Measure Better Sound

Safety Scan USA

ACOUSTIC IMAGING TECHNOLOGY

Let You See Leak And Partial Discharge

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Safety Scan USA

CRYSOUND

HANGZHOU CRYSOUND ELECTRONICS CO.,LTD.

Measure Better Sound

Environmental Management

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CRYSOUND

Measure Better Sound

HANGZHOU CRYSOUND ELECTRONICS CO.,LTD.

CRYSOUND was established in 1997 and the brand "CRY" comes from the initials of our founder Cao RuiYing. At CRYSOUND, we are passionate about what we do. During nearly 30 years of professional acoustic knowledge explo- ration and application CRYSOUND is dedicated to providing complete and high quality acoustic services and total solutions to solve the world's most complicated acoustic testing challenges for our clients. We are committed to realizing our mission to make acoustic measurements easier than ever.

Our technology are widely used for the electroacoustic testing of consumer electronics, environmental noise monitoring, detection of defects in automotive components,and industrial predictive maintenance. Besides our acoustic imaging technology has also not only widely helped factories achieve energy-saving production and intelligent upgrading, responding to global decarbonization strategy, but also solved their production safety problems and freed patrol inspectors from heavy work.

After decades of cooperation with customers, CRYSOUND has sold its products to 35+ countries. Our customers include Beats, Samsung, Harman, SONY, State Grid of China, SINOPEC, Honda, Nestel and other well-known interna- tional and Chinese brands.

In the future, CRYSOUND aims to build the world's most influential brand in the field of acoustics by empowering all industries with acoustic test solutions.

Environmental Management

Occupational Healthy&Safety

CE&TUV Management

Quality Management

24+Software copyrights

70+ core invention patents

TYPICAL CUSTOMERS

CNPC · WANHUA · HONDA · FUJITSU · PHILIPS · LG · beats by dr dre · Panasonic

中国海油 CNOOC · STATE GRID CORPORATION OF CHINA · DAIKIN · LONGi · mi · SAMSUNG · Google · SHURE

Sinopec · ExxonMobil · Nestlé · 中国中车 CRRC · COMPAL · HUAWEI · Microsoft · SONY

Chevron Phillips Chemical · PLN · alapítva 1869 PICK Szeged · TOYOTA · HARMAN A SAMSUNG COMPANY · FOSTER · Demant · VALVE

HAND-HELD ACOUSTIC IMAGER

CRY2620

CRY2620 is the 64-MIC version hand-held industrial acoustic imager, supporting the ultrasonic frequencies. As an entry-level product of CRYSOUND, it has powerful functions. This device can help quickly detect potential pressurized gas leakage and vacuum leakage in noisy industrial environments. It can identify potential partial discharge fault points in the power generating facilities.

CRY2623

CRY2623 is the 128 MIC version hand-held industrial acoustic imager that supports the ultrasonic frequencies. Same as CRY2620, it can help quickly detect potential pressurized gas leakage and vacuum leakage in noisy industrial environments, and quickly identify potential partial discharge fault points when used in power systems.
As a superior product, it is more alert and responsive than CRY2620. Also, it has extra functions, including PRPD mapping function and partial discharge type analysis function.

CRY2624

CRY2624 is the ATEX version anti-explosion hand-held industrial acoustic imager, support the ultrasonic frequencies, with II 3G Ex ic IIC T5 Gc explosion-proof grade. While sharing with similar functions with CRY2623, CRY2624 can be applied in a wider range of situations due to its anti-explosion function. It can be utilized in chemical plants containing dangerous flammable gases and hazardous area that have the strictly explosion-proof.

