FLIR GFx320 24° fixed lens

P/N: 74902-0102

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Document identity

Publ. No.: 74902-0102
Release:
Commit: 46126
Language: en-US
Modified: 2017-10-31
Formatted: 2017-12-05

Website

http://www.flir.com

Customer support

http://support.flir.com

Disclaimer

Specifications subject to change without further notice. Camera models and accessories subject to regional market considerations. License procedures may apply. Products described herein may be subject to US Export Regulations. Please refer to exportquestions@flir.com with any questions.

General description
The FLIR GFx320 is an infrared camera for optical gas imaging (OGI) in explosive atmospheres that visualizes and pinpoints leaks of methane and other volatile organic compounds (VOCs), without the need to shut down the operation. The portable camera also greatly improves operator safety, by detecting emissions at a safe distance, and helps to protect the environment by tracing leaks of environmentally harmful gases. The FLIR GFx320 is used in industrial settings such as oil refineries, natural gas processing plants, offshore platforms, chemical/petrochemical industries, and biogas and power generation plants.
Benefits:
• Certified for use in an explosive atmosphere. • Improved efficiency: The FLIR GFx320 reduces revenue loss by pinpointing gas leaks quickly and efficiently, and from a distance. It also reduces the inspection time by allowing a broad area to be scanned rapidly and without the need to interrupt the industrial process. The FLIR GFx320 is also used for temperature measurement, which makes it even more useful for predictive maintenance. • Increased worker safety: OGI allows gas leaks to be detected in a non-contact mode and from a safe distance. This reduces the risk of the user being exposed to invisible and potentially harmful or explosive chemicals. With a FLIR GFx320 gas imaging camera it is easy to scan areas of interest that are difficult to reach with conventional methods. The camera is ergonomically designed, with a bright LCD and tiltable viewfinder, which facilitates its use over a full working day. • Protecting the environment: Several VOCs are dangerous to human health or cause harm to the environment, and are usually governed by regulations. Even small leaks can be detected and documented using the FLIR GFx320 camera.
Detects the following gases: benzene, ethanol, ethylbenzene, heptane, hexane, isoprene, methanol, MEK, MIBK, octane, pentane, 1-pentene, toluene, xylene, butane, ethane, methane, propane, ethylene, propylene.

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.)
F-number	1.5
Focus	Manual focus
Zoom	1–8× continuous, digital zoom
Digital image enhancement	Noise reduction filter, high sensitivity mode (HSM)

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Detector data	
Detector type	Focal plane array (FPA), cooled InSb
Spectral range	3.2–3.4 µm
Detector pitch	30 µm
Sensor cooling	Stirling Microcooler (FLIR MC-3)
Detects following gases	Benzene, Ethanol, Ethylbenzene, Heptane, Hexane, Isoprene, Methanol, MEK, MIBK, Octane, Pentane, 1-Pentene, Toluene, Xylene, Butane, Ethane, Methane, Propane, Ethylene, Propylene

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, high sensitivity mode (HSM)

Measurement	
Temperature range	–20°C to +350°C (–4°F to +662°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)
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

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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, overlay recording mode, local adaptation of units, language, date and time formats

Storage of images	
Storage media	Removable SD or SDHC memory card
Image storage capacity	2000 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 from built-in GPS

Video recording in camera	
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

Video streaming	
Radiometric IR video streaming	Full dynamic to PC using USB cable. PC software capable of displaying the video stream include the following: • FLIR IR Camera Player • FLIR ResearchIR • FLIR Tools
Non-radiometric IR video streaming	RTP/MPEG4

Digital camera	
Built-in digital camera	3.2 Mpixels, auto focus, and two video lamps

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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 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
Battery capacity	4.4 Ah
Battery operating time	> 3 hours at 25°C (+68°F) and typical use
Battery charging	2–bay charger or AC adapter 90–260 VAC, 50/60 Hz or 12 V from a vehicle (cable with standard plug, optional)
Charging time	2.5 h to 95% capacity, charging status indicated by LED's
Charging temperature	0°C to +45°C (+32°F to +113°F), except for the Korean market: +10°C to +45°C (+50°F to +113° F)
DC operation	8 to 15.3 V DC, polarity protected (proprietary protected)
Power	8.5 W typically
Start-up time	Typically 7 min. @ 25°C (+77°F)

