Detect gas leaks

Protect the environment

See through flames

Improve safety
Making Invisible Gases Visible

Save Lives, Revenue and the Day

Optical gas imaging cameras give you the power to see invisible gases escaping into the environment faster and more reliably than traditional "sniffer" detectors. With a FLIR GasFindIR camera, you can see and document gas leaks and furnace problems that lead to lost product, lost revenues, fines and safety hazards.

Hydrocarbons
Scan thousands of connections quickly to detect hydrocarbon gas leaks from a safe distance, avoiding regulatory violations and lost revenue from service downtime.

SF6 Leaks
Detect even small SF6 leaks from gas-filled circuit breakers found in substations safely and quickly.

Furnace Tube Inspection
See furnace issues like internal coking and external scaling on product furnace tubes.

Boiler Inspection
Discover issues like ash, slag, and clinker build-ups in coal-fired boilers without shutting them down.

Product Loss
Companies have saved over $10 million annually in lost product by using FLIR's optical gas imaging.

Predictive Maintenance
Scan large areas and hundreds of connections quickly and efficiently to prevent unexpected service outages and lost revenues.

Carbon Monoxide Detection
Protect workers and the environment from toxic levels of CO by pinpointing leaks quickly and efficiently.

Refrigerant Gas Leaks
Detect refrigerant gas leaks from a safe distance without the need to shut down operations.

Carbon Monoxide Detection

Watch GF-Series videos at FLIR.com/GF-Series, or call 866.477.3687.
Optical Gas Imaging Cameras

Track Leaks to Their Source

More than 80% of a facility’s gas leaks will occur in less than 1% of inspected components. Inspectors spend over 99% of their time inspecting safe, non-leaking components. Not anymore.

The GF-Series optical gas detection cameras let you find hydrocarbon, natural gas and SF6 leaks quickly, accurately and safely without shutting systems down for inspection. Invisible to the naked eye, gas leaks look like smoke on infrared optical gas imaging cameras, making them easy to see. FLIR’s optical gas imaging cameras provide a number of benefits compared to traditional ‘sniffers.’ They:

• Scan a broader area much more rapidly
• See into areas that are difficult to reach with contact measurement tools, such as the thousands of connections and fittings within large petro-chemical facilities.
• Enhance your facility’s maintenance program by using the GasFindIR’s temperature measurement capabilities for predictive maintenance thermography.
• Appease EPA regulations since optical gas imaging is an accepted leak detection technique in the Method 21 Leak Detection and Repair Alternative Work Practice (Method 21 AWP) as well as the Green House Gas Reporting Rule.

GF300/320

Hydrocarbons

GF300 & GF320 allow you to survey large areas quickly and effectively, detecting small emissions within large complexes. These cameras are ideal for chemical/petrochemical applications such as:

• Oil refineries
• Natural gas processing plants
• Offshore platforms
• Bio-gas and power generation plants

Per EPA and API recommended testing guidelines, GF300/320 cameras can detect:

• Benzene
• Butane
• Ethane
• Ethylene
• Heptane
• Hexane
• Isoprene

• Methyl Ethyl Ketone (MEK)
• Methane
• Methanol
• MBK
• Octane
• Pentane
• 1-Pentane
• Propane
• Propylene
• Toluene
• Xylene

*GF300 and GF320 offer identical optical gas imaging capabilities. However, only GF320 is calibrated for temperature measurement.

GF304

Refrigerants

The FLIR GF304 was developed specifically to detect refrigerant gas leaks without interrupting or shutting down operations. Detecting refrigerant gas leaks early can save on costly replenishment and limit environmental impact. GF304 is ideal for:

• Food production, storage and retail
• Pharmaceutical
• Automotive
• Air conditioning

GF304 detects the following refrigerant gases:

• R125
• R134A
• R143A
• R245fa
• R404A
• R407C
• R410A
• R417A
• R422A
• R507A
• R413A
• R417A

These images taken with the FLIR GF320 optical gas imaging camera illustrate the difference between regular mode and the high sensitivity mode. A leak that barely shows up the regular rainbow color pattern thermal image in the middle shows up clearly in high sensitivity mode on the bottom.

Captured gas leak from production site.

Captured gas leak.

A leaking pressure gauge.

Gas leak is clearly visible on the thermal image.

