Tethered Ultrasonic Measurement Solution

High Resolution Wall Measurement and Defect Sizing

Accurate and precise feature classification and sizing

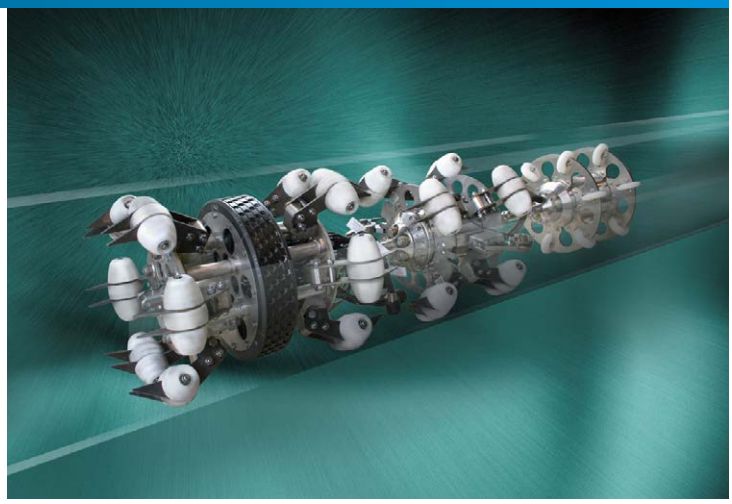
Remotely controlled crawler module with bidirectional motion

The inspection system allows for combining technologies

Unlimited power and real-time data through cable connection

Economical in-service inspection with a single entry/exit point

Some pipelines cannot be inspected with standard in-line inspection (ILI) solutions.
These pipelines can be classified as "unpiggable" for various reasons, including single access and limited pumping abilities.
Modification of these pipelines to enable standard in-line inspection procedures can be both expensive and technically complicated.



Solution

The inspection of these pipelines is made possible by ROSEN's TUM bi-directional self-propelled tethered inspection unit, which specifically addresses the challenges of single access and limited pumping abilities. Crawling both forward and backward through bends for up to 7.4 miles (12 kilometers), this solution provides high-resolution results in real-time. This high-performance bi-directional capability is achieved through lightweight low-friction modules, including the sensor carrier, electronic modules and data storage, combined with a powerful wheel-driven crawler. A cable supplies electrical power to the tool, brings the measured data to the control unit at the launching site, allows remote steering of the crawler and acts as a means for recovery in emergency situations. Certified data analysts can see corrosion and other defects immediately during the inspection and will provide a preliminary report on-site. A final report will be delivered upon completion of a detailed review of the inspection data. Additional integrity assessments such as corrosion growth and fitness-for-purpose as well as additional visualization software can also be delivered as required.

Benefits

- Accurate and precise feature classification and sizing by quantitative ultrasonic measurement
- Two sets of data (on both the inbound and outbound run) to ensure full coverage
- Real-time data analysis and preliminary report on-site, followed by a thoroughly reviewed final report
- Economical in-service inspection with single entry/exit point and no pumping required
- Unique tool configurations addressing individual operational requirements
- ASNT qualified personnel and ATEX Zone 2-certified equipment

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empowered by technology

Service Options

All aspects – from the inspection request to the final report – are covered with the flexibility to choose from various service options:

- ≥ 6" (4" in development), dual-/multi-diameter on request
- Geometry and wall thickness inspection in one run
- Post ILI – data alignment and combined evaluation
- Integrity assessments – RBI, FFP, CGA
- Easy-to-use visualization software
- Crack detection with shear wave technology and TOFD (axial and circumferential)
- On-board camera (for use in clear product)

Remarks and Features

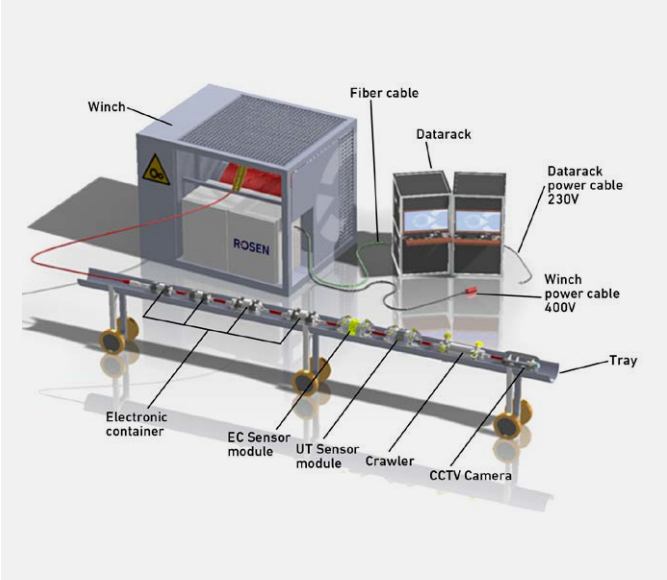
- Other tool sizes are available on request
- Higher pressure rating available on request
- Tailored solutions with different specifications available
- API 1163 certified services
- CE and ATEX certification available
- Specifications are subject to change according to specific requirements or tool configurations
- Contact ROSEN for more detailed information about the presented service

Technical Specifications

Standard Operating Specifications

Tool sizes available	6" - 48" (56")
Pipeline product	Liquids
Product temperature range	32°F - 149°F (0°C - 65°C)
Maximum operating pressure	508/1450 psi (35/100 bar) depending on tool
Operating speed range	Up to 0.22 mph (350 m/h)
Wall thickness range	0.160" - 2.000" (4 - 50 mm)
Minimum pipeline bend radius	1.5D
Maximum operating time	Unlimited

Note: Contact ROSEN for more detailed information.



Location and Orientation Capabilities

Axial position from closest weld	±4" (±0.1 m)
Circumferential position accuracy	±5°

Sizing Capabilities

	General metal loss Ø≥0.4" (10 mm)	**Pitting Ø≥0.32" (8 mm)**	**Axial grooving width ≥0.32" (8 mm)**	**Circumferential grooving length ≥0.32" (8 mm)**
Depth at POD = 90%	0.02" (0.4 mm)	0.06" (1.5 mm)	0.06" (1.5 mm)	0.06" (1.5 mm)
Depth sizing accuracy at 95% certainty	0.02" (±0.4 mm)	0.02" (±0.4 mm)	0.02" (±0.5 mm)	0.02" (±0.5 mm)
Width sizing accuracy at 95% certainty	0.06 - 0.12" (±1.5 - 3 mm)	0.06 - 0.12" (±1.5 - 3 mm)	0.06 - 0.12" (±1.5 - 3 mm)	0.06 - 0.12" (±1.5 - 3 mm)
Length sizing accuracy at 95% certainty	0.24" (±6 mm)	0.24" (±6 mm)	0.24" (±6 mm)	0.24" (±6 mm)

Abbreviations: POD = Probability of Detection
Length and width sizing depending on actual sampling rate and circumferential sensor spacing (resolution)

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