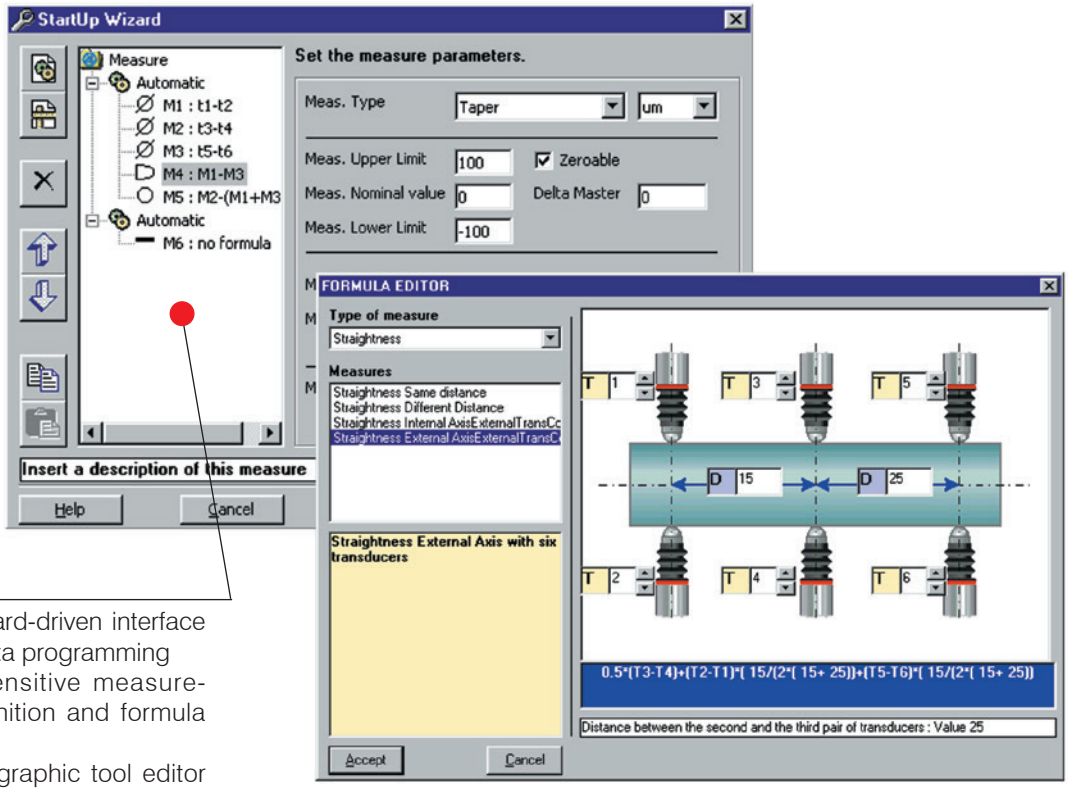
Native 32-bit Windows® software for shop floor applications: operator prompts with multimedia files (pictorials, drawings, photos, mov-ies).

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 (E9066™ family) or any Windows® compatible PC with:

- Pentium® 4 class microprocessor (or equivalent) with at least 1 GB RAM (2 GB recommended for Windows 7™)
- 800x600 SVGA monitor resolution or greater (XVGA 1024x768 recommended)
- At least 2 GB free hard disk space
- Supported Operating Systems: Windows 7™ 32-bit or 64-bit, Windows® Vista® Service Pack 1, Windows® Xp Service Pack 3



