FOTRIC TD3-LD
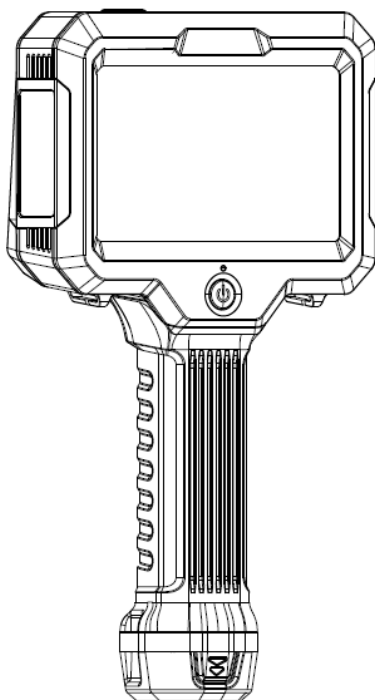# Quick Start Manual

FOTRIC

Symbols

For the symbols that appear in the documentation, the descriptions are listed below.

⚠ Warning	⚠ Caution
Potential death or serious injury inducing hazards	Potential danger of injury or property damage.

Safety information

The purpose of this section is to ensure that the user uses the product properly to avoid danger or property damage.

Before using this product, please read this instruction manual carefully and keep it in a safe place for future reference.

⚠ Warning

- Do not disassemble or modify the camera battery. The battery is equipped with safety and protection devices, which, if tampered with, may cause the battery to overheat.

- If the battery leaks and gets into your eyes, do not rub, wash with water and get immediate medical attention.

- Do not disassemble or modify the equipment in any way (unauthorized modifications or repairs will cause problems at your own risk).

⚠ Caution

- Protect the acoustic sensor array from stains, dust, and liquids that could affect the performance of the acoustic imaging camera or even cause permanent damage.

- Avoid using the product in humid, dusty, extremely hot, or cold environments. For humidity requirements see the product parameters table.

- It is strongly recommended to use the original power adapter. The power adapter requirements are listed in the product specification sheet.

- To prevent the potential risk of data loss, always copy (backup) data to the computer.

- When storing the acoustic camera, it is strongly recommended to use the original box and store it in a cool, dry, well-ventilated environment free from strong electromagnetic fields.

- When shipping the camera, it is strongly recommended that it be shipped in the factory packaging for protection.

Contents

1. Acoustic Imaging Camera

1.1 Front view

Figure 1.

1.2 Rear view

Digital camera

Spiral
microphone
array

Wrist band upper
connection

Wrist band lower
connection

Battery
back clip
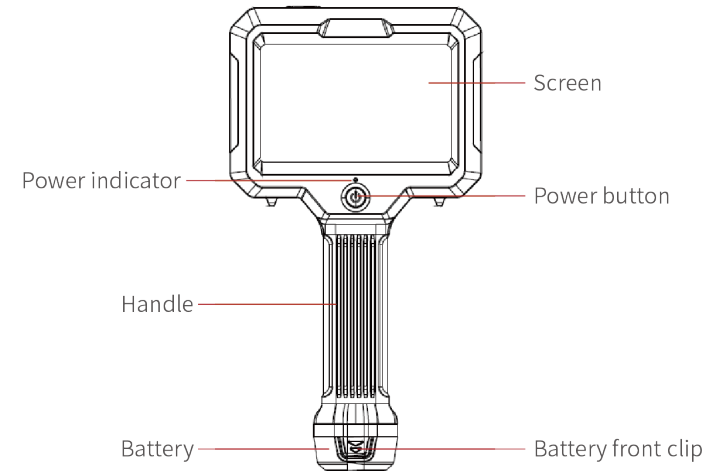
Figure 2.

