



## ULTRASONIC TRANSDUCERS FOR NON-DESTRUCTIVE TESTING DEVELOPMENT AND PRODUCTION

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### **SENDAST П121**

#### **INNOVATIVE TRANSDUCERS FOR INDUSTRIAL ULTRASONIC TESTING**

**HAVE NO ANALOGUES BY THE OPERATIONAL CHARACTERISTICS**

SENDAST П121 ARE THE FIRST TRANSDUCERS THAT COMBINE HIGH FINANCIAL ECONOMY WITH HIGH QUALITY OF THE PRODUCT.  
HAVE THREE STRONGEST COMPETITIVE ADVANTAGES

#### **UNIQUE ELECTRO-ACOUSTIC CHARACTERISTICS AND ERGONOMICS**

**FREQUENCY BROADBANDNESS OF USEFUL SIGNALS IS UP TO 140%.**

**Piezocrystal - lead zirconate titanate (non-composite).**

- High efficiency in steels with a large ultrasonic attenuation
- The maximum possible resolution

THERE ARE NO ANALOGUES IN THE WORLD

**INNOVATIVE ERGONOMICS.**

Patented geometry. The non-standard appearance which is visually marked out from all analogues. Reduces muscular fatigue of the testing inspector's fingers

THERE ARE NO ANALOGUES IN THE WORLD

**THE BUILT-IN SYSTEM OF SHIELDING AGAINST ELECTROMAGNETIC INTERFERENCE.**

Distinctive feature of П121 SENDAST from all other analogues is shielding even from the side of a piezocrystal

THERE ARE NO ANALOGUES IN THE WORLD

**CONVENIENT POSITION OF THE CONNECTOR**

SENDAST П121 are produced with horizontal and vertical position of the connector

#### **OPERATIONAL RESOURCE IS INCREASED UP TO 8 TIMES**

Multifold increase is provided by especially high wear resistant properties of the prism, produced of specialized, innovative polymer

#### **HIGH ECONOMIC EFFECT**

**PURCHASING COSTS FOR TRANSDUCERS CAN BE REDUCED UP TO 2 TIMES**

Saving effect is based on the ratio of operational resource to the price. Operational resource of SENDAST П121 is 6...8 times higher than their analogues (due to innovative wear resistance to abrasion). And the price of SENDAST П121 equivalent to the price of only about 2.5...3 of their analogues



**SENDAST П121 are ultrasonic single angle beam transducers. They are intended for carrying out manual ultrasonic testing of steel products and welded joints together with ultrasonic flaw detectors.**

**They are compatible with any flaw detectors of general use.**

#### **SCOPE**

**ultrasonic testing metals and welded joints**

- pipe rolling and metallurgical industries
- in the oil and gas industry
- in heavy and medium mechanical engineering
- thermal and nuclear energetics
- shipbuilding industry (construction and maintenance&repair)
- in the aerospace industry

#### **FOR TOP MANAGER**

**SENDAST П121 reduces the purchasing expenditures of the company**

#### **FOR TESTING INSPECTOR**

**SENDAST П121 has high quality, long durability and high usability**

#### **APPEARANCE**

**SENDAST П121 is just beautiful**

**SENDAST - MADE IN RUSSIA**



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## SENDAST П121 IN FIGURES

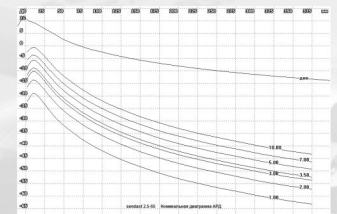
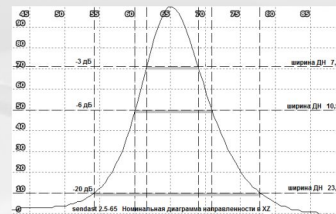
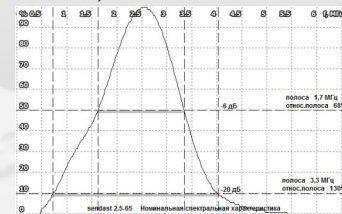
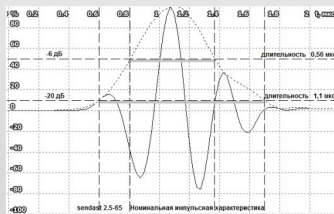
### ECONOMIC INDICATORS OF EFFICIENCY

