PENCIL PROBES LINE

The Red Crown™ pencil probe line developed by TESTAR, a Marposs division, to fulfil quality control requirements in the workshop is available in four variants:

Basic line:
A family of 52 standard models covering a measuring range from ± 0,5 to ± 5 mm. The pencil probes are supplied with full-bridge (LVDT) or half-bridge (HBT) transducer already calibrated for connection to any TESTAR electronic display units such as E18, E4, E4N, Quick Read Microcolumn and, through the data acquisition systems Easy Box and Gage Box™ to E9066s™ Industrial PC.

Compatible line:
A comprehensive list of probes covering the TESTAR standard measuring ranges with appropriate electrical connector and calibrated to comply with your existing electronic display unit.

Unplugged line:
The 52 standard models of the basic line can also be provided without connector. Based on established electrical characteristics supplied with each probe the user can add the necessary connector and perform the appropriate calibration to the electronics in use.

Soft touch line:
Pencil probes especially designed with very low measuring force to directly gauge delicate parts such as glass, TV tubes, car windshields and plastic material. These probes can be supplied in basic or compatible configuration.

Reliability and durability are assured in all models through innovative design and the use of the most suitable materials, developed thanks to TESTAR's extensive experience in the quality control sector.
Red Crown pencil probes assure precision measurements, even below one micron, and contribute to the quality of measurement data.

Red Crown™ product line offers:

- Comprehensive product range
- High quality and precision
- Competitive price
- Short delivery
- Durability

Red Crown™ pencil probes - the easiest choice to gauge your part.

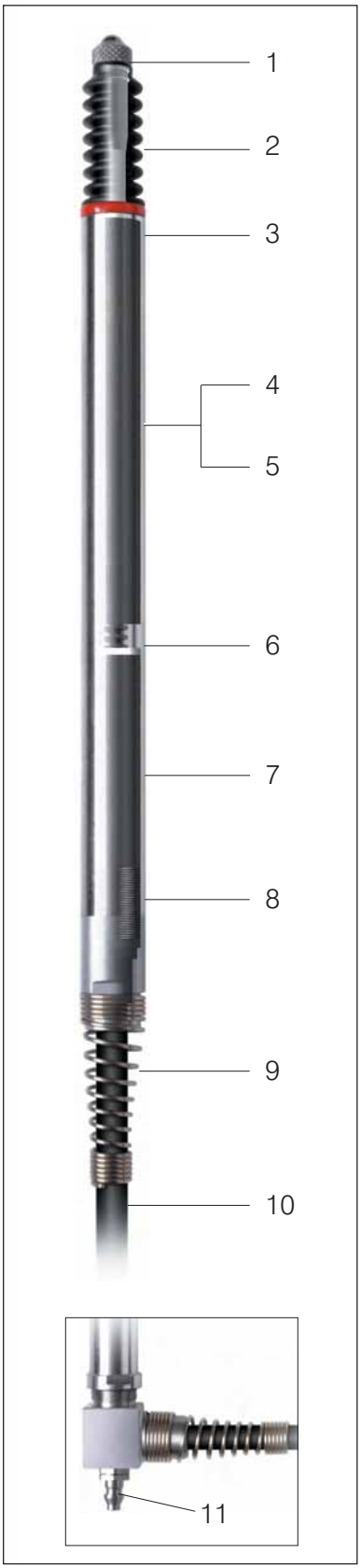
QUALITY GUARANTEE

TESTAR's technical team has over thirty years of experience in the manufacture and use of pencil probes for its own applications and those of third parties. Knowledge of the manufacturing workshop environment was essential to the development of the Red Crown product line.

TESTAR, which has ISO 9000 certification, manufactures every pencil probe to the strictest quality standards, on the basis of its own experience and in accordance with the quality that a measuring instrument must provide.
The Red Crown product is 100% tested, following internationally recognized procedures and using computerized equipment which define the basic product parameters.

THE PRODUCT

TESTAR experience has allowed the development of the Red Crown product line, a product with innovative features that satisfies the most demanding market standards.



Red Crown pencil probes consist of the following basic parts:

1 - **Contact.** Interchangeable (M2,5 or 4-48 UNF thread - standard model made of tungsten carbide, R=1,5 mm).
A wide range of optional contacts is available, to suit all specific measuring requirements. The "soft touch" models are typically supplied with interchangeable nylon contact to prevent surface damage.

2 - **Gaiter.** It is made of rubber (Fluoroelastomer) and protects the internal mechan-ical parts from dust or liquids (IP65).
It allows the product to function in the workshop, even in the harshest conditions. The "soft touch" models are provided without gaiter for consistent low measuring force.

3 - **Pencil probe body.** The stainless steel body has a hardened surface, to prevent damage to mechanical sliding parts in the event of high tightening torques.
The entire range of pencil probes includes versions with an external body diameter of both 8h6 mm and 3/8".

4 - **Guide system.** Mounted on ball bearings, guaranteeing optimum sliding movement of the mechanical parts.

5 - **Anti-rotation feature.** Facilitates contact assembly/disassembly.

6 - **Spring.** Determines the measuring force with which the contact touches the workpiece.
In addition to the standard spring normally supplied, there is a wide range of optional springs, for a greater or lower measuring force. The "soft touch" models are provided with special spring type to allow low measuring force (0,30 N at electrical zero with horizontal probe axis).

7 - **Transducer.** The transducer is made using high tech materials and production processes, which guarantee great precision. It is available in two configurations, full-bridge (LVDT) and half-bridge (HBT), allowing customization of the pencil probes to suit any electronic system on the market.