▲Technical Specifications

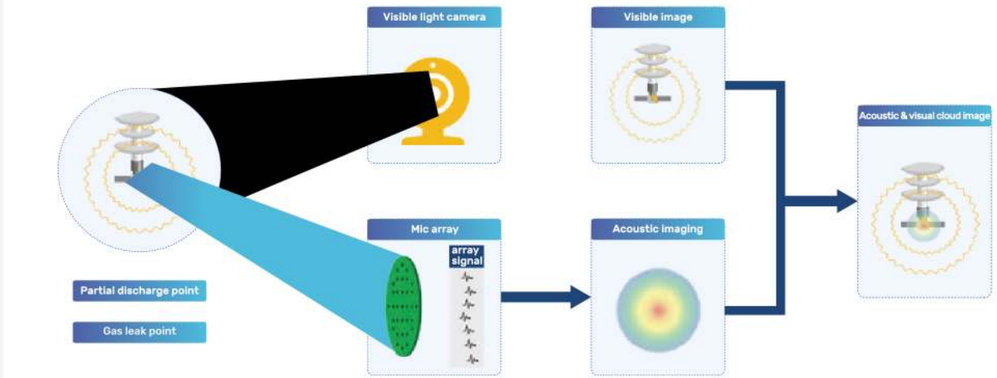
Acoustic Specification	CRY2620	CRY2623	CRY2624
Microphone array	64 channels MEMS microphone	128 channels MEMS microphones	
Effective test bandwidth	2kHz~40kHz	2kHz~48kHz	
Dynamic range		0.5dB~12dB user adjustable	
Test sound pressure level range	28~120dBA	25.7~132.5dBA	
Threshold values		-40dB~100dB	
Number of digits		24 bit	
Sound image FOV		62°	
Sound image frame rate		At least 25 FPS	
Leak detection rate	10m 5bar 2.4ml/s 0.5m 5bar 1.2ml/s	10m 5bar 0.92ml/s 0.5m 5bar 0.55ml/s 0.5m 0.14bar 1.6ml/s	
Detect distances	0.5m~70m	0.3m~120m	
General Specification			
Ingress protection (IP)	IP54		
Size	272mm x 174mm x 42mm		
Weight	1.7kg		
Warranty	2 years		
Self-diagnostic notification	Array-health test function to identify when microphone array needs attention		
System	Linux system		
Certificate	CE, FCC, RoHS-Compliant	CE, FCC,ATEX, CE, FCC, RoHS-Compliant, MSDS	RoHS-Compliant, MSDS
Software			
Report types	Gas/ISO 50001-compliant Waveform, Spectrum, Spectrogram, Leakage Assessment	Gas/Electricity, ISO 50001-compliant Waveform, Spectrum, Spectrogram, Leakage Assessment, Discharge Type Discrimination	
Power			
Battery capacity	1 x 6600mAH@7.2V Rechargeable battery (Support external battery)		
Battery life	4.5 hours operation time4+6 hours operation time		
Charger	USB Type-C port, USB PD protocal supported, 15W		
Power consumption	15W for battery charge, 29W for maximum power comsumption		
Energy management	Sleep / Auto power off modes		

Display	
Resolution	1024*600(614,400 pixels)
Size	7 inch
Touch screen	Capacitive touch screen
Brightness	Adjustable
Photo notes	Up to 5 photos notes for reference
Source	Show single or multiple sources
Standard palettes	Grayscale, Ironbow, Blue-red
Playback function	View photos & videos anytime Add notes or tags
Storage	
Internal storage	8G
External storage	TF memory card, 64G, expandable to 256G
Data storage format	JPG(Picture) MP4(Video) WAV(Audio)
Video length	5 minutes
Digital export	TF Card

Camera	
Camera FOV	62°
Camera focal length	3.04mm fixed focal
Camera pixel	length 8 million pixel
Interface	
	USB 3.0 Type-C USB host port 3.5mm headphone
Operating Environment	
Operating temperature	-20℃ ~ 50℃ 10% ~ 95% no condensation
Storage Environment temperature	-20℃ ~ 60℃ 10℃ ~ 45℃
Supported Language	
English, French, Chinese, German, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, etc.	

ACOUSTIC IMAGING PRINCIPLE

Acoustic imaging technology uses the 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 a 'sonogram' on device screen, which indicates the intensity of the sound by the colour of the image.