Analogue of SENDAST П121, the average price	3 200...3 700 RUB/piece
Resource and operational equivalent of one SENDAST П121 relative to analogues	6...8 analogues
The price equivalent of one SENDAST П121 relative to analogues	19 200...29 600 RUB/piece
SENDAST П121, price	10 890 RUB/piece
<b>The savings ratio of SENDAST П121</b>	<b>1,8...2,7</b>
<b>Absolute savings on purchasing one SENDAST П121</b>	<b>8 300...18 700 RUB</b>
The price equivalent of one analogue regarding SENDAST П121	1 360...1 815 RUB/piece

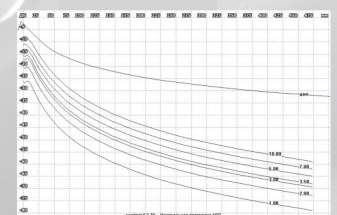
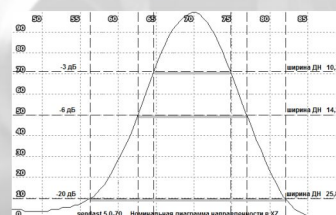
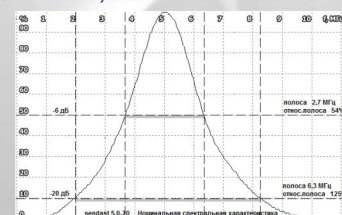
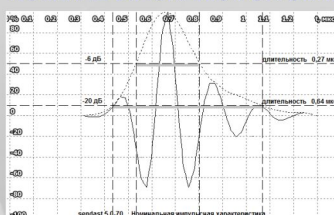
### NOMINAL SPECIFICATIONS