1.3 Side view

Product label
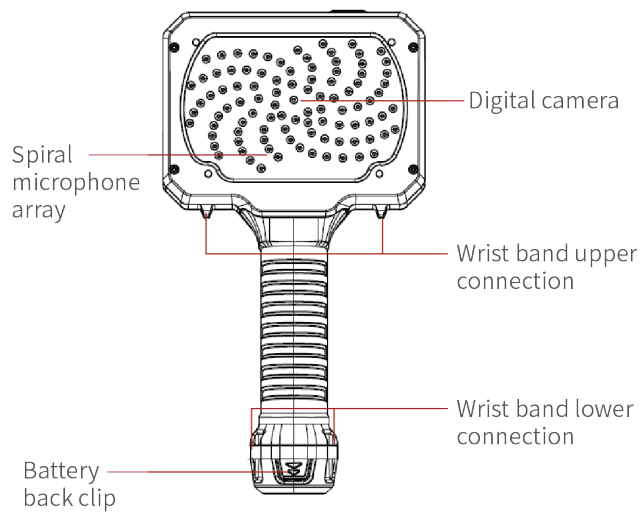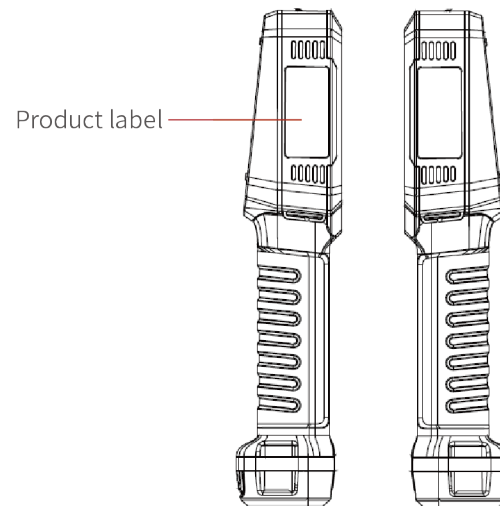
Figure 3.

1.4 Top view

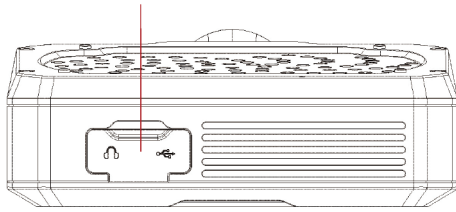Headphone connection interface、Type-C interface

Figure 4.

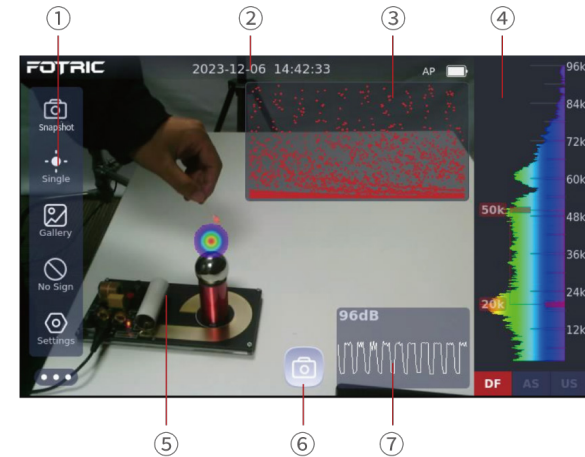# 2. Interface Introduction

2.1 Main interface

Figure 5.

① Menu bar: Capture mode(Snapshot, Recording), Signal filter mode (single, multi, filter), Gallery , Display mode (no sign, center, evaluation), Settings.

② Status bar: displays read-only information such as time, recording status etc.

③ PRPD graph(only applicable under partial discharge mode) : partial discharge's type and severity.

④ Frequency spectrum: displays the Faster Fourier Transformation

graph and allows specific frequency range selection and signal analysis.

⑤ Sound and video displays area: displays visible light screen and sound with palette-color overlay.

⑥ Photo/Video capture key: switchs between photo & video capture function according to the capture mode.

⑦ Sound intensity trend graph: displays the current maximum sound intensity and sound intensity trend.
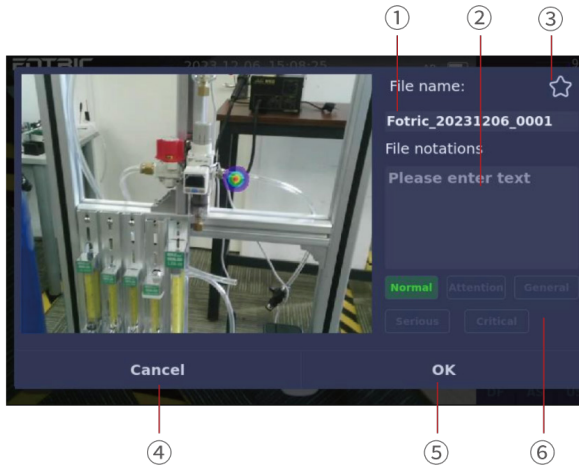
2.2 Save interface

Figure 6.

