SCIENTIFIC INDUSTRIAL GROUP

АЛТЕК®

NONDESTRUCTIVE TESTING

OIL, GAS AND PETROCHEMICAL INDUSTRY

2016

CONTENTS

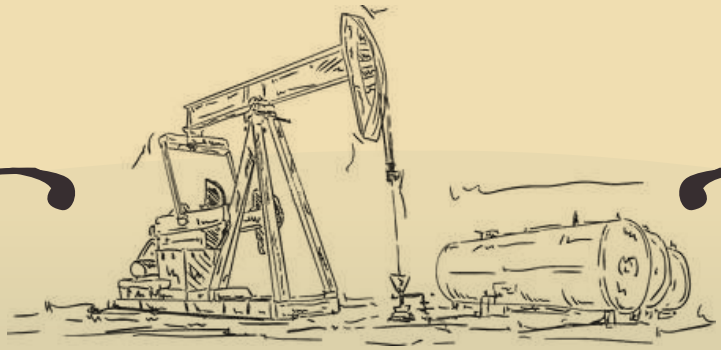
ABOUT US

Scientific Industrial Group “Altek” was founded in 1998. It unites several enterprises specialized in manual and automated ultrasonic and eddy-current testing, executing research, development, production, supply, after-sales and extended service of flaw-detectors series “PELENG” and automated testing series for wheelsets of railway vehicles “PELENG-AUTOMAT”.

Our team includes scientists and engineers, experienced in theory and practice of nondestructive testing (NDT), who execute wide-ranging and scientific researches and experimental-design development of creating manual and automated NDT instruments, based on the most modern engineering solutions.

The devices produced by group “Altek” have taken the leading place in NDT all over Russia and CIS.

COOPERATION OF «ALTEK» WITH GAS AND OIL INDUSTRIAL FACILITIES



Flaw-detectors of the PELENG family are, perhaps, the most mass ultrasonic flaw-detector equipment in Russia and the CIS countries. Oil and gas (since 2003) and petrochemical (since 2009) versions of our flaw-detector are successfully operated practically in all companies which are engaged in production, conversion and gas storage, oil and oil products. Many laboratories of nondestructive control widely use our equipment.

The equipment developed by us in recent years and not having import analogs which personified achievements of modern technologies in the field of instrument making allows to increase considerably performance of control of boring and main pipes.

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FLAW-DETECTORS

CONTENTS:

PREMIUM FLAW-DETECTOR «PELENG 307» UD3-307EC

Main Advantages

- two flaw-detectors (ultrasonic and eddy-current) for the price of one
- possible eddy-current scanning systems connection
- TOFD mode
- «Thickness gauge» mode
- has typical presets
- two types of amplification control: DAC and time-gain

FUNCTIONS

Besides ordinary flaw-detection tasks, UD3-307EC provides the following functions:

1. Weld testing according to СТО Газпром 2-2.4-083-2006, РД-25.160.10-КТН-015-15, РД-25.160.10-КТН-016-16 иРД-19.100.00-КТН-001-10;
2. Thickness measurement (detection of corrosion and scours);
3. Joint weld testing using TOFD mode in accordance with the requirements of CEN/TS 14751 (2004), E 2373 (USA, 1993) and BS 7706 (1993);
4. Polyethylene pipe testing in accordance with the technological instruction;
5. Eddy-current testing with the purpose of detecting surface and subsurface defects.

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TECHNICAL FEATURES

Ultrasonic test methods	pulse-echo pitch-catch
Eddy-current test methods	amplitude phase combined
Eddy-current testing modes	dynamic static
Ultrasonic channels number	1
Eddy-current channels number	1
Display	color TFT
Alarms	sound alarm front panel LEDs eddy-current transducer LED
Ultrasonic frequencies, MHz	0,40; 1,25; 1,80; 2,50; 5,00; 10,00
Ultrasonic pulser voltage, V high low	 120 4,5
Pulse repetition frequency, Hz	25 ... 5000
Eddy-current frequency, kHz	10 ... 100 (step 1)
Eddy-current pulser voltage, V	0,8; 1,5; 3,4; 8,3

Scan types	
ultrasonic	*A*-scan *W*-scan *B*-scan
eddy-current	running scan complex plane
Amplificaton range	
ultrasonic channel, dB	0...80
eddy-current channel, rel. units	0...80
Thickness measuring step, mm	0,01
Time-gain depth, dB	
edition «acceptance testing»	up to 60
other editions	up to 40
A-scan duration, ms	
minimum	1,3
maximum	10917
Thickness gaging range in steel, mm	3 ... 5000
Crack depth maesuring range in eddy-current mode, mm	0,1 ... 9,9
Flaw depth in steel measuring range with straght-beam transducer, mm	1 ... 32221
Temperature range, °C	–25 ... +50
Weight, kg	1,3
Dimentions, mm	140×220×42

ULTRASONIC FLAW-DETECTOR «PELENG» UD3-204

UD3-204 - general purpose flaw-detector. The device intended for carrying out ultrasonic control, and also is used as the thickness gauge. Besides detection of defects measurement and registration of characteristics of the revealed defects is provided.

Advantages

- typical presets
- frequency up to 25 MHz
- two independent channels
- thickness gauge mode
- metal case
- adjustable pulse shape

Flaw-detector UD3-204 has acoustic coupling track mode, time-gain mode, generalized DGS and custom DGS can be downloaded from a PC.