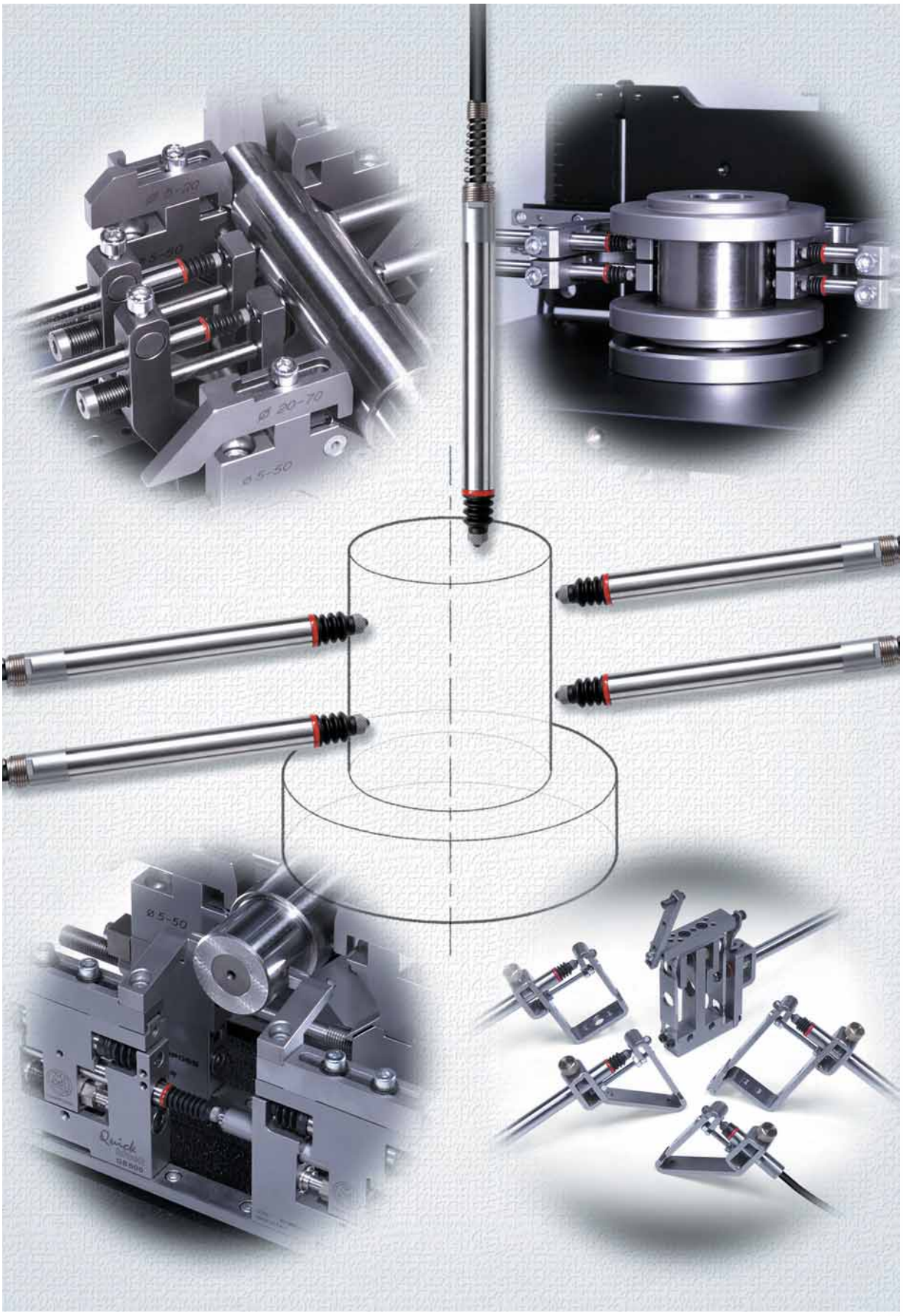
8 - **Pre-travel adjustment.** This device allows optimum adjustment of tangential interference with the workpiece to be checked. Pre-travel adjustment extends the life of the sliding parts inside the pencil probe.

9 - **Cable spring.** Always present , the cable spring guarantees an optimum cable curve radius, preventing damage.

10 - **Cable.** The 2 meters cable (EMC standards - directive 89/336/EEC) is highly resistant to tears and is covered with a sheath made of special material highly resistant to coolants. The cable outlet may be axial or radial. Extensions of various lengths are also available.

11 - **Pneumatic push - Vacuum retract.** Some models can be fitted with a manual or automatic pneumatic device to retract the contact (vacuum retract) or to move the contact to the measuring position (pneumatic push).
These functions are particularly useful for automatic applications. The "soft touch" models are designed to guarantee a tip force at electrical zero of 0,18 N.

EXAMPLES OF APPLICATIONS



THE BASIC LINE

The basic Red Crown product line includes 52 models to satisfy the various market needs.

TECHNICAL SPECIFICATIONS / ORDER CODES

Mechanical specifications

DESCRIPTION	MEASURING RANGE											
	± 0,5 mm	± 1mm						± 2,5mm			± 5mm		
	Standard	Standard		Pneum. Push	Long Range (LR) Standard	Long Range (LR) P. Push		Standard	Pneum. Push		Standard	Pneum. Push
Pre-travel at electrical zero (mm)	0,6/0,7	1,1/1,2						2,6/2,7			5,1/5,2	
Overtravel from electrical zero (mm)	≥ 0,65	≥ 1,5			≥ 9			≥ 3			≥ 5,1	
Pre-travel adjustment	Yes	Yes						Yes			Yes	
Pneumatic Push (PP) Vacuum Retract (VR)	-	-	VR(*)	PP	VR(*)	PP	-	VR(*)	PP	-	VR(*)	PP
Operating pressure bar	-	-		0,4÷1	-	0,5÷1	-		0,4÷1	-		0,4÷1
Operating pressure psi				6÷14,5		7,3÷14,5			6÷14,5			6÷14,5
Standard spring strength ($^{N}/_{mm}$ ± 15%)	0,17	0,14		0,08	0,1	0,02	0,08		0,03	0,06		0,02
Tip force at electrical zero (N ± 25%)	1	0,75		0,8÷2,5	0,7	0,5÷2	0,7		0,6÷2,3	0,7		0,7÷2,4
Guide system	ball bearing	ball bearing					ball bearing			ball bearing		
Repeatability (σ x 2,77) (µm)	≤ 0,15	≤ 0,15			≤ 0,3		≤ 0,2			≤ 0,4		
Degree of protection CEI/IEC 529	IP65	IP65					IP65			IP65		
Standard contact (R...mm)	1,5	1,5					1,5			1,5		
Optional contacts	Yes	Yes					Yes			Yes		
Linearity error (µm)	≤ 3 (0,3%)	≤ 5 (0,25%)					≤ 25 (0,5%)			≤ 50 (0,5%)		
Thermal drift at zero (µm/°C)	≤ 0,25	≤ 0,25					≤ 0,25			≤ 0,5		
Operating temperature (°C)	-10 +65	-10 +65					-10 +65			-10 +65		
Standard gaiter	Fluoroelastomer	Fluoroelastomer					Fluoroelastomer			Fluoroelastomer		
Std. connector (DIN 45322) Lumberg	SV50/6	SV50/6					SV50/6			SV50/6		
Cable length (m)	2	2					2			2		

(*) The Vacuum Retract function (contact pneumatic retraction) can be added by using the accessories code 4430245031 or 4430240679. It is also necessary to substitute the standard springs with the following ones:

±1 VR	spring **1024099711**
±1 LR	spring **1024099735**
±2,5 VR	spring **1024099721**
±5 VR	spring **1024099735** + spring-guide **1024099660**

Full-bridge (LVDT) electrical specifications

Trade name		F05		F10					F25			F50		
			FR05		FR10	FP10	FR11	FP11		FR25	FP25		FR50	FP50
Calibration frequency (KHz)		7,5		7,5					7,5			7,5		
Calibrated at		3,5V RMS with load 1MOhm //360 pF												
Max. current (mA RMS)		9		9					9			9		
I/O phase shift		≤ 10°		≤ 10°					≤ 10°			≤ 10°		
Sensitivity (mV/V/mm)		230 ±1%		230 ±1%					115 ±1%			115 ±1%		
Cable outlet	axial	ø 8	ø 3/8"	ø 8	ø 3/8"				ø 8	ø 3/8"		ø 8	ø 3/8"	
	radial				ø 8	ø 3/8"	ø 8	ø 3/8"		ø 8	ø 3/8"		ø 8	ø 3/8"
Order Code		**3441552000**	**3441552002**	**3441552001**	**3441552003**	**3441554000**	**3441554005**	**3441554001**	**3441554006**	**3441554002**	**3441554007**	**3441554003**	**3441554008**	**3441554004**	**3441554009**	**3441556000**	**3441556003**	**3441556001**	**3441556004**	**3441556002**	**3441556005**	**3441558000**	**3441558003**	**3441558001**	**3441558004**	**3441558002**	**3441558005**

Half-bridge (HBT) electrical specifications

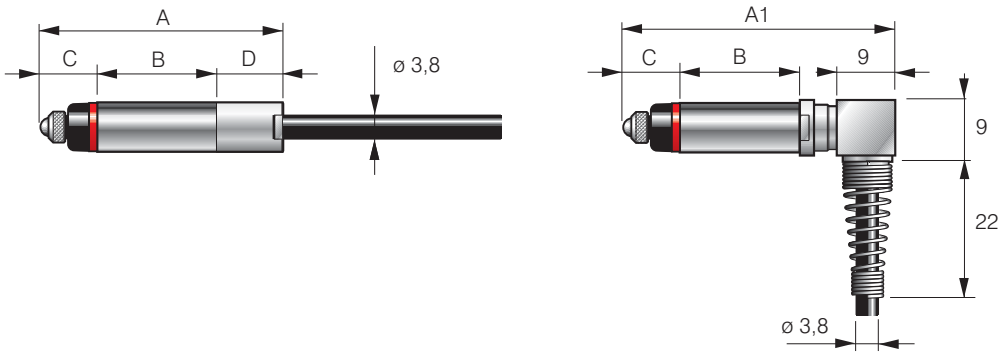
Trade name		H05		H10					H25			H50		
			HR05		HR10	HP10	HR11	HP11		HR25	HP25		HR50	HP50
Calibration frequency (KHz)		7,5		7,5					7,5			7,5		
Calibrated at		3,5V RMS with load 2 KOhm ± 0,1%												
Max. current (mA RMS)		5		5					5			5		
I/O phase shift		≤ 5°		≤ 5°					≤ 5°			≤ 5°		
Sensitivity (mV/V/mm)		73,75 ±1%		73,75 ±1%					36,9 ±1%			29,5 ±1%		
Cable outlet	axial	ø 8	ø 3/8"	ø 8	ø 3/8"				ø 8	ø 3/8"		ø 8	ø 3/8"	
	radial				ø 8	ø 3/8"	ø 8	ø 3/8"		ø 8	ø 3/8"		ø 8	ø 3/8"
Order Code		**3441551000**	**3441551002**	**3441551001**	**3441551003**	**3441553000**	**3441553005**	**3441553001**	**3441553006**	**3441553002**	**3441553007**	**3441553003**	**3441553008**	**3441553004**	**3441553009**	**3441555000**	**3441555003**	**3441555001**	**3441555004**	**3441555002**	**3441555005**	**3441557000**	**3441557003**	**3441557001**	**3441557004**	**3441557002**	**3441557005**

NOTE: The User manual is included in the package.

DIMENSIONS (mm)

The clamping diameter of all versions is available both as 8h6 mm or 3/8".

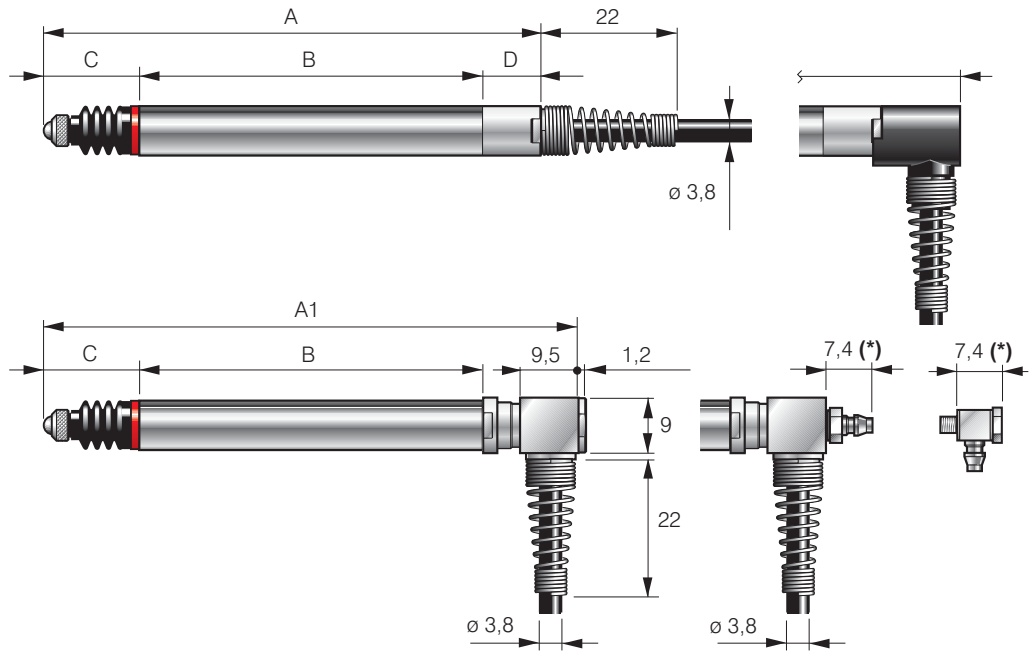
± 0,5 mm



± 1 mm

± 2,5 mm

± 5 mm



DIMENSIONS	MEASURING RANGE								
	± 0,5 mm	± 1mm				± 2,5mm		± 5mm	
				Long Range (LR)					
	Standard	Standard	Pneum. Push	Standard	Pneum. Push	Standard	Pneum. Push	Standard	Pneum. Push
A	39,2	80	-	-	-	92,5	-	118	-
A1	42.8	86	86	116,6	116,6	98,9	98,9	124	124
A2	-	92,5	-	-	-	105	-	130,5	-
B	19,2	57	57	76	76	68	68	84,5	84,5
C	9,2	13,5	13,5	25	25	15	15	21	21
D	10,8	9,5	-	-	-	9,5	-	12,5	-

(*) For pneumatic version only.
A / A1 / A2 / C refer to the electrical zero
(**) Right cable adapter is always supplied with the probes with axial cable outlet.

