LeakQ™/PDQ Mode™

Reporting Tool

Users Manual

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Introduction

Use the Fluke LeakQ™/PDQ Mode™ Reporting Tool to generate reports about the leaks and partial discharges from pictures captured with the Fluke ii900-Series Acoustic Imager. These reports enable you to prioritize the leaks or discharges for maintenance:

LeakQ: leak size and cost estimation

PDQ Mode: partial discharge type and pulse count

These Reporting Tools are available:

- Fluke Online Reporting: LeakQ & PDQ Mode
  - Web-based (Cloud) solution
  - Standardized reporting template
  - Leak Type selection for each capture
- Fluke Connect Desktop: LeakQ
  - Local PC installed application
  - No Leak Type selection (should be included at time of capturing the measurement)
  - Offers customization of reporting template

About Leak and Partial Discharge Reports

LeakQ Reports are estimates of air flow based on the sound it produces.The flow depends on the system pressure and the actual pressure at the point of the leak that depends on back pressure. This flow and pressure at the leak will vary due to several factors, such as the load of other tools or subsystems on the same line. The efficiency in converting electrical kW to compressed air CFM of a system is a variable in time that depends on the overall load and operating point that the compressors are working. All those elements add variance or uncertainty to the estimated cost of a leak.

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Typical tools only measure dB on a narrow frequency band. LeakQ does an automatic scan of the full frequency spectrum and captures the actual frequency range that the leak is generating. This makes the estimations more representative of the real leak rate than traditional tools.

The input for specific power is generally 30 kW/100CFM. The specific power is the power needed to generate a certain volume of compressed air and is a measure of system efficiency.

LeakQ mode automatically determines the distance to the target (a leak that shows inside the circle on the display). The distance measurement is up to 5 m (16 ft) depending on the environmental conditions. When a leak is detected and the Imager can determine the distance, the LeakQ value on the display gives an indication of the size of the leak. The value is based on the measured dB SPL value and the distance.

LeakQ estimates are based on the average sound generated by average leaks. Fluke has measured a large number of leaks types, at different flow rates, and at different pressures, and uses a regression model to estimate a flow rate out of a dB. No direct mathematical model to obtain flow from the sound signature of a leak exists.

PDQ Mode (ii910) captures data from a Partial Discharge (PD) that enables further analysis such as type of discharge and pulse count. The PD must be inside the circle on the display. When a PD is detected, the PD Count value on the display gives an indication of the pulses generated by that partial discharge.

Before You Start

Before you use the Reporting Tool, check that the ii900/ii910 Acoustic Imager firmware is up-to-date and the capture mode is correctly set.

Firmware Update ii900/ii910 Acoustic Imager

On the Imager, check your current firmware version:

1. Open the **Menu**.
2. Go to **Settings** > **Imager Info**.
3. Tap on **OS**.
4. If the version is not the same as what is available from the website, upgrade the Imager offline. See *ii900/ii910 Acoustic Imager Users Manual*.

Note

Windows 10 OS, or higher, is required for ii900/ii910 firmware upgrades.

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ii900/ii910 Capture Mode

The ii900/ii910 Acoustic Imager has several capture modes: Image, Video, LeakQ, and PDQ. To create analysis reports in the Reporting Tool, the capture mode must be set to LeakQ or PDQ mode when you save data files. Before you capture the data files, make sure that the capture mode is set correctly on the Imager for the report type you plan to generate.

To select the capture analysis mode:

1. Open the tool menu on the Imager.
2. Tap the Image icon to open the Capture Mode menu:
   a. Tap for the LeakQ mode (ii900 and ii910) for Leak quantification.
   b. Tap for the PDQ-Mode (ii910) for Partial Discharge.

Create a Report with Fluke Connect Desktop

Fluke Connect Desktop is an application installed on a local PC desktop.

Import Captures

To import captures:

1. Start the Fluke Connect Desktop application on your PC.
2. Turn off the ii900/ii910 Acoustic Imager.
3. Connect the Imager to the PC with a USB/USB-C cable.
4. Turn on the Imager.
5. Open Fluke Connect Desktop on the PC.

   The Fluke ii900 Series shows in the **TOOLS** tab.
6. Select **DOWNLOAD**.
7. Select **DOWNLOAD ALL** or **SELECT FILES** to transfer all or a selection of captures to Fluke Connect Desktop.
8. Select the destination folder and select **OK**.
9. Confirm deletion of downloaded files from the Imager or select **CANCEL** to proceed and keep the files in the Imager.

   Downloaded images are now available in the **MEASUREMENT** tab.

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Generate a Report

To create a report:

1. Go to the **IMAGING REPORTS** tab.
2. Select **CREATE REPORT**.
3. At the prompt, select **BASIC ACOUSTIC** and select **CONTINUE**.
4. Select the applicable images and select **ADD MEASUREMENTS**.

   The report offers multiple options:

   - Editing Fields: change logo, author, date, as well as other fields.
   - Operating conditions
   - Field list: select variables
5. Select **SAVE**, **EXPORT**, or **PRINT**.

Create a Report with Online Tool

The Online Reporting Tool is a web-based (Cloud) solution for report creation.