Besides, in UD3-204 there is a mode of assessment of coefficient of attenuation of ultrasonic waves in material of a test piece (it is used in the DGS mode), and also the mode of the accounting of curvature of a surface helping to determine precisely coordinates of defects at control across forming the cylinder.

Features

- gain range 120 dB and step change of amplitude of the pulse
- plotting of DGS on points
- creation of curvilinear thresholds as ARD-diagrams or curvilinear thresholds on points (DAC curves)
- one or two scans on one screen, the mode of the full screen during the work in single-channel option
- three curvilinear tresholds in each gate with color indication
- semi-automatic sensitivity set

TECHNICAL FEATURES

Ultrasonic test methods	pulse-echo pitch-catch
Ultrasonic channels number	2
Ultrasonic frequency, MHz	0,4; 0,62; 1,25; 1,8; 2,0; 4,0; 2,5; 5,0; 10,0; 15,0; 25,0
Primary indicator	color TFT 640x480 pix.
Pulse repetition rate, Hz	25 ... 5000
Gain range, dB	0 ... 120 (step 1)
Time-gate nodes number	64
Information display	double view full-screen view
Scan types	A-scan: current; «Magnify»; «Envelope»; «Freeze»; screenshot; W-scan («beam path»); B-scan;
A-scan duration, µs	1 ... 8188
A-scan delay, µs	0 ... 10 (step 0,1) 10 ... 8188 (step 1)

Gates number	1 or 2
Gate indication levels pulse-echo pitch-catch	 3 1
Theshold, display height %	5...95 (step 1)
Time measurement range, µs	10 ... 8188
Beam angle range, deg.	0 ... 90 (step 1)
Velocity range, m/s	300 ... 30000 (step 1)
Thickness measurement range, mm	0,4 ... 3000
Thickness measurement resolution, mm	0,01
Battery type	LiIon
Continuous work time, h, at display brightness 4	10
Charging time, h	5
Weight, kg	2,65
Dimentions, mm	235x190x60

EDDY-CURRENT FLAW-DETECTOR «PELENG» EC-100

EC-100 is intended for detection of surface and subsurface defects in electroconductive materials by eddy-current method of nondestructive control. Works both with passive, and with active probe; and also with scanners of control of locking threads of drill pipes.

Advantages

- the smallest eddy-current flaw-detector having complex plane
- the shock-proof silicone cover with a support is included in the package
- dynamic and static operation modes

TECHNICAL FEATURES

Test methods	phase/ amplitude combined
Test modes	dynamic / static
Channels	1
Indicator	LCD display
Scan types	running scan dynamic scale complex plane
Extra indicators	sound alarm, LED
Frequency, kHz	10 ... 100 (step 1)
Amplification range, dB	0 ... 99
Battery type	NiMH
Continuous operation time with 4 batteries with backlight mode 4, h	16
Charge time, h	12
Weight, kg: flaw-detector Power unit	 0,34 0,1
Dimentions, mm: flaw-detector Power unit	 90×143×35 72×77×35

ULTRASONIC THICKNESS GAUGE ALTEK "AT-17"

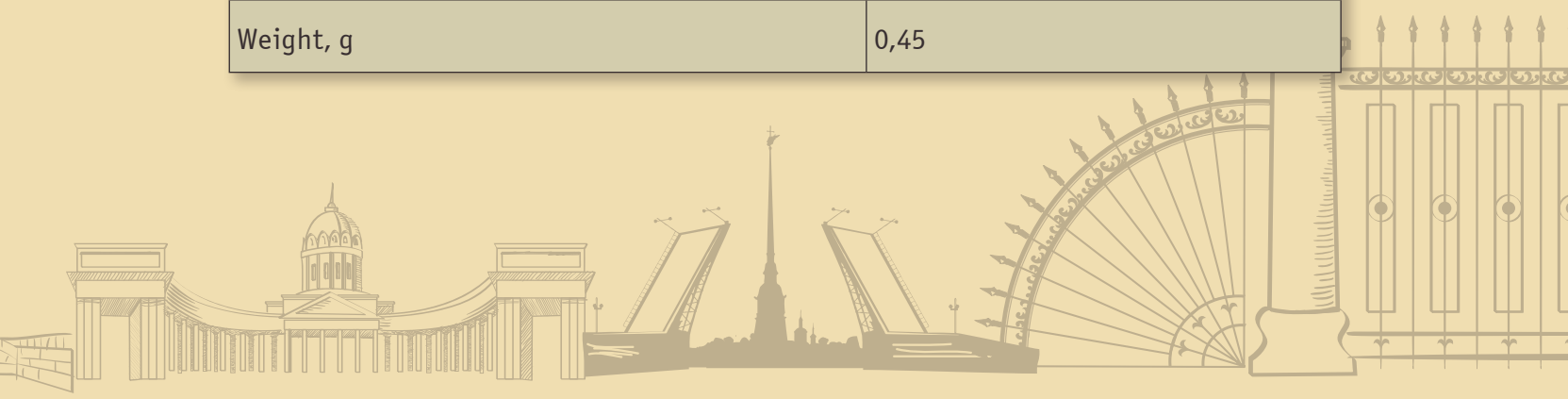
Designed to measure the thickness of the plane-parallel items (pipe walls, boilers, cylinders, pressure vessels, etc.) with smooth, rough, corroded or painted surfaces. Products can be made of different materials such as steel, titanium, aluminum, plastic, ceramics, glass, etc.

