

## P/N: 44602-0101

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### Website

<http://www.flir.com>

### Customer support

<http://support.flir.com>

### Disclaimer

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### General description

The FLIR GF309 is an infrared camera for furnace and high temperature inspection (e.g., of industrial furnaces, chemical heaters, and coal-fired boilers), without the need to shut down the operation. The portable camera also greatly improves operator safety, by measuring through flames at a safe distance, for all types of furnaces. A good knowledge of the furnace condition can avert failures and unscheduled shutdowns

Industrial furnaces, heaters, and boilers are found in the chemical, petrochemical, and utility industries.

### Benefits:

- **Improved efficiency:** The FLIR GF309 reduces inspection time by measuring the temperature through flames without the need to interrupt the industrial process or await scheduled service shutdowns. A furnace camera can help you to determine how to run a furnace/boiler efficiently to give the best fuel economy and maximize production output and quality. As the FLIR GF309 has a wide temperature range, high-accuracy electrical and mechanical inspections can be performed, which makes the camera even more useful for predictive maintenance.
- **The wireless connectivity of the camera** allows you to connect to smart phones or tablets for the wireless transfer of images or the remote control of the camera—a useful function if regulations require a second person to accompany the furnace inspector or thermal images needs to be sent quickly for a second opinion.
- **Increased worker safety:** High-temperature measurement can be performed through flames in a non-contact mode, and from a safe distance. Custom-built, the FLIR GF309 also features a detachable heat-shield designed to reflect heat away from the camera and the camera operator, providing increased protection. The camera is ergonomically designed, with a bright LCD and tiltable viewfinder, which facilitates its use over a full working day.
- **Increased furnace safety:** Good knowledge of furnace/boiler condition and operating parameters can provide the information needed to avert catastrophic failures and prevent unscheduled shutdowns.

### Imaging and optical data

IR resolution	320 × 240 pixels
Thermal sensitivity/NETD	<15 mK @ +30°C (+86°F)
Field of view (FOV)	14.5° × 10.8°
Minimum focus distance	0.5 m (1.64 ft.)
Focal length	38 mm (1.49 in.)
Lens identification	Automatic
F-number	1.5
Focus	Automatic (one touch) or manual (electric or on the lens)
Zoom	1–8× continuous, digital zoom
Digital image enhancement	Noise reduction filter

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<b>Detector data</b>	
Detector type	Focal plane array (FPA), cooled InSb
Spectral range	3.8–4.05 $\mu\text{m}$
Detector pitch	30 $\mu\text{m}$
Sensor cooling	Stirling Microcooler (FLIR MC-3)
<b>Electronics and data rate</b>	
Full frame rate	60 Hz
<b>Image presentation</b>	
Display	Built-in widescreen, 4.3 in. LCD, 800 $\times$ 480 pixels
Viewfinder	Built-in, tiltable OLED, 800 $\times$ 480 pixels
Automatic image adjustment	Continuous/manual; linear or histogram based
Manual image adjustment	Level/span
<b>Image presentation modes</b>	
Image modes	IR image, visual image
<b>Measurement</b>	
Temperature range	-20°C to +1500°C (-4°F to +2732°F)
Accuracy	$\pm 1^\circ\text{C}$ ( $\pm 1.8^\circ\text{F}$ ) for temperature range (0°C, to +100°C, +32°F to +212°F) or $\pm 2\%$ of reading for temperature range (>+100°C, >+212°F)
<b>Measurement analysis</b>	
Spotmeter	10
Area	5 boxes with max./min./average
Profile	1 live line (horizontal or vertical)
Isotherm	Above/below/interval
Difference temperature	Delta temperature between measurement functions or reference temperature
Reference temperature	Manually set or captured from any measurement function
Emissivity correction	Variable from 0.01 to 1.0 or selected from editable materials list
Reflected apparent temperature correction	Automatic, based on input of reflected temperature
Measurement corrections	Reflected temperature, distance, atmospheric transmission, humidity, external optics
<b>Set-up</b>	
Menu commands	Level, span Auto adjust continuous/manual/semi-automatic Zoom Palette Start/stop recording Store image Playback/recall image
Color palettes	Iron, Gray, Rainbow, Arctic, Lava, Rainbow HC
Set-up commands	1 programmable button, local adaptation of units, language, date and time formats



