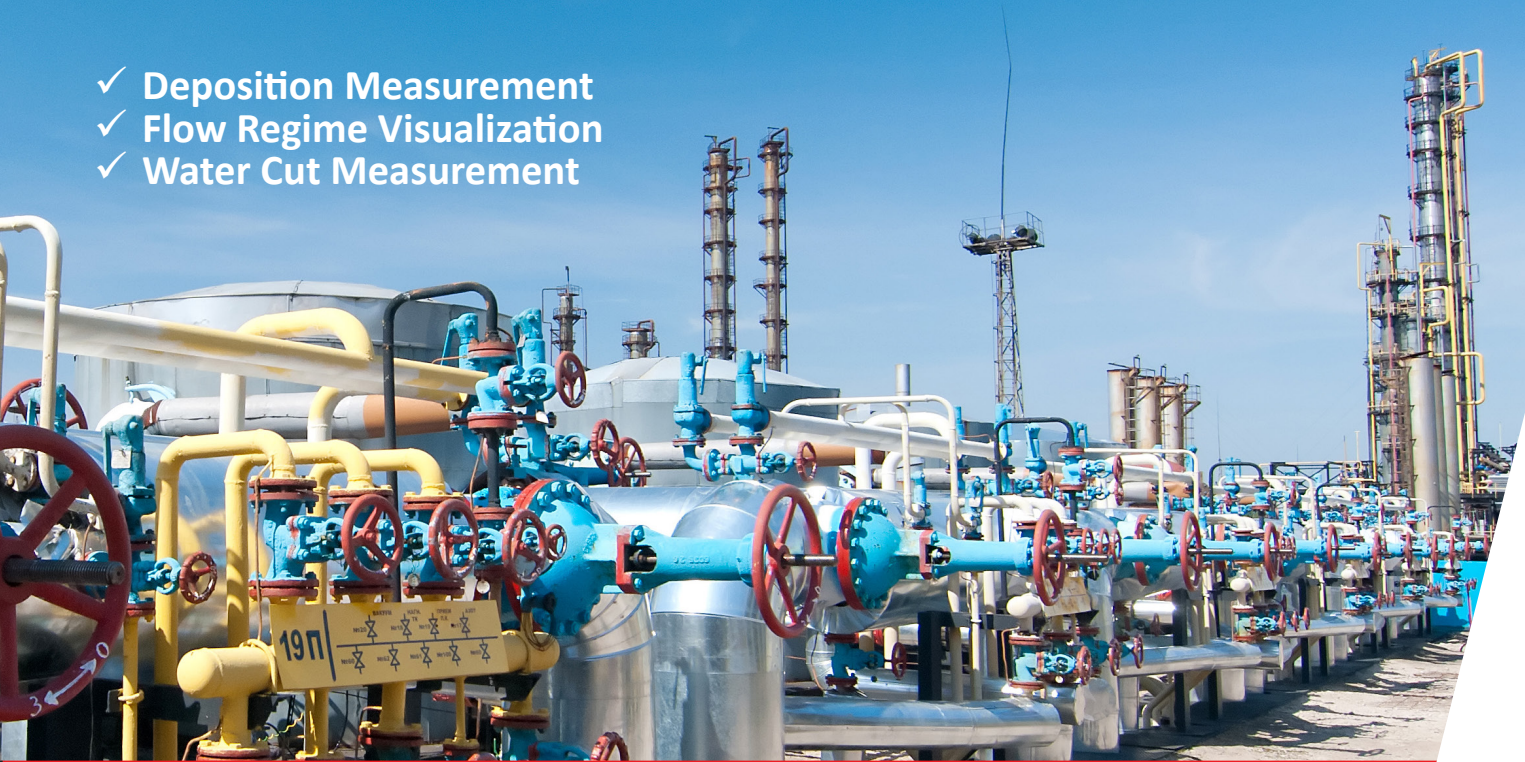


PIPELINE MONITORING

- ✓ Deposition Measurement
- ✓ Flow Regime Visualization
- ✓ Water Cut Measurement



**How costly is an unplanned pipeline shut down?
Can we see and measure pipeline deposits in real-time?
What is the possibility of water-cut measurements when no
mixing is available?**

Pipelines are critical assets to the various segments of the Oil&Gas industry. The ability to see the inside of pipelines in real-time has been a dream of the industry. ROCSOLE's Electrical Tomography based SEE BEYOND technology, is the answer that is sure to make measurable savings for the operators. Considering the costs involved and the rising demand for energy efficient operations, real-time process insights linked to pipeline deposits and un-detected water and gas slugging are highly valuable. ROCSOLE provides a variety of services and data analytics to improve the business value of the customer. These solutions can be provided as an integration into the existing control systems or as cloud-based SaaS Services.

ROCsole
SEE BEYOND.