Environmental data	
Operating temperature range	–20°C to +50°C (–4°F to +122°F)
Ambient temperature range (certification range for explosive atmospheres)	–20°C to +40°C (–4°F to +104°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)
Explosive (hazardous) environment	• IEC 60079-0:2011 • IEC 60079-11:2011 • IEC 60079-15:2010 (partial) • IEC 60079-28:2015 • BS EN 60079-0:2012 • BS EN 60079-11:2012 • BS EN 60079-15:2010 • BS EN 60079-28:2015 • ANSI/ISA-12.12.01-2013 • CSA 22.2 No. 213 • ATEX directive 2014/34/EU
Low voltage	73/23/EEC
RoHS	2011/65/EU
WEEE	2012/19/EU

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Environmental data	
EMC	• The Electromagnetic Compatibility (EMC) Directive 2014/30/EU • 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	EN/UL/IEC 60950-1

Physical data	
Camera weight, incl. battery	2.72 kg (6.00 lbs.)
Camera weight, excl. battery	2.50 kg (5.51 lbs.)
Battery weight	0.21 kg (0.47 lbs.)
Camera size (L × W × H)	245 × 166 × 164 mm (9.6 × 6.5 × 6.4 in.)
Battery size (L × W × H)	141 × 43 × 28 mm (5.5 × 1.7 × 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, silicone

Certifications	
Compliance	• ATEX/IECEx, Ex ic nC op is IIC T4 Gc II 3 G • ANSI/ISA-12.12.01-2013, Class I Division 2 • CSA 22.2 No. 213, Class I Division 2

Shipping information	
Packaging, type	Cardboard box
List of contents	• Battery charger • Battery, 2 ea. • Hand strap • Hard transport case • HDMI-DVI cable • HDMI-HDMI cable • Infrared camera with lens • Lens cap (mounted on lens) • Lens cap strap • Memory card • Neck strap • Power supply, incl. multi-plugs • Printed documentation • Screwdriver TX20 • USB cable
EAN-13	7332558012567
UPC-12	845188013714

- T197692; Battery charger, incl. power supply with multi plugs
- T910814; Power supply, incl. multi plugs
- T199183ACC; Battery
- 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.
- T910815ACC; HDMI to HDMI cable 1.5 m
- T910816ACC; HDMI to DVI cable 1.5 m

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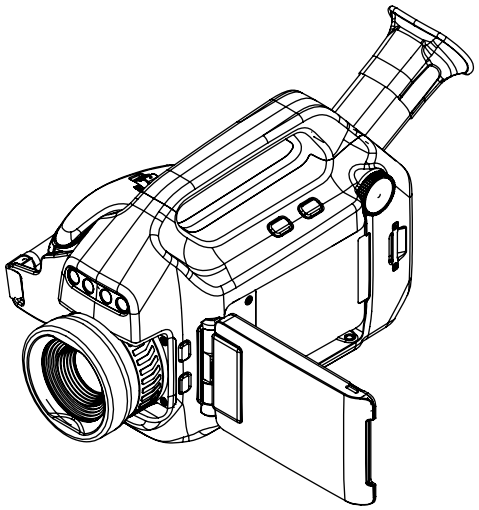
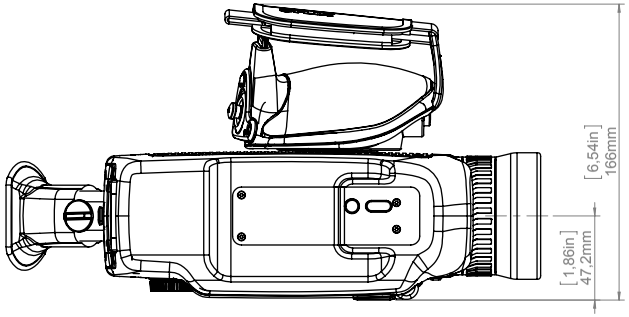
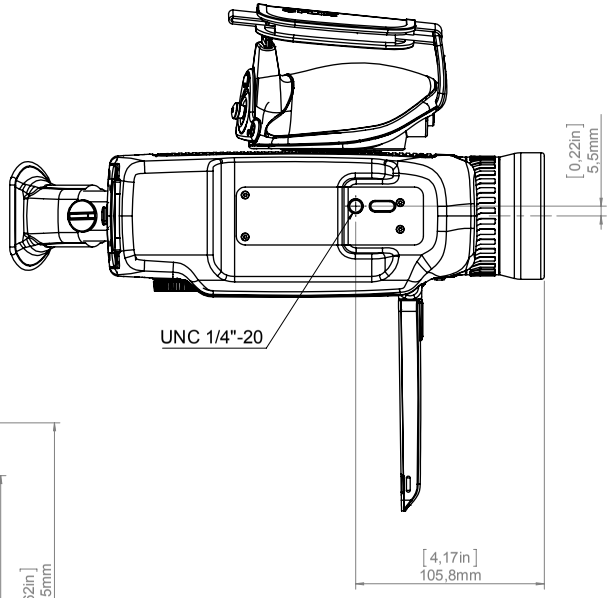
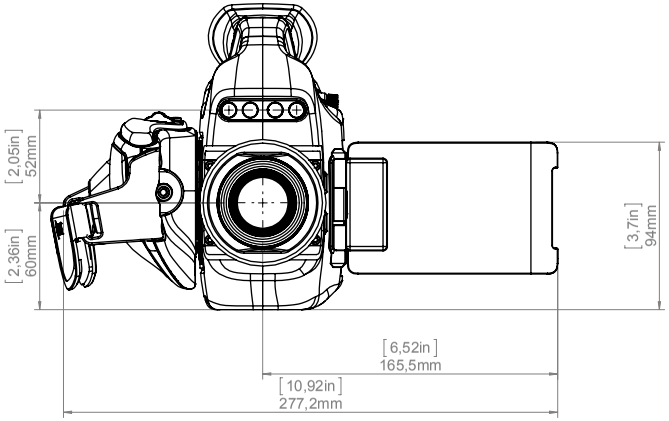
- T199466ACC; Hard transport case
- T129739ACC; Lens cap
- T129867ACC; Lens cap strap
- T129729ACC; Neck strap
- T129728ACC; Hand strap
- T911309ACC; Screwdriver TX20