① File name: displays the file name, which is editable by tapping to summon a virtual keyboard.

② Text annotation: tap on the box to summon a virtual keyboard and insert text annotation.

③ ☆ Favorite: apply the 'favorite' tag to the image. The tag enables the image filter function. On the gallery interface, images, tapping on the tag will display only the files with the tag.

④ Cancel: undo the changes.

⑤ OK: confirm to save the changes

⑥ Defect severity levels: assign a defect severity level to the image.The levels include: Normal, Attention, General(defect), Severe(defect), and Critical(defect).
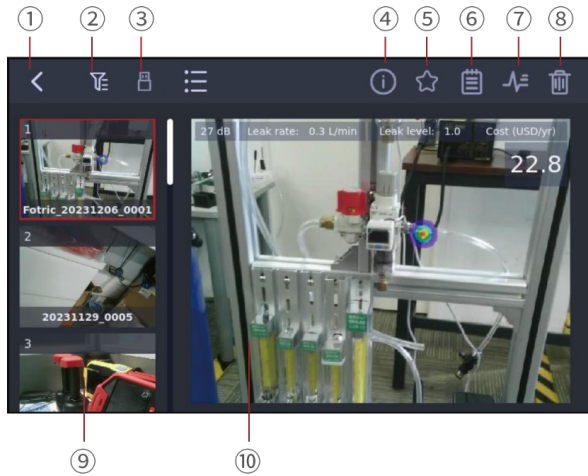
2.3 Gallery

Figure 7.

① ‹ Return: return to the main interface.

② Filter: images in the gallery can be filtered by the 'favorite' tag or the defect severity level.

③ Data export: the icon lights up after the device is connected to an external USB hard drive by the type C interface, as illustrated in Figure 4.It enables to export images and videos exportation.

④ Image information: pulls down a floating window that summarizes information contains in the image: Max sound pressure level, distance parameter, selected frequency range (for more information, please refer to section 4.1), and defect severity level.

⑤ Favorite: apply or undo the 'favorite' tag.

⑥ Text annotation: add, edit or delete text annotation;

⑦ Frequency spectrum: display or withdraw the frequency spectrum.

⑧ Delete: delete the selected file;

⑨ Image list: display the list of files. Press and hold for 2 seconds to enable multiple selection.

⑩ Image display area: display the current selected file screen, graphs and other information.

2.4 Settings

Figure 8.

① Save:

1. 'Save folders': users may create and select folders to hold captured data;

2. 'Save set': toggle the information that appears on exported photos and videos. For detailed data export instruction, please refer to section (2.3 ③);

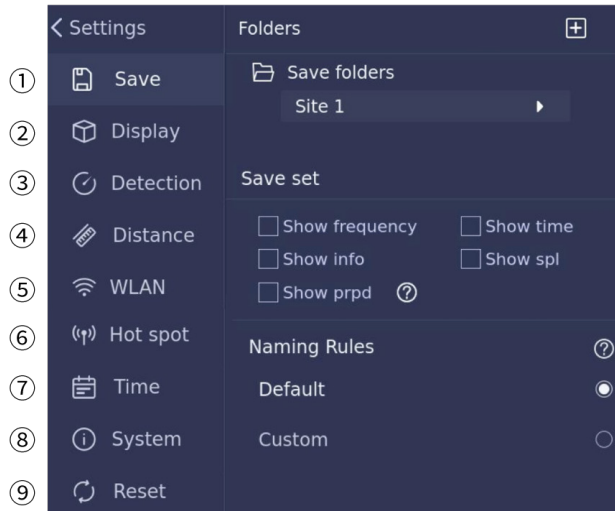3. 'Naming rules': users may select between the default file naming convention (FOTRIC_YYYYMMDD_ xxxx) or a customized naming format (XXXXXXXX_xxxx) where 'x' stands for the image index

number and 'X' stand for user input characters, length maximum being 15.

② Display: on this interface, user may adjust screen brightness, sound output, and the size of the chatter pattern of signal filter mode (2.1 ②).

③ Detection mode: on this interface, user may switch the camera's detection mode between partial discharge detection and leakage detection.

1. Under 'partial discharge mode', the camera can display PRPD graph, which characterizes the type and severity of the partial discharge.

2. Under 'leakage mode', the camera enables 'evaluation' mode, which enables leakage cost quantification.

For more detailed introductions, please refer to section 4.2 and 4.3.

