

P/N: 44601-0102

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Document identity

Publ. No.: 44601-0102

Commit: 93579

Language:

Modified: 2023-10-09

Formatted: 2023-10-09

Website

<http://www.flir.com>

Customer support

<http://support.flir.com>

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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 tablet PCs 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)	24° × 18°
Minimum focus distance	0.3 m (1.0 ft.)
Focal length	23 mm (0.89 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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Detector data	
Detector type	Focal plane array (FPA), cooled InSb
Spectral range	3.8–4.05 μm
Detector pitch	30 μm
Sensor cooling	Stirling Microcooler (FLIR MC-3)
Electronics and data rate	
Full frame rate	60 Hz
Image presentation	
Display	Built-in widescreen, 4.3 in. LCD, 800 × 480 pixels
Viewfinder	Built-in, tiltable OLED, 800 × 480 pixels
Automatic image adjustment	Continuous/manual; linear or histogram based
Manual image adjustment	Level/span
Image presentation modes	
Image modes	IR image, visual image
Measurement	
Temperature range	–20°C to +1500°C (–4°F to +2732°F)
Accuracy	±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 (>+100°C, >+212°F)
Measurement analysis	
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
Set-up	
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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Storage of images	
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
Geographic Information System	
GPS	Location data automatically added to every image and video from built-in GPS
GPS logging	Log file (csv) of GPS data in 10 second or 1 minute increments with date, time, latitude, longitude, altitude, state, DOP.
Video recording in camera	
Radiometric IR video recording	*.seq video clips to memory card (3.7 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
Video streaming	
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: • FLIR IR Camera Player • FLIR ResearchIR
Non-radiometric IR video streaming	RTP/MPEG4
Digital camera	
Built-in digital camera	3.2 Mpixels, auto focus, and two video lamps
Laser pointer	
Laser	Activated by dedicated button
Laser classification	Class 2
Laser type	Semiconductor AlGaInP diode laser, 1 mW, 635 nm (red)
USB	
USB	• USB-A: Connect external USB device • USB Mini-B: Data transfer to and from PC
USB, standard	USB Mini-B: 2.0 high speed
Composite video	
Video out	Digital video output (image)
Power system	
Battery type	Rechargeable Li ion battery
Battery voltage	7.2 V

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Power system	
Battery capacity	4.4 Ah
Battery operating time	> 3 hours at 25°C (+77°F) and typical use
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)
Battery documents	For documents like MSDS and UN38.3 test reports/summaries, see: https://support.flir.com/resources/msds

Environmental data	
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	• 73/23EEC • 2004/108/EC • 2002/95/EC • 2002/96/EC
EMC	• EN61000-6-4 (Emission) • EN61000-6-2 (Immunity) • FCC 47 CFR Part 15 class A (Emission) • EN 61 000-4-8, L5
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
Declaration of conformity	See: https://support.flir.com/resources/DoC

Physical data	
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)	306 × 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

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Physical data	
Housing material	Aluminum, magnesium
Grip material	TPE thermoplastic elastomers
Shipping information	
Packaging, type	Cardboard box
List of contents	• Infrared camera with lens • Battery charger • Battery, 2 ea. • Hard transport case • HDMI-DVI cable • HDMI-HDMI cable • Heat shield • Lens cap (2 ea.) • Lens cap (mounted on lens) • Memory card • Power supply, incl. multi-plugs • Printed documentation • Shoulder strap • USB cable
Packaging, weight	
Packaging, size	400 × 190 × 510 mm (15.7 × 7.5 × 20.1 in.)

Supplies & accessories:

- T911881ACC; Camera bag and harness, G series
- T197388; IR lens, f=92 mm (6°) with case (for GF300, GF309, GF320, GF346)
- T197385; IR lens, f=38 mm (14.5°) with case (for GF300, GF309, GF320)
- T198360; Furnace IR lens extender, 24° with case for GF309
- T198659; IR lens, f=23 mm (24°) 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
- T911975ACC; Memory card SD 16 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
- T300449; Heat shield and GF309 FOV6 bundle
- T300430; IR lens 6° + case and extender (GF309)
- 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
- T199233; FLIR Atlas SDK for .NET
- 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)



