R-Scan Ultrasonic Corrosion Scanner (Raqeb Model)
PUS (CI 110)

-The Importance of Corrosion Inspection

-Ultrasonic Testing

-Ultrasonic Corrosion Inspection Scanner R-Scan (Raqeb Model)

Key Advantages

- Lightweight and durable aluminum chassis
- Precision magnetic wheel system equipped with high-resolution encoder
- Integrated ultrasonic wheel probe with automated wetting mechanism
-10-inch high-definition touchscreen display
- Operates without the need for couplant or external water supply
- Capable of corrosion monitoring and thickness measurement (range: 2–100 mm)
- Reliable performance on coated surfaces up to 10 mm thick
- High-speed scanning of pipes with diameters as small as 50 mm

The Importance of Corrosion Inspection

Tanks, pipelines, fittings, and valves are critical components of equipment used in the oil, gas, and petrochemical industries. Due to continuous exposure to the stored process fluids, these components are prone to corrosion over time. Corrosion typically occurs as a gradual reduction in wall thickness, caused by metal loss from the internal surfaces of the equipment. This degradation can lead to structural defects, internal wall failure, leakage, complete rupture, or even explosion. Failure to detect corrosion and its associated damage in a timely manner can result in catastrophic and often irreversible consequences—impacting human safety, operational costs, and the environment. With the rapid advancement of modern Non-Destructive Testing (NDT) technologies, it is now possible to inspect equipment without causing any damage. Ultrasonic inspection systems, in particular, offer high-precision corrosion monitoring and wall thickness measurement. These technologies significantly improve defect detection accuracy, enhance operational safety and reliability, and reduce the overall inspection cycle time.

Ultrasonic Testing

Ultrasonic testing is undoubtedly one of the most practical non-destructive testing (NDT) methods for detecting corrosion and measuring the thickness of metallic tanks.

This method requires access only to the external surface of the equipment. There is no need to open or access the internal surface, making it suitable for in-service inspections.

During the ultrasonic testing process, high-frequency sound waves are transmitted into the wall of the tank or pipe using a probe. These waves reflect off the inner surface and are received either by the same probe or another one.

The received echoes are converted into electrical pulses and sent to the ultrasonic device. The device amplifies and filters these signals, then displays them on its screen in waveform format.

By analyzing the time interval between the reflected signals and using the known speed of sound in the metal, the device accurately calculates and displays the wall thickness.

PEJVAK Rayan co

Pejvak Rayan Company

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Corrosion Inspection Capability

Applicable Components and Materials:

- Various types of metallic pipes and tanks exposed to corrosive fluids
- Transmission pipelines with diameters of 2 inches and above
- Fittings and elbows
- Valves and structural components
- Metal sheets and plates
- Automotive CNG cylinders
- Various types of industrial steam boilers

Ultrasonic Corrosion Inspection Scanner R-Scan (Raqeb Model)

Model PUS (CI 110), Manufactured by Pejvak Rayan

The semi-automatic **R-Scan (Raqeb)** scanner is designed for ultrasonic corrosion inspection and thickness measurement of metallic pipes and tanks.

It supports both ferrous and non-ferrous materials with diameters of **50 mm (2 inches) and above**, and wall thicknesses ranging from **2 to 100 mm**. The system enables precise monitoring of corrosion and accurate thickness evaluation.

Using a portable mouse-like scanner that moves along the outer surface, it transmits ultrasonic waves into the internal wall.

The reflected signals are analyzed to measure wall thickness and assess corrosion. Results are displayed in both numerical and graphical formats, including **A-Scan, B-Scan, Thickness Digit**, and **Heat Map**.

Equipped with magnetic wheels and an encoder, the scanner can move quickly over curved surfaces. This allows continuous, real-time monitoring of thickness as digital values and full-color profiles. Compared to conventional point-based thickness gauges, this system offers the added advantage of visual mapping.

Key features include

- **Full access to all parameters and configurations** via dedicated software
- **Accurate positioning of internal corrosion** with colored B-Scan visualizations
- Advanced electronics, such as **high-speed FPGA microprocessors**, enable the integration of intelligent and up-to-date features.
- The system stores all inspection data and images, which can be exported offline or as Excel files for further analysis.