Leaking air conditioner in HSM mode

Leaking air conditioner

Leaking air conditioner in HSM mode

Watch GF-Series videos at FLIR.com/GF-Series, or call 866.477.3687.
**GF306**

**SF6 & Ammonia**

One pound of SF6 has the same global warming impact of 24,000 pounds of CO². Because of its long lifespan and high potency, even a relatively small amount of SF6 can have a significant impact on global climate change. Safeguard the environment and meet environmental regulations with FLIR GF306, ideal for:

- Utilities
- Ammonia plants

GF306 detects the following gases:
- Acetic Acid
- Acetyl Chloride
- Acetic Anhydride
- Allyl Bromide
- Allyl Chloride
- Allyl Fluoride
- Arzynhydrous Ammonia
- Bromine
- Chlorine

**GF346**

**Carbon Monoxide**

FLIR GF346 is designed to detect carbon monoxide (CO) emissions from a safe distance. GF346 can quickly scan broad areas to pinpoint small leaks, increase worker safety and protect the environment in the following industries:

- Steel industry
- Bulk chemicals manufacturing
- Packaging plants
- Petrochemical industry

GF346 detects the following gases:
- Acetonitrile
- Acetyl cyanide
- Arsine
- Bromine
- Carbon monoxide
- Chlorine
- Chloroacetic acid
- Chloroform
- Cyanogen bromide
- Dichloromethane
- Ethane
- Ethylene
- Ethyl chloroacetate
- Germane
- Hexyl isocyanide
- Ketene
- Methyl chloride
- Nitro oxide
- Silane

**GF309**

**Through-Flame**

FLIR GF309 is equipped with a special midwave "flame filter" engineered to see in the high temperatures (up to 1,500°C) encountered during industrial furnace and boiler inspections. A nickel-coated heat shield improves worker safety and comfort during inspection. Add the furnace IR 14.5-degree lens extender to measure the temperature of furnace tubes and ovens through small view ports.

**Furnace Inspection** – The GF-309 gives inspectors clear thermal imagery of fired product tubes, allowing them to distinguish between internal coking and external scaling, helping to avoid costly tube overheat failures. The ability to identify coking also allows for proper planning of unit shutdowns and de-coke procedures.

**Burner Alignment** – With the GF-309's specialized filters, inspectors can accurately scan for proper burner alignment and check for flame impingement, identifying if the flame pattern is causing localized tube overheating.

**Fire Box Inspection** – Its wide temperature range makes the GF-309 well-suited for external firebox inspections, detecting the hot spots on the outside of a firebox that indicate a problem with the internal refractory bricks or insulating blankets.