Advantages

- metal casing and strike-resistant display
- built-in set-up sample
- the range of the measured thickness from 0,8 mm
- a possibility of measurement of thickness through a paint coat
- interface, clear and simple
- representation of results of measurements in digit and A-scanning
- possibility of battery charging from USB

TECHNICAL FEATURES

Measured thickness range, mm in steel	0,8...300
Permissible measured error H, mm	± (0,01H+0,1)
Additional error of measurement, mm, (roughness Rz ≤ 320 μm)	± 0,2
Discretization of thickness indication, H, mm	0,01 when H<100 0,1 when H>100
Velocity range, m/s	1000 ... 15000
Measurement execution time, s	3
Measured materials:	• Steel • Aluminum • Copper • Brass • Titan • Cast iron • Glass • Polyethylene • Ceramics • Plastic
Continuous work time, h	8
Dimensions, mm	60x35x170
Weight, g	0,45



TRANSDUCERS
AND SCANNING SYSTEMS

CONTENTS

CHORD-TYPE PIEZOELECTRIC TRANSDUCERS

This type of transducers is made for quality control of butt joints of polyethylene pipes performed by a heated tool. The application of these PET is recommended by СП 42-103-2003 (appendix H) and other regulatory documents.

GENERAL FEATURES

- transducers are made of elastic compound for the best acoustic coupling;
- transducers are supplied with calibration block, made of PET pipe containing FBH-flaw.

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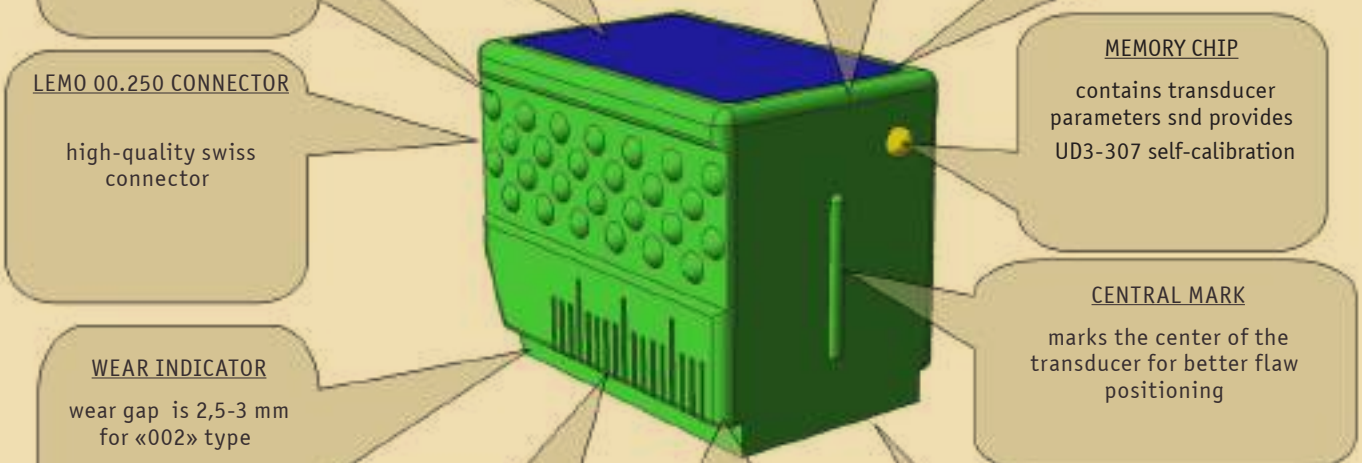
PIEZOELECTRIC TRANSDUCERS

Advantages

- low price
- plexigals wedge
- built-in memory
- plastic and metal cases
- antiskid shape of cases

GENERAL PURPOSE SHEAR WAVE TRANSDUCERS

GENERAL FEATURES



ANTISKID PROFILE

transducer is easy to hold in gloves or in naked palm

WEAR-RESISTANT COVER

steady to the abrasive particles and couplants

GREEN CASE

clear and bright color makes it visible

PLASTIC CASE

provides low friction and stable coupling

LEMO 00.250 CONNECTOR

high-quality swiss connector

MEMORY CHIP

contains transducer parameters snd provides UD3-307 self-calibration

CENTRAL MARK

marks the center of the transducer for better flaw positioning

WEAR INDICATOR

wear gap is 2,5-3 mm for «002» type and 1,5-2 mm for «003» type.

Indicator allows to estimate actual wear

MILLIMETER SCALE

allows to chech index point

SMOOTH EDGES

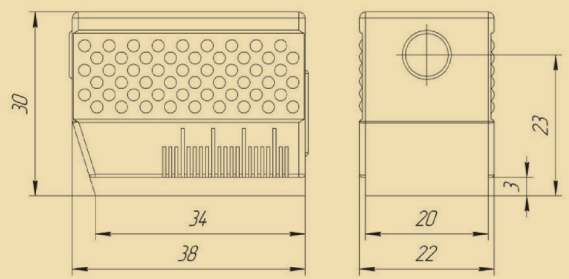
transducer has fine grip

CAN BE CURVED

probe can be curved to diameter from 18 to 325 mm.