PIPE SENSOR

PERFORMANCE

Technology	Electrical Tomography	Resolution	11- 22mm (0.43- 0.87")
Accuracy / Precision	Application dependent (Please contact Rocsole)		
Typical Diameters	2" - 10"		
Pressure Range	Up to 242 bar (3520 PSI)		
Temperature Range	Up to 175 °C (350 °F)		

ELECTRICAL CHARACTERISTICS

Supply Voltage	24Vdc	Output	- Modbus/TCP
Electronics	24Vdc @ 3A		- Modbus/RTU (RS485 & RS232)
Computer	24Vdc @ 3A		- Analog 4-20mA

MECHANICAL CHARACTERISTICS

	Weight	Material	Zone
Pipe	Varies	Varies	Zone 0
Electronics Cabinet	44.9 - 76.8 Kg	Varies	Zone 1
Computing Unit	30 Kg	SS 1.4404 (AISI 316L)	Safe Zone

ZONE 0

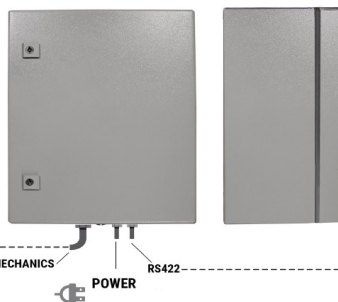
MECHANICS PIPE



CABLE CONDUCTOR

ZONE 1

ELECTRONICS CABINET



MECHANICS

POWER

RS422

SAFE ZONE



TOMOGRAPHIC
IMAGE

INTERFACE
TRENDS

ENVIRONMENTAL

Approvals	ATEX, IECEx, CSA (optional)	Operating Temperature Sensor	-40 .. +175 °C
Method of Protection	No special needs	Operating Temperature Electronics	-40 .. +50 °C
Installation	With online factory support	Operating Temperature Computing Unit	-40 .. +50 °C
Compliance	EN	System Storage Temperature	-40 .. +65 °C

ADDITIONAL INFORMATION

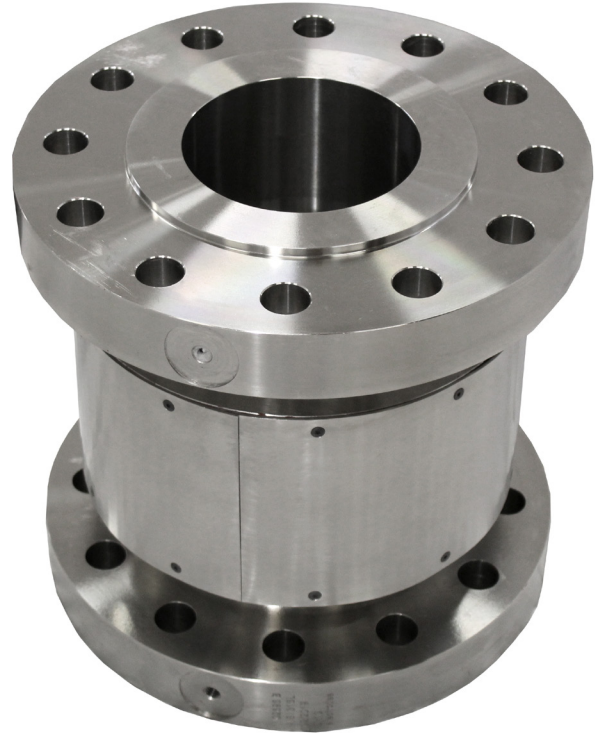
Spares	Separate list, please ask from Rocsole
Product Code	PIPE-8 .. 64
Software	Rocsole Webroc

PIPE APPLICATION

KEY FEATURES:

- Reliable and real-time measurement
- Works in conductive and non-conductive fluid media
- Pipeline deposits, Flow regime visualization and water-cut all in one sensor
- Full cross-sectional measurement – SEE the “big picture”
- Signals are always backed up with 3D imaging
- Sensor works even when contaminated
- Material of the deposit can often be identified
- Different phases flowing can be differentiated
- Works in multiphase flow regimes
- Water-cut can be measured in difficult flow conditions
- AI based trending of the data

ROCSOLE PIPE SENSOR:



BENEFITS:

- Optimize pigging requirements and pipeline cleaning
- Helps to validate pigging efficiency
- Prevent unplanned shut downs
- SEE BEYOND helps to utilize the full pipeline capacity
- No re-calibrations required
- No radioactive sources involved and is completely safe
- Easy user-interface, integrates into existing control systems
- Detailed data analytics available
- Customized reporting available

USER INTERFACE:



ROCSOLE is the world's leading provider of tomographic equipment for the process industries. We have invented and innovated the area of robust and reliable in-situ sensors paired with our software using electrical tomography through our own design, development and testing. We have carried out a vast number of trials and pilot project with customers. Our solutions are industrial scale with fast-acting and high-resolution technology capable of determining and monitoring deposits and emulsified liquids in real-time for critical processes.

Our solutions are used in multi-industry. Oil & Gas has challenges with emulsion layers and quick deposit build-ups. The similar challenges are found not only in Pulp & Paper, Food Processing, Detergent production (FMCG), Chemical Industry but also in the Semiconductor Production Process. ROCSOLE™ is commercially active in these sectors, with the focus area being Oil & Gas.

ROCSOLE™ has a broad IP portfolio with worldwide granted patents. We are backed by Shell Ventures, Repsol Energy Ventures, Equinor Energy Ventures as well as the Finnish TESI investment company.

For more information, visit
www.rocsole.com

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SEE BEYOND.