Transfer Files to PC

To transfer files from the Imager to a PC:

1. Connect the Imager to a PC with a USB/USB-C cable.
2. Turn on the Imager.
3. Find your Imager (**FLK-ii900 Series**) in Windows File Explorer.
4. Go to **User Data** > **Storage**.
5. If applicable, select the default or custom created folder.
6. Copy the required .as2 files to a (temporary) folder on your PC.

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Generic Reports

For generic reports:

1. Go to Fluke Online LeakQ Reporting Tool:

Supported Browsers are Google Chrome™, Mozilla® Firefox®, and Microsoft® Edge Chromium

2. Review and **Accept** the Terms of Service.
3. To upload your selection of measurements:
   a. Click **Drag and drop AS2 files here or click**.

      A new Windows File Explorer opens.

   b. Select the measurement files (.as2) and click **Open**.

      The selected measurements upload to the online tool.

LeakQ Reports

To create a LeakQ report:

1. Enter (optional):
   - Survey Name
   - Company Name
   - Survey Comments
2. Enter the variables in **Operating Conditions** menu.
3. Select the unit system between Imperial or Metric.
4. Enter the **Currency**. Input either a symbol ($) or a code (USD), this selection does not affect the results.
5. Select the **Gas Type** and the **Cost** of that gas. If it is air, select the cost as zero. The report considers only one type and cost of gas for each report.
6. Enter the variables:
   - Pressure of the system. This value is used when no pressure value has been logged on leak tags in the .as2 file.
   - Cost of electricity for the kW/hour.
   - System Specific Power ratio (in kW/CFM). The Specific Power at certain pressure is a value typically indicated on compressor data sheets.
   - Number of hours the system operates in a year (for example, 8760 hours for plants that operate 24 hours, 7 days/week).

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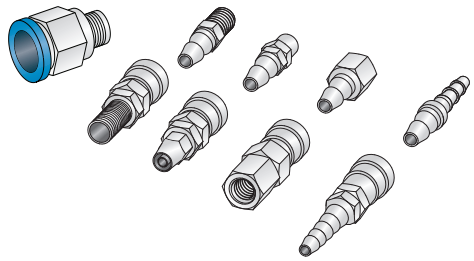
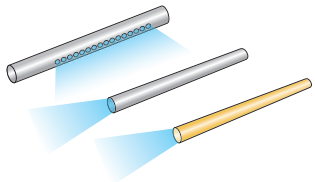
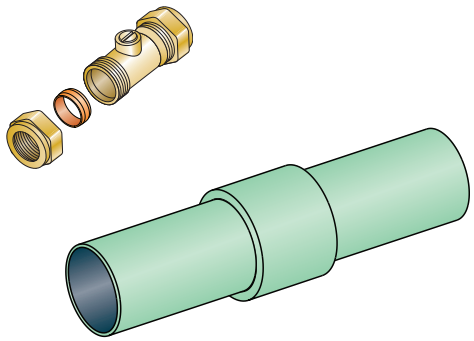
7. As an option, if not provided, select the **Leak type** for the individual measurement. See Table 1.

Table 1. Leak Types

Leak Type	Description	
Quick Connect	Leaks in a joint or interface that is not threaded	
Open End	Large, clean holes/open-ended pipes/missing nuts and screws	
Threaded Coupling	Leaks on metallic threads or cracks in welds	
Hose	Leaks in rubber, flexible, and plastic hoses and pipes	
Other	Reporting Tool uses a generic average leak. Select this type if the leak is unknown.	
Automatic	LeakQ Reporting tool auto selects the type based on an analysis of the sound pattern for the leak.	

8. Click **RECALCULATE**.
9. Click **GENERATE REPORT**. A pop-up window prompts for a print location.
10. Select a destination:
    a. **PRINT** to a specific printer location.
    b. **SAVE** as PDF file to a file folder location.

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PDQ Reports

To create a PDQ report:

1. In the **PDQ Operating Conditions** drop-down list, select the operating frequency.
2. As an option, enter more information about the report:
   - Survey Name
   - Company Name
   - Survey Comments
3. Click **GENERATE REPORT**.

   A pop-up windows appears.
4. Select a destination:
   a. **PRINT** to a specific printer location.
   b. **SAVE** as PDF file to a file folder location.

Tips

Table 2 is a list of common problems and solutions.

Table 2. Troubleshooting Guide

Problem	Solution
ii900/ii910 firmware update failed.	• Make sure the new firmware file is located in the top (root) level of ii900 folder. • Make sure the file extension (.swu) is correct. • Make sure the original filename is used, for example, (1) cannot be included as part of the filename.
Report shows zero for LeakQ.	Set the mode to LeakQ (rather than image or video mode).
Values seem too high for air.	You may be double-counting energy cost of air and cost of air lost. Cost of gas lost should be used for gases which have a finite cost, such as, oxygen, nitrogen, and hydrogen.
Values are lower than what shows on an ultrasonic single-point tool.	Both are estimates. Fluke estimates are often more conservative.
Capture in PDQ Mode is saved as only an image.	The partial discharge is too weak to capture additional information about the partial discharge.

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