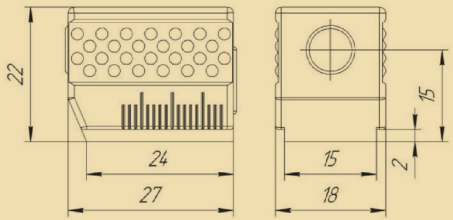
TECHNICAL FEATURES

Factor 002



Transducer mark	Freq. MHz	Crystal	Index, mm	Memory chip
П121-1,25-40-002	1,25	rectangle, 16×12 mm	10	no
П121-1,25-40-002П				yes
П121-1,25-50-002			13	no
П121-1,25-50-002П				yes
П121-1,25-65-002			17	no
П121-1,25-65-002П				yes
П121-1,8-40-002	1,8	disc, ∅12 mm	9	no
П121-1,8-40-002П				yes
П121-1,8-45-002			10	no
П121-1,8-45-002П				yes
П121-1,8-50-002			11	no
П121-1,8-50-002П				yes
П121-1,8-60-002			12	no
П121-1,8-60-002П				yes
П121-1,8-65-002			13	no
П121-1,8-65-002П				yes
П121-2,5-50-002	2,5	disc, ∅12 mm	11	no
П121-2,5-50-002П				yes
П121-2,5-60-002			12	no
П121-2,5-60-002П				yes
П121-2,5-65-002			13	no
П121-2,5-65-002П				yes
П121-2,5-70-002			15	no
П121-2,5-70-002П				yes
П121-2,5-74-002			15	no
П121-2,5-74-002П				yes