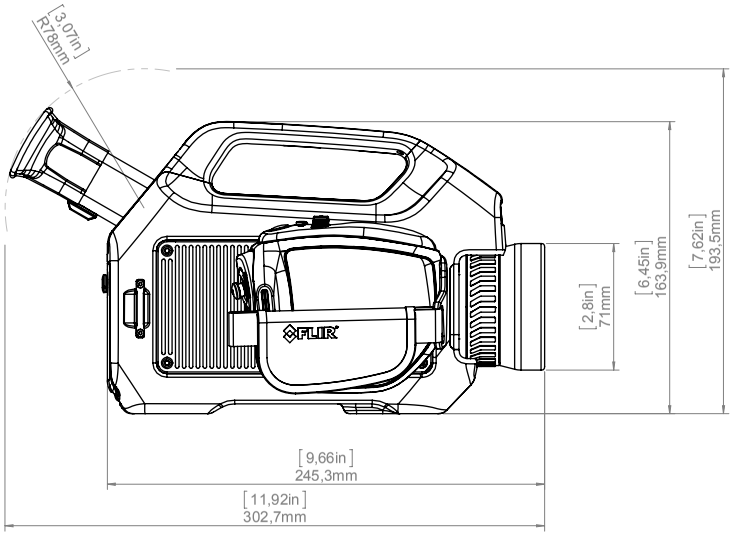
GFx320 24 deg











-

Modified	Check	Drawn by
2016-04-13	ANLI	R&D Thermography

Denomination

GFx320 basic dimensions

-

Size	Sheet
A3	1(2)
Scale 1:3	
Drawing No. T129664	Size A

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November 25, 2016 AQ320204

EU Declaration of Conformity

This is to certify that the System listed below have been designed and manufactured to meet the requirements, as applicable, of the following EU-Directives and corresponding harmonising standards. The systems consequently meet the requirements for the CE-mark.

Directives:

2014/30/EU Electromagnetic Compatibility
2014/34/EU ATEX
2012/19/EU WEEE

Standards:

EN 61000-6-3	**Emission**
EN 61000-6-2	**Immunity**
EN 62133:2012	**Safety – Batteries**
IEC 60825-1	**Safety - Laser**
IEC 62471	**Safety - Photobiological**
EN 60950-1	**Safety - General**
BS EN 60079-0:2012+A11:2013	**Explosive atmosphere - General**
BS EN 60079-11:2012	**Explosive atmosphere - Intrinsic**
BS EN 60079-15:2010	**Explosive atmosphere - Type n**
BS EN 60079-28:2015	**Explosive atmosphere - Optical**

Notified Body
Element Materials Technology **0891 (Body no)**

System: **FLIR GFx320**

FLIR Systems AB
Quality Assurance

Björn Svensson
Director

Antennvägen 6, P.O. Box 7376, SE-187 15 Täby, Sweden [T] +46 (0)8 753 25 00 [F] +46 (0)8 753 23 64 Registered No. 556256-6579
www.flir.se

