

# METRAVI PRO<sup>®</sup>

## PRO AI-09 / PRO AI-09EX INDUSTRIAL ACOUSTIC IMAGER

### PRODUCT INTRODUCTION

The Metravi Pro AI-09 Industrial Acoustic Imager helps industries reduce losses caused due to gas leakage, partial discharge and other accidents. It shows you the exact location of leaks and the software tells you how much they cost annually, assisting you in keeping energy expenditures and hence, production costs low. Compared to traditional ultrasonic leak detectors and other conventional methods, the Metravi Acoustic Imager is considerably more accurate and improves energy efficiency.

Natural gas companies, petrochemical plants, chemical plant areas, metallurgical plants, pipelines in the manufacturing industry, automatic braking systems on the bottom of trains in the transportation industry, and wind blade manufacturing plants, all have complex pipeline distributions, complex gas types and high testing requirements. Traditional detection methods are difficult to cover comprehensively and easily leave behind hidden safety hazards. With the use of an acoustic imager, all types of gas pipelines leaks can be detected.

The Pro AI-09 quickly scans large areas and locates leaks by listening to, recognising, and analysing the sounds they emit. Real-time sound image display, helps the detection of pressurised or vacuum leaks significantly faster compared to other conventional methods. The device only needs adjustments for the test frequency range and the test dynamic range to meet varied test requirements.

The imager adopts an aluminium alloy shell, which is sturdy & durable, and can adapt to the complex and changeable working environment. It is easy to operate and can be used quickly.

It supports camera mode, video mode, and offers flexible on-site data recording. The large-capacity TF data storage card can be expanded, and the test results can be quickly exported and reported.

### FEATURES

#### High-performance Microphones for Efficient Detection and High Accuracy

**128 digital MEMS microphones** provide exceptionally high sensitivity, sound resolution and detection accuracy, real-time audio-visual display, anti-jamming, help detection.

#### Leakage Assessment

By activating the leak measurement function, the camera continuously displays the amount of leaks and losses as well as the level of loss.

#### PD Detection & PD Type Identification

Partial discharges are detected before serious faults occur, even faster than a thermal camera would detect them.

#### Analytics and reports

Template-based processing and recording of data, waveforms, spectra and spectrograms are supported by a report analysis tool software, generating ISO-50001 compliant, editable protocols in Excel format.

#### Multi Gas Detection

Leaks of all pressurised gases can be detected, regardless of the type of gas, including SF6.

#### Fully Functional

All-round recordings of test results with photos, audio and video. Automatic export of reports, ledgers and data processing function.

#### Ideal Protection

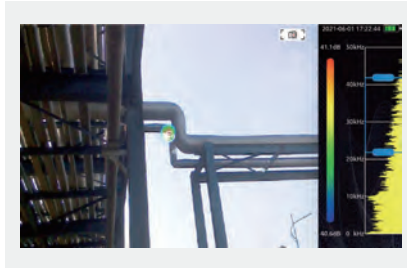
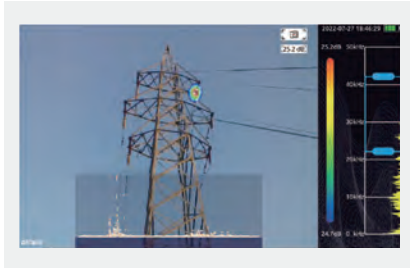
Ingress Protection Grade IP54. **Explosion-proof\* ATEX certification (Only in Pro AI-09EX).**



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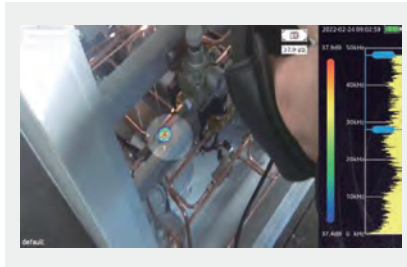
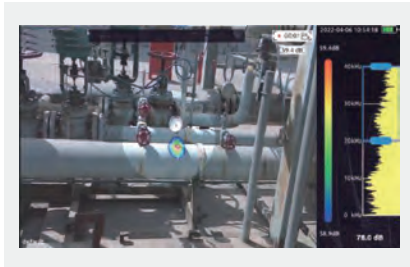
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### FEATURES