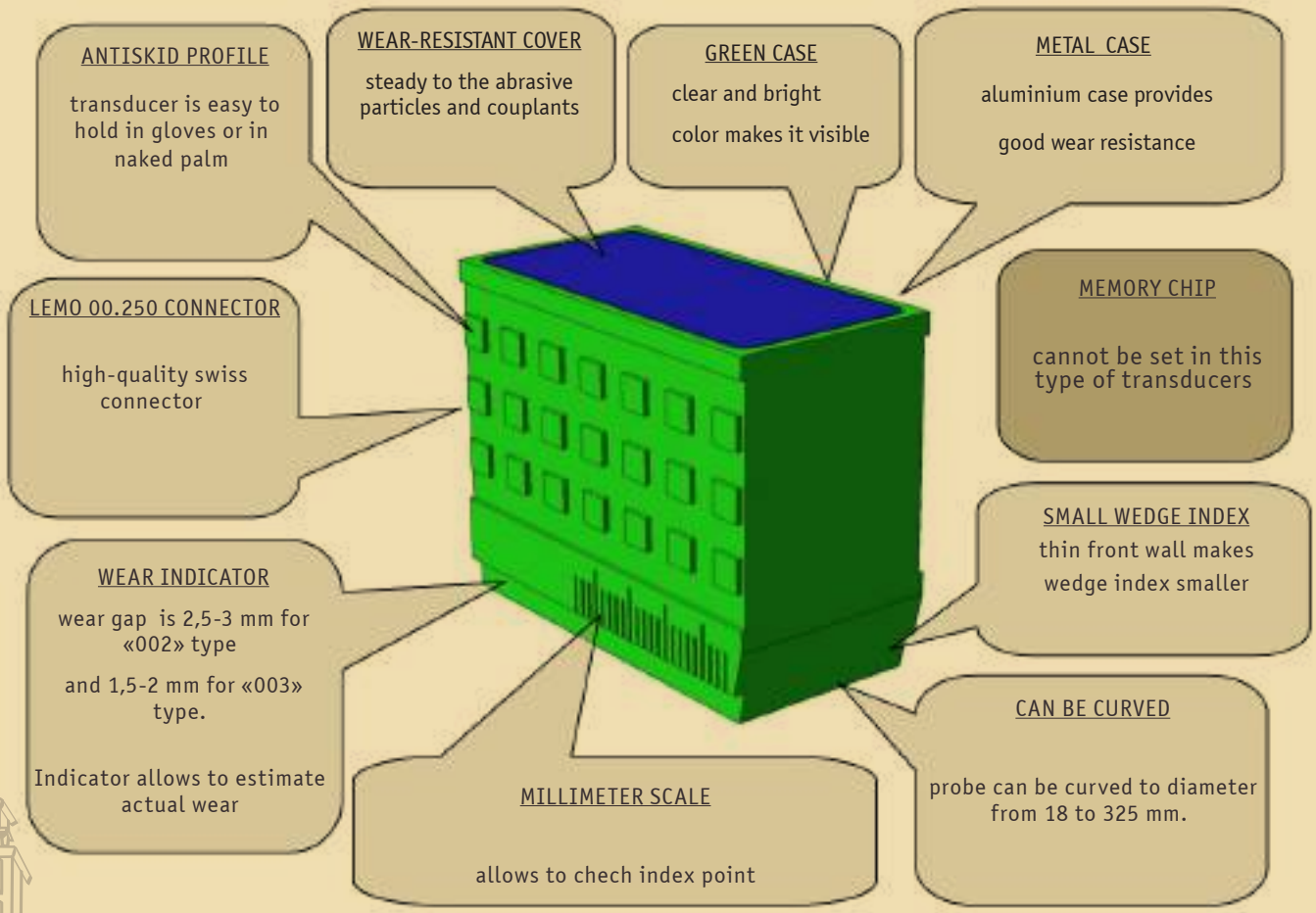
Factor 003



Transducer mark	Freq. MHz	Crystal	Index, mm	Memory chip
П121-2,5-40-003	2,5 МГц	disc, ∅10 mm	7	no
П121-2,5-40-003П				yes
П121-2,5-50-003			10	no
П121-2,5-50-003П				yes
П121-2,5-60-003			9	no
П121-2,5-60-003П				yes
П121-2,5-65-003			9	no
П121-2,5-65-003П				yes
П121-2,5-70-003			11	no
П121-2,5-70-003П				yes
П121-2,5-90-003		8×10 mm	-	no
П121-2,5-90-003П				yes
П121-5-40-003	5,0 МГц	rectangle, 5×10 mm	6	no
П121-5-40-003П				yes
П121-5-45-003			6	no
П121-5-45-003П				yes
П121-5-50-003			5	no
П121-5-50-003П				yes
П121-5-60-003			6	no
П121-5-60-003П				yes
П121-5-65-003			7	no
П121-5-65-003П				yes
П121-5-70-003			8	no
П121-5-70-003П				yes
П121-5-74-003			9	no
П121-5-74-003П				yes

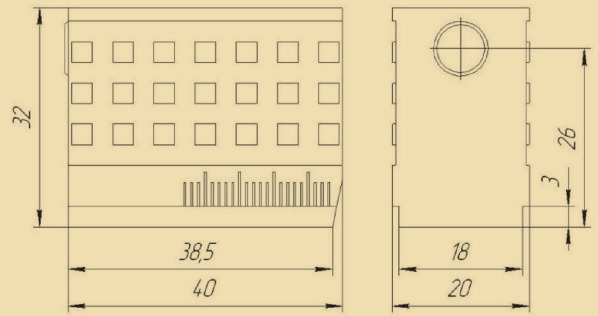
GENERAL PURPOSE WEAR-RESISTANT SHEAR WAVE TRANSDUCERS

GENERAL FEATURES



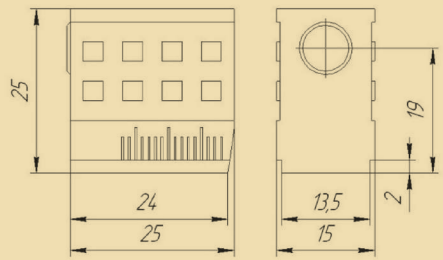
TECHNICAL FEATURES

Factor 002M



Transducer mark	Freq. MHz	Crystal	Index, mm
П121-1,25-40-002М	1,25	disc, ∅12 mm	10
П121-1,25-50-002М			13
П121-1,25-60-002М			17
П121-1,8-40-002М	1,8	disc, ∅12 mm	9
П121-1,8-45-002М			10
П121-1,8-50-002М			11
П121-1,8-60-002М			12
П121-2,5-50-002М	2,5	disc, ∅12 mm	11
П121-2,5-60-002М			12
П121-2,5-65-002М			13
П121-2,5-70-002М			13
П121-2,5-74-002М			15

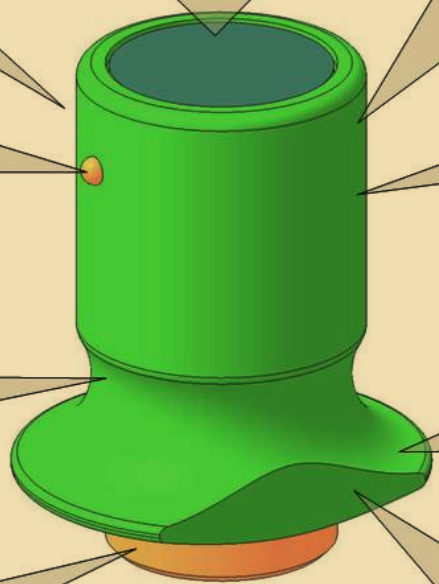
Factor 003M



Transducer mark	Freq. MHz	Crystal	Index, mm
П121-2,5-40-003М	2,5	disc, ∅10 mm	7
П121-2,5-50-003М			10
П121-2,5-60-003М			9
П121-2,5-65-003М			11
П121-2,5-70-003М			11
П121-2,5-90-003М		8×10 mm	-
П121-5-40-003М	5,0	rectangle, 5×10 mm	6
П121-5-50-003М			6
П121-5-60-003М			6
П121-5-65-003М			7
П121-5-70-003М			8
П121-5-74-003М			9

