Analysis Tool Manual

V2.0

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Table of Contents

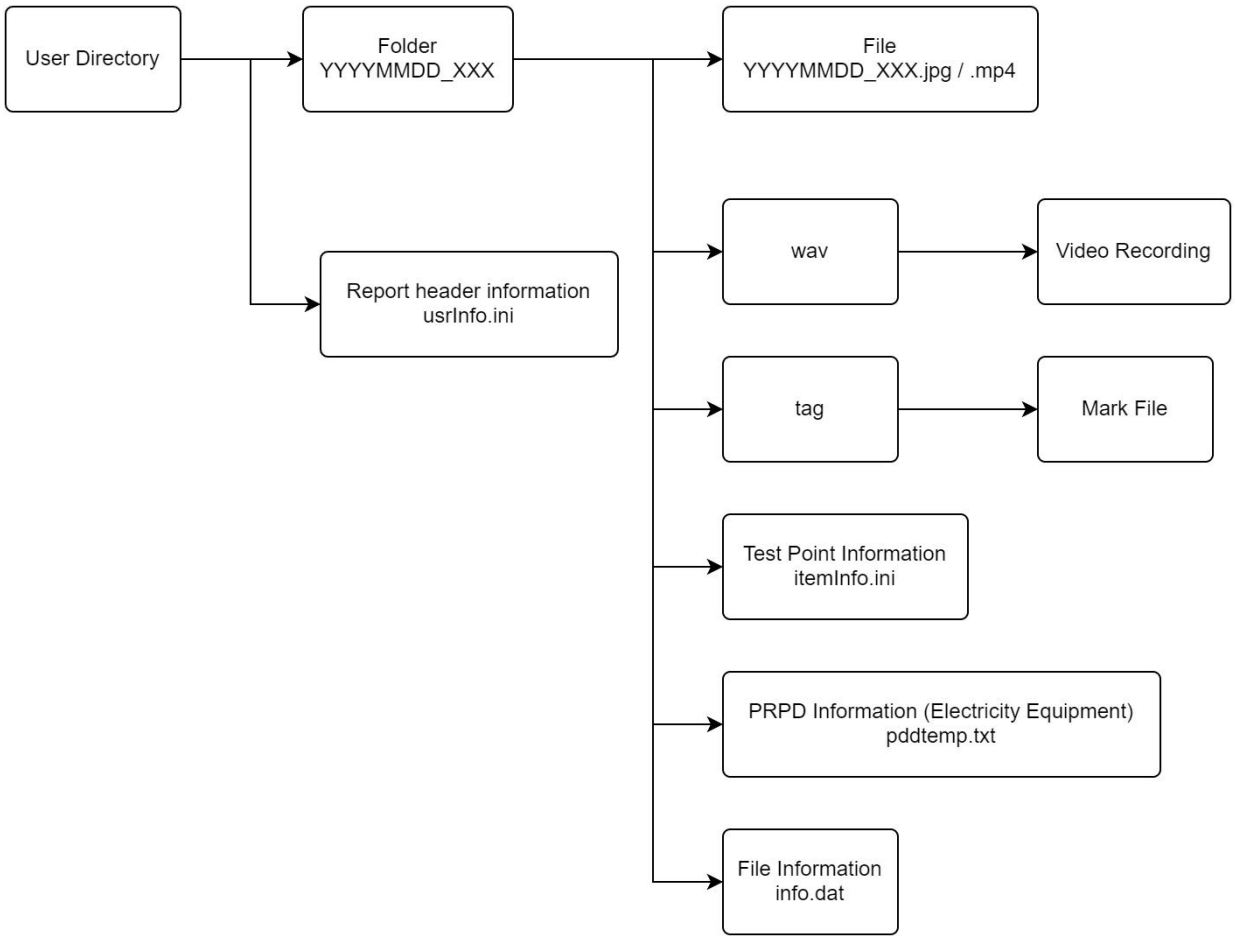
1.Overview

This software is specially adapted to the CRY26XX Handheld Acoustic Imager to view and analyze data from pictures and videos taken by the imager, and to edit and output the corresponding test reports. It is only available for Windows.

2.Interface Functional Description

2.1. Menu Bar

2.1.1. File



File storage format (may vary slightly depending on device firmware version)

2.1.1.1. Import

Import the file to be analyzed and select the path to the user directory corresponding to the file;

You can import user directories only if you have the **usrInfo.ini** file, otherwise you cannot import them, and you can only open one user directory at a time;

2.1.1.2. Delete

Delete the currently selected file from the file list, local files are not deleted.

2.1.1.3. Delete in Batch

When you click to enter the batch deletion status, the "Batch Delete Button Area" is displayed, and you can't switch the file view.

2.1.2. Edit

2.1.2.1. New Report

New report page (power/gas), support for multiple report pages, up to 30

2.1.2.2. Export Report

Export the report page currently being edited

- Custom

  Simplified Chinese/English only, XLSX format

- ISO50001

  PDF format

2.1.3. Settings

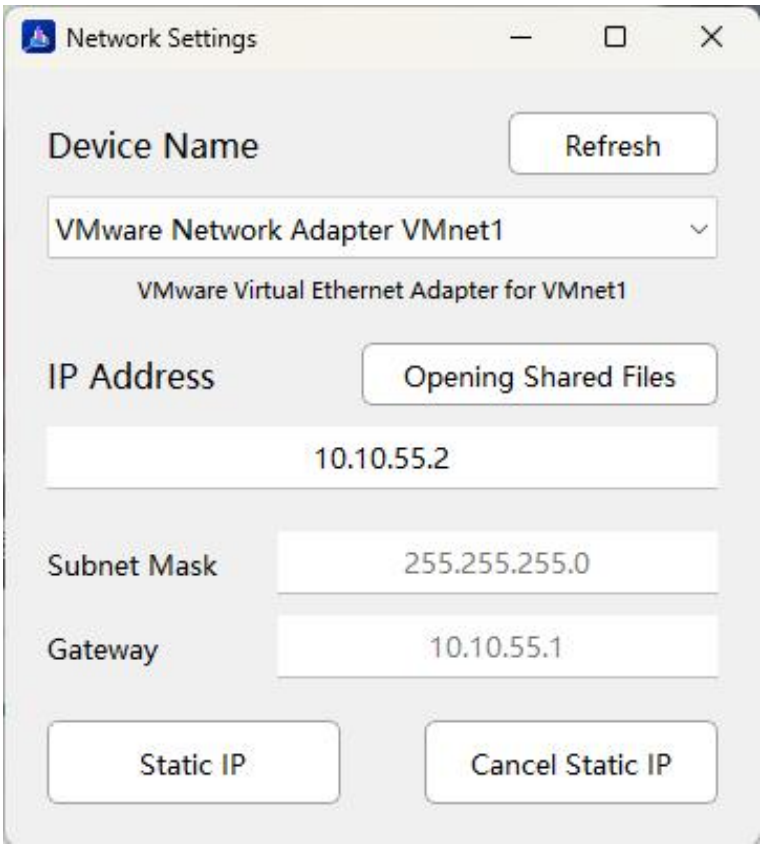
2.1.3.1. Language

Set software/report language, 6 languages available

2.1.3.2. Network Settings

Specifically adapted to Handheld Acoustic Imaging Equipment with static IP functionality