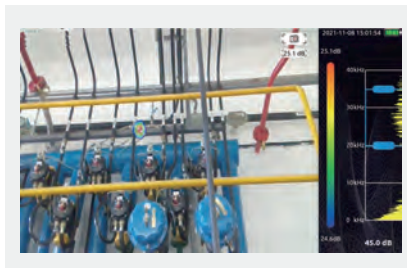
### Large Test Distance Range

The effective test distance is 0.3m-120m



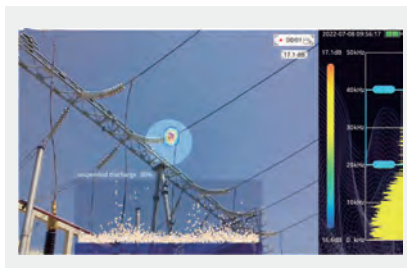
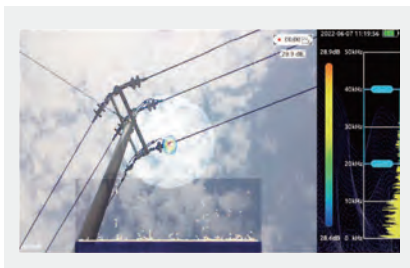
### High Test Accuracy

The leak detection rate is 1m,7bar, 0.37ml/s, 10m,7bar,0.7ml/s.



### High efficiency

With the high refresh rate of 25FPS and a large field of view of 62°, it helps make efficient inspections.



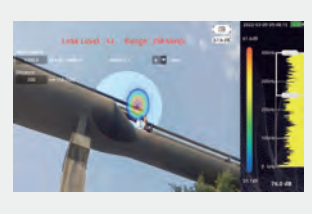
### High resistance to interference

With the "focus" function and advanced anti-interference algorithms, it eliminates peripheral interference.

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### FUNCTIONS



### Leak Rate Quantification

Pro AI-09 Acoustic imager is able to realistically estimate the leak flow rates. The screen shows the leak level and corresponding economic value loss data.



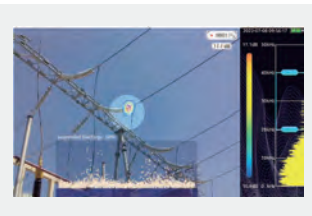
### Focusing Function

The focusing function is mainly used to eliminate environmental interference noise, reflection noise and multi-source interference. It narrows the test area to the aperture, eliminating interference from sources outside the aperture and helping you to find small leaks in complex sound field environments.



### Ultrasonic Monitoring

The equipment can modulate the signal in the ultrasonic frequency band to the audible frequency band, and can monitor the sound with headphones. Ultrasonic modulation is realised by superheterodyne. The reference frequency of modulation can be set. It is recommended to use a frequency band of about 38.6kHz for near modulation and monitoring.

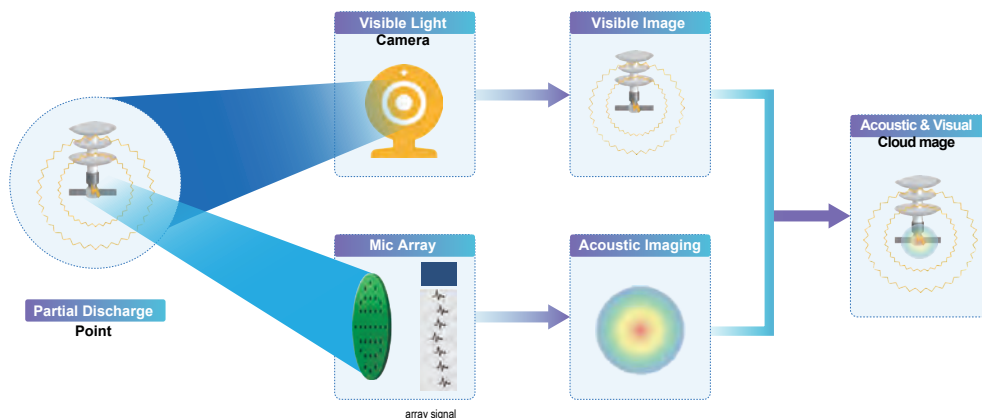


### PRPD

The acoustic imager comes with a PRPD mapping function that can judge the type of partial discharge and help the user to diagnose discharge faults.