④ Distance: configure the distance parameter. The value can be set between 0.1~130m. Adjustment of this parameter will impact the cost estimation outcome of the leakage evaluation mode.

⑤ WLAN: similar to hot spot, the WLAN function allows the camera to link to a PC and conduct software version upgrade. Detailed software upgrade instruction is available at "www.fotric.com/support-td3-acoustic-camera".

⑥ Hot spot: similar to WLAN, the hot spot function allows the camera to link to a PC and conduct software version upgrade.

⑦ Time: Set up the time for the software system.

⑧ System: the system interface records miscellaneous information about the camera, including the model name, current system language, serial number, system version, the IP address that enables system upgrade, remaining power display, and remaining storage capacity display.

⑨ Reset: reset parameters to factory default settings, delete all saved files.

3. Quick Start

1. Place a fresh battery in the battery compartment of the acoustic camera.

2. Press and hold the power button for 3 seconds to turn on the camera.

3. Select the detection mode in Settings->Detection according to the application. For more details, please refer to section 4.

4. Aim the camera at the target object.

5. Press the 📷 key once to freeze the image. On the freeze image interface, users may apply the 'favorite' tag, modify the file name, add file notations, and select defect severity level.

6. Click the OK key to save or the cancel key to discard the modifications.

7. Image or video files can be viewed in the 'Gallery'.

8. Insert the accessory USB disk drive into the type-C interface, as illustrated in figure 4.

9. Click the 🔌 in gallery interface to export the image or the video.

10. Install the SonicLab software, which can be found on the FOTRIC website 'https://www.fotric.com/support-td3-acoustic-camera' on a PC.

11. Start the SonicLab professional analysis software.

12. Copy the exported data to the PC with the accessory USB disk drive.

13. Click the `Data Import` button on the left of the SonicLab interface to bind the exported data to the software.

14. Find the exported files in SonicLab, and double-clickthe selected files to open them for analysis.

15. Select the target file and click `Generate Report` button on the top right of the SonicLab interface to export an editable word report.

4. Operational Tips

4.1 Frequency filtering

The frequency spectrum on the right side of the screen displays sound signals amplitude distribution on the frequency scale. The camera supports fine analysis on specific frequency range. Users may isolate target signals and minimize interference by adjusting the size and position of the red filter window highlighted by the yellow rectangle.
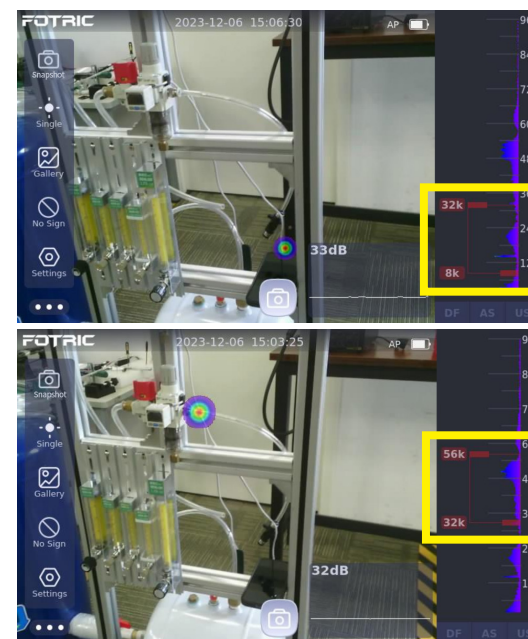

Figure 9.

4.2 Gas leakage evaluation

To initiate leakage detection mode, navigate to Settings -> Detection interface, and select 'Leakage Mode'.

For precise leakage assessment, accurately complete the 'Parameters Config' table with the relevant details.

The default value for the parameters are: Correction factor: 1; Currency: USD; Energy cost(USD/kWh): 1.2; Gas cost(USD/L): 0; Power ratio(kW/(m^3/min)): 7; Gas leak unit: L/min.

The correction factor reconciles any differences between the calculated and the actual measured leakage rates, which may arise from variables such as leakage shape, ambient humidity, and background noise.

The power ratio reflects the energy required to compress a unit volume of the specified gas, which is essential for a comprehensive evaluation.
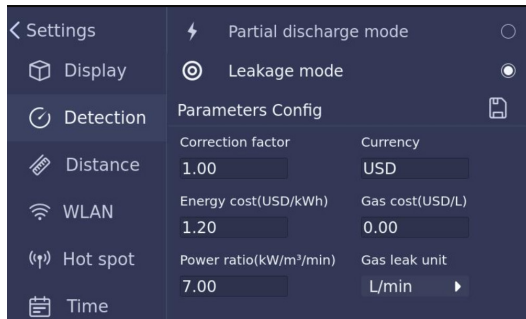

Figure 10.