PRODUCT HIGHLIGHTS

Multi-type Gases
Leaks of all pressurized gases can be detected regardless of the type of gas

High Test Accuracy
128-microphone array

Easy to Operate
Only adjust two parameters to meet the vast majority of test requirements

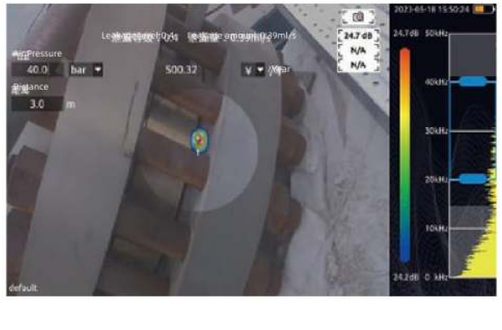
Fully Functional
All-round record of test results with photos, audio and video recordings, and automatically export reports,ledger and data processing function

Ingress Protection Grade
IP54

Explosion-proof Certification
ATEX-II 3 G Ex ic IIC T5 Gc

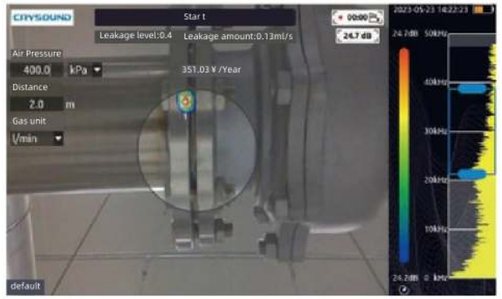
PRODUCT FEATURES

Far Test Distance
The effective test distance is 0.3m-120m



High Test Accuracy
The leak detection rate is 10m, 5bar, 0.92ml/s 0.5m, 5bar, 0.55ml/s

High Efficiency
With the high refresh rate of 25FPS and large field of view of 62°, it is a great assistant for efficient inspections.



High Noise Immunity
With “FOCUS” function and advanced noise-immunity algorithms, it can minimize the impact of environmental noise.

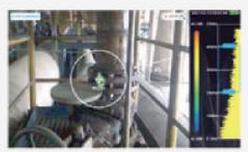
FUNCTION INTRODUCTION

Leak Rate Quantification

Acoustic imager could realistically estimate the leak flow rates. The screen show the leak level and corresponding economic value loss data.

PRPD（Phase Resolved Partial Discharge）

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.



Focusing Function

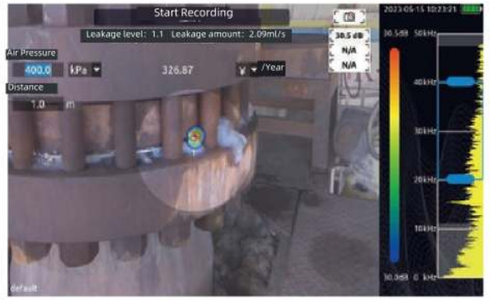
The focusing function is mainly used to eliminate environmental interference noise, reflection noise, multi-source interference. It narrows the test area to the aperture, eliminating interference from sources outside the aperture and helping you to find small leaks in complex sound field environments.

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 realized 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.

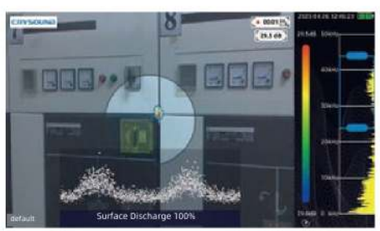
LEAK RATE QUANTIFICATION

Compressed air is a major source of power, but leaks can be a big problem in factories. Leakage accounts for 10-50% of the total air supply, resulting in significant energy loss. Even a small 1mm hole can cause a loss of about 3525 kWh per year. Large factories may have thousands of leakage points. Many inspectors listen for gas leaks, which means that by the time a leak is detected, it is already leaking quite badly. The CRYSOUND acoustic imager can quickly detect gas leaks from a distance and estimate the leakage volume in real-time, reducing inspection time and energy waste.