## ACOUSTIC IMAGING PRINCIPLE

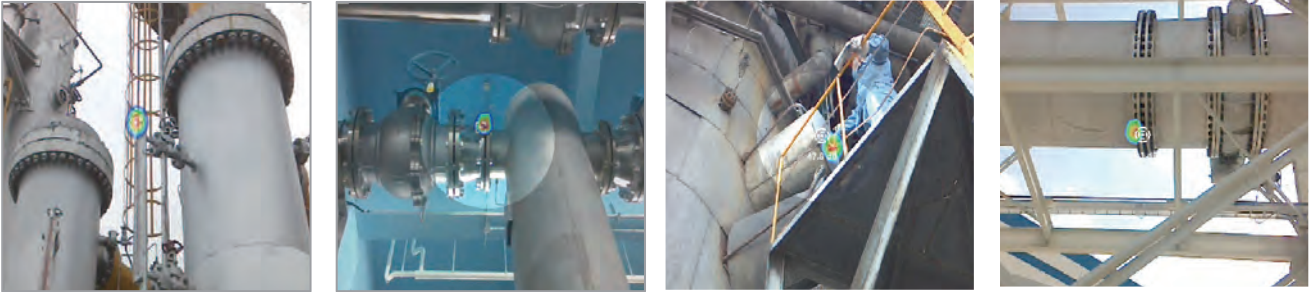
Acoustic imaging technology uses the inbuilt microphones array to scan and receive spatial sound waves, pinpoint the location of the sound source by the phase difference of the sound waves. Then superimpose optical information to obtain



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### INDUSTRIAL APPLICATIONS



### Gas Leak Detection for all pressurised gas leaks

Typical Application Industries:

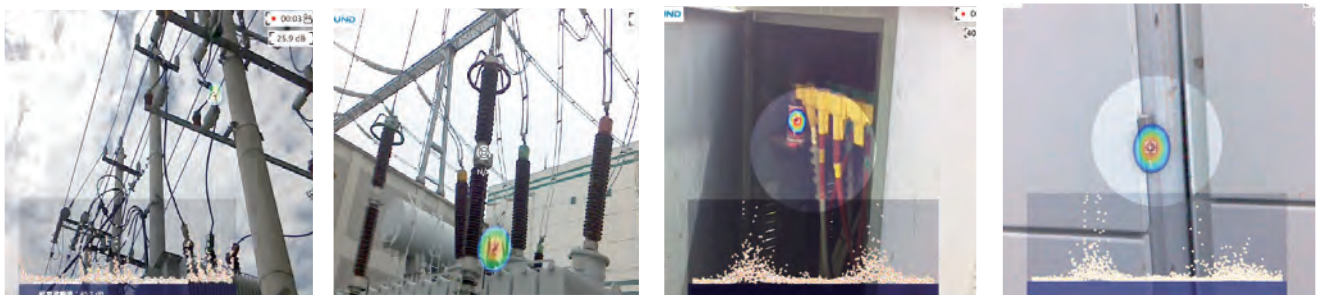
- Chemical, energy, smelting, manufacturing and other industries gas leak inspection
- Environmental Protection - Leak enforcement inspection
- Emergency Management -Hazardous gas leak enforcement inspection



### Periodic Air Tightness Testing for Pipes

Typical Application Industries:

- Rail Transport - brake systems
- Air Conditioning - heat exchanger Vehicles, ships, aircraft
- Chemical Industry - pipeline/installation Lithium batteries
- Tyre Manufacturing
- Wind Blades



### Partial Discharge Detection for self-distributed Power Plants & Sub-stations

Typical Application Industries:

- Chemical, energy, smelting, manufacturing and other industries gas leak inspection
- Environmental Protection - Leak enforcement inspection
- Emergency Management -Hazardous gas leak enforcement inspection

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### APPLICATION : GAS LEAK DETECTION CASES

It can be used in following industries: Power, Petrochemical, Oil & Gas, Manufacturing, Metallurgical, Food and Beverage, Automotive, Pharmaceutical, Transportation, etc.