Technical and Functional Highlights

- **Advanced Wheel Probe Technology**: Utilizes a wheel probe system equipped with an automatic wetting mechanism, eliminating the need for couplant and simplifying inspection procedures.
- **Versatile Surface Scanning**: Capable of scanning a wide range of geometries, including straight pipes, elbows, and bends, ensuring full coverage of complex components.
- **Dynamic Gain Control**: Incorporates dynamic gate adjustment to compensate for probe-to-surface variations, significantly reducing operator-induced errors and enhancing measurement accuracy.
- **B-Scan Visualization**

In the B-Scan view of the software, varying material thicknesses are displayed in distinct colors. Each thickness range is assigned a specific color code, enabling clear and immediate identification of wall thinning caused by corrosion or erosion. This intuitive visual representation allows operators to quickly assess structural integrity and detect critical areas at a glance.

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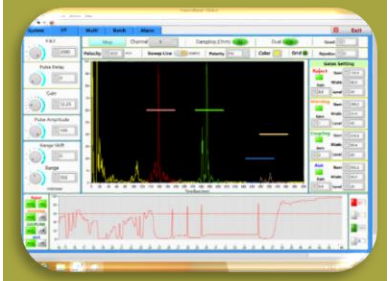

Competitive Advantages of the Raqeb Scanner Compared to Foreign Models

- **50% lighter** than comparable foreign models, enabling easier handling and installation
- **Capable of testing through coatings** up to 10 mm thick, eliminating the need for surface removal
- **Simplified result interpretation**, reducing operator dependency and training time
- **Highly competitive pricing**, offering superior cost-efficiency
- **Fast access to spare parts and technical service**, ensuring minimal downtime
- **Comprehensive and ongoing training** available locally within the country
- **Warranty and after-sales support provided inside Iran**, ensuring long-term reliability and peace of mind

Advantages of the PUS (CI 110) R-Scan Ultrasonic Corrosion Scanner

- ✓ **Ultrasonic-based thickness measurement and corrosion monitoring of ferrous and non-ferrous pipes and tanks**
- ✓ **High safety standards with no environmental or human health hazards**
- ✓ **No need for internal surface access of pipes or tank walls**
- ✓ **Capable of in-service inspection without interrupting operations**
- ✓ **Integrated data acquisition and storage for test results**
- ✓ **Offline and online reporting and analysis of inspection data**
- ✓ **High-precision thickness measurement up to 0.01 mm accuracy**
- ✓ **Ability to inspect through coatings up to 10 mm thickness**
- ✓ **Eliminates the need for consumables such as corrosion coupons**
- ✓ **Easy-to-use interface and operation**
- ✓ **Lightweight and portable design**
- ✓ **No requirement for liquid couplants (e.g., water)**
- ✓ **Dedicated software with permanent image storage of detected corrosion areas**
- ✓ **Full data logging functionality with both real-time (online) and post-inspection (offline) monitoring and reporting capabilities**

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Advantages of choosing Pejvak Rayan Company

Industrial Ultrasonic Testing Equipment Manufacturer

-Trusted Expertise:
Over 20 years of experience in ultrasonic testing systems.

-Advanced Technology:
High-accuracy flaw detection with global standards; suitable for pipes, billets, rebars, ingots, sheets, and plates.

-Cost-Effective Quality:
Competitive pricing tailored for Asian markets — without compromising performance.

-Complete Service:
On-site installation, professional training, and ongoing technical support.

Experience world-class technology with region-friendly pricing

Pejvak Rayan – Precision You Can Rely On

Specifications of the RAQEB Ultrasonic Corrosion Inspection Scanner		
1	*Testing Principle*	*Ultrasonic Wave Propagation*
2	*Functionality*	*Wall thickness measurement and corrosion monitoring of pipes and tanks with diameters above 50 mm and wall thickness ranging from 2 mm to 100 mm.*
3	*Probe and Cable*	*One dual-element (T/R) wheel probe, operating at a frequency range of 5 to 10 MHz (adjustable based on the thickness of the test object), equipped with a specialized ultrasonic test cable and encoder compatibility.*
4	*Detectable Artificial Defects*	*Flat-bottom hole (FBH) with a 2 mm diameter, tailored according to the thickness and material of the test piece.*
5	*Test Mode*	*Semi-automatic operation.*
6	*Couplant System*	*Semi-automatic oil injection system; no need for continuous manual application of couplant by the operator.*
7	*Calibration Storage*	*Capable of storing up to 2000 calibration profiles and various configuration settings, with easy recall functionality.*
8	*Test Data Recording*	*All test results are recorded in B-Scan format, with the ability to annotate part numbers, defect locations, and wall thickness values. Data can be exported via USB flash drive or CD and presented to inspection personnel.*
9	*Accessories*	*Magnetic four-wheel mouse-type scanner for manual deployment, equipped with an encoder and flexible spring-loaded probe holder (Probe Wheel), plus one standard calibration block.*
10	*Display System*	*A-Scan, B-Scan, Digital Thickness Display, and Heat Map.*
11	*Special Features*	• *Independent gain (sensitivity) adjustment for each gate.* • *Real-time point-to-point thickness display directly on B-Scan images.* • *Dynamic gain control capability.*
12	*Testing Technique*	*Dry coupling using the Probe Wheel.*
13	*Battery*	*Rechargeable lithium-ion battery supporting up to 8 hours of continuous operation. Input: 5V, 6.5A; Output: 3.2V.*