The 'Evaluation' option within the display mode is accessible only after selecting 'Leakage Mode.'
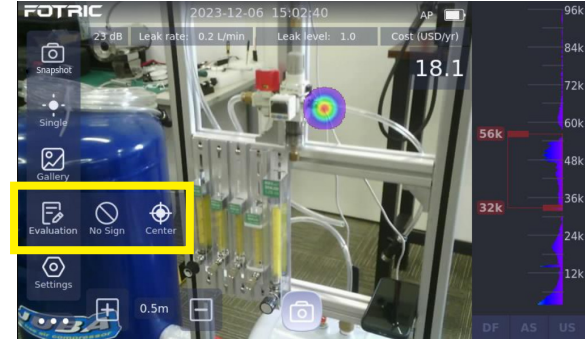

Figure 11.

Within the 'Evaluation' interface, the camera provides an estimate of the annual cost associated with the detected leakage.
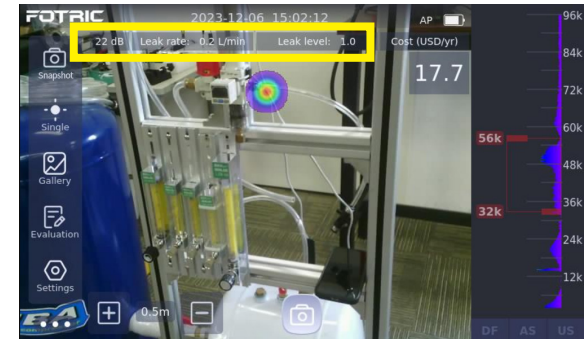

Figure 12.

4.3 Partial discharge detection

To engage the partial discharge detection mode, navigate to Settings -> Detection , select 'Partial Discharge Mode'.

In this mode, the Phase Resolved Partial Discharge (PRPD) graph is displayed in the top right corner of the screen. Click on the graph for an expanded view. When partial discharges are detected, the PRPD graph will plot the pulses in a sinusoidal pattern, indicating the phase angle and magnitude of each discharge occurrence.

The PRPD graph is a powerful diagnostic tool in acoustic cameras, and it enables the visualization of discharge patterns over time. This visual representation helps to distinguish between different types of discharges and to identify problematic insulation in electrical equipment.
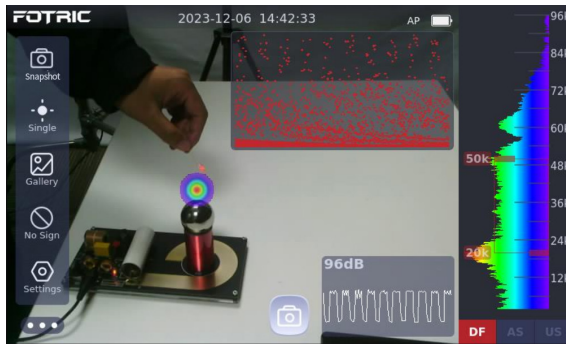

Figure 13.

4.4 Signal filter mode selection

The TD3-LD features three signal filter options: Single, Multiple, and Filter.

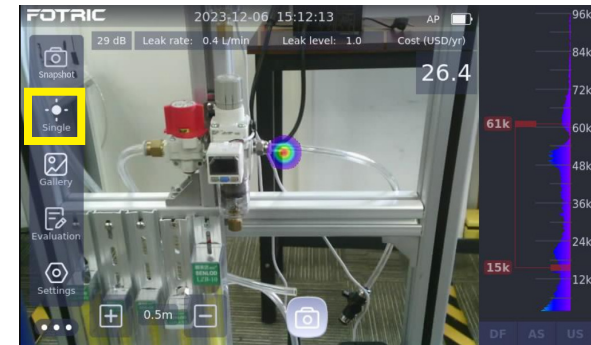'Single' mode isolates and displays the strongest signal.

Figure 14.