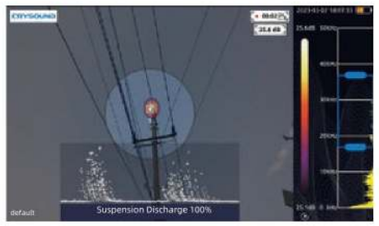
PRPD INTELLIGENT RECOGNITION

PRPD (Phase Resolved Partial Discharge) is a method of displaying partial discharge pulses with phase identification. Different types of discharges exhibit different characteristics in the PRPD map. Based on the PRPD map, the CRYSOUND acoustic imager has added an offline partial discharge type identification function, which can display the type of partial discharge in real-time during the inspection process, making every customer a master of partial discharge fault diagnosis.



Surface discharge

Surface discharge refers to the discharge phenomenon along the interface of different aggregated state dielectrics. Usually, the discharge along the surface of solid dielectrics is more common in gas or liquid dielectrics.



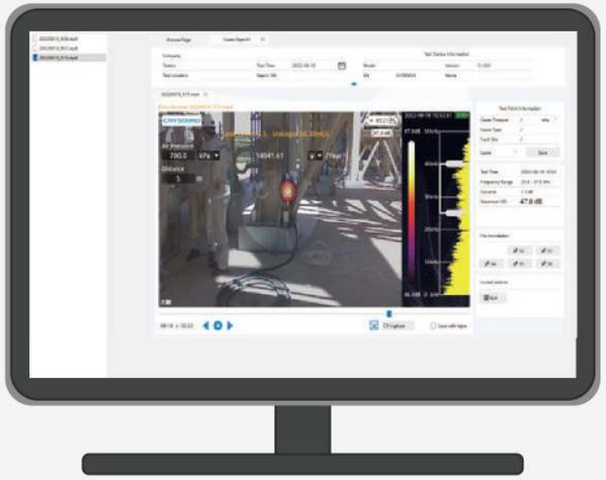
Suspension discharge

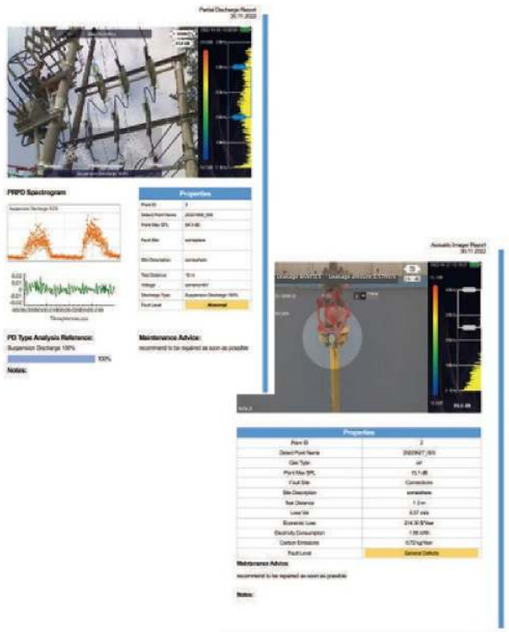
There is poor contact discharge due to a small gap between an internal metal part and a conductor (or grounding body), such as the transformer core and metal bolts, where they lose electrical potential connection.

Corona discharge

Corona discharge usually occurs when the high voltage conductor is completely surrounded by gas.

REPORTING SOFTWARE





Support PD Identification and Leak Quantification

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

Meet ISO 50001-compatible Standard

Reporting software allows you to create organized and detailed ISO 50001-compatible report with the images you captured, videos taken by CRYSOUND handheld acoustic imager.

Provide Intelligent Algorithm

The software with cutting-edge algorithm helps you make intelligent maintenance decisions. You do not need have the more in-depth knowledge and understanding to explain the result. We developed and manufactured the acoustic imager and designed the software to fully accompany it. The accuracy and consistency of report is ensured.

OUR SOFTWARE FEATURES

Easy to Create a New Report

Users can effortlessly generate reports by following a few simple steps:

Step 1 : Users can build a new report template.

Step 2 : Users can import the desired pictures and videos for reference. Once the media files are uploaded, the system takes care of the rest.

Step 3 : The system automatically extracts relevant information from the pictures and videos and populates the report form accordingly. The filled information includes details such as the detected person, detection time, device model, software version number, detection location, device serial number, and report template type.