COMPATIBLE LINE

TESTAR has developed a number of Red Crown models with the required connector and calibration, ready to be used as replacement of non-TESTAR probes. This allows the user to take advantage of the latest technology designed in the Red Crown product without the need to replace the existing electronic unit.
For mechanical specifications and dimensions of these probes see the corresponding model in the basic line.
This line is in continuous development and you can find the latest list of products with order codes by visiting our web site www.testar.com

BASIC MODELS			MEASURING RANGE								
			± 0,5 mm		± 1 mm		± 1 mm LONG RANGE	± 2,5 mm		± 5 mm	
MANUFACTURER	TRANSD. TYPE	Ø	H05	HR05	H10	HR10	HR11	H25	HR25	H50	HR50
TESA	HALF-BRIDGE (HBT)	8	3441561000	3441561001	3441561002	3441561003 (*)	3441561005 (*)	3441561007	3441561008 (*)	3441561010	3441561011 (*)
MERCER		8	3441564000	3441564001	3441564002	3441564003 (*)	3441564005 (*)	3441564007	3441564008 (*)	3441564010	3441564011 (*)
METEM		8	3441569000	3441569001	3441569002	3441569003 (*)	3441569005 (*)	3441569007	3441569008 (*)	3441569010	3441569011 (*)
METREL		8	3441563000	3441563001	3441563002	3441563003 (*)	3441563005 (*)	3441563007	3441563008 (*)	-	-
MAHR-FEINPRUEF		8	3441567000	3441567001	3441567002	3441567003 (*)	3441567005 (*)	3441567007	3441567008 (*)	3441567010	3441567011 (*)
NOVIBRA		8	-	-	3441568003	-	-	-	-	-	-
MACHSIZE-SYSTEM E		8	3441562009	3441562010	3441562008	3441562011	3441562013	-	-	-	-
AIR GAGE		3/8"	3441562000	3441562001	3441562002	3441562003 (*)	-	3441562005	3441562006 (*)	-	-
MANUFACTURER	TRANSD. TYPE	Ø	F05	FR5	F10	FR10	FR11	F25	FR25	F50	FR50
ETAMIC (ZDB)	FULL-BRIDGE (LVDT)	8	3441565009	3441565010	3441565006	3441565011	3441565013	3441565007	3441565015	3441565008	3441565017

(*) The Vacuum Retract function (contact pneumatic retraction) can be added by using the accessories code 4430245031 or 4430240679. It is also necessary to substitute the standard springs with the one reported in the table on page 4.

PNEUMATIC PUSH MODELS			MEASURING RANGE			
			± 1 mm	± 1 mm LONG RANGE	± 2,5 mm	± 5 mm
MANUFACTURER	TRANSD. TYPE	Ø	HP10	HP11	HP25	HP50
TESA	HALF-BRIDGE (HBT)	8	3441561004	3441561006	3441561009	3441561012
MERCER		8	3441564004	3441564006	3441564009	3441564012
METEM		8	3441569004	3441569006	3441569009	3441569012
METREL		8	3441563004	3441563006	3441563009	-
MAHR-FEINPRUEF		8	3441567004	3441567006	3441567009	3441567012
MACHSIZE-SYSTEM E		8	3441562012	3441562014	-	-
AIR GAGE		3/8"	3441562004	-	3441562007	-
MANUFACTURER	TRANSD. TYPE	Ø	FP10	FP11	FP25	FP50
ETAMIC (ZDB)	FULL-BRIDGE (LVDT)	8	3441565012	3441565014	3441565016	3441565018

NOTE : The User manual is included in the package.

TECHNICAL SPECIFICATIONS / ORDER CODES

Mechanical specifications

DESCRIPTION	MEASURING RANGE											
	± 0,5 mm	± 1mm						± 2,5mm			± 5mm		
	Standard	Standard		Pneum. Push	Long Range (LR) Standard	Long Range (LR) P. Push		Standard	Pneum. Push		Standard	Pneum. Push
Pre-travel at electrical zero (mm)	0,6/0,7	1,1/1,2						2,6/2,7			5,1/5,2	
Overtravel from electrical zero (mm)	≥ 0,65	≥ 1,5			≥ 9			≥ 3			≥ 5,1	
Pre-travel adjustment	Yes	Yes						Yes			Yes	
Pneumatic Push (PP) Vacuum Retract (VR)	-	-	VR(*)	PP	VR(*)	PP	-	VR(*)	PP	-	VR(*)	PP
Operating pressure bar	-	-		0,4 ÷ 1	-	0,5 ÷ 1	-		0,4 ÷ 1	-		0,4 ÷ 1
Operating pressure psi				6 ÷ 14,5		7,3 ÷ 14,5			6 ÷ 14,5			6 ÷ 14,5
Standard spring strength ($N/_{mm}$ ± 15%)	0,17	0,14		0,08	0,10	0,02	0,08		0,03	0,06		0,02
Tip force at electrical zero (N ± 25%)	1	0,75		0,8 ÷ 2,5	0,7	0,5 ÷ 2	0,7		0,6 ÷ 2,3	0,7		0,7 ÷ 2,4
Guide system	ball bearing	ball bearing					ball bearing			ball bearing		
Repeatability (σ x 2,77) (µm)	≤ 0,15	≤ 0,15			≤ 0,3		≤ 0,2			≤ 0,4		
Degree of protection CEI/IEC 529	IP65	IP65					IP65			IP65		
Standard contact (R...mm)	1,5	1,5					1,5			1,5		
Optional contacts	Yes	Yes					Yes			Yes		
Thermal drift at zero (µm/°C)	≤ 0,25	≤ 0,25					≤ 0,25			≤ 0,5		
Operating temperature (°C)	-10 +65	-10 +65					-10 +65			-10 +65		
Standard gaiter	Fluoroelastomer	Fluoroelastomer					Fluoroelastomer			Fluoroelastomer		
Cable length (m)	3,5	3,5					3,5			3,5		

(*) The Vacuum Retract function (contact pneumatic retraction) can be added by using the accessories code 4430245031 or 4430240679. It is also necessary to substitute the standard springs with the one reported in the table on page 4.