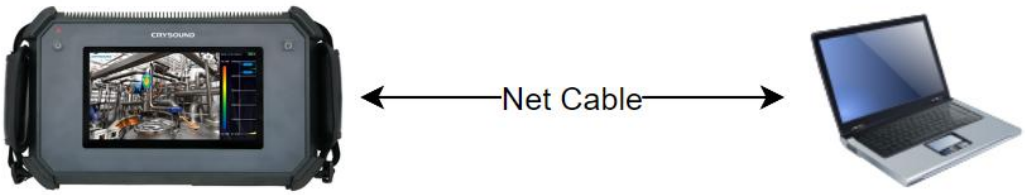
2.1.3.2.1. Function



- **Refresh**: retrieve and get the list of computer NIC names (when there are NIC changes, you need to manually click the refresh button)
- **IP Address**: to be set the static IP address of the NIC (10.10.55.xxx, except 10.10.55.55)
- **Opening Shared Files**: when the computer is successfully connected to the equipment, open the TF card storage path of the sound camera (the CRY26XX needs to be inserted with a TF card)
- **Subnet Mark**: Default, cannot be changed.
- **Gateway**: adapted, cannot be changed
- **Static IP**: applies the "IP address" to the currently selected network card

- **Cancel Static IP**：cancel the static IP of the currently selected NIC and set it to a dynamically obtained IP address.

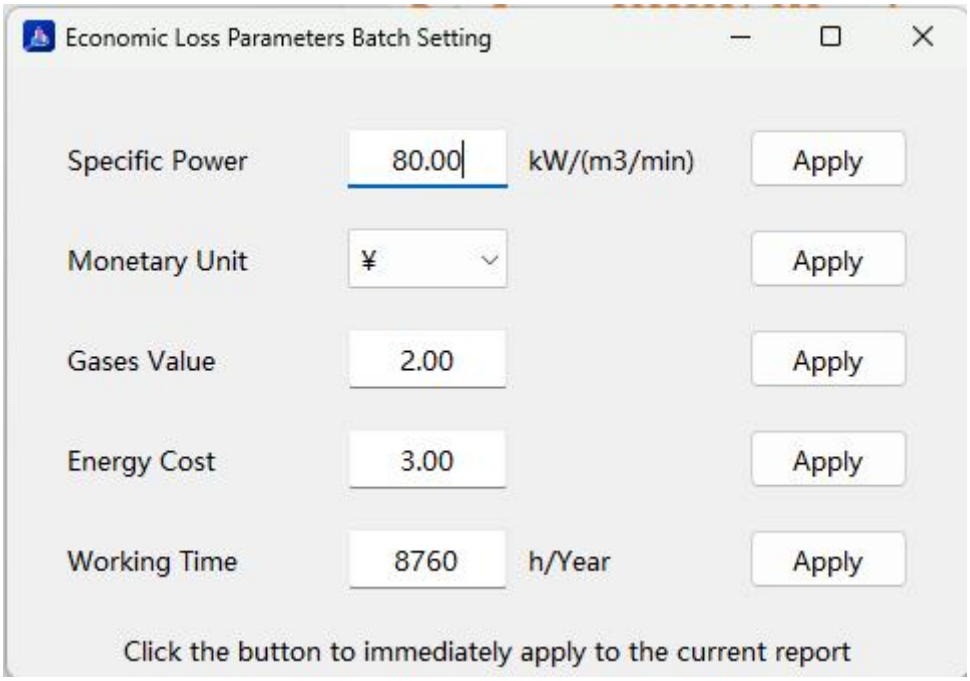
2.1.3.2.2. Operation



Device and computer connection method

- Connect the camera to the computer as shown above.
- Open the "Network Settings" interface and click the "Refresh" button to get the list of network card names.
- Select the name of the network card connected to the camera.
- Edit the "IP Address".
- Click "Static IP" button.
- Wait 1-2min (until the network card applies the IP and connects to the Handheld Acoustic Imaging Equipment) and click on the "Open Shared File" button to operate the file.
- (optional) Click "Cancel Static IP" button after operation is completed.

2.1.3.3. Economic Loss Parameters



Economic loss parameter setting interface

The parameters are adapted to the functional parameters in the CRY26XX;

- **Apply**: Apply the corresponding parameters to all selected test points in the current gas report and any future added test points (if the test points do not have default parameters). Only change the currency unit symbol without performing currency conversion.

2.1.4. Help

2.1.4.1. About

Description of the software version and software usage;

2.2. Tool Bar

Toolbar buttons

From left to right the shortcut functions are: Import File, Delete File, Batch Delete, New Gas Report, New Electricity Report, Export Customized Report, Export ISO50001 Report, Economic Loss Parameter, Language;

2.3. File List

Displays a list of imported files;

- **In Browse Page**

  Click on the file to view and switch;

- **In Report Page**

  Checking the checkbox adds the corresponding test point to the current report page;

  Unchecking the box removes the corresponding test point from the current report page;

2.3.1. Batch Delete Button Area

After clicking "Batch Delete Files", a button area is displayed above the file list;

Batch Delete Button Area

- **Checkbox:** select all/unselect all files
- **Delete:** batch delete selected files
- **Cancel:** exit batch delete status

2.4. Home Page

2.4.1. Preview screen

Preview and display files, view file information: File name display, image/video display, video play and frame switching buttons, file tag information, image information, file annotations, time-domain waveform, PRPD spectrum.

2.5. Browse Page

Report page header information

Can be modified and save;

2.5.1. Report information

Reads and displays the contents of usrInfo.ini in the imported user directory, which is exported to be displayed in the report;

2.5.2. Test Device Information

Same reporting information;

2.6. Preview interface

Preview the displayed file, view the file information, analyze the file, and form the report content (preview interface is described separately). The added test point is a preview interface, and the maximum number of test points that can be added to each report is 100.

2.6.1. File name display

Displays the name of the currently viewed file;

Current file name display

2.6.2. Picture/video display

Display the selected file picture/video;

2.6.3. Video playback switch frame button

Tip: Display when video file

Playback progress, video operation buttons

Frame switching button: when the file is a video, picture frame switching for the currently playing video.