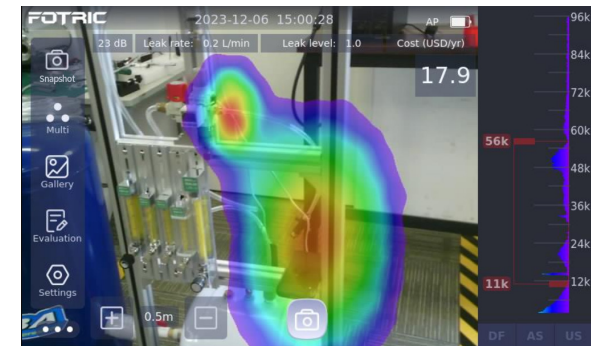'Multiple' mode visualizes all significant signals within a chosen frequency range.

Figure 15.

'Filter' mode provides a customizable threshold to control which sound signals are displayed.

Note: the "Filter" mode is disabled when the 'Evaluation' display mode is active.

5. About This Manual

This manual is used as a guide and the photos, graphics, icons and illustrations provided in the manual are for explanation and illustration purposes only and may differ from the specific product, please refer to the actual product. This manual may be updated by FOTRIC without notice due to product version upgrade or other needs.

The trademarks and images used in this manual are for illustrative purposes only and are the copyright of the trademark owner.

Disclaimer

The products (hardware, software, etc.) provided in this manual may be defective, faulty or malfunctioning and FOTRIC disclaims all warranties of any kind, express or implied, including but not limited to warranties of merchantability, satisfactory quality, fitness for a particular purpose, non-infringement of third-party rights, etc. FOTRIC shall not be liable for any special, incidental, consequential, or indirect damages arising out of the use of this manual or our products including, but not limited to, damages arising from loss of business profits, loss of data or documentation.

To the maximum extent permitted by law, our liability will not exceed the amount you paid for the product.

After the product is connected to the Internet, it may be exposed to risks including but not limited to network attacks, hacker attacks, virus infections, etc. The Company will not be responsible for any

abnormal operation of the product or information leakage caused by such problems, but will provide you with technical support in a timely manner.

The product can sense motion detection and fire events under correct installation and configuration, but cannot avoid accidents or resulting personal injury or property damage.

When using this product, you are requested to strictly comply with applicable laws. You agree that this product is intended for civilian use only and shall not be used in violation of the rights of third parties, medical/safety equipment or other applications where the failure of the product could result in life-threatening or personal injury, and for fog of mass destruction, biochemical weapons, nuclear explosions or any unsafe use of nuclear energy or for hazardous or inhumane purposes. Any loss or liability arising from such use will be borne by you.

In the event of a conflict between the above and applicable law, the provisions of the law shall prevail.

6. How to Contact FOTRIC

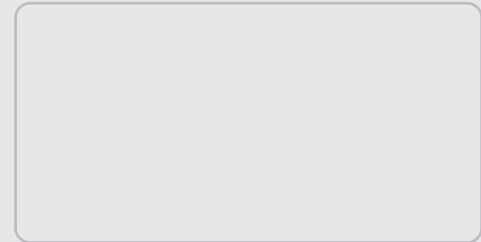If you need to contact FOTRIC, please address the following

✉ info@fotric.com

⌂ www.fotric.com

Certificate of QC

This is to certify that the device or instrument listed on this card meets the requirements of FOTRIC quality control procedures.

FOTRIC TD3 series' technical standards are formulated following the international standards for the industrial testing infrared thermal imager and the relevant standards cited therein, as listed below:

FCC 47 CFR Part 15 Radio Frequency Devices
EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use
EN IEC 61000-3-3:2013 Voltage fluctuations
EN IEC 61000-6-2:2019 EMC immunity requirements
EN IEC 61000-6-4:2019 General standards for EMC
EN IEC 61000-3-2:2019 Limitation of harmonic currents

Warranty Card

Thank you for choosing FOTRIC. We design products to deliver long-lasting performance under our warranty policy (starting from date of original purchase). If any manufacturing defects appear under normal use, the product will be repaired or replaced by FOTRIC INC. with no cost to the owner.
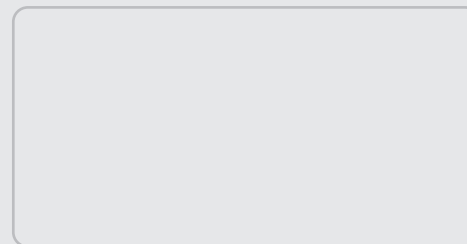
Innovation Excellence Integrity

FOTRIC INC.