GENERAL PURPOSE STRAIGHT-BEAM TRANSDUCERS

GENERAL FEATURES



LEMO 00.250 CONNECTOR

high-quality swiss connector

WEAR-RESISTANT COVER

steady to the abrasive particles and couplants

PLASTIC CASE

reduces the cost of the transducer

MEMORY CHIP

contains transducer parameters snd provides UD3-307 self-calibration

GREEN CASE

clear and bright

color makes it visible

RIM

provides better acoustic couple with less efforts

THIN WAIST

greatly facilitates transducer grip

BRASS FEEDWELL

provides low friction with steel, with smooth scanning

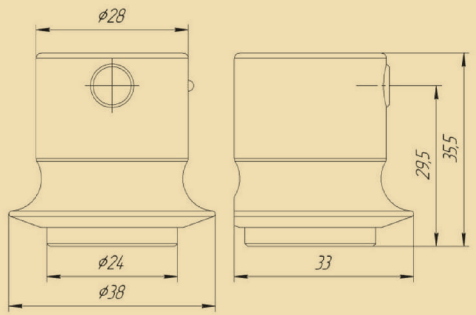
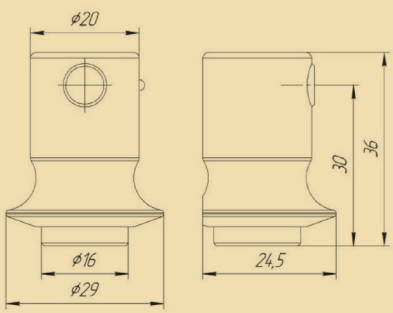
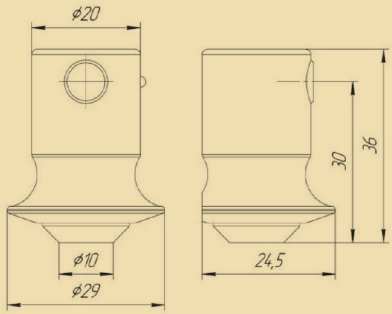
ALUMINIUM OXIDE FACE

has supreme wear resistance

RIM CUT

rim is cut on one side for better test accessibility

TECHNICAL FEATURES

Factor K20	Factor K12 and 002	Factor K6
		

Transducer mark	Freq. MHz	Crystal, mm	Test range, mm	Memory chip
Single crystal				
П111-1,25-К20	1,25	∅20	15 ... 180 [1)]	no
П111-1,8-К20	1,8	∅20	15 ... 180 [1)]	no
П111-1,8-К12		∅12	15 ... 180 [2)]	no
П111-2,5-К12	2,5	∅12	10 ... 180 [2)]	no
П111-2,5-К12П				yes
П111-5-К12	5,0	∅12	15 ... 70 [3)]	no
П111-5-К6		∅6	5 ... 70 [3)]	no
П111-10-П6	10,0	∅6	2 ... 30 [4)]	no
Dual crystal				
П112-2,5-12-002	2,5	∅12/2 (2 pcs.)	2 ... 30 [2)]	no
П112-5-12-002	5,0	∅12/2 (2 pcs.)	5 ... 30 [3)]	no
П112-5-12-002П			5 ... 30 [3)]	yes

SCANNER TOFD

These scanners are used for control of welds and internal structure of the object with thickness up to 300 mm. The scanner contains a track encoder and a laser pointer of the weld center.

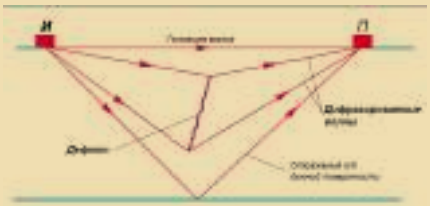
Advantages

- reduction of time for search of defects in welds
- detection of defects of any orientation
- high repeatability and accuracy of determination of theextent of defects
- the evident image of location of defects in controlled section
- the magnetic clip provides reliable positioning of scanner on an object

Scanners are used in conjunction with multifunctional flaw-detector PELENG UD3-307EC.

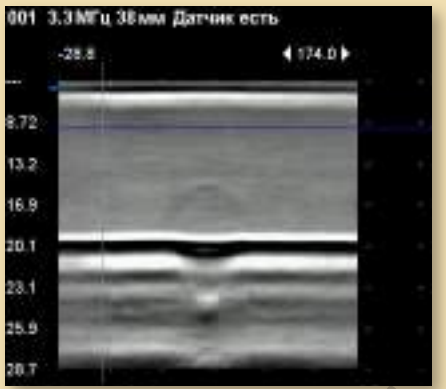
TOFD - Time of Flight Diffraction method

The course of beams at control by a diffraction and time method of ultrasonic control (TOFD) is presented in the drawing :



The type of signals on A-development on which setup of the equipment is made is presented in the drawing:

The image received with application of scanner TOFD and flaw-detector of UD3-307EC



EDDY-CURRENT TRANSDUCERS

Advantages

- Transducers are made for operation in the phase mode of detuning from influence of slope angle
- There are both passive, and active (“smart”) probes
- Low intrinsic noises
- Wear resistance
- An additional protective cap in a set
- The LED signaling about exceeding of a threshold of actuating is duplicated on the casing of the transformer
- Only branded high-quality LEMO connectors are used

TECHNICAL FEATURES OF PASSIVE TRANSDUCERS

Probe mark	Probe diameter	Dimentions, mm	Frequency, kHz	Connector
Altek ПН-4-АК-002	1,2	∅15x77	70	LEMO 8-pin
Altek ПН-7,5-АК-003	2,5	∅15x97		
Altek ПН-15-АК-004	6,5	∅15x92		

TECHNICAL FEATURES OF ACTIVE TRANSDUCERS

Probe mark	Probe diameter mm	Purpose	Dimen., mm	Freq., kHz	Connector
Altek ПНА-4-001	1,2	Al	∅15x97	750	LEMO 8-pin
Altek ПНА-4-002		Fe		1500	

EDDY-CURRENT SCANNERS OF DRILL PIPE LOCKING THREADS

Eddy current scanner locking thread of drill pipe is designed to detect defects such as a crack in the threads according to API 7 (or similar). This equipment rejects time-consuming magnetic particle, liquid penetrant and ultrasonic inspection of threads. Scanners provide sensitivity to the thread root cracks with a depth of 0.5 mm.