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<b>Storage of images</b>	
Storage media	Removable SD or SDHC memory card , two card slots
Image storage capacity	> 1200 images (JPEG) with post process capability per GB on memory card
Image storage mode	IR/visual images Visual image can automatically be associated with corresponding IR image
Periodic image storage	Every 10 seconds up to 24 hours
File formats	Standard JPEG, 14 bit measurement data included
<b>Geographic Information System</b>	
GPS	Location data automatically added to every image from built-in GPS
<b>Video recording in camera</b>	
Radiometric IR video recording	*.seq video clips to memory card (7.5 and 15 Hz).
Non-radiometric IR video recording	MPEG4 (up to 60 minutes/clip) to memory card. Visual image can automatically be associated with corresponding recording of non-radiometric IR video.
Visual video recording	MPEG4 (25 minutes/clip) to memory card
<b>Video streaming</b>	
Radiometric IR video streaming	Full dynamic to PC using USB cable or to mobile devices using Wi-Fi. PC software capable of displaying the video stream include the following: <ul style="list-style-type: none"><li>• FLIR IR Camera Player</li><li>• FLIR ResearchIR</li><li>• FLIR Tools</li></ul>
Non-radiometric IR video streaming	RTP/MPEG4
<b>Digital camera</b>	
Built-in digital camera	3.2 Mpixels, auto focus, and two video lamps
<b>Laser pointer</b>	
Laser	Activated by dedicated button
Laser classification	Class 2
Laser type	Semiconductor AlGaInP diode laser, 1 mW, 635 nm (red)
<b>USB</b>	
USB	<ul style="list-style-type: none"><li>• USB-A: Connect external USB device</li><li>• USB Mini-B: Data transfer to and from PC</li></ul>
USB, standard	USB Mini-B: 2.0 high speed
<b>Composite video</b>	
Video out	Digital video output (image)
<b>Power system</b>	
Battery type	Rechargeable Li ion battery
Battery voltage	7.2 V
Battery capacity	4.4 Ah
Battery operating time	> 3 hours at 25°C (+77°F) and typical use



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<b>Power system</b>	
Charging system	In camera (AC adapter or 12 V from a vehicle) or 2-bay charger
Charging time	2.5 h to 95% capacity, charging status indicated by LED's
External power operation	AC adapter 90–260 VAC, 50/60 Hz or 12 V from a vehicle (cable with standard plug, optional)
DC operation	10.8 to 16 V DC, polarity protected (proprietary protected)
Power	8.5 W typically
Start-up time	Typically 7 min. @ 25°C (+77°F)
<b>Environmental data</b>	
Operating temperature range	–20°C to +50°C (–4°F to +122°F)
Storage temperature range	–30°C to +60°C (–22°F to +140°F)
Humidity (operating and storage)	IEC 68-2-30/24 h 95% relative humidity +25°C to +40°C (+77°F to +104°F) (2 cycles)
Directives	<ul style="list-style-type: none"> <li>• 73/23EEC</li> <li>• 2004/108/EC</li> <li>• 2002/95/EC</li> <li>• 2002/96/EC</li> </ul>
EMC	<ul style="list-style-type: none"> <li>• EN61000-6-4 (Emission)</li> <li>• EN61000-6-2 (Immunity)</li> <li>• FCC 47 CFR Part 15 class A (Emission)</li> <li>• EN 61 000-4-8, L5</li> </ul>
Encapsulation	IP 54 (IEC 60529)
Shock	25 g (IEC 60068-2-27)
Vibration	2 g (IEC 60068-2-6)
Safety	Power supply: EN/UL/IEC 60950-1
<b>Physical data</b>	
Camera weight, excl. lens and battery	1.94 kg (4.27 lb.)
Camera weight, incl. lens and excl. battery	2.24 kg (4.94 lb.)
Camera weight, incl. lens and battery	2.48 kg (5.47 lb.)
Battery weight	0.24 kg (0.52 lb.)
Heat shield weight	0.50 kg (1.09 lb.)
Camera size, excl. lens (L × W × H)	284 × 169 × 161 mm (11.2 × 6.7 × 6.3 in.)
Cameras size, incl. lens (L × W × H)	305 × 169 × 161 mm (12.0 × 6.7 × 6.3 in.)
Cameras size, incl. heat shield (L × W × H)	320 × 243 × 195 mm (12.6 × 9.6 × 7.7 in.)
Battery size (L × W × H)	141 × 47 × 28 mm (5.5 × 1.8 × 1.1 in.)
Battery charger size (L × W × H)	158 × 122 × 25 mm (6.2 × 4.8 × 1.0 in.)
Tripod mounting	UNC ¼"-20
Housing material	Aluminum, magnesium
Grip material	TPE thermoplastic elastomers



