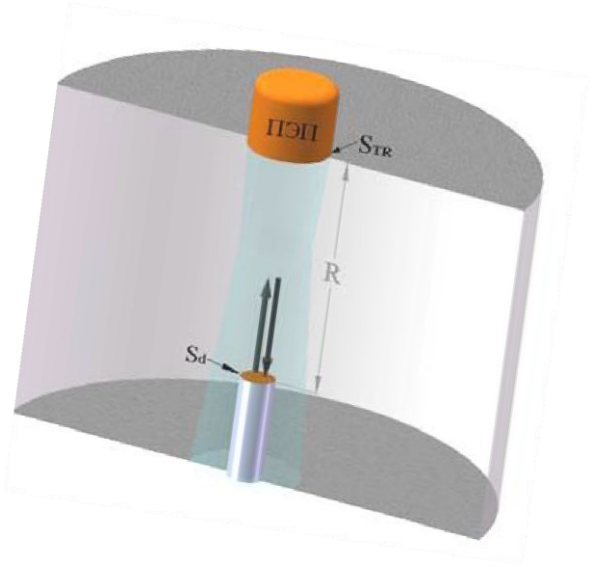
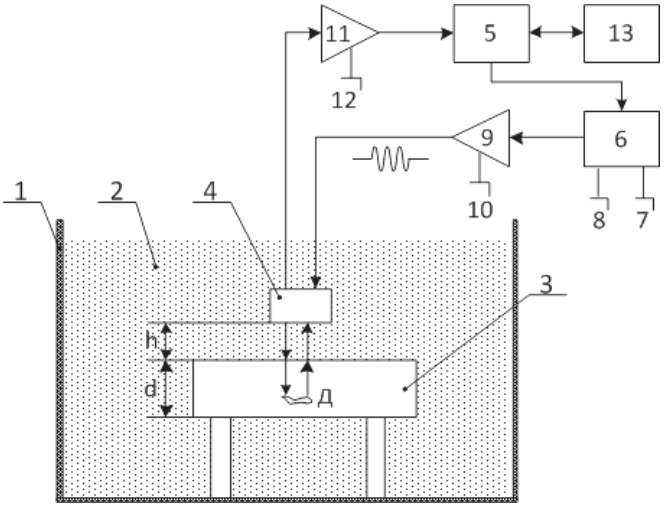
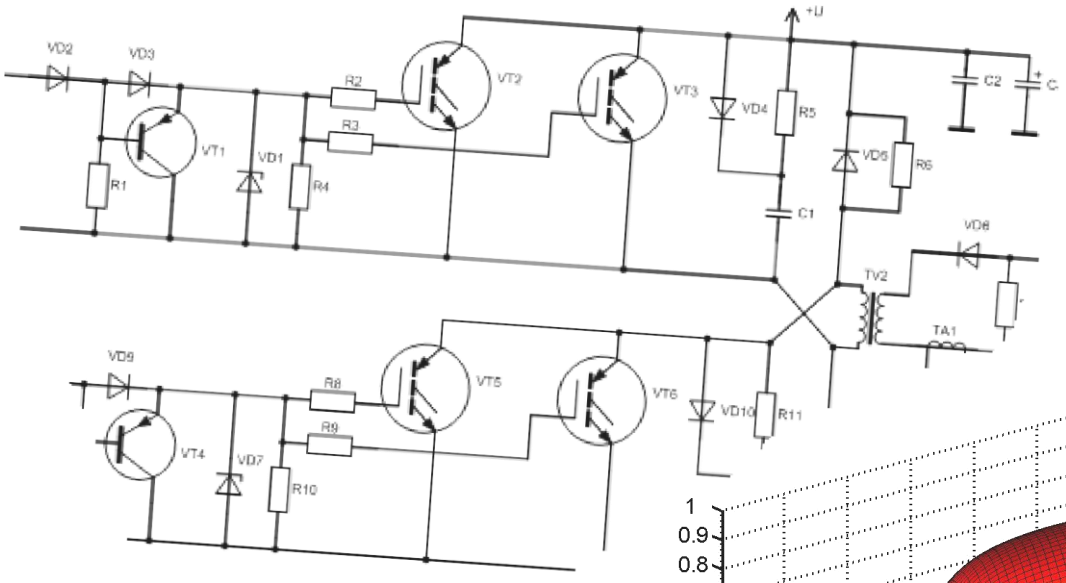
National Technical University
"Kharkiv Polytechnic Institute"