Clause	Test
22.5.2	Before Seal Test Voltage Test (Component)
22.5.1	Conditioning (Component)
22.5.3.2	Seal Component Test (Component) Method 3
22.5.3.3	After Seal Test Dielectric Test (Component)
N/A	Critical Drawings

Compliance
Test Data Report

Manufacturer/Applicant:

FLIR Systems AB
Antennvägen 6, 187 66 Täby, Sweden

/Element Materials Technology
Century Court Tolpits Lane Walford, Herts, UK WD18 9RS

Product description:
IDCA Component within the FLIR George Camera, Model GFx320.

Note: Testing will be with respect to EN/IEC 60079-15:2010 clause 22.5 as this testing is more onerous than ANSI/ISA 12.12.01:2012 and CSA/CAN C22.2 No. 213 (reaffirmed 2013) requirements.

CEIT# 17072-1: SB4293v2 (500-0525-00-07)

CEIT# 17072-2: SB4310v2 (500-0525-00-07)

CEIT# 17072-3: SB4275v2 (500-0525-00-07)

MET Laboratories, Inc.
13501 McCallen Pass
Austin, Texas 78753
(512) 287-2500

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Test Report issued under the responsibility of:

TEST REPORT

IEC 60950-1

Information technology equipment – Safety – Part 1: General requirements

Report Number ..... :	1517398STO-001
Date of issue ..... :	11 November 2016
Total number of pages	76 pages
Applicant's name ..... :	FLIR Systems AB
Address ..... :	Box 7376, SE-187 15 Täby, SWEDEN
Test specification:	
Standard ..... :	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No ..... :	**IEC60950_1F**
Test Report Form(s) Originator ..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2014-02

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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

TEST REPORT issued by an Accredited Testing Laboratory. Accredited by Swedac, no 1003, ISO/IEC 17025

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	Infrared Optical Gas Imaging Camera
Trade Mark ..... :	FLIR
Manufacturer ..... :	FLIR Systems AB
Model/Type reference ..... :	FLIR GFX320
Ratings ..... :	7.2VDC (battery operated), Class III CLASS 2 LASER PRODUCT

Testing procedure and testing location:

☒ **CB Testing Laboratory**: Intertek Semko AB

Testing location/ address .....: Torshamnsgatan 43
SE-164 40 Kista, SWEDEN

☐ **Associated CB Laboratory:**

Testing location/ address .....:

Tested by (name + signature).....: Leif Söderlund

Approved by (name + signature).....: Anna Karin Cedergren

☐ Testing procedure: **TMP**

Testing location/ address .....:

Tested by (name + signature).....:

Approved by (name + signature).....:

☐ Testing procedure: **WMT**

Testing location/ address .....:

Tested by (name + signature).....:

Witnessed by (name + signature)....:

Approved by (name + signature).....:

☐ Testing procedure: **SMT**

Testing location/ address .....:

Tested by (name + signature).....:

Approved by (name + signature).....:

Supervised by (name + signature)...:

☐ Testing procedure: **RMT**

Testing location/ address .....:

Tested by (name + signature).....:

Approved by (name + signature).....:

Supervised by (name + signature)...:

Intertek Semko AB
Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden
Telephone +46 8 750 00 00, Fax +46 8 750 60 30
www.intertek.se
Registered in Sweden: No: SE556024059901, Registered office: As address

S 114 14-05 Strömberg 214248

		Ref. Certif. No.
IEC IECEE CB SCHEME		SE-84962

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product	Infrared Optical Gas Imaging Camera
Name and address of the applicant	FLIR Systems AB, Box 7376, 187 15 Täby, SWEDEN
Name and address of the manufacturer	Same as applicant
Name and address of the factory Note: *When more than one factory, please report on page 2*	FLIR Systems AB, Antennvägen 6, SE-187 66 Täby, SWEDEN
Ratings and principal characteristics	7.2VDC (battery operated), Class III
Trademark (if any)	FLIR
Customer's Testing Facility (CTF) Stage used	-
Model / Type Ref.	FLIR GFX320
Additional information (if necessary may also be reported on page 2)	See page 2
A sample of the product was tested and found to be in conformity with	IEC 60950-1:2005+A1+A2 (EN 60950-1:2006+A11+A1+A12+A2)
As shown in the Test Report Ref. No. which forms part of this Certificate	1517398STO-001

This CB Test Certificate is issued by the National Certification Body

Intertek Semko AB
Box 1103
SE-164 22 Kista, Sweden
Int +46 8 750 00 00

Intertek

Signature:

Bo Berglöf

Date: 11 November 2016

EHG

	Ref. Certif. No.
IEC IECEE CB SCHEME	**SE-84962**

Additional information (if necessary)

Common Modifications and Special National Conditions for CENELEC countries have been checked.
National differences for CA and US have also been checked during the testing.