**Coal-Fired Boilers** – The GF-309 is ideal for identifying slag buildup that can potentially interfere with heat transfer, cause localized tube corrosion, and result in catastrophic mechanical failure when the slag “clinkers” fall.
### Imaging Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>GF300/320</th>
<th>GF304</th>
<th>GF306</th>
<th>GF346</th>
<th>GF309</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Detector Type</strong></td>
<td>Cooled InSb</td>
<td>Cooled QWIP</td>
<td>Cooled QWIP</td>
<td>Cooled InSb</td>
<td>Cooled InSb</td>
</tr>
<tr>
<td><strong>Spectral Response</strong></td>
<td>3.2 – 3.4 µm</td>
<td>8.0 – 8.6 µm</td>
<td>10.3 – 10.7 µm</td>
<td>4.52 – 4.67 µm</td>
<td>3.8 – 4.05 µm</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>520 x 240</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Pixels</strong></td>
<td>76,800</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermal Sensitivity</strong></td>
<td>&lt;15 mK @ +30°C (+86°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±1°C (±1.8°F) for temperature range 0°C to +100°C (+32°F to +212°F) or ±2% of reading for temperature range &gt;+100°C (&gt;+212°F)*</td>
<td>±1°C (±1.8°F) for temperature range 0°C to +100°C (+32°F to +212°F) or ±2% of reading for temperature range &gt;+100°C (&gt;+212°F)*</td>
<td>±1°C (±1.8°F) for temperature range 0°C to +100°C (+32°F to +212°F) or ±2% of reading for temperature range &gt;+100°C (&gt;+212°F)*</td>
<td>±1°C (±1.8°F) for temperature range 0°C to +100°C (+32°F to +212°F) or ±2% of reading for temperature range &gt;+100°C (&gt;+212°F)*</td>
<td>±1°C (±1.8°F) for temperature range 0°C to +100°C (+32°F to +212°F) or ±2% of reading for temperature range &gt;+100°C (&gt;+212°F)*</td>
</tr>
<tr>
<td><strong>Temperature Range</strong></td>
<td>-40°C to 350°C (40°F to 662°F)</td>
<td>-40°C to 350°C (40°F to 662°F)</td>
<td>-40°C to 350°C (40°F to 662°F)</td>
<td>-40°C to 350°C (40°F to 662°F)</td>
<td>-40°C to 350°C (40°F to 662°F)</td>
</tr>
<tr>
<td><strong>High Temp Option</strong></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Lens Options</strong></td>
<td>Standard: 24° x 18°; Optional: 14.5°, 6°</td>
<td>Standard 24° x 18°; Optional: 14.5°</td>
<td>Standard 24° x 18°; Optional: 14.5°</td>
<td>Standard 24° x 18°; Optional: 14.5°</td>
<td>Standard 24° x 18°; Optional: 14.5°</td>
</tr>
<tr>
<td><strong>Zoom</strong></td>
<td>1 – 8x Continuous Digital</td>
<td>1 – 8x continuous, digital zoom</td>
<td>1 – 8x Continuous Digital</td>
<td>1 – 8x continuous, digital zoom</td>
<td>1–8x Continuous Digital</td>
</tr>
<tr>
<td><strong>Color LCD</strong></td>
<td>4.3” 800 x 480 Pixels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Adjustable Viewfinder</strong></td>
<td>Tiltable OLED, 800 x 480 pixels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Video Camera w/ Lamp</strong></td>
<td>3.2 MP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Laser Spot</strong></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Video Out</strong></td>
<td>HDMI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spotmeters</strong></td>
<td>10*</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>Area Boxes</strong></td>
<td>5 (min./max./avg.)</td>
<td>5 (min./max./avg.)</td>
<td>5 (min./max./avg.)</td>
<td>5 (min./max./avg.)</td>
<td>5 (min./max./avg.)</td>
</tr>
<tr>
<td><strong>Profiles</strong></td>
<td>1 live line (horiz. or vert.)</td>
<td>1 live line (horiz. or vert.)</td>
<td>1 live line (horiz. or vert.)</td>
<td>1 live line (horiz. or vert.)</td>
<td>1 live line (horiz. or vert.)</td>
</tr>
<tr>
<td><strong>Delta T</strong></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Annotation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GPS</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>File Storage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Radiometric JPG</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Radiometric Video (15 Hz)</strong></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MPEG Video Recording</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*GF300 is not calibrated for temperature measurement.*
**Reporting Software**

**Help to Make the Right Call: Analysis & Recommendations**

Whether you’re looking for hydrocarbon emissions, SF6 leaks or furnace problems, FLIR cameras are powerful tools for finding a variety of problems in a variety of facilities. But your ability to document and report your findings is just as important as your ability to discover potential problems in the first place. Your reports need to be easily customized for any situation and customer requirement; they need to reflect your professionalism and the quality of your work; and your recommendations for action need to be clear and well-documented in order for others to complete repairs.

FLIR offers several reporting software products, including VideoReport, which is designed specifically for optical gas detection.

**FLIR Tools Mobile**

**Import, Process and Share Images Quickly with the Free App that Speeds Decisions**

Get the word out straight from the field with FLIR Tools Mobile for Apple® and Android™. Connect your smartphone or tablet to your GF-Series camera, then use the app to transfer video from the camera, take on more measurement spots, add text, change palettes, add notes, and generate a PDF. Email video and findings to colleagues and customers in no time. Upload to Dropbox and Box.net accounts. Or use the app to show images right on site to those who need to know immediately.

**FLIR Tools Mobile also lets you stream live video from your GF-Series, plus take remote control of GF-Series functions, including focus, level, span and many other modes. This functionality is perfect when you need to place the camera off on its own for monitoring or safety reasons, or need to share live imaging with others nearby.**

**Key Features:**
- Wirelessly import images from the camera’s SD card
- Stream live video
- Remotely control and record images and video
- Analyze and tune radiometric images and measure temperatures
- Create PDF reports with text and custom logos
- Share images and reports using e-mail, Box and Dropbox

**QuickReport**

**Create Reports Directly from Your Camera**

All FLIR cameras come with the powerful QuickReport analysis and reporting software that allows you to import your infrared and visible-light images into an easy-to-read report. You can measure, adjust, add notes, and send your reports to others for review in PDF format.