Powerful Analysis Functions

Our software is equipped with an array of powerful analysis functions that provide valuable insights. These functions include:

- Comprehensive Estimation: The system can accurately estimate various parameters, such as working hours, electricity consumption, carbon emissions, and annual financial loss, based on the amount of gas leakage.
- Advanced PRPD Analysis: By utilizing FFT analysis, the system can effectively analyze the Partial Discharge types with PRPD patterns, enabling users to gain a deeper understanding of the data.
- Defect Classification and Maintenance Suggestions: The system goes even further by classifying defected partial discharge and providing valuable suggestions for maintenance, ensuring proactive and informed decision-making.

Adequate Report Content & Forms

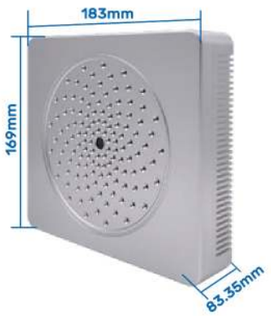
Our system ensures that the generated reports contain comprehensive and relevant content. Here are some key features:

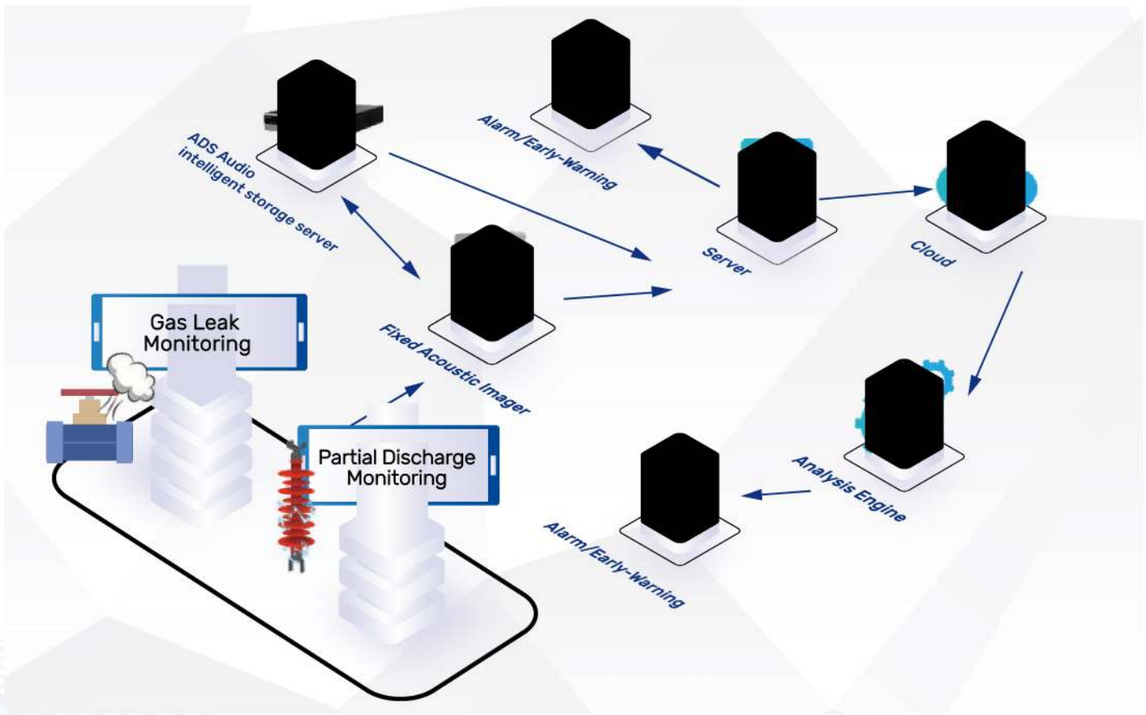
- Frame Extraction and Analysis: Users have the flexibility to extract any frame from a video. After analyzing the selected frames, the system automatically adds them, along with the associated information, to the report, enhancing the report's visual appeal and accuracy.
- Waveform, Spectrum, and Spectrogram: Our system also provides waveform, spectrum, and spectrogram analysis related to videos, allowing users to delve deeper into the data and gain a more comprehensive understanding.
- Delivery in Multiple Formats: To cater to diverse user preferences, the reports can be delivered in both Excel and PDF formats. This flexibility ensures that users can easily access and share the reports in their preferred format.