CLASS 2 LASER PRODUCT
Refer to separate IEC 60825-1:2014 test report 1611196STO-001, issued by Intertek Semko AB

LED classification
Refer to separate IEC 62471:2006 test report 1611198STO-001, issued by Intertek Semko AB

END

Date: 11 November 2016 Signature:

MET Laboratories, Inc. *Safety Certification - EMI - Telecom - Environmental Simulation - NEBS*
914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 949-1802 • FAX (410) 354-3313

December 13, 2016

FLIR Systems AB
Mr. Johan Eidefors
Antennvägen 6
PO Box 7376
SE-187 15
Täby, Sweden

Subject: FLIR Systems AB, GFx320 Optical Gas Imaging Camera
Listing Number E114032; MET Project Number 92286
Safety Standards:
- UL 60950-1/CSA C22.2 No. 60950-1, Second Edition, Information Technology Equipment
- ANSI/ISA-12.12.01-2016 Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, Seventh Edition
- C22.2 NO. 213-16 – Nonincendive electrical equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 hazardous (classified) locations, Second Edition

Dear Mr. Eidefors:

Congratulations on successfully completing the MET Certification process for the GFx320 Optical Gas Imaging Camera. FLIR Systems AB may begin to apply the MET Mark on the previously identified product at this time in accordance with the MET Mark Utilization Agreement or the MET Applicant Contract. The report covering the above stated product is forthcoming.

Thank you for the opportunity to perform this service for FLIR Systems AB. We look forward to future opportunities with your company.

Sincerely,
MET LABORATORIES, INC.

Rick Cooper
Director,
Safety Business Line

1 # TYPE EXAMINATION CERTIFICATE

2 **Product or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU – Annex VIII**

3 Type Examination Certificate No.: **EMT16ATEX0032X**

4 Product: **Optical Gas Imaging Camera, GFx320**

5 Manufacturer: **FLIR SYSTEMS AB,**

6 Address: **Antennvägen 6, SE-187 15 Täby, Sweden**

7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Element Materials Technology certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014.

The examination and test results are recorded in the confidential report **TRA-029115-33-00A.**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012/A11:2013 **EN 60079-11:2012** **EN 60079-15:2010**

EN 60079-28:2015

Except in respect of those requirements listed at section 18 of the schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to specific conditions of use specified in the schedule to this certificate.

11 This TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of this product shall include the following:

II 3 G

Ex ic nC op is IIC T4 Gc

Rating: **8.4 V_{max}, 7.2 V_{nom}**

This certificate and its schedules may only be reproduced in its entirety and without change. This certificate is issued in accordance with the Element Materials Technology Ex Certification Scheme.

S P Winsor, Certification Manager

Issue date: 2016-12-07

Unit 1, Pendle Place, Skelmersdale, West Lancashire, WN8 9PN, United Kingdom
Element Materials Technology Warwick Ltd.
Registered in England and Wales. Registered Office: 5 Fleet Place, London, EC4M 7RD
Company Reg No. 02536659

UKAS PRODUCT CERTIFICATION 0178

IECEx Technical Report: GB/EMT/ExTR16.0015/00 details

ExTR :	
ExTR Reference Number *: (automatic numbering)	GB/EMT/ExTR16.0015/00
Status*:	Issued
ExTR Free Reference Number*:	TRA-029115-33-00A
Date of Issue*: (yyyy-mm-dd)	2016-12-07
List of Standards Covered*:	IEC 60079-0 (Ed.6.0); IEC 60079-11 (Ed.6.0); IEC 60079-15 (Ed.4); IEC 60079-28 (Ed.2)
Issuing ExTL*:	EMT - Element Materials Technology
Endorsing ExCB*:	EMT - Element Materials Technology
Manufacturer*:	FLIR SYSTEMS AB Antennvägen 6, SE-187 15 Täby,
Country of Manufacture*:	Sweden
Ex Protection*:	Intrinsic Safety Non-Sparking
Ratings:	8.4Vmax, 7.2Vnom (2s2p battery pack)
Equipment*:	Optical Gas Imaging Camera
Model Reference*:	GFx320
Related IECEx Certificates:	IECEx EMT 16.0016X issue: 0 [Current]
Comment:	
Attachment:	

