

# AUTS Axle-4(OS-4)



**System for automated  
ultrasonic inspection  
of railway axles**

# AUTS Axle-4 (OS-4)

## System for automated ultrasonic inspection of railway axles

### Purpose

- Main purpose of the system is to find all kinds of defects in railway axle body according to RD32.144-2000, EN 13261, M101, DSTU 31334 & BN 918275;
- The system is able to check machined or semi-machined axles during their production.

### Advantages

- Design of the system is compact and ergonomic
- The system can be either integrated into the production line or operated as a stand-alone inspection station
- Metal structure test is also provided to check the structure conformity to applicable standards
- High productivity of the system is due to absence of multiplexing schemes in eight scanning modules. Time required for inspection of one axle is up to 8 min.

### Key features

- Ultrasonic testing is automatically performed from the radial surface by immersion technique
- Axle to be tested is fully placed into the immersion tank, where it is rotated by central clamping devices, and the scanning is performed during linear motion of UT scanner along the axle
- The System evaluates equivalent sizes and depths of the defects
- An axle is inspected along its entire length, except for dead zones in its center and bolt holes
- Testing facility has its own closed-circuit system of immersion liquid intake, supply and purification.

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System for automated ultrasonic inspection of railway axles during production

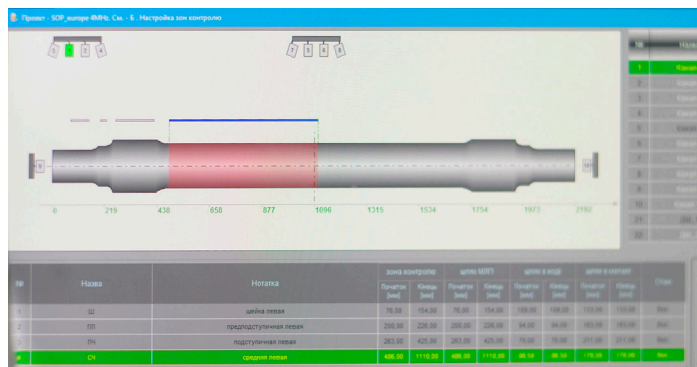
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## Test object (TO) parameters:

The System allows for the magnetic particle inspection of the railway axles within the following range:

Maximum diameter	300 mm
Maximum length	2600 mm
Minimum diameter	175 mm
Minimum length	2060 mm
Temperature of the TO	from 3°C up to 45°C



## Major technical characteristics of the Stand

- **UT module completed with the PETs provides for detection of the defects equivalent in their reflectivity to the artificial flat-bottom (FB) reflectors with the following diameters: 1,0; 1,5; 2,0; 3,0; 5,0; 6,0; 9,0 mm depending on the requirements of applicable standards – RD 32.144-2000, DSTU GOST 31334, GOST 33200, EN 5948, EN 13261, BN 918275, or AAR M-101.**

- **UT module completed with the axial PETs provides for detection of the defects equivalent in their reflectivity to the artificial FB reflectors with the following diameters:**

As per RD 32.144-2000:

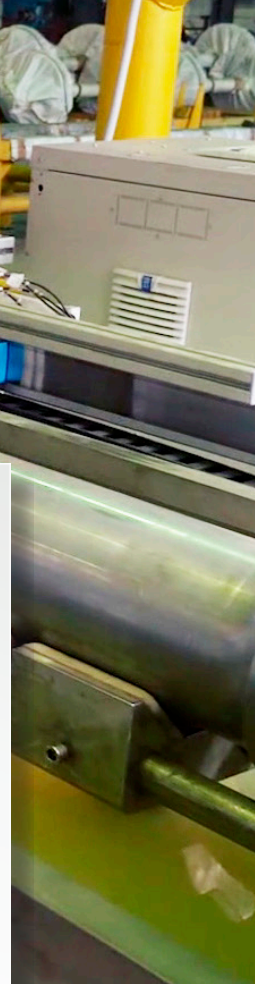
- - 3.0 mm (Se 7.1 mm<sup>2</sup>) at a depth of up to 380 mm
- - 6.0 mm (Se 28.3 mm<sup>2</sup>) at a depth of 380 to 700 mm
- - 9.0 mm (Se 63.6 mm<sup>2</sup>) at a depth of 700 to (l3/2+50) mm.

As per AAR M-101:

- - 3.2 mm at a depth of 2 inches to 15 inches
- - 6.35 mm from 15 inches to 30 inches
- - 9.5 mm from 30 inches to 46 inches







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23 May 2022 # 292

*Operation of the UMPK OS-38 System*

DDAP-RAX LLC is the manufacturer of finished railroad axles for Ukrainian market as well as for the countries of Europe, Asia and America.

Magnetic particle inspection System for the railroad axles testing UMPK OS-38 manufactured by ULTRACON-SERVICE LLC is being exploited by our enterprise since January 2022. It is used as a stationary quality control post integrated in the technological production line of the railroad axles.

**UMPK OS-38 System** ensures testing of finished products by the magnetic particle luminescent method in accordance with the DSTU EN ISO 9934, GOST 21105, ISO 6933, ASTM E1444 standards requirements to the MPI and provides confident detection of the surface flaws of different orientation on the railroad axles as per EN 13261, AAR M-101, AAR S-659, DSTU GOST 31334, GOST 33200, RD 32.144-2000 standards requirements.

Manufacture and assemblage of the **UMPK OS-38 System** are completed taking into account customized requirements to building, dimensions and disposition of the System itself and its control units.

To date, the System's being successfully used; it allows to follow the requirements of both internal and export specifications to high quality non-destructive testing of the axles.

In February 2022, the Magnetic Particle Inspection System **UMPK OS-38** for railroad axles testing successfully passed the audit (Technical Inspection of finished axles) in compliance with the Standard AAR S-659 (Section G-II).

**Deputy Head of Q&C**

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