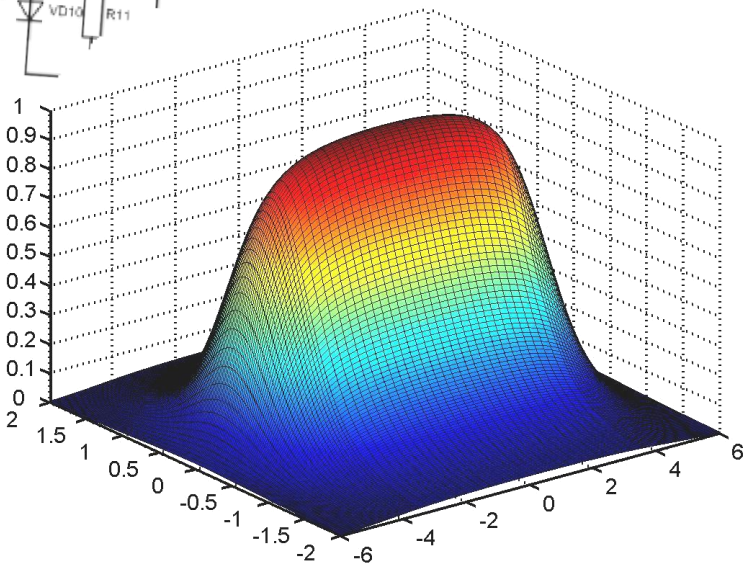
Department of Computer and Radioelectronics
control and diagnostic systems"





DEVELOPMENTS





Computerized EMA flaw detector for inspection of products with heavily corroded surfaces

ultrasound input surface

The EMA flaw detector is designed to detect "hydrogen" and other delaminations in metals with a heavily corroded surface by introducing ultrasound without the use of stripping.

Technical specifications: Ultrasonic waves used: shear, surface; ultrasonic oscillation frequency – 0.5 – 6 MHz;
probing frequency – up to 40 Hz; dynamic range of the RFC – 30 dB; Maximum sensitivity – a disk reflector, optimally located relative to the EMAP with a diameter of 1.2 mm; Indication of the detection of an unacceptable defect – three-tone sound and three-color light. The flaw detector is equipped with a relay output to provide information about the presence of an unacceptable defect, as well as built-in metal presence sensors.

Electronic EMA converters for various purposes

Direct EMAP for control with a gap to 6mm

For control without dead zone

EMAP for control superficial in waves

Inclined EMAP

Direct EMAP

Probe pulse generator for stationary installations with EMA microprocessor converters

Probing pulse generator for automatic and mechanized installations for ultrasonic longitudinal inspection of metal products, shear, surface and normal waves

Universal generator that sets

Main technical characteristics of GZI

No. n/n	Parameter	Value	Note
1	Synchronization, kHz	0.5; 1.0; 2.0 (smoothly adjustable)	External, pulse amplitude 5, duration 2 μs
2	Number of pulses in a packet	from 1 to 16	adjustable
3	Packet filling frequency, MHz	From 1 to 3	adjustable
4	Output voltage, V; Peak current, A	500 - 1500 (depends on frequencies); up to 200	Maximum amplitude value on EMAP
5	Supply voltage; Power supply of the output stage,	220, 50Hz; 35	Network protected from interference
6	Rated output power in pulse mode, W	At least 6500	
7	Emergency operating modes generator	- output short circuit protection, - protection of the generator power part from overheating, - isolation between power circuits and generator output	
8	Ambient operating temperature range environment, °C Relative air humidity	- 10 to + 40 a little over 80%;	
9	The GSI board and power supply are placed in a volume with dimensions (WxDxH), mm	420x360x190	The GSI boards and the power supply are mounted in the same housing

Dual-processor ultrasonic non-contact thickness gauge

The device is designed to measure the diameter and thickness of products made of conductive and (or) ferromagnetic materials without the use of a contact fluid by the electromagnetic-acoustic method. The use of the device does not require special cleaning of the product surface from paint, plastic coating, oil, rust, scale, etc. When inspecting pipe products in operation, only the thickness of the metal is measured. The measurement result is not affected by the thickness of the outer coating and deposits on the inner surface of the shell.