Switch one picture frame at a time

2.6.4. Function buttons

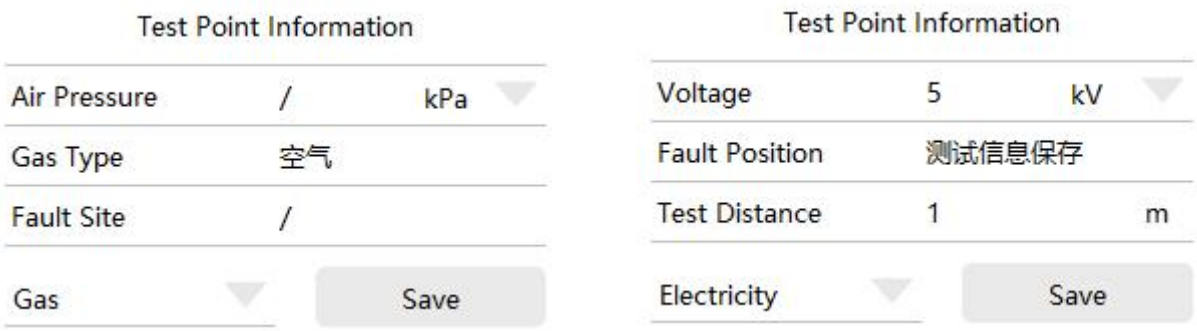
Tip: Displayed when video file

Function buttons

- **Lock button:** lock a frame in the video, only one picture can be locked; the picture is exported to the report
- **Intercept Video:** Intercept a video, if there is a video recording, then the audio will be intercepted together.

- **Export with report (customized report):** when selected, the intercepted video and audio will be exported with the report.

2.6.5. Test Point Information

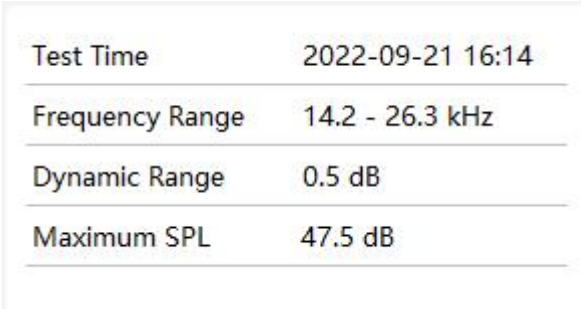


Gas/Electricity Type Label Information

Read the content information of **itemInfo.ini** in the corresponding file and display it;

If the file does not exist, the default display is the same type content as the report page type; can be edited and modified;

2.6.6. Picture information



Picture information parameter display

Parameter information corresponding to the current picture;

Maximum sound pressure level is obtained by text recognition, supports modification, and this parameter is exported to the report; when viewing video files, parameter information of locked pictures is exported;

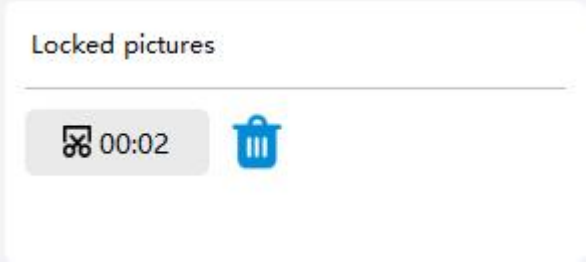
2.6.7. File Annotation

Document annotation information view

Annotation information added to the CRY26XX Handheld Acoustic Imager: Picture Annotation (Img), Audio Annotation (Aud), Text Annotation (Txt), click the button to view;

2.6.8. Locked Pictures (Video File)

Tip: Display when video file



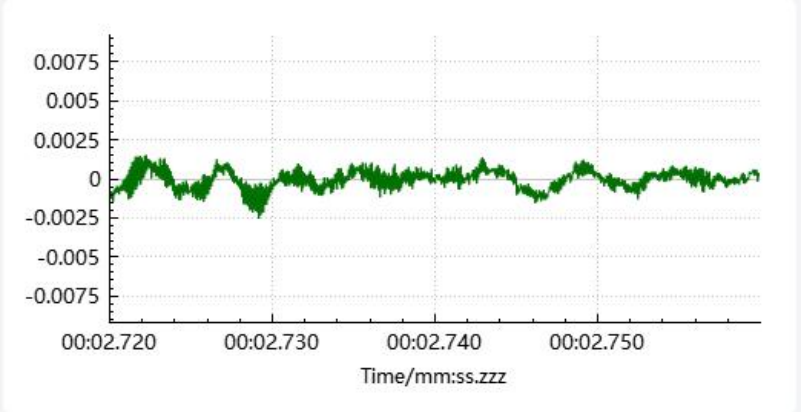
Locked picture viewing area

Locked picture timestamp in video;

- **Timestamp:** click button, video slider moves to timestamp position
- **Delete:** button to unlock

2.6.9. Time Domain Waveform

Tip: Display when video file



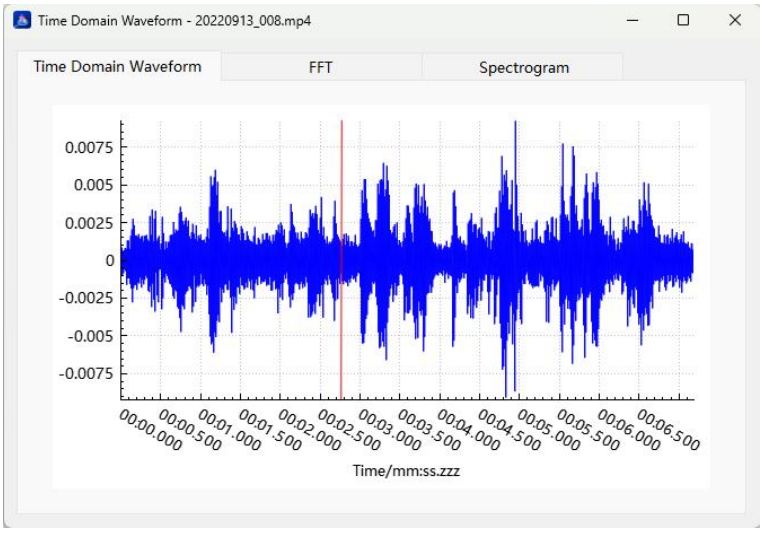
Time-domain waveform curve of the image frame

Draws the time-domain waveform graph of the audio data for the current image frame. If there is no audio data or it cannot be read, it will display a blank space.

If the file contains audio data, clicking on the waveform area will display a time-domain waveform interface consisting of a time-domain waveform, spectrum graph, and spectrogram.