The main features of this equipment:

- does not require careful surface preparation control
- time control of a single thread 20-30 seconds
- electronic protocol in flaw-detector
- indicative evaluation of the depth of the detected cracks

Use justification

In modern foreign and domestic standards and methods of diagnosing of drilling equipment references of a possibility of carrying out eddy-current control (State standard specification P 54383-2011 or API Spec 5DP) appear. It is developed and prepares for entering of GOST P ISO 10893-2, determining conditions of carrying out vikhretokovy control of steel seamless and welded pipes, and also criteria of rejection. In the DS-1 standard (Volume 3) there is a description of the procedure of carrying out electromagnetic control of a body of a pipe. Eddy-current control is one of kinds of electromagnetic control. In 2015 we wrote a technique of vikhretokovy control of boring pipes which was approved "Vniitneftetruby" LTD (Samara).

Our equipment allows to simplify and accelerate considerably carrying out diagnosing of threaded connections of boring pipes.

Scanner types

- Nippel scanners for two thread types API 7, for example, NC 50 and NC 46
- Coupler scanners for two thread types API 7, for example, NC 56 and NC 61
- Universal nippel scanner for threads from NC 23 to NC 77
- Universal coupler scanner for threads from NC 23 to NC 77

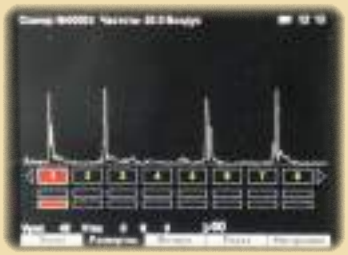
PIPE BODY SCANNER

COMPETITIVE ADVANTAGES

- Use of multi-channel data scanners can significantly increase the testing efficiency
- Allow control at speeds up to 1 m/sec
- Scanners can be integrated into automated production lines control and integrated into mass production
- There is no direct contact of scanner and object that ensures the safety of equipment
- Allows the detection of defects in any orientation

Scanners are used in conjunction with multi function flaw-detector Peleng UD3-307EC

Practical features



- The graphical interface ensures ease of analysis of information from a large number of transducers. The monitoring process is intuitive. In case of exceeding the threshold triggers a light and audible indication with a maximum amplitude of the signal is highlighted in red.

- For confirmation of the defect scanner has a data output mode with one selected (by the operator or automatically) transducer. This mode displays a running scan, which clearly is possible to estimate exceeding the threshold.

- Set of the sensitivity of the ECP occurs on the calibration. There are several modes, allowing to achieve an optimal result settings. Also there is the setting possibility “on air”.

- There is the possibility of creating a protocol on results of the inspection.

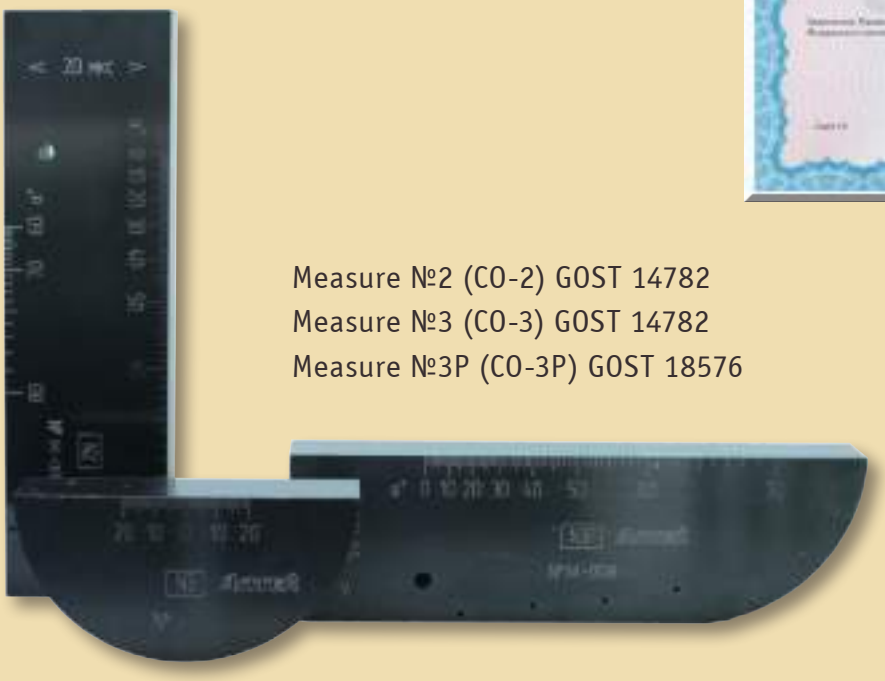
MEASURES
AND CALIBRATION BLOCKS

CONTENTS

ULTRASONIC MEASURES

1. A set of ultrasonic measures of ККО-3 is included in the State register of measuring instruments. Intended for reproduction and storage of the physical quantity of the specified geometric dimensions of the artificial defects and is used for verification, calibration and adjustment of ultrasonic flaw-detectors.

Registration number: **63388-16**



Measure №2 (СО-2) GOST 14782
Measure №3 (СО-3) GOST 14782
Measure №3Р (СО-3Р) GOST 18576


СВИДЕТЕЛЬСТВО

2. A set of ultrasonic measures of KKO-2 is included in the State register of measuring instruments. Intended for reproduction and storage of the physical quantity of the specified geometric dimensions of the artificial defects and is used for verification, calibration and adjustment of ultrasonic flaw-detectors.

