UNIQUE

TECHNICAL SPECIFICATION

MULTIPURPOSE CUSTOM-MADE PIPE MEASURING AND INSPECTION SYSTEM FOR WIDELY VARIOUS RANGE OF DIAMETERS OF CYLINDRICAL AND CONICAL PIPES

FEATURES

- Non-contact laser measurement
- Precise measurement head
- Video inspection (frontal and side)
- Laser alignment
- Rangefinder (built-in \ external)
- Coating thickness measurement

Measurable parameters

The system allows for measurement of:

- Inner diameter
- Ovality
- Conicity
- Out-of-roundness
- Non-straightness
- Bore threading measurement
- Length measurement
- Shape deviation

The system scans profile of inner surface and performs:

- Surface anomalies detection
- Deviation from the shape calculation
- Geometric dimensions of the inner surface profile calculation

The system performs laser-alignments using integrated PSD sensor and external laser emitter.

APPLICATION

Quality and geometric dimensions check during production as well as periodic inspection of components and assemblies.

- Smooth, Profiled and Rifled pipes
- Barrels
- Extruders
- Precise Cylinders
- Conical bores

DESCRIPTION

Multipurpose Custom-Made Complete Pipe Measuring and Inspection system (Probius™ unique) can be used with a widely various range of diameters.

The high adoptive system can solve a wide range of operations. Measuring parameters can be set by customer (inner diameter, ovality, out-of-roundness, shape deviation, non-straightness; conicity, bore threading, profiling width/height and angle etc) as well as using measurement channels (rotating laser 2D scanner, frontal and video inspection channels, distance gauge and PSD sensor).

The auto-centering legs automatically adapts to the diameter of the pipe and maintains a constant unclamping pressure. This mechanism allows the instrument to measure pipes with a variable diameter or measure the conical bores.

The frontal video inspection channel especially designed for hi-res video inspection of pipe interiors. The side video inspection channel is located on the rotating laser scanner and provides all-round visibility (panoramic photograph) by hi-resolution camera with adjustable focus. It allows to get full information about visual defects.

Measurement results are a displayed on a PC in real time using custom software. Measurement data can be displayed and archived according to user requirements.

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SPECIFICATION

Profile measurement accuracy, mm	+/- 0.01
Non-straightness measurement accuracy, mm	+/- 0.01
Probe position, mm	+/- 1 | +/- 0.5 option
Diameter Range, mm	40-300 | from 20 optional
Pipe length, mm	up to 30 000
Movement method	Manual by rod | Self-crawling
Video inspection channel	Front: panamorph lens, 5 Mpix | Side: 5 Mpix, Autofocus
Camera angle (frontal)	180^0 with distortion elimination
Connection “probe”-”computer”	Wired | Wireless - WiFi
Battery life (for wireless devices), hrs	Up to 8
Power	220 V 50 Hz 200 W via power supply

OPTIONS

- Wire | Wi-Fi data transfer
- Power supply | battery module
- Self-moving probe | Manual moving
- Supports centering | Auto-centering legs
- Frontal video channel | Side video channel
- Non-straightness measurement
- Coating thickness measurement channel

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Build your own solution

PS–	/pipe type /	D1-D2	/measuring channels/	-	/movement method/	-	/Centering method/	-	/accessories/	-	/data transfer/	-	/calibration unit/
	SP		LRS		MM		CM(L)		PE		W0		CAL1
	RT		6B		SM		CM(R0)		WE		W1		CAL2
	ST		FVI		SMAC		CM(R6)		GTK		W2		
	DF(x)		SVI		PSV		CM(R3)		PB				
			NS				CM(D)						
			LD				CM(U)						
			LDO										

The type of checked object (pipe)	
SP	Device for measurement of smooth pipes
RT	Device for measurement of profiled pipes, rifled tubes, siphons. * Profile height does not exceed 5 mm
ST	Device for measurement of stators, screw pumps and pipes. Profile height does not exceed 25 mm
DF(x)	Device for measurement of pipes with a cross-section shape different from circle, where (x): H-hexagonal S-square and rectangular tubes T-triangle tubes C - free-form * customer should provide drawings of the pipe
Diameter Range	
D1-D2	Diameter range of the pipe D1 - Minimum D2 - Maximum
Measuring channels	
LRS	Rotating laser scanner * It is possible to combine with SVI
6B	6 BEAM static laser sensor body
FVI	Front camera with high-resolution HDR (high dynamic range) and panamorphic wide-angle lens. * It is possible to combine FVI with NS(x). In this case, fish-eye HiRes lens is integrated instead of panamorphic wide-angle lens.