FIXED ACOUSTIC IMAGER

▲Technical Specifications

Device Model	CRY2623M	CRY2624M
Number of Microphone Channels	128 channels	
Test Frequency Range	2kHz ~ 48kHz	
Camera Resolution	8million	
Frame Rate	25FPS	
Test Distance	0.5~50m	
Weight	About 1.3kg	
Size	183mm X 169mm X 85.35mm	
Storage	8G internal storage, 64G TF card expansion storage	
Operating Temperature	-10℃~+50℃	
Supply Voltage	DC12-20V	
Power Consumption	About 14W	
IP Degree of Protection	IP56	
Fixed way	Bottom 1/4 -20UNC thread/M5 screw fixing	
Explosion-proof certification	X	Ex ic II C T4 Gc & CNEX





OD

The data communication supports wired data transmission and can be expanded to support WI-FI. The transmission of test data supports RTSP/RTMP streaming.

The bottom is equipped with M5 thread and 1/4-20UNC thread for convenient fixing of the pan-tilt.

Flexible Deployment

The acoustic imaging online monitoring system is a device fault monitoring system based on acoustic imaging technology. Fixed acoustic imager is deployed in key monitoring areas to achieve unattended, all-weather 24/7 fault monitoring and alarm, realizing the intelligent operation and maintenance requirements of power equipment, and providing strong guarantee for the safe and stable operation and maintenance of the power system.

Mobile Carried Installation

The CRYSOUND Fixed acoustic imager can be carried with unmanned aerial vehicles, robots and other intelligent inspection platforms to achieve the automation of inspection processes. Even in the face of dangerous gas leaks, adverse weather conditions etc., it can meet the multiple needs of accurate positioning of fault points and ensuring the personal safety of inspectors.

CRY2625:
Mobile Carried Installation Specification

▲Technical Specifications

Acoustic Specification	
Microphone array	128 channels MEMS
Effective test bandwidth	microphones 2kHz~48kHz
Test sound pressure level range	28~130dB
Sound image FOV	62°
Sound image frame rate	At least 25FPS
Detect Distance	0.5m~30m
Camera	
Camera FOV	62°
Camera focal	3.04mm fixed focal
length Camera pixel	length 8 million pixel
Storage	
Internal storage	8G
External storage	TF memory card, 64G, expandable to
Data storage format	256G JPG(Picture) MP4(Video)
Video length	WAV(Audio)
Digital export	5 minutes
Drone	TF Card
Type	DJI M300RTK M350RTK
Environment	
Operating Environment	-20℃ ~ 50℃ 10% ~ 95% no condensation
Storage temperature	-20℃ ~ 60℃
Altitude	Under 5000 meters
Power	
Voltage	Same as SKYPORT, DC
Power interface	12V Same as SKYPORT
Power consumption	10W
General Specification	
Ingress protection (IP)	IP42
Size	167mm x 167mm x 210mm
Weight	930g
Installation	SKYPORT V2
Self-diagnostic notification	Array-health test function to identify when microphone array needs attention
System	Linux system
Software	
Agreement	DJI PSDK Agreement
Report	Gas/Electricity, ISO 50001-
type	compliant PRPD
Analysis	

Safety Scan USA

SOFTWARE PAGE DISPLAY

Front-end sensing module

Detect and locate leakage points to achieve real-time alarm and accurate capture of leaks.

ADS Audio Intelligent Storage Server

Store video and audio data and support for forwarding of various protocols.

ACS Audio Intelligent Computing Server

Achieve fault point display, recording, and i ntelligent data processing.

Cloud Analysis Engine

The cloud fault library can achieve intelligent analysis and intelligent learning.

