A2075 SoNet

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RF PATENT NO.108627

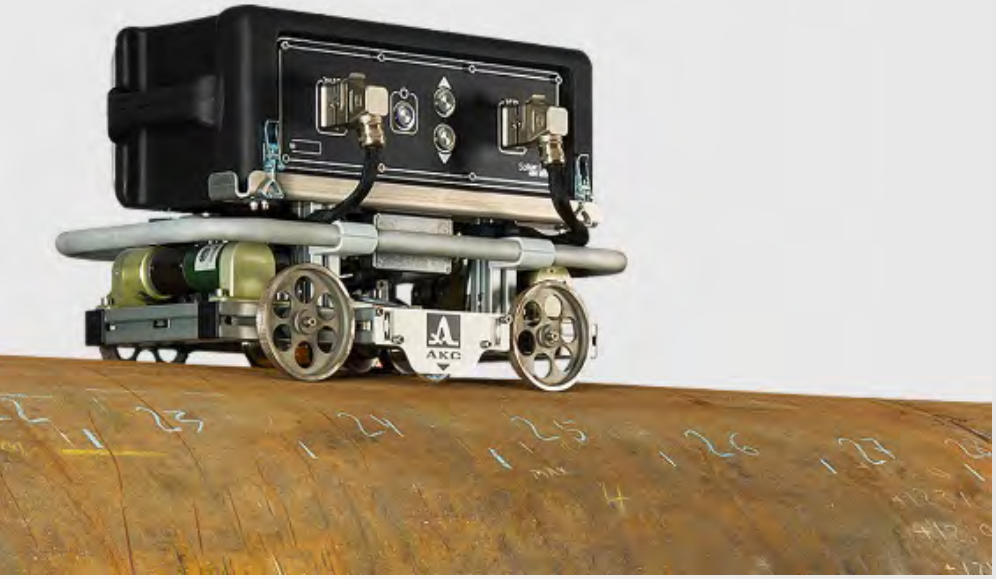
ACOUSTIC CONTROL SYSTEMS

Devices for non-destructive testing of metals, plastics and concrete

AUTOMATED ULTRASONIC SCANNER-FLAW DETECTOR

PRODUCT CATALOGUE

A2075 SoNet



AUTOMATED ULTRASONIC SCANNER-FLAW DETECTOR

Noncontact ultrasonic scanner-flaw detector A2075 SoNet is applicable for automatic flaws search in the metal pipe's walls of 720 – 1420 mm in diameter and with thickness starting from 6 mm.

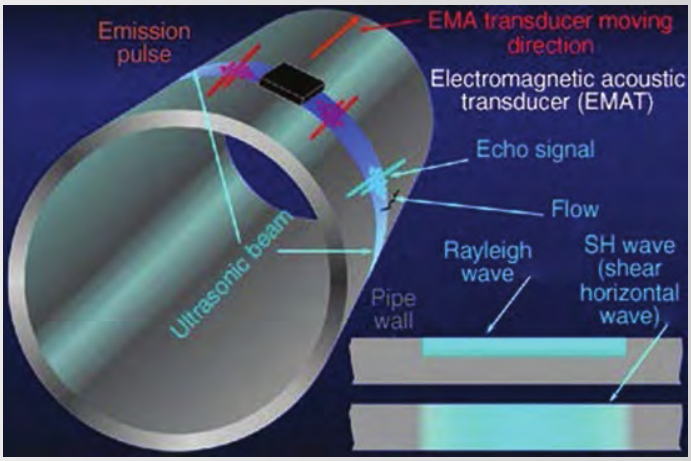
Mainly the instrument is used as a part of flaw detection sets. Such flaw detection sets are used for searching flaws in gas pipelines, oil pipelines and products pipe line during major repairs or during the construction process.

Scanner-flaw detector A2075 SoNet is able to successfully detect both types of flaws: stress-corrosion flaws and other surface or internal flaws of the pipe.

The inspection is conducted by an inline automatic moving of the inspecting part of a flaw detector along generatrix on the external surface of a pipe. During the inspection full circle flaw detection is held. An image of a pipe section is made right during the scanning that helps to estimate the flaws found, to plot the coordinates, to estimate their type and shape, using standard tools of nondestructive testing.