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	** Panamorphic wide-angle lens is not available for D1<90 mm
SVI	Side camera installed inside the rotating laser scanner. Available for devices with the diameter of the body more than 60 mm. Equipped with backlighting. Side camera gives you an opportunity to get a panoramic picture of a scanned area and assess the size of defects.
NS(x)	Straightness measurement channel, where (x) the range of measurement of NS(5) +/-5 mm, NS(20) 20 mm. The system with “Straightness measurement channel” is supplied with an external laser module. The probe is equipped with a PSD sensor and rangefinder. * 45 mm PSD sensor is also available for some systems. Contacts us to find out more.
LD xxx	Built-in rangefinder (accuracy ±1 mm). xxx is the pipe length range. Pipe length - up to 30 m. *) For pipe length more than 30 m, contact us.
LDO xxx	External rangefinder (accuracy ±0.5 mm). xxx is the pipe length range. Pipe length - up to 30 m. *) For pipe length more than 30 m, contact us.
Movement method	
MM	Manually: movement by hand using a telescopic rod (similar to tentpole) with 500 mm sections
SM	Self-moving probe for movement along a horizontal line of the object (without precise centering). This is not compatible with NS channel.
PSV	Special modification for measurement of vertically oriented objects. Ordering PSV modification, you should either order HST option (lifting winch/hoist) or inform us about your own lifting mechanism.
Centering method	
CM(L)	Interchangeable legs
CM(R0)	Interchangeable rings
CM(R6)	Self-aligning rollers – based ot 6 spring-loaded rollers
CM(R3)	Self-aligning rollers – based ot 3 spring-loaded rollers
CM(D)	Inverted diaphragm type centering
CM(U)	SMAC TYPE CENTERING Self-moving probe with automatic centering in the tube. This is compulsory when ordering NS channel.
Accessories	
PE	The extension tube allows you to measure the pipe from its very edge. Without this option, there are uncheckable areas on both sides of the pipe (up to 200 mm, depends on the probe modification).

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WE	Balancing weight to keep the probe balance when checking conical surfaces. Very special option for narrow application.
GTK(x)	Operator console based on Getac (or similar) laptops, where x: sr, br – semi-rugged, fr - rugged notebooks *according to ruggedness class
PB	Lightweight, but extremely strong case
Data transfer	
W0	Data transfer and power supply via cable (option)
W1	Wireless data transfer from device to operator console, powered by cable.
W2	Wireless data transfer from device to operator console, powered by cable. Up to 8 hours of battery life.
Calibration	
CAL1	Calibration module for laser scanner calibrating
CAL2	Calibration module for straightness channel calibrating

Example of product code: **PS-RT(100-150) LRS – FVI/SVI/NS(5)/LD(15)-SM-CM(6R)-PB-W2-CAL2**

The device for profiled pipes from 100 to 150 mm in diameter equipped with laser rotating scanner, frontal and side video camera, built-in range finder with the range 15 meters, straightness measurement channel with the range of +/-5 mm, self-moving with precise centering by six spring-loaded rollers, wireless data transfer and powered by battery. Supplied by calibrating module CAL2. Packed in a strong plastic case.

Send us your solution with pipe(s) parameters and drawings for checking up

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Examples of solutions

PS-RT(80-90)-LRS/FVI/LD(15)-SM-CM(L)—PB-W0 -CAL1

The device for profiled pipes from 80 to 90 mm in diameter equipped with laser rotating scanner, frontal video camera, built-in range finder with the range 15 meters, self-moving with legs centering, data transfer and powered by cable. Packed in a strong plastic case.

Contents of delivery

Name	Quantity, pcs.
Measuring probe	1
Communication unit	1
Set of connecting cables including probe-communication unit power&data cable communication unit power cable communication unit – PC data cable	1
Set of legs	2 sets per diameter
Calibration unit CAL1	1
Case	1
Software for Windows	1
User manual	1
Quality Certificate	1
Calibration Certificate	1




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PS-RT(90-120)-LRS/6B/NS(2.5)/LD0(15)-SM-CM(U)-PB-W2 -CAL1

The device for conical pipes with diameter increasing from 90 to 120 mm equipped with laser rotating scanner and 6-beam static scanner, straightness measurement channel with the range of +/-2.5 mm, external range finder with the range 15 meters, self-moving with self-centering legs, wireless data transfer and powered by battery. Packed in a strong plastic case.

Contents of delivery

Name	Quantity, pcs.
Measuring probe	1
Communication unit	1
Set of connecting cables including probe-communication unit charging cable communication unit power cable	1
Calibration unit CAL1	1
Laser module for NS with power supply	1
Range finder with tripod	1
Case	1
Software for Windows	1
User manual	1
Quality Certificate	1
Calibration Certificate	1

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FOR YOUR NOTES

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