Registration number: **63389-16**

Measure KO-V1 (ISO 2400)
Measure KO-V2 (ISO 7963)

EDDY-CURRENT MEASURES

1. **A set of measures of artificial defects КМИД-ВТ** included in the State register of measuring instruments. Intended for reproduction and storage of the physical quantity of the specified geometric dimensions of the artificial defects, the thickness of dielectric coatings and is used for verification, calibration and adjustment eddy current flaw-detectors.

Registration number: **59638-15**

The measures are metal bars with coated working surfaces and artificial defects attached to them samples of dielectric coatings in the form of films or plates of predetermined thickness.

- СО-210.01 (Fe)
- СО-211.01 (Fe)
- СО-212.01 (Fe)

2. **A set of measures of artificial defects НО-37-38-38 ТПС** is included in the State register of measuring instruments. Intended for reproduction and storage of the physical quantity of the specified geometric dimensions of the artificial defects and is used for verification, calibration and adjustment eddy current flaw-detectors. Defects are made on the working surfaces of the steps, one of which simulates surface roughness Rz=160...320.

Registration number: **59756-15**


СВИДЕТЕЛЬСТВО

- НО-037
- НО-038
- НО-038 (ТПС)

MEASURES FROM INDUSTRIAL REGISTERS

In addition to the measures from the state register, we produce measures of trade registries. All ultrasonic transducers chord type are supplied with the appropriate sample size. Scanners eddy current testing of pipe body and thread connections are also supplied with the respective configuration examples, in which the flaws are made in accordance with the requirements of the customer.

We can produce the defects of complex shapes and the finite length on a flat and radial surfaces, which is extremely important in eddy-current flaw-detection.

1. Chord type samples are made due to:

- ИПТ-010-95
- СП 42-103-2003

2. Blocks with notch are made due to:

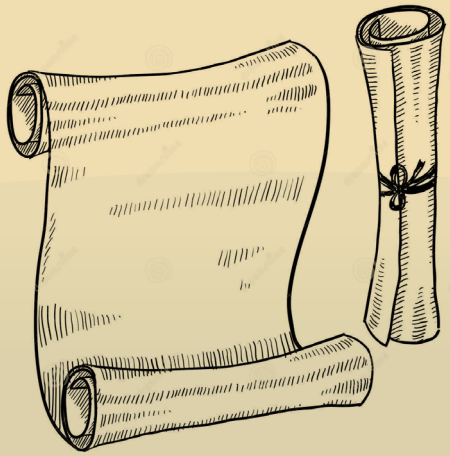
- СТО ГАЗПРОМ 2-2.4-083-2006
- РД-25.160.10-КТН-016-15
- РД-19-100.00-КТН-001-10
- РД-08.00-60.30.00-КТН-046-1-05
- МДС 53-1.2001
- СНИП 3.03.01-87
- РДИ 38.18.016-94
- СТО 00220256-005-2005
- СТО 00220256-014-2008
- МТ-РТС-К-01-94

3. Specimens for eddy current testing are made in accordance with the requirements of the customer. As in normative documents on diagnosis of drill pipes, there are no explicit requirements for eddy-current flaw-detection, we propose to use the technique of eddy current testing of drill pipes of «Vniineftehim» LTD.

SERVICE

CONTENTS

THE DEVELOPMENT OF STANDARDS AND TECHNICAL INSTRUCTIONS



During latest 12 years group “Altek” together with head profile organizations and educational facilities of Saint-Petersburg develops new and improves existing methods of ultrasonic and eddy-current testing methods for critical machine parts of railway transport and oil and gas equipment. In addition, we designed techniques of eddy-current testing.

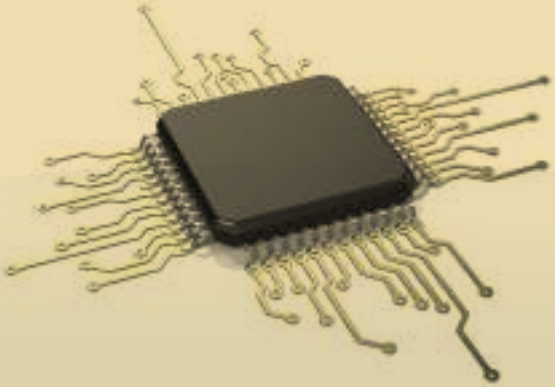
Developed methods are implemented in hand-operated and automates instruments of “Altek” series.

METROLOGY SERVICE

In the group «ALTEK» a metrological Department. The specialists of this service are engaged in the verification and calibration of domestic and foreign non-destructive testing, and calibration and reference calibration and tuning samples and measures.

Metrology service performs the activities on the basis of the certificate in the field of ensuring the uniformity of measurements, has all the nesessary certificates and permits. The quality management system of metrological service meets the requirements of ISO 9001-2015.

REPAIR



Specialists in the diagnosis and repair of nondestructive testing provide the repair of their own equipment. In addition, we are engaged in repair of non-destructive testing of other manufacturers, including foreign ones.

We are always happy to help you! If you have any hardware problems, or if you need advice working with our devices, please contact us and we will promptly assist you.

PERSONNEL TRAINING

Skilled teachers of the “Altek” group perform operator training in working with hand-operated flaw-detectors “Peleng” series and automated “Peleng-Automat” series. Training course includes theory and practice.

Training course for hand-operated flaw-detectors takes 48 hours, and automated flaw-detectors require 72 hours. After completion of the course a certificate is issued. Lectures and practical training take place in the “Altek” premises at the following address:

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Saint-Petersburg, Russia

NOTES

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