		SENDAST П121 2.5 MHz						SENDAST П121 5.0 MHz						
		П121 - 2,5 - 40	П121 - 2,5 - 45	П121 - 2,5 - 50	П121 - 2,5 - 60	П121 - 2,5 - 65	П121 - 2,5 - 70	П121 - 5,0 - 40	П121 - 5,0 - 45	П121 - 5,0 - 50	П121 - 5,0 - 60	П121 - 5,0 - 65	П121 - 5,0 - 70	П121 - 5,0 - 75
Working wave type		shear												
Frequency	MHz	2,5 ± 0,25												
Entry angle in Steel (according to GOST* 14782-86)	°	40,0±1	45,0±1	50,0±1	60,0±2	65,0±2	70,0±2	40,0±1	45,0±1	50,0±1	60,0±2	65,0±2	70,0±2	75,0±2
Arrow	mm	10,0±1	10,5±1	11,0±1	9,5±1	10,0±1	11,0±1	7,0±1	7,0±1	7,5±1	5,5±1	6,0±1	6,5±1	8,0±1
Single delay time	μS	4,9±0,25	4,6±0,25	4,2±0,25	3,8±0,25	4,0±0,25	4,2±0,25	3,1±0,25	3,0±0,25	2,4±0,25	2,7±0,25	3,0±0,25	3,0±0,25	3,4±0,25
Reserve of sensitivity (according to GOST* 14782-86)	dB	not less 35	not less 37	not less 40	not less 40	not less 40	not less 45	not less 45	not less 50	not less 50	not less 55	not less 55	not less 55	not less 50
Pulse duration on -20dB	μS	1,0 ± 0,15						0,55 ± 0,08						
Pulse duration on -6dB	μS	0,59 ± 0,06						0,29 ± 0,04						
Bandpass range on -20dB	MHz	3,2 ± 0,2						6,0 ± 0,6						
Bandpass range on -6dB	MHz	1,7 ± 0,2						2,7 ± 0,3						
Bandwidth on -20dB	%	130 ± 20						120 ± 20						
Bandwidth on -6dB	%	70 ± 15						60 ± 15						
Directional diagram width on -20dB	°	13,0±1,5	15,0±1,5	18,5±1,5	22,0±1,5	23,5±1,5	24,0±1,5	15,5±1,5	18,5±1,5	21,5±1,5	23,5±1,5	25,0±1,5	26,0±1,5	29,0±1,5
Directional diagram width on -6dB	°	6,0±1	7,0±1	8,0±1	10,0±1	11,0±1	11,5±1	8,5±1	9,0±1	10,0±1	11,0±1	11,5±1	14,0±1	16,5±1
Directional diagram width on -3dB	°	4,0±0,5	5,0±0,5	6,0±0,5	6,5±0,5	7,0±0,5	8,0±0,5	6,0±0,5	6,5±0,5	7,0±0,5	7,5±0,5	7,5±0,5	10,0±0,5	12,5±0,5
Capacity	pF	1900 ± 200						650 ± 100						
Piezocrystal - disc, lead zirconate titanate	mm	Ø12						Ø6						
Internal RL-circuit of correction		Not available						Not available						
Internal protection against electromagnetic interference and noise		Available						Available						
Connector		Lemo series 00						Lemo series 00						
Working surface	mm	27 × 15						22 × 11						
Overall dimensions (L×W×H)	mm	37×18×23 ± 1 with horizontal connector 36×18×24 ± 1 with vertical connector						32×13×21 ± 1 with horizontal connector 31×13×22 ± 1 with vertical connector						
Weight	gr	22 ± 2						12 ± 2						
Operating temperature range	°C	-20...+90 Allowed time of the continuous contact with subject of control from T°=180°C is up to 1 minute						-20...+90 Allowed time of the continuous contact with subject of control from T°=180°C is up to 1 minute						
The average time to failure	hr	Not less 1500						Not less 1500						
The average passage way	m	8000						8000						
Measurement conditions		Generator pulse bipolar rectangular one period 100V 0,4μs Pull-up resistor 50 Ohm parallel Cable 50 Ohms 1m CO-3: C <sub>S</sub> =3239m/s C <sub>L</sub> =5935m/s T <sub>S</sub> TIME DELAYS ALONG THE RADIUS ↑↓=33,91 μs T <sub>L</sub> TIME DELAYS ALONG THE RADIUS ↓=18,50 μs CO-2: C <sub>S</sub> =3228m/s C <sub>L</sub> =5910m/s						Generator pulse bipolar rectangular one period 100V 0,2μs Pull-up resistor 50 Ohm parallel Cable 50 Ohms 1m CO-3: C <sub>S</sub> =3239m/s C <sub>L</sub> =5935m/s T <sub>S</sub> TIME DELAYS ALONG THE RADIUS ↑↓=33,91 μs T <sub>L</sub> TIME DELAYS ALONG THE RADIUS ↓=18,50 μs CO-2: C <sub>S</sub> =3228m/s C <sub>L</sub> =5910m/s						

### NOMINAL DIAGRAMS FOR SENDAST П121-2,5-65



### NOMINAL DIAGRAMS FOR SENDAST П121-5,0-70



The working surface of transducers can be adapted on request to the pipe profile Ø 32...159 mm  
The transducers comply with GOST\* 14782-86, 26266-90 GOST\*, GOST\* R 55725-2013 on execution and electro-acoustic parameters  
The transducers correspond to the group II species I GOST\* 27.003-90. Not repaired, nonrestorable, single-function  
The transducers correspond to the group R2, C4 GOST\* R 52931-2008 in terms of requirements of operation  
\*GOST is Russian State Standard