Full-bridge (LVDT) electrical specifications

Trade name	F05	FR05	F10	FR10	FP10	FR11	FP11	F25	FR25	FP25	F50	FR50	FP50
Sensitivity (mV/mm/V)	152÷ 248		217÷ 228					112÷ 120			114÷ 122		
Linearity error (µm)	≤ 2,7 (0,3%)		≤ 3,6 (0,2%)					≤ 15 (0,3%)			≤ 38 (0,4%)		
Energising frequency range (kHz)	2÷ 20		2÷ 20					2÷ 20			4÷ 9		
Energising Voltage range (Vrms)	1÷ 7		1÷ 7					1÷ 7			1÷ 7		
Energising current range (mA/V)	5,9÷ 0,8		5,4÷ 0,6					3,2÷ 0,5			2,6÷ 1,5		
I/O phase shift (°)	38÷ -1,2		13÷ -7					10÷ -8			-3,3÷ -8,4		
Zero phase frequency (kHz)	17,5		7,5					6			-		
Calibration load (kΩ)	100		100					100			100		
Test frequency (kHz)	7,5		7,5					7,5			7,5		
Test Voltage (Vrms)	3,54		3,54					3,54			3,54		
Test load	1 MΩ//360 pF		1 MΩ//360 pF					1 MΩ//360 pF			1 MΩ//360 pF		
Sensitivity at test conditions (mV/mm/V)	240 ±5%		239 ±5%					118 ±5%			116 ±5%		
Linearity at test conditions (µm)	≤ 3 (0,3%)		≤ 2 (0,1%)					≤ 25 (0,5%)			≤ 50 (0,5%)		
Energising current at test conditions (mA/V)	2		2					1			2		
I/O phase shift at test conditions (°)	10±2		1,5±1					2±2			7±2		
Cable outlet axial	ø 8	ø 3/8"	ø 8	ø 3/8"				ø 8	ø 3/8"		ø 8	ø 3/8"	
Cable outlet radial			ø 8	ø 3/8"	ø 8	ø 3/8"	ø 8	ø 3/8"	ø 8	ø 3/8"	ø 8	ø 3/8"	ø 8	ø 3/8"
Order Code	**3441566002**	**3441566008**	**3441566007**	**3441566009**	**3441566023**	**3441566028**	**3441566024**	**3441566029**	**3441566025**	**3441566030**	**3441566026**	**3441566031**	**3441566027**	**3441566032**	**3441566039**	**3441566042**	**3441566040**	**3441566043**	**3441566041**	**3441566044**	**3441566051**	**3441566054**	**3441566052**	**3441566055**	**3441566053**	**3441566056**

Half-bridge (HBT) electrical specifications

Trade name	H05	HR05	H10	HR10	HP10	HR11	HP11	H25	HR25	HP25	H50	HR50	HP50
Sensitivity (mV/mm/V)	70÷ 87		79÷ 87					59÷ 74			31÷ 33		
Linearity error (µm)	≤ 2,5 (0,3%)		≤ 0,9 (0,05%)					≤ 16,2 (0,3%)			≤ 23 (0,2%)		
Energising frequency range (kHz)	2÷ 20		2÷ 20					2÷ 20			2÷ 20		
Energising Voltage range (Vrms)	2÷ 5		2÷ 5					2÷ 5			3÷ 5		
Energising current range (mA/V)	1,8÷ 0,2		2,9÷ 0,4					2,1÷ 0,3			1,8÷ 0,3		
I/O phase shift (°)	25÷ -17		17÷ -14					27÷ -19			16÷ -11		
Zero phase frequency (kHz)	7,5		7					7			7		
Calibration load (kΩ)	1		1					1			1		
Test frequency (kHz)	7,5		7,5					7,5			7,5		
Test Voltage (Vrms)	3,54		3,54					3,54			3,54		
Test load (kΩ)	2		2					2			2		
Sensitivity at test conditions (mV/mm/V)	91,5 ±5%		89 ±5%					77 ±5%			34,5 ±5%		
Linearity at test conditions (µm)	≤ 3		≤ 5					≤ 25			≤ 50		
Energising current at test conditions (mA/V)	0,6		0,6					0,7			0,7		
I/O phase shift at test conditions (°)	3,5±2		1±2					3±2			1±2		
Cable outlet axial	ø 8	ø 3/8"	ø 8	ø 3/8"				ø 8	ø 3/8"		ø 8	ø 3/8"	
Cable outlet radial			ø 8	ø 3/8"	ø 8	ø 3/8"	ø 8	ø 3/8"	ø 8	ø 3/8"	ø 8	ø 3/8"	ø 8	ø 3/8"
Order Code	**3441566001**	**3441566005**	**3441566004**	**3441566006**	**3441566003**	**3441566018**	**3441566014**	**3441566019**	**3441566015**	**3441566020**	**3441566016**	**3441566021**	**3441566017**	**3441566022**	**3441566033**	**3441566036**	**3441566034**	**3441566037**	**3441566035**	**3441566038**	**3441566045**	**3441566048**	**3441566046**	**3441566049**	**3441566047**	**3441566050**

NOTE: The User manual is included in the package.

"Soft Touch" Line

These models are offered to satisfy some specific measurement requirements where tip force must consistently be kept at a very minimum value. Typical applications include glass, TV tubes, car windshields and generally plastic material as found in the electronics industry (cellular phone shells, computers and printers components etc.)