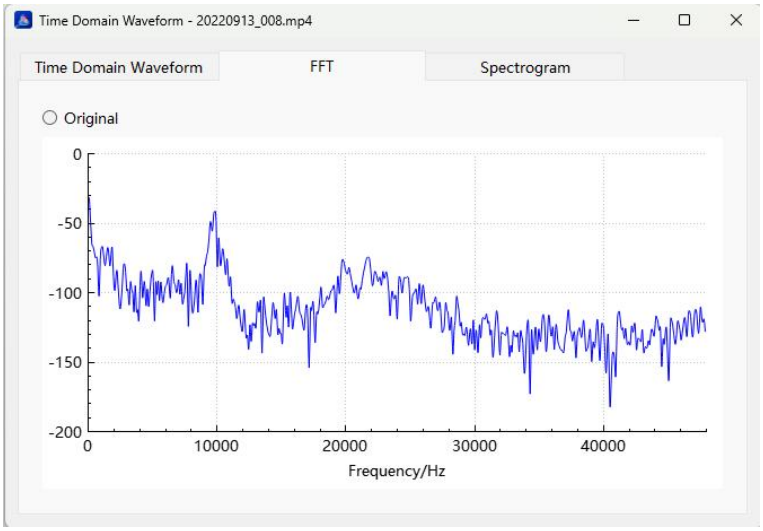
2.6.9.1. Time Domain Waveform

Including the entire audio data, the red vertical line indicates the current position of video playback.



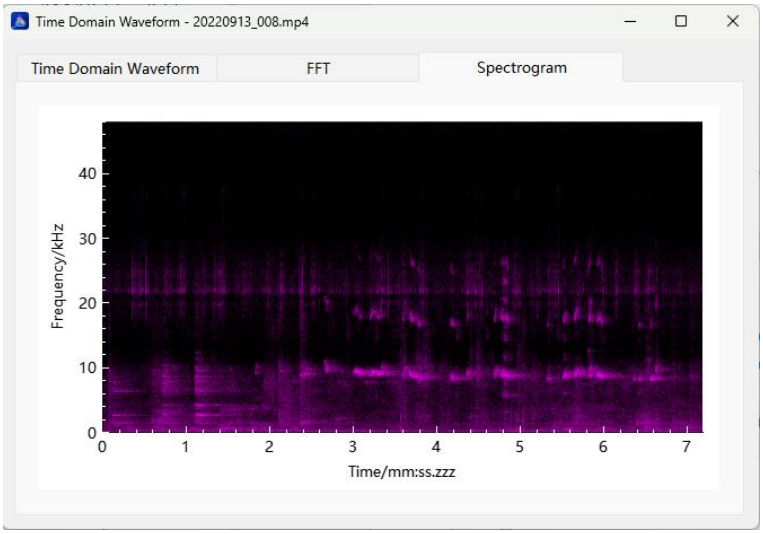
2.6.9.2. FFT

It includes the audio data of the current image frame. The vertical axis can be switched between displaying dB values and raw values by selecting or deselecting the "Raw Value" radio button.



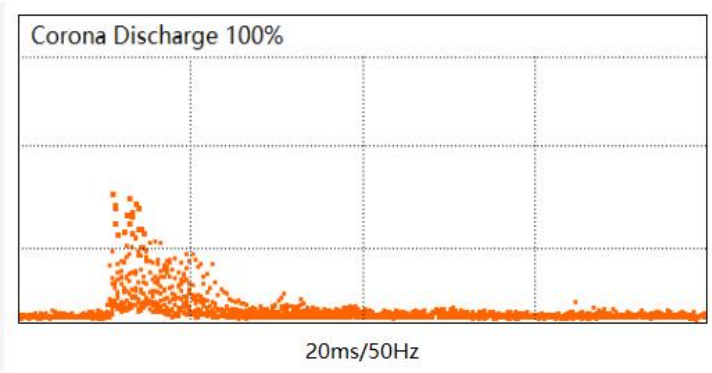
2.6.9.3. Spectrogram

Including the entire audio data.



2.6.10. PRPD (Electricity)

Tip: Displayed during video file playback.



PRPD (Partial Discharge Pattern) spectrum and discharge type display

Analyze the audio data and plot the PRPD (Partial Discharge Pattern) spectrum in conjunction with the pddtemp.txt file. Display the PRPD spectrum, discharge type, and synchronization frequency corresponding to the current image frame. If there is no audio data, it will be displayed as blank.

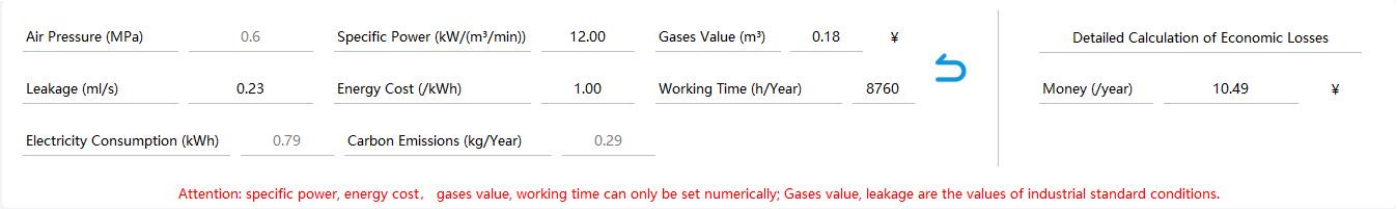
2.6.11. Test Result Determination

Test Result Determination Entry

Analyze the various data of the current file and fill in the test result determination. It can be exported to the report.

- **Fault Level**: Select from the dropdown menu.
- **Discharge Type (Electricity):** Type of localized discharge for the sound source. If there is no audio data, manually enter the information.
- **Maintenance Advice:** Measures for addressing the leakage source/localized discharge point.
- **Export Annotations (ISO50001 Gas Report):** Corresponds to the button in "File Annotations." Check the checkbox to export images and text annotations. A maximum of two image annotations can be exported per file.
- **Judgement Basis (ISO50001):** Export to the report.