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Shipping information	
Packaging, type	Cardboard box
List of contents	<ul style="list-style-type: none"> <li>• Infrared camera with lens</li> <li>• Battery charger</li> <li>• Battery, 2 ea.</li> <li>• Hard transport case</li> <li>• HDMI-DVI cable</li> <li>• HDMI-HDMI cable</li> <li>• Heat shield</li> <li>• Lens cap (mounted on lens)</li> <li>• Memory card</li> <li>• Power supply, incl. multi-plugs</li> <li>• Printed documentation</li> <li>• Shoulder strap</li> <li>• USB cable</li> <li>• Wi-Fi USB micro adapter (depending on CE and FCC regulations regarding wireless equipment for your country)</li> </ul>
Packaging, weight	
Packaging, size	400 × 190 × 510 mm (15.7 × 7.5 × 20.1 in.)

## Supplies & accessories:

- T911881ACC; Camera bag and harness, GF series
- T198361; Furnace IR lens extender, 14.5° with case for GF309
- T197692; Battery charger, incl. power supply with multi plugs
- T910814; Power supply, incl. multi plugs
- T199367ACC; Battery Li-ion 7.2 V, 4.4 Ah, 32 Wh
- T199183ACC; Battery Li-ion 7.2 V, 4.4 Ah, 32 Wh
- T911650ACC; Memory card SD Card 8 GB
- 1910423; USB cable Std A <-> Mini-B
- T198509; Cigarette lighter adapter kit, 12 VDC, 1.2 m/3.9 ft.
- 1910423ACC; USB cable Std A <-> Mini-B
- T910815ACC; HDMI to HDMI cable 1.5 m
- T910816ACC; HDMI to DVI cable 1.5 m
- T197555; Hard transport case for FLIR GF3xx-Series
- T197482; Heat Shield for FLIR GF309
- T951387; Wi-Fi USB micro adapter
- T130007; Extended Calibration Certificate
- T198567; ThermoVision™ System Developers Kit Ver. 2.6
- T198566; ThermoVision™ LabVIEW® Digital Toolkit Ver. 3.3
- APP-10002; FLIR Tools Mobile (Android Application)
- T198586; FLIR Reporter Professional (license only)
- T300243; FLIR Thermal Studio Pro, 1 Year Subscription
- T300083; FLIR Thermal Studio Pro, Perpetual license
- T300341; FLIR Thermal Studio Standard, 1 Year Subscription
- T300258; FLIR Thermal Studio Standard, Perpetual license
- T198584; FLIR Tools
- T198583; FLIR Tools+ (download card incl. license key)
- T198697; FLIR ResearchIR Max + HSDR 4 (hardware sec. dev.)
- T199014; FLIR ResearchIR Max + HSDR 4 (printed license key)
- T199044; FLIR ResearchIR Max + HSDR 4 Upgrade (printed license key)
- T198696; FLIR ResearchIR Max 4 (hardware sec. dev.)
- T199013; FLIR ResearchIR Max 4 (printed license key)
- T199043; FLIR ResearchIR Max 4 Upgrade (printed license key)
- T198731; FLIR ResearchIR Standard 4 (hardware sec. dev.)
- T199012; FLIR ResearchIR Standard 4 (printed license key)
- T199042; FLIR ResearchIR Standard 4 Upgrade (printed license key)
- T199233; FLIR Atlas SDK for .NET
- T199234; FLIR Atlas SDK for MATLAB