TECHNICAL SPECIFICATIONS / ORDER CODES

Mechanical specifications

DESCRIPTION	MEASURING RANGE																	
	± 0,5 mm	± 1mm								± 2,5mm				± 5mm				
	Standard	Standard		Pneumatic Push (*)			Long Range (LR) Standard		Long Range (LR) Pneum. Push (*)		Standard	Pneumatic Push (*)			Standard	Pneumatic Push (*)		
Pre-travel at electrical zero (mm)	0,6/0,7	1,1/1,2									2,6/2,7				5,1/5,2			
Overtravel from electrical zero (mm)	≥ 0,65	≥ 1,5					≥ 9				≥ 3				≥ 5,1			
Pre-travel adjustment	Yes	Yes									Yes				Yes			
Pneumatic Push (PP)	-	-		PP		PP	-		PP	PP	-	PP		PP	-		PP	PP
Vacuum Retract (VR)	-	-		-		VR	-		-	VR	-	-		VR	-		-	VR
Operating pressure bar	-	-		0,5÷2		0,125÷2	-		0,5÷2	0,125÷2	-	0,5÷2		0,125÷2	-		0,5÷2	0,125÷2
Operating pressure psi				7,3÷29		1,825÷29			7,3÷29	1,825÷29		7,3÷29		1,825÷29			7,3÷29	1,825÷29
Air Leak Rate (at 1,0 bar) (ml/min)	-	-		<350			-		<350		-	<350			-		<350	
Standard spring strength ($^{N}/_{mm}$ ± 15%)	0,07	-	0,13	0,045		-	-	0,033	0,014	-	-	0,033	0,0135	-	-	0,034	0,0137	-
Tip force at electrical zero (N ± 30%)	0,29	0,06	0,29	0,18÷1,23		0,09÷1,41	0,06	0,18	0,12÷1,17	0,09÷1,41	0,06	0,29	0,18÷1,23	0,09÷1,41	0,065	0,29	0,18÷1,23	0,09÷1,41
Guide system	ball bearing																	
Repeatability (σ x 2,77) (μm)	≤ 0,15	≤ 0,15		≤ 0,15			≤ 0,3		≤ 0,3		≤ 0,2	≤ 0,2			≤ 0,4		≤ 0,4	
Degree of protection CEI/IEC 529	IP50	IP50		IP53		IP50	IP50		IP53	IP50	IP50	IP53		IP50	IP50		IP53	IP50
Standard contact (R...mm)	1,5	1,5		1,5			1,5		1,5		1,5	1,5			1,5		1,5	
Optional contacts	Yes	Yes		Yes			Yes		Yes		Yes	Yes			Yes		Yes	
Linearity error (μm)	≤ 3 (0,3%)	≤ 5 (0,25%)		≤ 5 (0,25%)			≤ 5 (0,25%)		≤ 5 (0,25%)		≤ 25 (0,5%)	≤ 25 (0,5%)			≤ 50 (0,5%)		≤ 50 (0,5%)	
Thermal drift at zero (μm/°C)	≤ 0,25	≤ 0,25		≤ 0,25			≤ 0,25		≤ 0,25		≤ 0,25	≤ 0,25			≤ 0,5		≤ 0,5	
Operating temperature (°C)	-10 +65	-10 +65		-10 +65			-10 +65		-10 +65		-10 +65	-10 +65			-10 +65		-10 +65	
Standard gaiter	-	-		-			-		-		-	-			-		-	
Std. connector (DIN 45322) Lumberg	SV50/6	SV50/6		SV50/6			SV50/6		SV50/6		SV50/6	SV50/6			SV50/6		SV50/6	
Cable length (m)	2	2		2			2		2		2	2			2		2	

(*) The compressed air must be filtered better than 5 μm and must be dry with a dew point of between 2°C and 5°C.

Full-bridge (LVDT) electrical specifications

Trade name		F05L	FS10L	F10L	FPA10L	FP10L	FPVA10L	FPV10L	FS11L	FR11L	FPA11L	FP11L	FPVA11L	FPV11L	FS25L	F25L	FPA25L	FP25L	FPVA25L	FPV25L	FS50L	F50L	FPA50L	FP50L	FPVA50L	FPV50L
Calibration frequency (kHz)		7,5	7,5												7,5						7,5					
Calibrated at		3,5V RMS with load 1 MOhm 360 pF																								
Max. current (mA RMS)		9	9												9						9					
I/O phase shift		≤ 10°	≤ 10°												≤ 10°						≤ 10°					
Sensitivity (mV/V/mm)		230 ±1%	230 ±1%												115 ±1%						115 ±1%					
Cable outlet	axial	•		•	•		•				•		•			•	•		•			•	•		•	
	radial		•			•		•	•	•		•		•	•			•		•	•			•		•
Order Code		**3441552005**	**3441554019**	**3441554017**	**3441554021**	**3441554015**	**3441554023**	**3441554013**	**3441554020**	**3441554018**	**3441554022**	**3441554016**	**3441554024**	**3441554014**	**3441556011**	**3441556008**	**3441556012**	**3441556009**	**3441556013**	**3441556010**	**3441558011**	**3441558008**	**3441558012**	**3441558009**	**3441558013**	**3441558010**

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

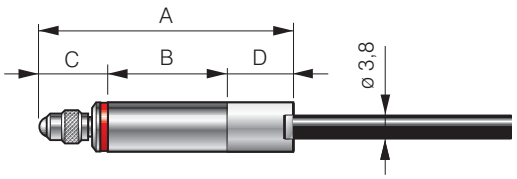
Trade name		H05L	HS10L	H10L	HPA10L	HP10L	HPVA10L	HPV10L	HS11L	HR11L	HPA11L	HP11L	HPVA11L	HPV11L	HS25L	H25L	HPA25L	HP25L	HPVA25L	HPV25L	HS50L	H50L	HPA50L	HP50L	HPVA50L	HPV50L
Calibration frequency (kHz)		13	13												13						13					
Calibrated at		3V RMS with load 2 KOhm ± 0,1%																								
Max. current (mA RMS)		2	2												2						2					
I/O phase shift		≤ 2°	≤ 2°												≤ 2°						≤ 3°					
Sensitivity (mV/V/mm)		73,75± 0,2%	73,75 ±0,2%												73,75 ±0,2%						29,5 ±0,3%					
Cable outlet	axial	•		•	•		•				•		•			•	•		•			•	•		•	
	radial		•			•		•	•	•		•		•	•			•		•	•			•		•
Order Code		**3441561028**	**3441561031**	**3441561029**	**3441561034**	**3441561026**	**3441561038**	**3441561022**	**3441561021**	**3441561030**	**3441561037**	**3441561027**	**3441561041**	**3441561025**	**3441561032**	**3441561015**	**3441561035**	**3441561016**	**3441561039**	**3441561023**	**3441561033**	**3441561017**	**3441561036**	**3441561018**	**3441561040**	**3441561024**

NOTE : The User manual is included in the package.

DIMENSIONS *(mm)*

The clamping diameter of all versions is 8h6 mm.