APPLICATIONS IN INDUSTRIES

CASES IN GAS LEAK DETECTION

CRYSOUND acoustic imagers show you the exact location of leaks and software tells you how much they cost annually, assisting you in keeping production costs low. Compared to traditional ultrasonic leak detectors and other conventional methods, the acoustic imager is considerably more accurate and could improve 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, high testing requirements. Traditional detection methods are difficult to cover comprehensively and easily leave behind hidden safety hazards.

overhead pipe flange leak

giant steam flange leak

workshop top pipe joint leak

pipe welded seam leak

blast furnace nitorgen leak

Dry Running gas seals/Nitrogen leak

Gas leak

CO2 leak

Exhaust leak

Other flammable and explosive gases leak

Oxygen/Nitrogen/Argon leak

Natural gas leak

CASES IN PARTIAL DISCHARGE DETETCTION

The acoustic imager integrates collection, processing, analysis, and display functions, and has a large-capacity lithium battery for long-lasting use. The 7-inch screen allows for clear viewing of faults, and faults can be recorded using various methods such as photography and video. The acoustic imager also displays partial discharge types in real-time, and PC tools can be used to generate reports with a single click.

It is a powerful tool for detecting partial discharge faults in the power industry, and can help you quickly and accurately locate these faults. Inspectors are able to use the results of detection to promptly repair faults, effectively preventing damage to power equipment caused by partial discharge and enabling predictive maintenance to ensure the normal operation of the power system.

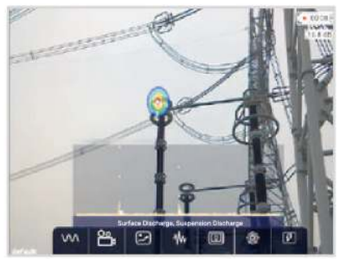
Discharge of insulators on 10kv transmission towers

Discharge of insulators on gantry structures

Discharge of insulators on wall-mounted conduits

Discharge of support insulators

Discharge of 35kV incoming line porcelain insulator



Discharge of 500KV substation voltage equalizing ring

Discharge of insulators on 10kv tower poles

Discharge of porcelain bushings on outgoing lines

Discharge of 110kv main busbars

Discharge of insulators on gantry structures

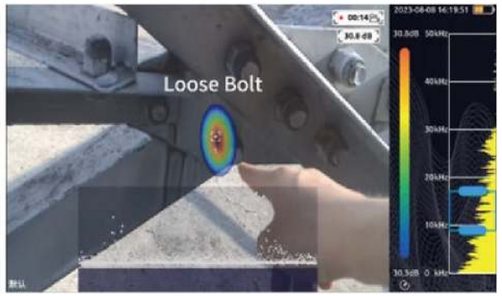
Discharge of dropout switch

Discharge due to insulator breakdown

OTHER APPLICATIONS

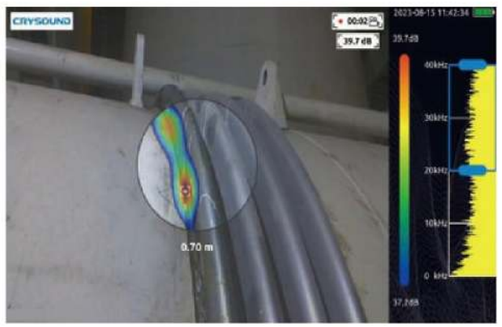
Abnormal Sound Testing

Case Study: Transmission Tower Bolt Loosening
Test 1.Mount the exciter onto the transmission tower to induce vibrations in the tower.
2.Loose screw components will vibrate upon impact from the exciter, producing sound.
3.Open the industrial acoustic imager and adjust the frequency range to 4kHz to 15kHz to detect the location of bolt .



Vacuum Leak Testing

Case Study:
Case 1: Use an acoustic imager to detect leaks at the packing of the vacuum pump drive end, within a frequency range of 20kHz to 40kHz.
Case 2: Use an acoustic imager to detect leaks at the upper flange of the condensate water pump inlet electric gate, within a frequency range of 20kHz to 40kHz.



Safety Scan USA

Measure Better Sound

Our Distribution Map

50 + NETWORK
3000 + CUSTOMERS

United States	Japan	Netherlands	Hungary
Switzerland	France	Spain	Saudi Arabia
South Africa	India	Thailand	Indonesia
Singapore	Australia	Brazil	Etc.