**Key Features**
- Adjust level, span, and color palette
- Change isotherm and temperature levels
- Create spot meters, lines, and areas
- Email images and reports in PDF format
- Alter parameters for dew point and radiation alarms
- Add your company logo to inspection reports
- Drag-and-drop images and preview report pages
- Digitally zoom and pan up to 8 times
- Manipulate Fusion images

Visit www.flir.com/GF-Series to download trial versions of our powerful software tools.
Your professionalism drives you to know everything you can about your business; that’s why you’ll want to get the most of your GF-Series camera. FLIR cameras are easy to use and intuitive, but only expert training will give you the knowledge and skills to wring every last bit of capability from your investment. An Infrared Training Center (ITC) certificate is proof of your expertise in operating your camera and interpreting the thermal information it provides.

During the three days of the ITC’s Optical Gas Imaging certification course, you’ll learn how to setup and operate FLIR GF-Series cameras, what gases can be found with the technology, and discover how different environmental conditions can affect the ease or difficulty of gas leak detection while earning 2.0 IACET CEUs. Training includes classroom instruction and lab time covering basic inspection procedures, permitting requirements, safety practices, and more.

ITC courses provide:
- Industry-leading, high-quality interactive instruction
- Most qualified international instructors
- Most extensive hands-on laboratories
- ISO 9001 registered
- Online training courses are also available

Other ITC courses include:
- Level I, Level II, and Level III
- Building Diagnostics
- Building Science certificate
- Weatherization & Energy Audits
- Commercial Roof IR Inspections
- Commercial Electrical IR Inspections

Attend classes at our training center, locally at one of our regional classes, or in your facility with our on-site service.

For full course descriptions, updated schedules, and more information, visit the ITC website at www.infraredtraining.com or call 1.866.872.4647.
Rent
FLIR’s rental program is a great way to make sure you are getting the model, performance and features you need. Our rental department has all the current models in stock, and we are ready to help.

Lease
Leasing is a great way to minimize your initial expense, and there may be tax advantages for you to lease. FLIR has several options for those interested in starting or upgrading your program. Give us a call and we can help.

Trade Up
FLIR offers trade-in value for many existing cameras. Contact your FLIR representative for trade-in program, and check into our stock of Pre-Owned cameras while you’re at it.

About FLIR
The World Leader in Designing, Manufacturing & Marketing Thermal Imaging Systems
All infrared cameras are not created equal, because infrared camera manufacturers are not all the same. FLIR stands above the rest. The largest commercial infrared company in the world, FLIR has nearly 50 years of experience building and integrating high-performance infrared cameras, giving us a command of these specialized technologies that no one else can touch. FLIR’s products are at work every day saving lives, protecting our troops overseas, and helping to keep borders and facilities safe.

Now, FLIR’s cameras are available for your personal use, too. You can have a FLIR on your boat, your car or even as a home security camera. The same FLIR technology in your GF-Series camera is in Audi and BMW cars as a pedestrian detection system. And if you enjoy hunting and outdoor activities, there’s an inexpensive FLIR for you too. You might not know FLIR by name, but you have been seeing our products at work since the 1980’s.

FLIR.com/GF-Series
See GasFindIR in action, access case studies and much more online.

Where There’s “Smoke”...
Leaking gas looks like smoke in infrared and still images don’t do justice to the GF-Series’ capabilities. You’ll be amazed how quickly the camera detects different gases, and you can see side-by-side comparisons of gas leaks from visible light cameras, where a potentially dangerous situation looks completely innocuous. Access “leak” footage of SF6, natural gas, carbon monoxide, methane, heptane and other gases, as well as footage of furnace and boiler inspections at FLIR.com/GF-Series.

Online Resource Center
Find out more about GF-Series cameras and what the can do for you. Visit FLIR.com/GF-Series to access:
• "Gas Detection: The Professional Guide"
• Case Studies
• Technical Papers
• Product Literature

Or call 866.477.3687 to speak with a FLIR Specialist.

Watch GF-Series videos at FLIR.com/GF-Series, or call 866.477.3687.