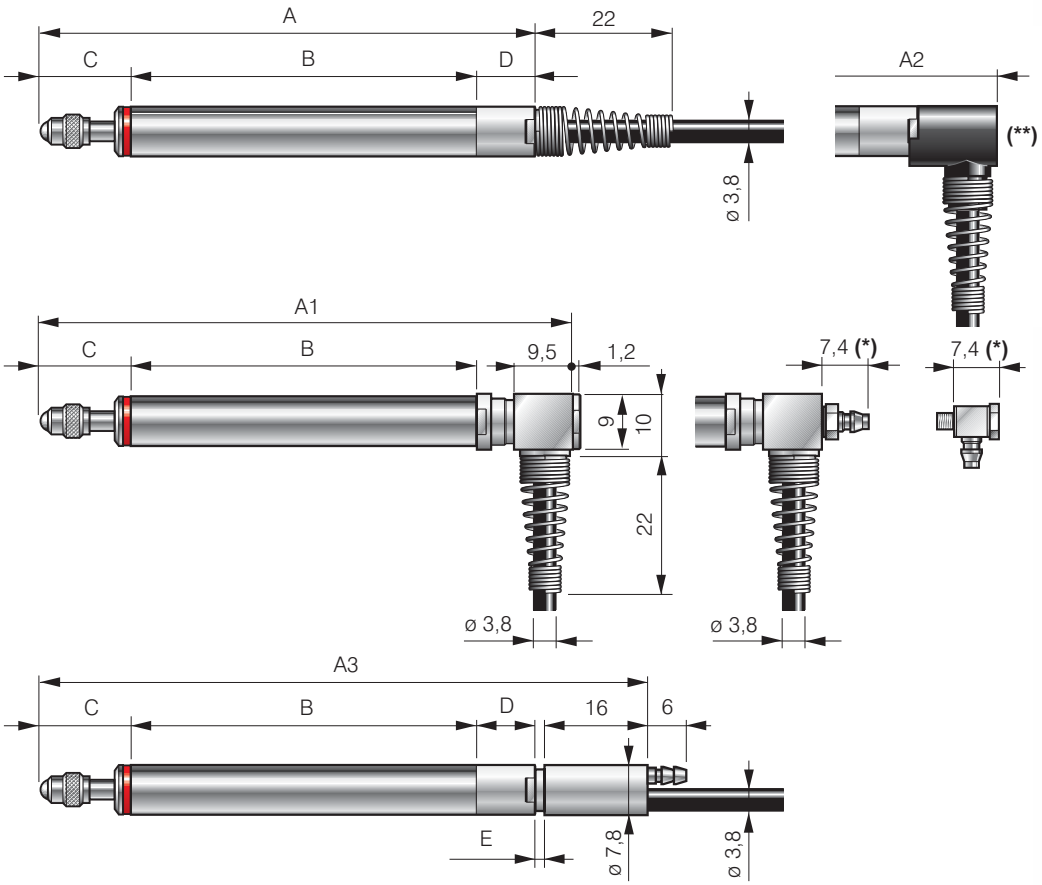
± 0,5 mm



± 1 mm

± 2,5 mm

± 5 mm



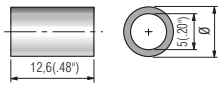
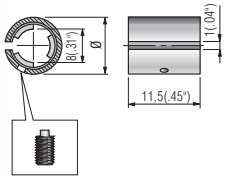
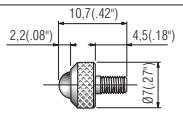
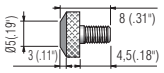
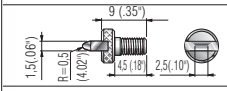
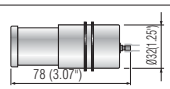
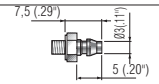
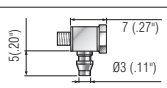
DIMENSIONS	MEASURING RANGE								
	± 0,5 mm	± 1mm				± 2,5mm		± 5mm	
				Long Range (LR)					
	Standard	*Standard*	*Pneum. Push*	*Standard*	*Pneum. Push*	*Standard*	*Pneum. Push*	*Standard*	*Pneum. Push*
A	42,15	78,5	-	-	-	91	-	113	-
A1	-	84,5	84,5	111,6	111,6	97,35	97,35	119,45	119,45
A2	-	91	-	-	-	103,5	-	125,5	-
A3	-	-	96	-	122,8	-	108,6	-	130,95
B	19,2	57	57	76	76	68	68	84,5	84,5
C	12,15	12	12	19,9	19,9	13,5	13,5	16	16
D	10,8	9,5	9,5	9,5	9,5	9,5	9,5	12,5	12,5
E	-	-	1,475	-	1,375	-	1,55	-	1,95

(*) For pneumatic version only. A / A1 / A2 / A3 / C refer to the electrical zero

(**) Right cable adapter is always supplied with the probes type F10L, F25L, F50L, H10L, H25L, H50L with axial cable outlet.

ACCESSORIES

A wide range of accessories allows to adapt the standard product to satisfy specific application needs.

ACCESSORIES	MEASURING RANGE	± 0.5				± 1				± 1 LR		± 2.5				± 5				± 1 PP		± 1 LR PP		± 2.5 PP		± 5 PP		ORDER CODE
	Cable output	A		R		A		R		R		A		R		A		R		R		R		R		R		
	Body diameter	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	8 mm	3/8"	
	Spring 0,4 N					•	•	•	•																			1024099711
	Spring 1 N					•	•	•	•																			1024099712
	Spring 2 N					•	•	•	•																			1024099713
	Spring 2,5 N					•	•	•	•																			1024099714
	Spring 0,4 N											•	•	•	•													1024099721
	Spring 1 N											•	•	•	•													1024099722
	Spring 2 N											•	•	•	•													1024099723
	Spring 2,5 N											•	•	•	•													1024099724
	Spring 0,4 N (*)									X	X					•	•	•	•									1024099731
	Spring 1 N															•	•	•	•									1024099732
	Spring 2 N									Y	Y					•	•	•	•									1024099733
	Spring 2,5 N															•	•	•	•									1024099734
	Spring 0,35 N									•	•					•	•	•	•									1024099735
	Spring 0,4 N									•	•																	1024099530
	Spring 2 N									•	•																	1024099743
	Spring2,5 N									•	•																	1024099744
	Spring 0,4 N	•	•	•	•																							1024099751
	Spring 2 N	•	•	•	•																							1024099753
	Spring 2,5 N	•	•	•	•																							1024099754
	Spring-guide	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1024099660
	Double ended wrench Ch. 7/8 (thickness 1,5 mm)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1320709000
	Bushing outside ø10 mm	•		•		•		•		•		•		•		•		•		•		•		•		•		1019826001
	Bushing outside ø3/8"	•		•		•		•		•		•		•		•		•		•		•		•		•		1019826002
	Dowel M3x10	•		•		•		•		•		•		•		•		•		•		•		•		•		1024099760
	Dowel 4-40 UNC x.375"	•		•		•		•		•		•		•		•		•		•		•		•		•		1024099761
	Contact ø 5 mm / M 2,5	•		•		•		•		•		•		•		•		•		•		•		•		•		3392409910
	Contact ø 5 mm / 4-48 UNF		•		•		•		•		•		•		•		•		•		•		•		•		•	3392409911
	Flat contact M 2,5	•		•		•		•		•		•		•		•		•		•		•		•		•		3392409912
	Flat contact 4-48UNF		•		•		•		•		•		•		•		•		•		•		•		•		•	3392409913
	Cut contact M 2,5	•		•		•		•		•		•		•		•		•		•		•		•		•		3392409914
	Cut contact 4-48UNF		•		•		•		•		•		•		•		•		•		•		•		•		•	3392409915
 LVDT / HBT	Cable extension 2 m	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6735932015
	Cable extension 5 m	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6735932016
	Cable extension 10 m	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6735932017
	Vacuum pump + L=1 m tubing							•	•	•	•			•	•			•	•									4717008002
	Axial air adaptor							•	•	•	•			•	•			•	•									4430245031
	Radial air adaptor							•	•	•	•			•	•			•	•	•	•	•	•	•	•	•	•	4430240679
	Adaptor for cable protection spring	•	•			•	•					•	•			•	•											1024099765
	Adaptor for cable protection spring			•	•			•	•	•	•			•	•			•	•	•	•	•	•	•	•	•	•	1024099766
	Cable protection spring (2 m)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1090221011