2.6.12. Economic Loss Estimation (Gas)

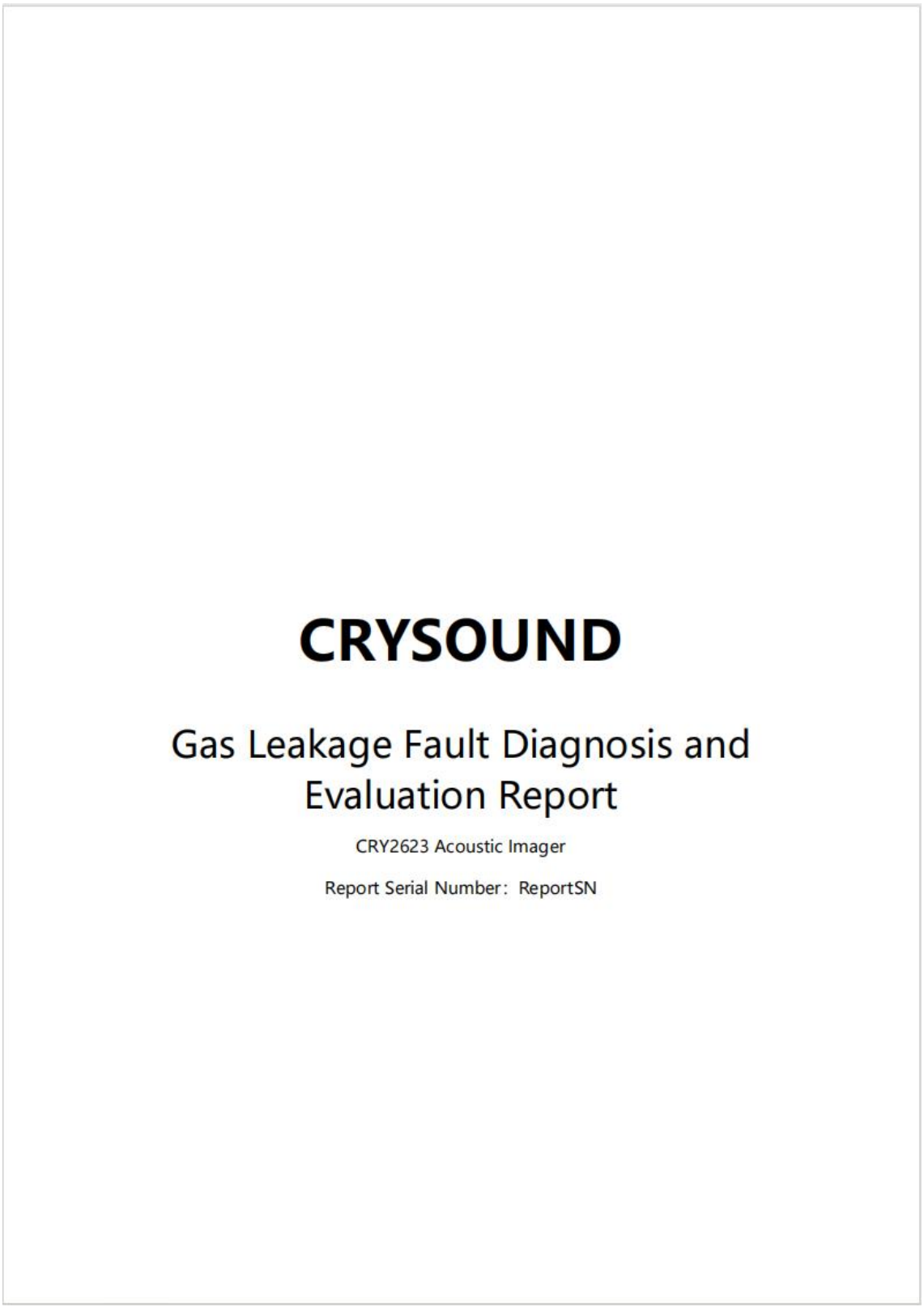


Economic Loss Estimation

Estimate the economic loss based on the leakage amount and the set loss parameters.

- **Air Pressure:** Read from info.dat file, cannot be modified.
- **Leakage:** Leakage amount corresponding to the current image/video frame.
- **Specific Power/Energy Cost/Gases Value/Working Time:** Read from info.dat file, or manually set through "Settings -> Economic Loss Parameters." If the parameter is not included in info.dat, the parameter value set in the analysis software will be used.
- **Restore File Parameter Settings:** Button available when loss parameters are present in info.dat; clicking it will restore the parameter values to those in info.dat if any manual modifications were made.
- **Electricity Consumption:** Calculated based on the gas leakage amount, cannot be modified.
- **Carbon Emissions:** Calculated based on the gas leakage amount, cannot be modified.
- **Money:** Calculated based on the parameters on the left side, cannot be directly modified.

Appendix A Custom Gas Report (XLSX)


CRYSOUND

Gas Leakage Fault Diagnosis and Evaluation Report

CRY2623 Acoustic Imager

Report Serial Number: ReportSN

1. Test Information

Test Company		CRYSOUND
Test Site		Site
Test Date		2023-08-18
Device Information	Model	CRY2623
	Serial Number	222BD027
	Software Version	6.0.0.3
Tester		Tester

2. Technical Standards

Non-destructive testing—Test methods for ultrasonic leak detection (GB T 34638-2017)

3. Test Result

There are 1, total leakage 3.14 ml/s, annual loss 4.25 ¥, electricity consumption 10.74 kWh, annual carbon emission 3.96 kg

- Test Fault Point (1) is Air leakage, the running state is Minor Defect

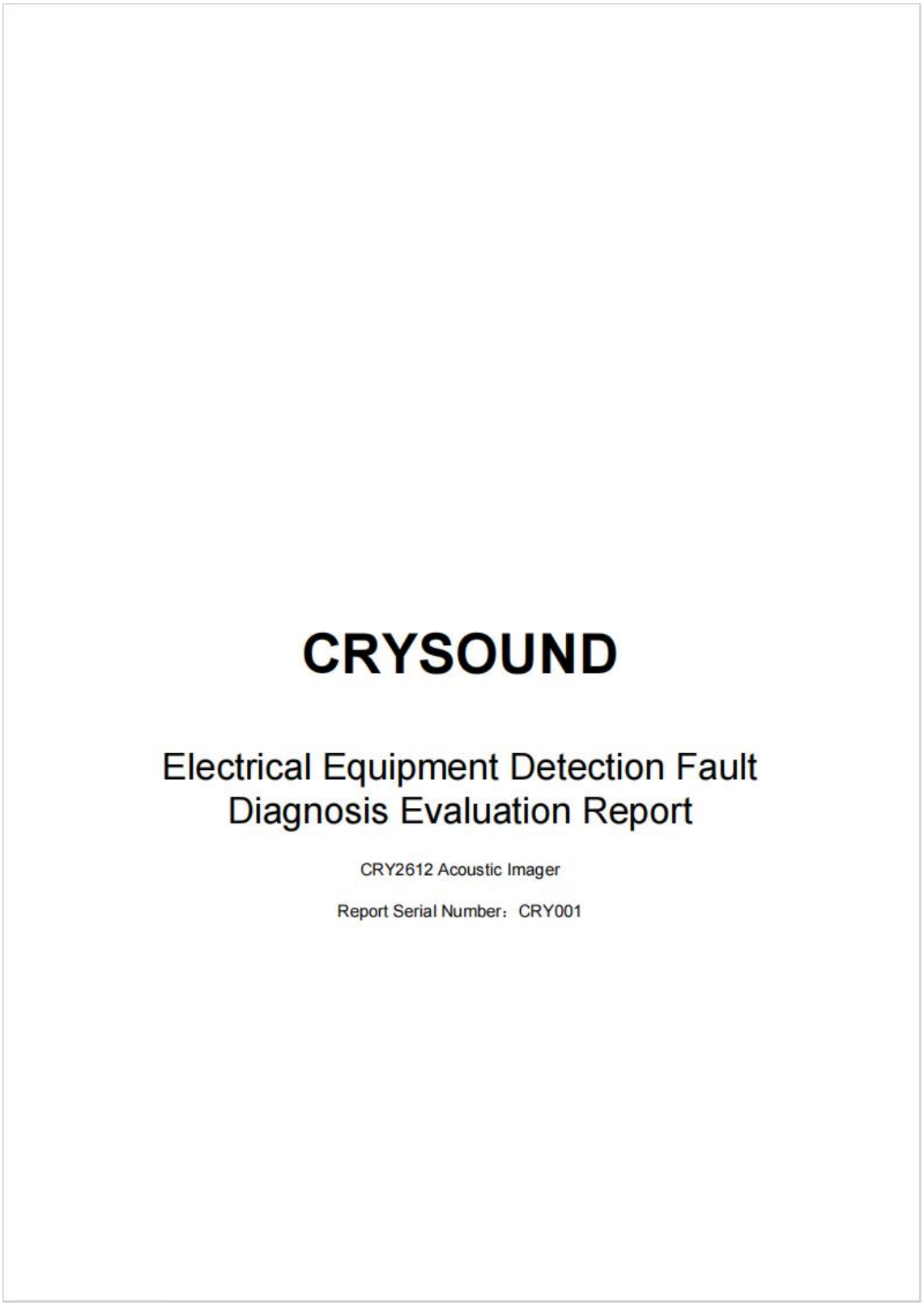
Description of Defect Level:

Serious Defects	The defect is serious and needs to be dealt with immediately.
Larger Defects	The defect is relatively serious, but the equipment can continue to operate safely in a short period of time, but it needs to be dealt with as soon as possible.
General Defects	It has little impact on short-term safe operation, but it needs to be included in annual and quarterly maintenance
Minor Defects	It has little effect on short-term safe operation. You can continue to observe and wait for maintenance during the next shutdown.
No defects	

Please see appendix for details:

20230818_001.mp4		
Test Point Information		
Fault Site	**Gas Type**	**Fault Level**
Fault Site	Air	Minor Defect
Site Description	Description	
Max SPL	**Air Pressure**	**Maintenance Advice**
40.9 dB	0.0103 MPa	can be ignored
Detailed Calculation of Economic Loss (/year)	**Gas Leak Grade**	**Gas Leakage Flow (work condition ml/s)**
4.25 ¥	1.3	3.14
Electricity Consumption (kWh)	**Carbon Emission (kg/Year)**	
10.74	3.96	

Appendix B Custom Electricity Report (XLSX)



CRYSOUND

Electrical Equipment Detection Fault Diagnosis Evaluation Report

CRY2612 Acoustic Imager

Report Serial Number：CRY001

1.Test Information

Test Company		CRYSOUND
Test Site		site
Test Date		2021-10-25
Device Information	Model	CRY2612
	Serial Number	20CBD001
	Software Version	4.1.0.0
Tester		Tester

2.Technical Standards

DL/T 393-2010 Regulations of condition-based maintenance & test for electric equipment
DL/T417-2006 Guide for partial discharge measuring of power equipment
DL/T 1416–2015 General technical specification for ultrasonic based partial discharge tester
DL/T596-1996 Preventive test code for electric power equipment
GB/T11022-1999 Common specifications for high-voltage switchgear and controlgear standards（trial implementation）
Q/GDW 11059.1—2013 Field application guide for partial discharge on-site testing technology of Gas Insulated Switchgear Part 1: Ultrasonic
Q/GDW 1168-2013 Regulations of condition-based maintenance & test for electric equipment
Q/GDW 1799.1-2013 State grid corporation of China working regulations of power safety（Power station section）
Q/GDW 11400—2015 Field application guide for high frequency partial discharge on-site testing technology of power equipment

3.Test Result

There are 1 fault points detected this time:

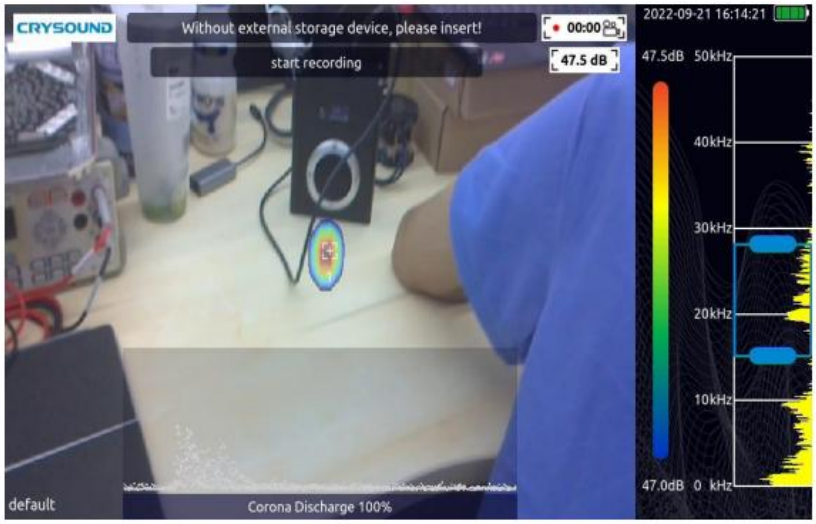
- Test Fault Point (1) is Corona Discharge 100%, the running state is Abnormal

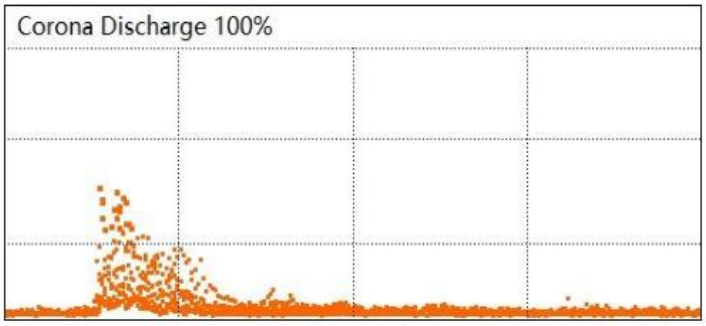
Description of Defect Level:

Defects	The detection pattern of typical partial discharge and the discharge amplitude is large, so it is recommended to repair in a short time, and the monitoring should be strengthened before repair.
Abnormal	With partial discharge characteristics and small discharge amplitude, can be included in the annual inspection, quarterly maintenance plan for deficiency elimination.
Normal	No typical discharge pattern and no discharge was detected.