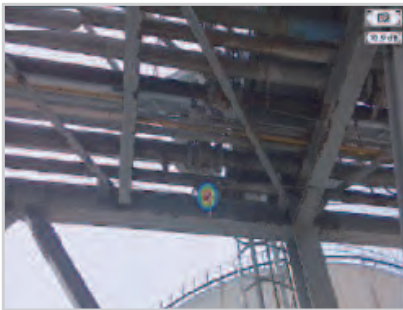
Overhead pipe flange leak



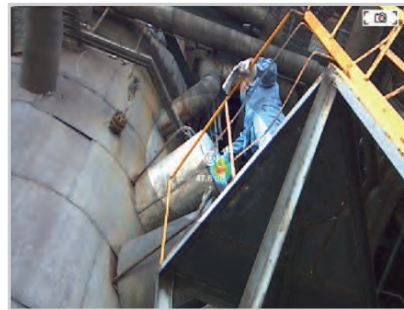
Giant steam flange leak



Workshop top pipe joint leak



Pipe welded seam leak



Blast furnace nitrogen leak



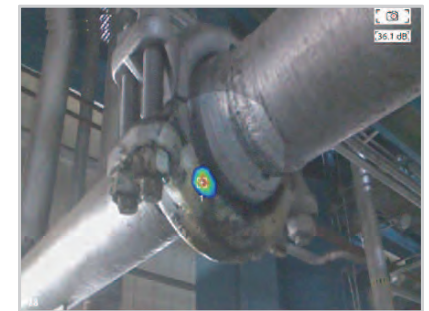
Dry Running gas seals/Nitrogen leak



Gas leak



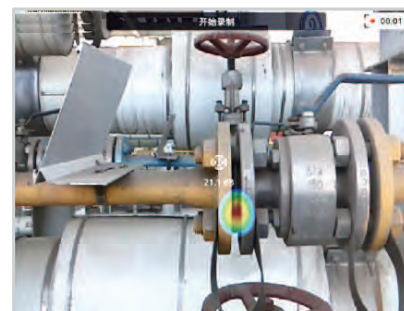
CO2 leak



Drain valve/exhaust gas leak



Flange/process gas leak



Nitrogen pipe/Flange leak



Natural gas valve leak

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### REPORTING SOFTWARE FEATURES



### Supports PD Identification and Leak Quantification

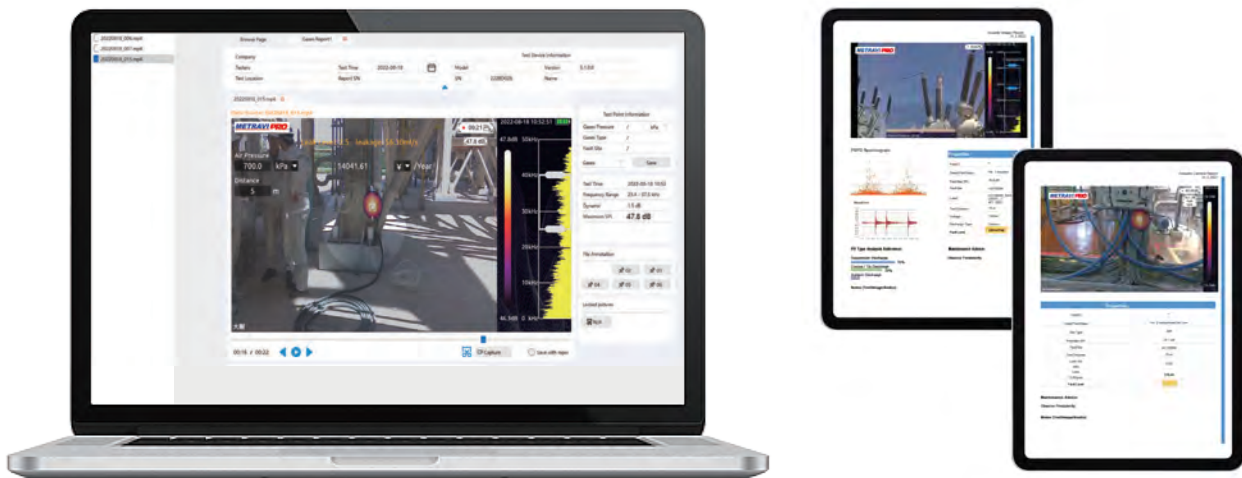
To develop a detailed report, the user can input certain variables such as gas type, pressure, gas cost, tester information, etc, among many other useful and necessary information. The analysis tool calculates leak and loss value estimate for all pressurised gases leaks, and assesses the severity of partial discharges, as well as judges the PD type with PPRD pattern.