X For FR 11 and HR 11 versions, the value is 0,2 N **Y** For FR 11 and HR 11 versions, the value is 1 N **LR** Long Range **PP** Pneum. Push **A** Axial **R** Radial

(*) Only for Soft Touch Models

Note: for contact extension see Quick Set section, par. 4.3 CONTACT EXTENSIONS

REPAIRABILITY

Red Crown pencil probes were designed to satisfy the increasing demand for products easily repairable at low cost.
The use of Red Crown probes makes it possible, offering the following advantages:

- Extended average product life
- Reduced maintenance costs
- Rapid repairs, limiting the number of spare probes

PROCESS CONTROL

Red Crown mechanical and electronic component manufacturing lines are automated, guaranteeing constant quality.
Particular attention is paid to the inspection of the basic quality parameters, such as:

- **Accuracy**

  The accuracy of a measuring instrument is its ability to provide measurements which are close to a true value. An accuracy error in a measuring instrument is a systematic indication error.

  - Sensitivity error
  The part of the accuracy error proportional to the position of the measurement range. The sensitivity of a measuring instrument is defined as the variation in the response divided by the corresponding variation in the input signal. Expressed as a percentage (%).

  - Linearity error
  The part of the accuracy error remaining after subtraction of the sensitivity error. Expressed in microns or as a full scale percentage.

- **Repeatability**

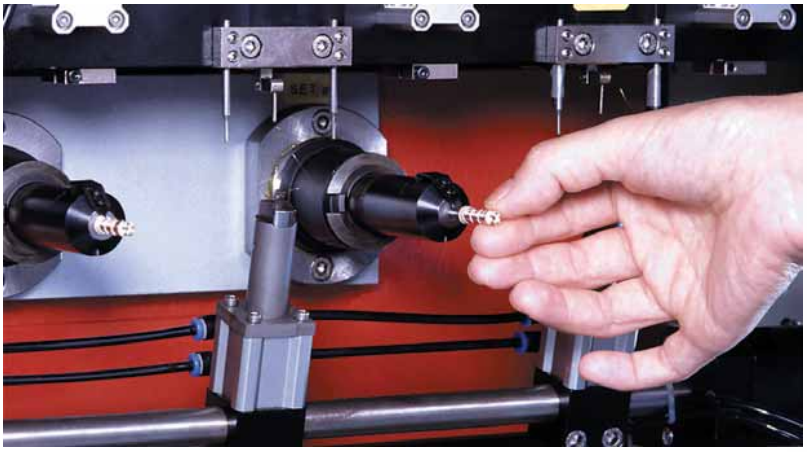
  A measuring instrument's repeatability is its ability to supply values which are very close to one another when it is applied to the same workpiece under the same controlled conditions. Expressed in microns.

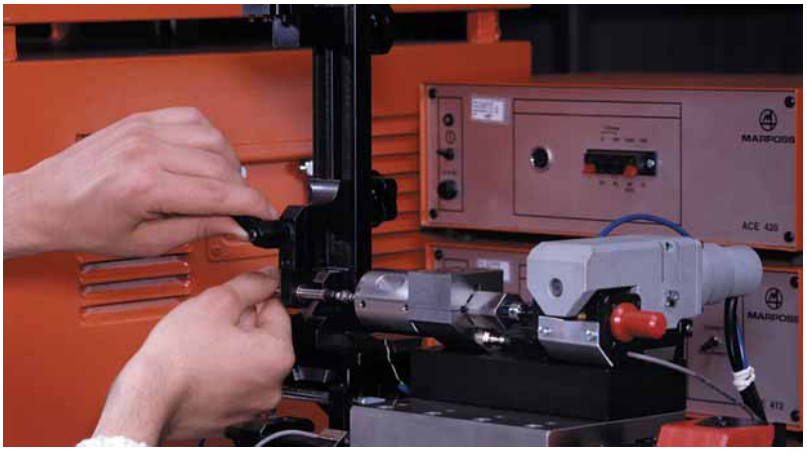
- **Measuring force**

  The force applied to the workpiece by the probe contact in the measuring condition. The specified force is stated at electrical zero with the probe in a horizontal position. Expressed in Newtons.

- **Pre-travel adjustment**

  Determines the optimum contact working position according to the size of the workpiece. Correctly adjusted, this prevents damage due to impact with the workpiece and extends the life of the pencil probe.





- **Degree of protection**

  All probes are tested to IP65.

- **EMC standard cable**

  All RED CROWN probes comply with EMC standards (EEC directive 89/336). This is invalidated if the probes are connected to electronic systems which do not comply with EMC standards.

For a full list of address locations, please consult the Marposs official website: www.marposs.com - www.testar.com

D6L01003G0 - *Edition 10/2010 - Specifications are subject to modifications*

Marposs has an integrated system to manage the Company quality, the environment and safety, attested by ISO 9001, ISO 14001, OHSAS 18001 and QS9000 T&E certifications. Marposs has further been qualified EAQF 94 and has obtained the Q1-Award.