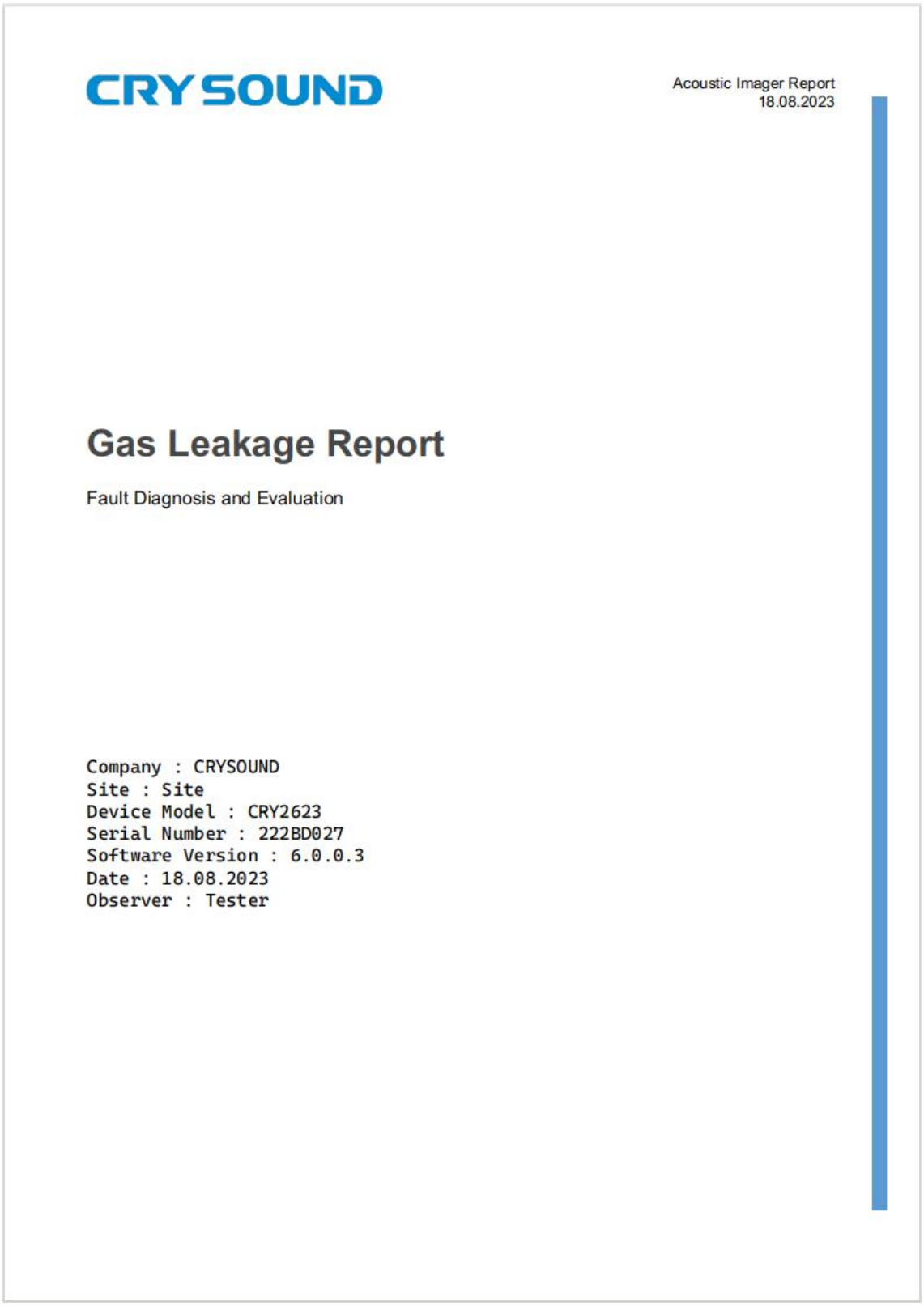
Please see appendix for details:

20220921_032.mp4		
Test Point Information		
Fault Site	**Test Distance**	**Fault Level**
Fault Site	1.5m	Abnormal
Site Description	Description	
Max SPL	**Voltage**	**Maintenance Advice**
47.5 dB	2V	need to repair





Appendix C ISO50001 Gas Report (PDF)



CRY SOUND

Acoustic Imager Report
18.08.2023

Gas Leakage Report

Fault Diagnosis and Evaluation

Company : CRYSOUND
Site : Site
Device Model : CRY2623
Serial Number : 222BD027
Software Version : 6.0.0.3
Date : 18.08.2023
Observer : Tester

Acoustic Imager Report
18.08.2023

Overview of the Inspection	
Number of leaks points	1
Potential loss estimation	4.25 ¥/Year
Maximum Fault	40.9 dB
Electricity Consumption (Total)	10.74 kWh
Carbon Emissions (Total)	3.96 kg/Year

Fault Level	Description
Serious Defects	*The defect is serious and needs to be dealt with immediately.*
Larger Defects	*The defect is relatively serious, but the equipment can continue to operate safely in a short period of time, but it needs to be dealt with as soon as possible.*
General Defects	*It has little impact on short-term safe operation, but it needs to be included in annual and quarterly maintenance*
Minor Defects	*It has little effect on short-term safe operation. You can continue to observe and wait for maintenance during the next shutdown.*
No Defects	/

Acoustic Imager Report
18.08.2023

Inspection Details						
Point ID	Point Name	Loss Vol	Economic Loss	Fault Level	Carbon Emissions	Electricity Consumption
1	20230818_001	3.14 ml/s	4.25 ¥/Year	Minor Defects	3.96 kg/Year	10.74 kWh

Acoustic Imager Report
18.08.2023

Maintenance Advice:

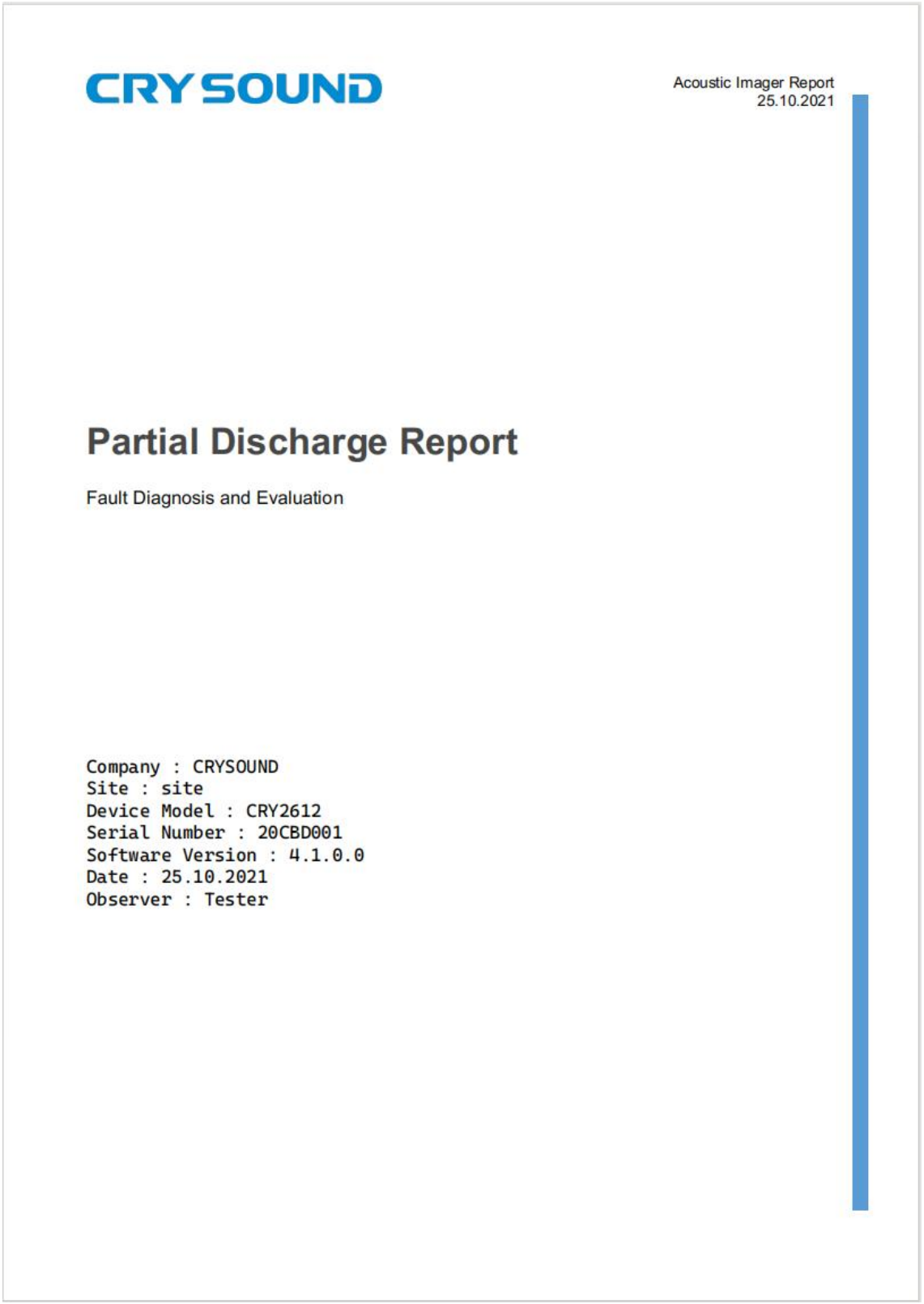
can be ignored

Properties	
Point ID	1
Detect Point Name	20230818_001
Gas Type	Air
Point Max SPL	40.9 dB
Fault Site	Fault Site
Site Description	Site Description
Test Distance	0.5 m
Loss Vol	3.14 ml/s
Economic Loss	4.25 ¥/Year
Electricity Consumption	10.74 kWh
Carbon Emissions	3.96 kg/Year
Fault Level	Minor Defects

Notes:

Judgement

Appendix D ISO50001 Electricity Report (PDF)



CRY SOUND

Acoustic Imager Report
25.10.2021

Partial Discharge Report

Fault Diagnosis and Evaluation

Company : CRYSOUND
Site : site
Device Model : CRY2612
Serial Number : 20CBD001
Software Version : 4.1.0.0
Date : 25.10.2021
Observer : Tester

Acoustic Imager Report
25.10.2021

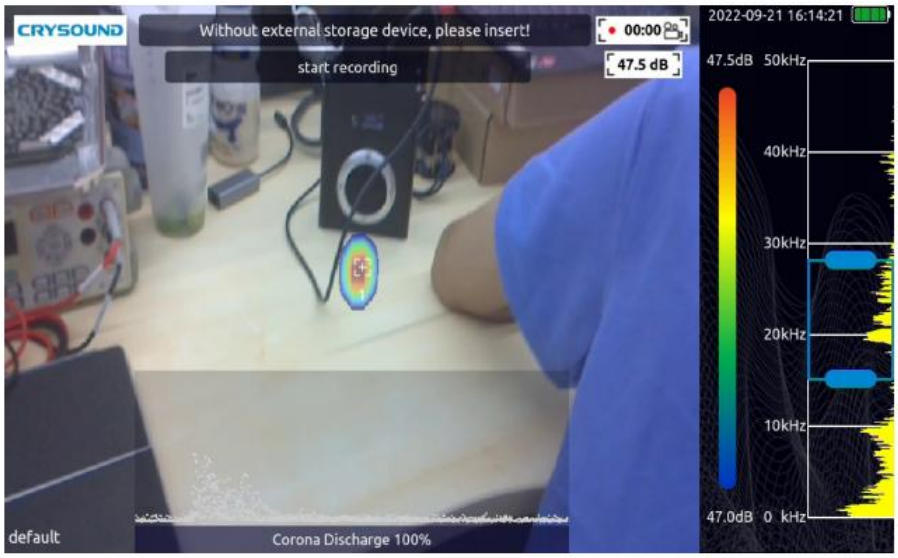
Overview of the Inspection	
Number of PD faults	1
Maximum dB values	47.5 dB
Minimum dB values	47.5 dB

Fault Level	Description
Defects	*The detection pattern of typical partial discharge and the discharge amplitude is large, so it is recommended to repair in a short time, and the monitoring should be strengthened before repair.*
Abnormal	*With partial discharge characteristics and small discharge amplitude, can be included in the annual inspection, quarterly maintenance plan for deficiency elimination.*
Normal	*No typical discharge pattern and no discharge was detected.*

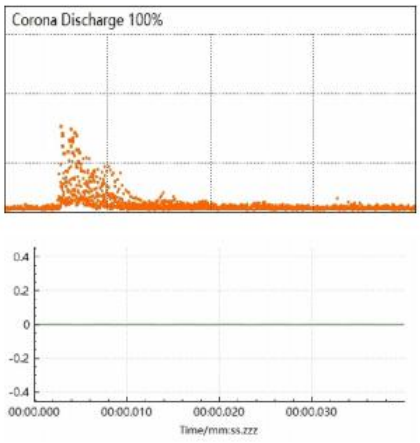
Acoustic Imager Report
25.10.2021

Inspection Details			
Point ID	Detect Point Name	Max SPL	Fault Level
1	20220921_032	47.5 dB	Abnormal

Acoustic Imager Report
25.10.2021



PRPD Spectrogram



Properties	
Point ID	1
Detect Point Name	20220921_032
Point Max SPL	47.5 dB
Fault Site	Fault Site
Site Description	Description
Test Distance	1.5 m
Voltage	2V
Discharge Type	Corona Discharge 100%
Fault Level	Abnormal

PD Type Analysis Reference:

Corona Discharge 100%

100%

Maintenance Advice:

need to repair

Notes:

judgement