FEATURES

- Operating principle of the scanner- flaw detector is a wave guided pulse echo inspection technique excitation (sending) and receiving of ultrasonic waves in a pipe's body is made without a contact (without using a couplant) with a help of electro-magnetic acoustic (EMA) transducers.
- Detection of a stress-corrosion and corrosion flaws in the pipe's body. Detection of flaws in flats (sheet products) with indication of flaw's quantity, relative dimensions and locations (coordinates).
- Wi-Fi connection between the PC and the scanner-flaw detector provides a great mobility and the possibility for the operator to conduct testing remotely.
- An image of a pipe section is made right during the scanning that helps to estimate the flaws found and helps to decide if an additional inspection with the other NDT methods is necessary.
- Continuing documentation of the results as a scanning image of the pipe.
- Efficient review of the collected scan images in the screen of the Notebook.
- Post-processing of the scan images along with recording of the location, orientation and the type of the flaws.
- Time required to set up the instrument and start inspection is just 3 minutes.
- The possibility to upload the data from intratubal inspection and attach it to the main report.
- Block structure of the instrument makes it possible to promptly replace a broken blocks on-the-site by only one operator.
- Portability – the scanner – flaw detector can be carried by 2 people and can be operated by 1 user.

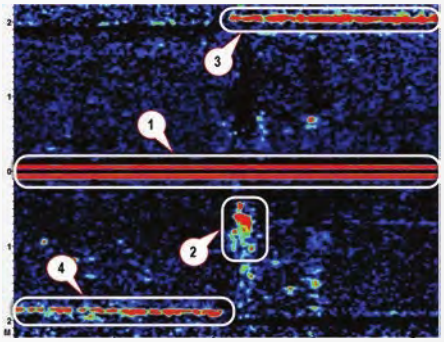


ADVANTAGES

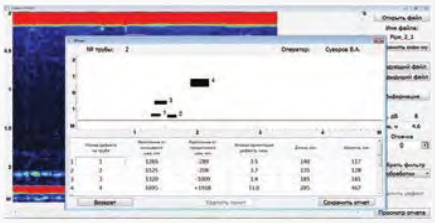
- Productivity – up to 7 meters of pipe per minute.
- High sensitivity – detection stress-corrosion flaws and corrosion from 1mm.
- Scanner flaw-detection is able to work on the pipe that has been earlier shelled from the old isolation.The scanner ensures 100% recurrence of the data.
- The scanner-flaw detector provides a high percentage of detectability of stress-corrosion flaws and delaminations comparing the result of a intratubal flaw-detection.
- High reliability – operating temperature range from -30° to +50°C.

SOFTWARE: SCAN IMAGES, REPORTS

The user gets the scan images of the pipe in real-time.



This scan image was taken from the pipe with 1 420 mm in diameter and 2 200 mm in length. In the center section of the picture an image of a "blind zone" of the transducer can be seen (1). Lower - there are the image corresponding to the stress-corrosion flaw (2). In top and bottom section of the picture image of a longitudinal joint (3, 4).



On the morrow of the pipe inspection, the operator mark out the abnormal areas. The operator prepares the report with the coordinates and location scheme of the detected flaws using the information from the abnormal areas that were marked out earlier.


Отчет по обследованию трубы №2 сканером-дефектоскопом А2075 SoNet

Номер дефекта на трубе	Расстояние от кольцевого шва, мм	Расстояние от продольного шва, мм	Угловая ориентация дефекта, часы	Длина, мм	Ширина, мм
1	1365	-289	3.5	140	117
2	1525	-208	3.7	135	128
3	1320	-1009	1.4	185	181
4	1895	+1918	11.0	285	467

The example of the report prepared with use of the gathered scan image is shown in the figure on the right. The main information about the testing object is reflected in the report. Black rectangles indicate the flawed areas which were marked out by the operator. Black horizontal line in the bottom of the figure indicates the longitudinal joint. The orientation of a black line is set by the operator during the scanning. Further, the coordinates and the dimensions of the flawed areas are listed in the table.