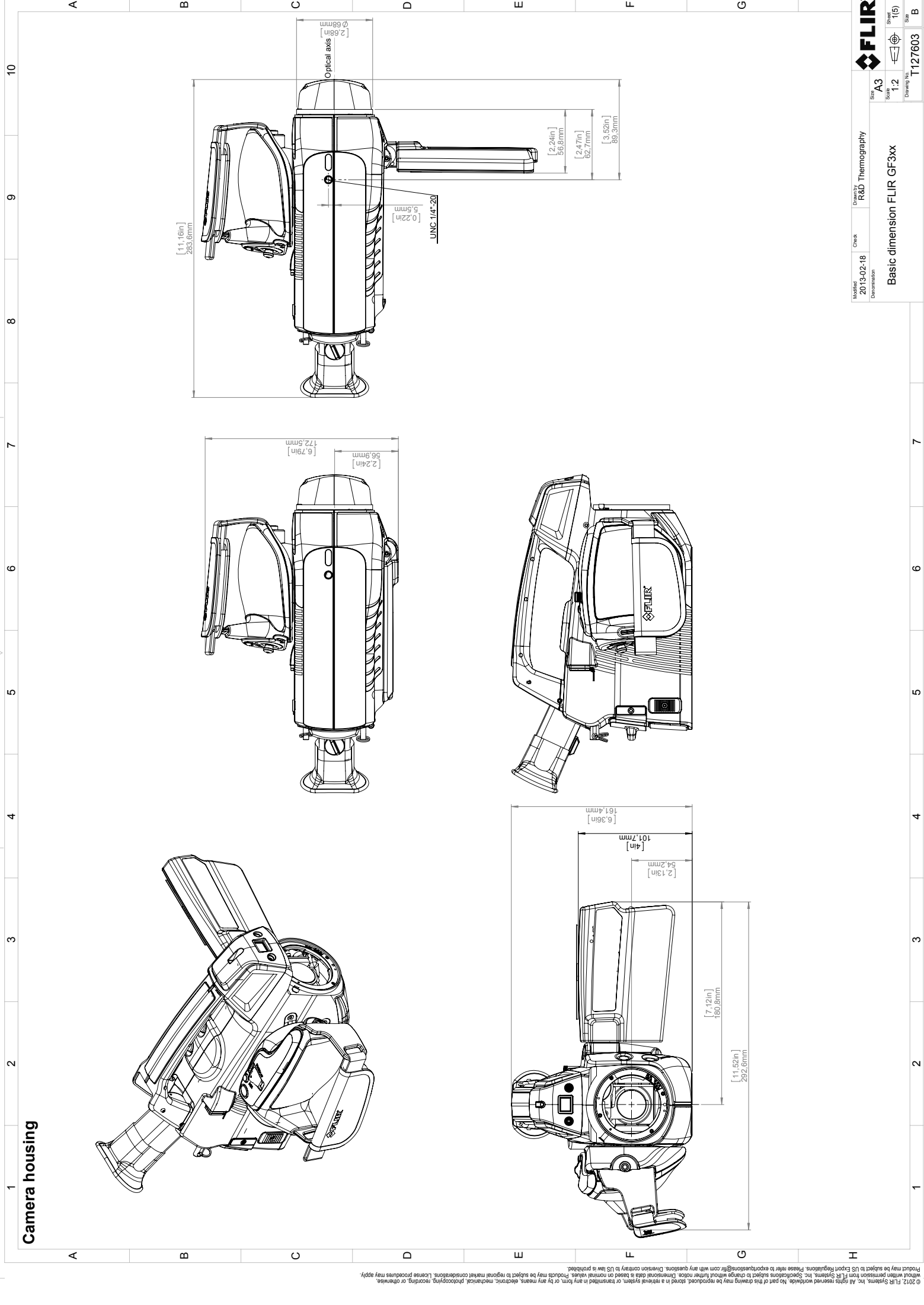
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- T198731; FLIR ResearchIR Standard 4 (hardware sec. dev.)
- T199012; FLIR ResearchIR Standard 4 (printed license key)
- T199042; FLIR ResearchIR Standard 4 Upgrade (printed license key)



Camera with Lens f=23mm and extender