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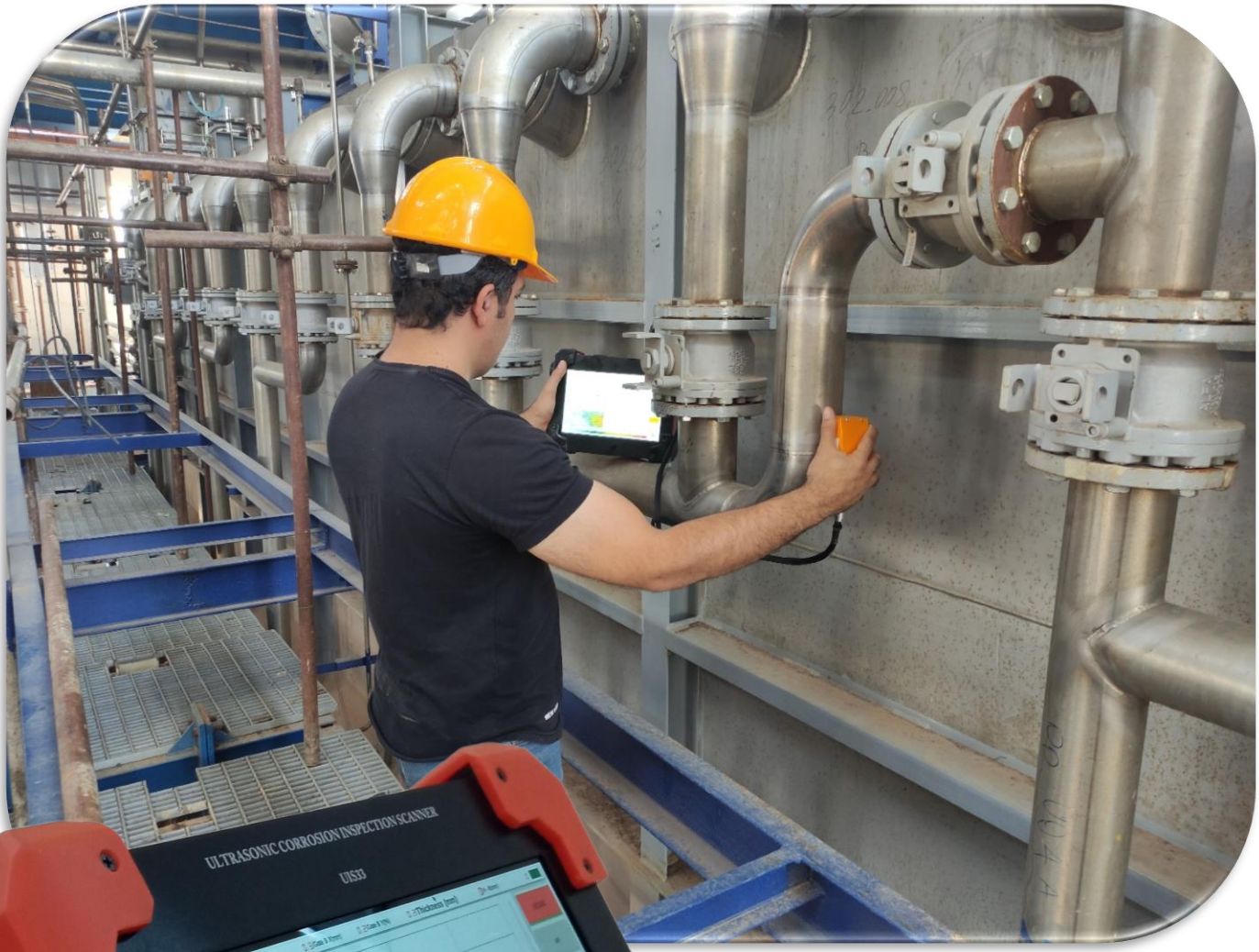

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