DELIVERY SET

- PC-Panasonic Toughbook CF-U1
- Charging unit with cable for PC
- Receiver-transmitter unit (RTU)
- Transfer platform
- Block of the electro-magnetic acoustic transducer
- Transportation packing for scanning device
- Transportation packing for RTU, PC and spare parts
- Passport (can be sent by e-mail)
- Operation manual (can be sent by e-mail)
- The standard (technique) of ultrasonic testing of a pipe's base metal with the non-contact ultrasonic scanner-flaw detector A2075 SoNet (can be sent by e-mail)

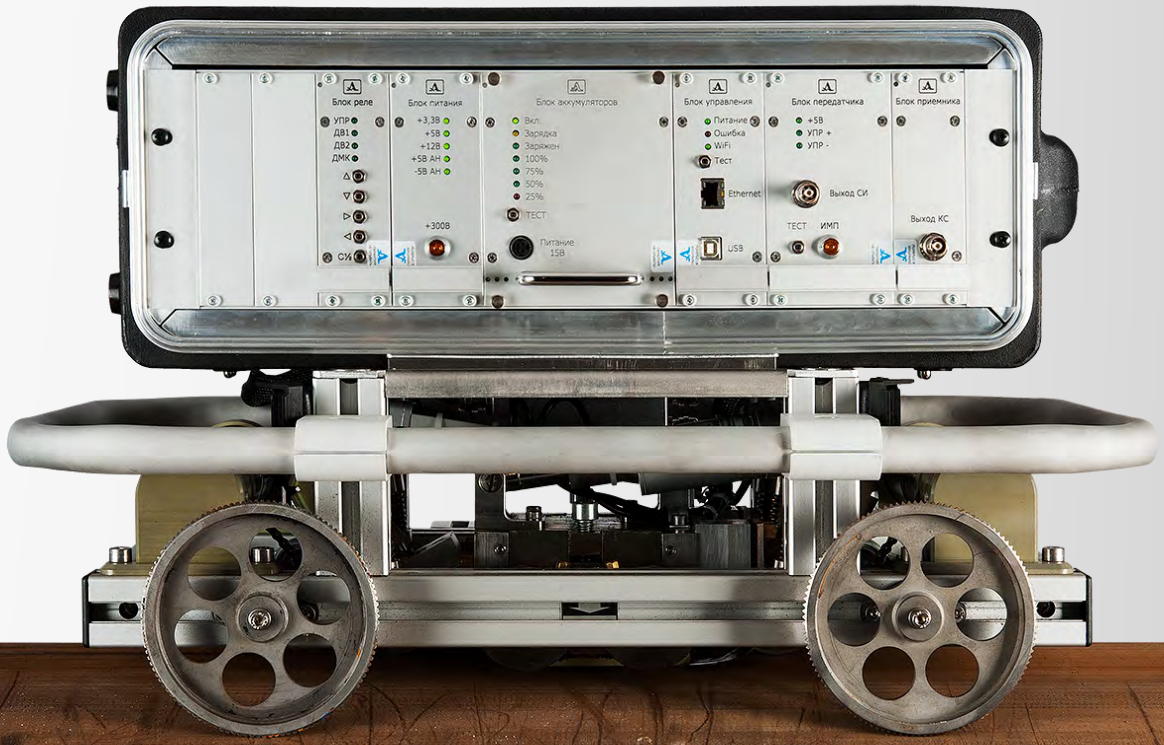
LIST OF SPARE PARTS AND TOOLS

- Inductor of the electro-magnetic acoustic transducer (3 items)
- General-purpose tester
- Cross screwdriver
- Flat-blade screwdriver
- Set of allen keys
- Allen key for the encoder

A2075 SoNet can be supplied with the additional items:

- Charging unit with cable for accumulator unit of (RTU)
- Accumulator for PC
- Field magnet of the electro-magnetic acoustic transducer

Velocity	3 020 m/s
Operating frequency	0.5 MHz
Range of the calibrated amplifier	from 0 to 40 dB
Limit of the acceptable basic absolute accuracy in measuring of the coordinates of the flaws along the circumference of the pipe, not more than	±100 mm
Limit of the acceptable basic absolute accuracy in measuring of the coordinates of the flaws towards the pipe, not more than	±20 mm
Maximum sensitivity of the receiver, not less than	20 μV
Measurement accuracy of the amplitude ratio of signals at the receiver input, not more than	±1 dB
Power	accumulator blocks
Voltage	12 V
Operating time (accumulator)	8 h
Weight	42 kg
Average error-free running time	30 000 hours
Average lifetime, not less than	4 years
Operation conditions:	
air temperature	from -40 to +50°C
relative air humidity at a temperature of +35 °C, not more than	95%
Dimensions	407 x 655 x 407 mm



ACOUSTIC CONTROL SYSTEMS

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