## FLIR GF309 14.5° Fixed lens

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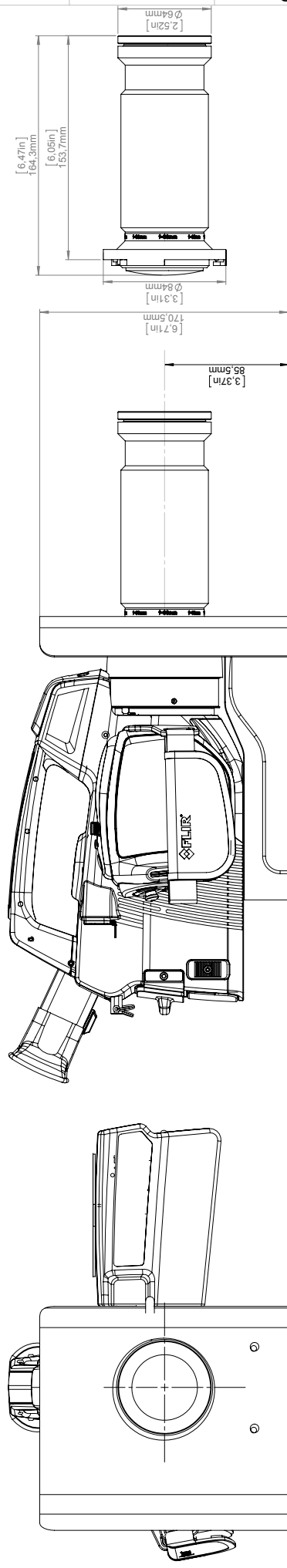
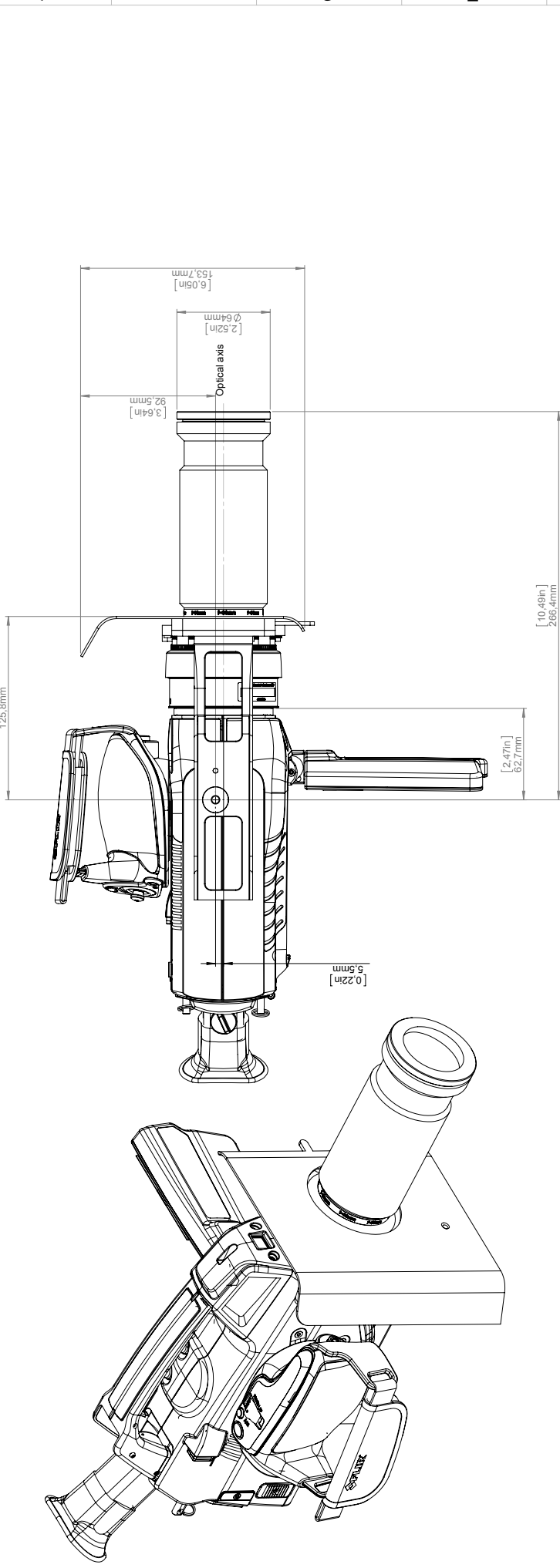
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- INST-EW-0230; Extended Warranty 1 Year for GF3xx, GFX320, G300pt, GF620, SC670X
- INST-EWGM-0210; Premium Service Package for A6604, GF3xx-series, GFX320, G300pt, GF620, GasFindIR HSX, GasFindIR LW, SC4000
- INST-GM-0175; General Maintenance Package for G300a, GF3xx

# Camera with Lens f=38mm and extender



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For additional dimensions see page 1

Modified	2013-02-18	Checked	Drawn by	R&D Thermography	Size	A3	
Drawn by	R&D Thermography	Scale	1:2	Sheet	5(5)	Drawing No.	T127603
Basic dimension FLIR GF3xx							