### Meets ISO 50001-compatible Standards

Reporting software allows creation of organised and detailed ISO 50001-compatible reports with the images captured and videos taken using the Metravi Pro AI-09 handheld acoustic imager

### Provides Intelligent Algorithm

The built-in software, with cutting-edge algorithm, helps make intelligent maintenance decisions. The user does not need have in-depth knowledge and understanding to explain the results. Metravi developed and manufactured the acoustic imager and designed the software to fully work in sync to give comprehensive results and analysis, ensuring the accuracy and consistency of reporting.



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### TECHNICAL SPECIFICATIONS

#### ACOUSTIC SPECIFICATIONS

Microphone array	128 channels MEMS microphone
Effective test bandwidth	2kHz-48kHz
Dynamic range	0.5dB-12dB user adjustable
Test sound pressure level range	25.7-132.5dBA
Auto max/min dB gain	User-settable, minimum test bandwidth 1kHz
Number of digits	24bit
Sound image FOV	62°
Sound image frame rate	At least 25 FPS
Leak detection rate	10m 5bar 0.92ml/s 0.5m 5bar 0.55ml/s
Detect distances	0.3m-120m

#### CAMERA

Camera FOV	62°
Camera focal length	3.04mm fixed focal length
Camera pixel	8 million pixel

#### DISPLAY

Resolution	1024*600 (614,400 pixels)
Size	7 inch
Touchscreen	Capacitive touchscreen
Brightness	Adjustable
Photo notes	Up to 5 photos notes for reference
Source	Show single or multiple sources
Standard palettes	3: Grayscale, Ironbow, Blue-Red
Playback function	View photos, videos anytime, and add notes or tags

#### INTERFACE

USB 3.0 Type-C USB host port
3.5mm headphone socket

#### OPERATING ENVIRONMENT

Operating environment	-20°C - +50°C RH 10% - 95% no condensation
Storage temperature	-20°C - +60°C
Charging temperature	10°C - 45°C

#### STORAGE

Internal storage	About 8G
External storage	TF memory card, at least 64G, expandable to 256G
Data storage format	.jpg (picture), mp4 (video), .wav (recordings)
Video length	5 minutes
Digital export	TF Card

#### SOFTWARE

Report types	Gas/Electricity, ISO 50001-compliant
Analysis	Waveform, Spectrum, Spectrogram, leakage assessment, discharge type discrimination

#### GENERAL

Ingress Protection (IP)	IP54
Size	272mm×174mm×42mm
Weight	1.7kg
Warranty	2 years
Self-diagnostic notification	Array-health test function to identify when microphone array needs attention
System	Linux system
Certification	CE, FCC, RoHS-compliant, MSDS, CNEX, ATEX

#### POWER

Battery capacity	1×6600mAh@7.2V Rechargeable battery and 1×external battery package
Battery life	Continuous 4+6 hours operation time
Charger	USB Type-C port USB PD protocol supported, 15W
Power consumption	15W for battery charge; 29W for maximum power consumption
Energy management	Sleep/Auto power off modes