WIZARDS

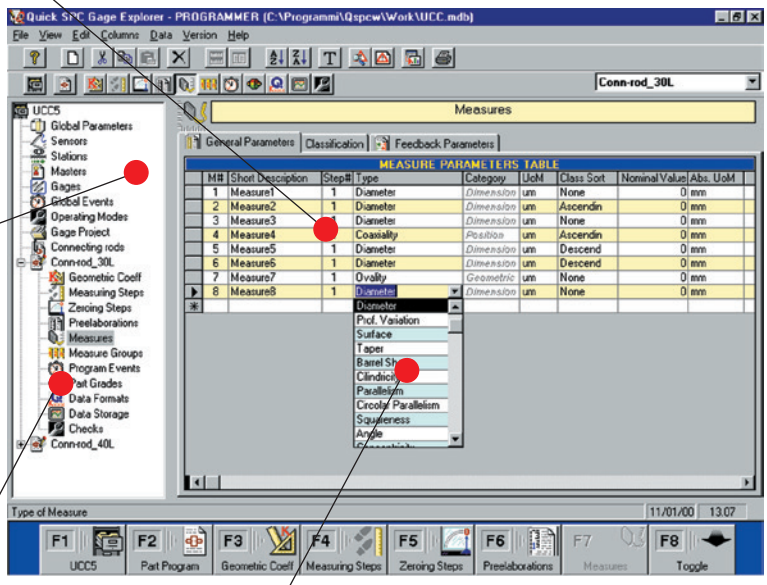
- Simple wizard-driven interface for easy data programming
- Context sensitive measurements definition and formula creation
- Integrated graphic tool editor to create operator prompts and instructions

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

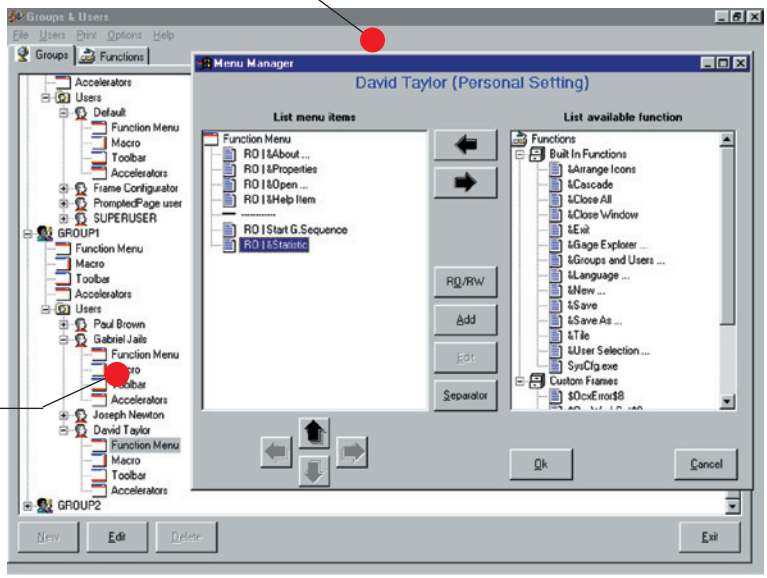
- Embedded Q-DAS® statistical software for on-line control charts, machine and process capability analysis
- Q-DAS® qs-STAT® compliant data storage

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.

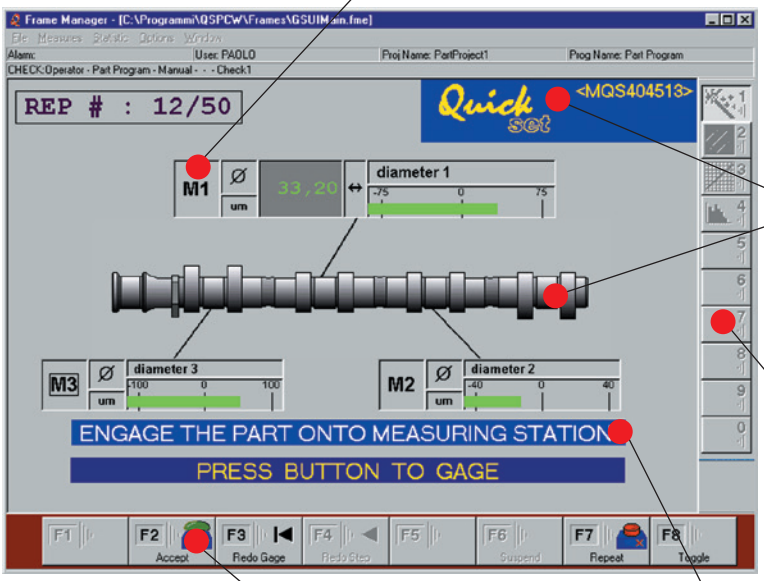


SECURITY

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.

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

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worldwide addresses

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