Main technical specifications

- Linearly polarized shear waves were used;
- Range of measured thicknesses (for steel), mm.2 - 45 (200);
- Permissible measurement error (without surface cleaning), less, mm.±0.1;
- Thickness or diameter measurement resolution, mm0.1;
- Minimum controlled diameter, mm6;
- Temperature of the controlled product,°C up to 80(600);
- Ambient temperature,°C30...+50;
- Distance between the EMA transducer and the surface of the controlled area metal, mm.. up to 3;
- Weight of the electronic unit of the thickness gauge, kg1.4;
- Mass of the EMA converter, kg0.35;

Eddy current flaw detector "MALYUK M"

Characteristics of controlled surfaces:

- temperature of the controlled metal, °C -20 to +50;
- there should be no burrs, metal shavings, or burrs on the surface of the controlled metal;
- Controlled material – ferromagnetic or non-ferromagnetic steel, cast iron.

The degree of protection against penetration of solid objects and water for the flaw detector is IP30 according to GOST 14254-80.

According to the operating conditions, the flaw detector belongs to the climatic type UHL 1.1 according to GOST 15150-69.

The flaw detector can be used in shop and laboratory conditions:

- ambient temperature, °C .....-10+40;
- atmospheric pressure, kPa 84106.7;
- The device is powered by built-in batteries,
  – mains power ~220 V 50 Hz via a mains adapter;
- The power consumed by the device from the network is no more than 1 W;
- Mass defectoscope 500 g;
- Overall dimensions of the flaw detector: 150x105x45 mm3;
- Information presentation – on a seven-digit LED indicator and using a tone sound indicator;
- The limit of control sensitivity is a rectangular groove with a depth of 0.1 mm on a flat sample of size 45.

Electronic eddy current flaw detector VD-1GD

The device is designed to detect surface defects in electrically conductive products, assess the shape of the defect (crack or hole), and measure the depth of defects.

Main technical characteristics of the flaw detector:

- Minimum detectable defect size:0.2 mm
- Minimum defect disclosure:0.005 mm
- Defect depth measurement range: up to20 mm
- Maximum distance between eddy current transducer and product surface: 5 mm
- Operating temperature range: -15...+40
- Dimensions of the electronic unit of the flaw detector:189 x 104.5 x 33.2/59 mm
- Flaw detector power supply: Two AA batteries or accumulators
- Weight of the flaw detector: a little more0.5 kg.

Electronic eddy current flaw detector ECD-1

Stethoscope ECD-1 designed for detection production, operational and stress corrosion cracks in metal structures, including under a layer of insulating coating and/or corrosion.

Controlled objects: pipes, oil and gas pipelines, energy, chemical and special production facilities, parts of structures, machines, mechanisms, etc.

Main technical characteristics of the flaw detector:

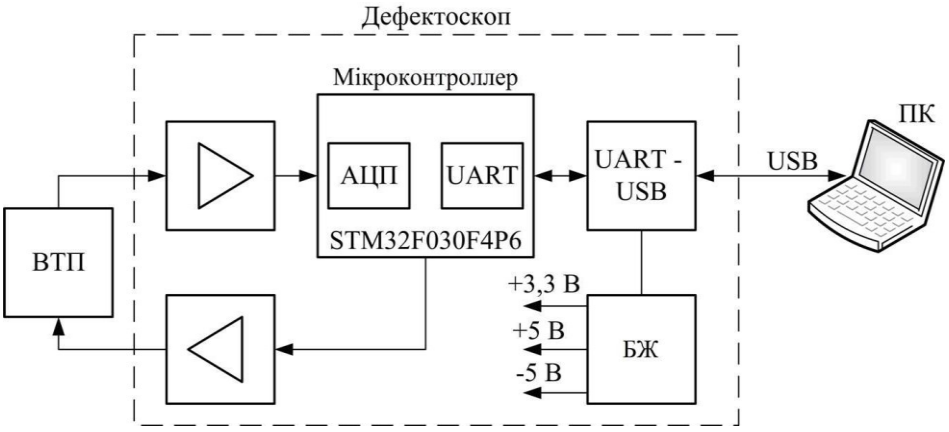
- Minimum detectable defect size:0.1 mm
- Minimum defect disclosure:0.005 mm
- Maximum distance between eddy current transducer and product surface: 0.5mm
- Operating temperature range: -15...+40
- Dimensions of the electronic unit of the flaw detector:134 x 70 x 24 mm
- Flaw detector power supply: Two AA batteries or accumulators
- Weight of the flaw detector: a little more0.3 kg.

Electronic eddy current flaw detector ECD-1-USB

The ECD-1-USB flaw detector is designed to detect production, operational and stress corrosion cracks in metal structures, including under a layer of insulating coating and/or corrosion.

Controlled objects: pipes, oil and gas pipelines, energy, chemical and special production facilities, parts of structures, machines, mechanisms, etc.

An eddy current flaw detector can be a component of a control system with the ability to interface with a PC, store and process data.



Main technical characteristics of the flaw detector:

- Minimum detectable defect size:0.1 mm
- Minimum defect disclosure:0.005 mm
- Maximum distance between eddy current transducer and product surface: 0.5mm
- Operating temperature range: -15...+40
- Dimensions of the electronic unit of the flaw detector:90 x 50 x 25 mm
- Power supply of the flaw detector: fromUSB PC interface
- Weight of the flaw detector: a little more0.15 kg.

Eddy current thickness gauge for dielectric coatings
VTDEP-1 microprocessor

The thickness gauge is designed for non-destructive testing and measurement of the thickness of bitumen, film and other dielectric protective coatings on electrically conductive (metal) substrates.

The device is used to measure the thickness of protective insulation on oil and gas pipelines before laying them in the ground or carrying out repair and preventive work, controlling fire-resistant coatings on steel metal structures, etc.

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Main technical specifications	
Coating thickness measurement range, mm	0.2 - 20.5 *
Minimum base thickness, mm	1.0

* - depends on the converter

MAGNETIC FIELD VOLTAGE METER PF-2M

The PF-2M meter is designed to measure the intensity of stationary magnetic fields.

The device makes it possible to determine the magnitude and direction of local magnetic poles, and allows you to determine the magnitude of the residual magnetization of products and their components made of ferromagnetic materials.

The device can be used to detect ferromagnetic magnetized bodies in biological objects.

Technical specifications

The PF-2M meter has 5 sensitivity ranges: 50; 100;

200; 300; 400 A/m

Measured fields are constant.

The limit of the basic induced error of measuring the magnetic field strength is ±10%.

AC power supply

voltage 220 ± 10% V

frequency 50 Hz

The power consumed by the device is no more than 3 W.

Overall dimensions:

magnetic field strength transducer, length – 105 mm, diameter – 10 mm;

electronic unit – 158x209x289 mm.

Device weight – 2.5 kg.

Electronic residual magnetization meter ION-1M

Appointment:

The device is designed to determine the residual magnetization of parts and workpieces after demagnetization, as well as the residual magnetization of parts magnetized during magnetic particle inspection, grinding, unloading parts with a magnetic washer, and in other cases. The device consists of a housing with a digital indicator and a remote probe.

Technical specifications:

No.	Parameter	Value
1.	Measurement ranges	0-1999 A/m
2.	Measurement error not more than	5%
3.	Power consumption is slightly more	75 mW
4.	Permissible ambient temperature range	- 10 +40 °C
5.	Dimensions	120x75x35 mm
6.	Mass	0.12 kg