Last modified: 07/12/2016 16:49:02

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IECEx Quality Assessment Report: GB/EMT/QAR16.0003/00 details

QAR :	
QAR Reference Number *: (automatic numbering)	GB/EMT/QAR16.0003/00
Related QARs:	
Status*:	Issued
QAR Free Reference Number*:	TRA-029741-32-00A
Audit Date*: (yyyy-mm-dd)	2016-09-06
Date of Issue*: (yyyy-mm-dd)	2016-10-14
Valid until*: (yyyy-mm-dd)	2019-09-05
Site(s) audited*:	FLIR SYSTEMS AB, Antennvägen 6, SE-187 66 Täby, Sweden
Issuing ExCB*:	EMT - Element Materials Technology
Manufacturer*:	FLIR SYSTEMS AB, Antennvägen 6, SE-187 66 Täby,
Country of Manufacture*:	Sweden
Product information*:	No current certificate
Protection concept*:	No current certificate
Related IECEx Certificates: (automatic linking)	
Related Certificates: (manual insertion)	
Related IECEx Certificates for previous versions:	
Comment:	
Attachment:	

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element

Final IECEX And ATEX Report On Equipment For Use In Potentially Explosive Atmospheres

For

FLIR Systems AB

On

GFx320 camera

Report No. GB/EMT/ExTR16.0015/00 (TRA-029115-33-00A)

02 December 2016

EXR004 1.0

IECEx TEST REPORT COVER

ExTR Reference Number..... :	GB/EMT/ExTR16.0015/00
ExTR Free Reference Number ..... :	TRA-029115-33-00A
Compiled by + signature (ExTL) .... :	A Chandrahasan
Reviewed by + signature (ExTL).... :	D Lyden
Approved by + signature (ExCB) ... :	B Trafford
Date of issue ..... :	2016-12-02
Ex Testing Laboratory (ExTL)..... :	Element Materials Technology
Address ..... :	Unit 1, Pendle Place, Skelmersdale, West Lancashire, WN8 9PN, United Kingdom
Ex Certification Body (ExCB)..... :	Element Materials Technology
Address ..... :	Unit 1, Pendle Place, Skelmersdale, West Lancashire, WN8 9PN, United Kingdom
Applicant's name..... :	FLIR SYSTEMS AB
Address ..... :	Antennvägen 6, SE-187 15 Täby, Sweden
Standards associated with this ExTR package ..... :	IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010, IEC 60079-28:2015 EN 60079-0:2012/A11:2013, EN 60079-11:2012, EN 60079-15:2010, EN 60079-28:2015
Clauses considered ..... :	All clauses considered for IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-28:2015 IEC 60079-15:2010 Clauses: 1,2,3,4,19,22,24,25.
Related Amendments, Corrigenda or ISHs ..... :	N/A
Test item description..... :	Optical Gas Imaging Camera
Model/type reference ..... :	GFx320
Code (e.g. Ex _ II_ T_)..... :	Ex ic nC op is IIC T4 Gc ⟨Ex⟩ II 3 G
Rating..... :	8.4 V_{max}, 7.2 V_{nom} (2s2p battery pack)

ExTR Package Contents
Assembled ExTR documents and Additional reference material:
IECEx Test Report Cover
IECEx Test Report: IEC 60079-0:2011 (Edition 6.0)
IECEx Test Report: IEC 60079-11:2011 (Edition 6.0)
IECEx Test Report Addendum: IEC 60079-15:2010 (Edition 4.0)
IECEx Test Report Addendum: IEC 60079-28:2015 (Edition 2.0)
IECEx Test Report of National Differences: EU/EEA differences in relation to ATEX directive 2014/34/EU.
Attachment 1: Photographs
Attachment 2: Test equipment used
Attachment 3: IECEx ISH/ Decision Sheets applied

ExTR Package Contents
Assembled ExTR documents and Additional reference material:
Attachment 4: ATEX Directive (2014/34/EU) - Essential Health and Safety Requirements list

Manufacturer's name .....:	FLIR SYSTEMS AB
Address .....:	Antennvägen 6, SE-187 15 Täby, Sweden
Trademark.....:	FLIR
Certificate No. (optional) .....:	IECEx EMT 16.0016X (IECEx) EMT16ATEX0032X (ATEX)

Particulars: Test item vs. Test requirements

Classification of installation and use ..... :	Hand-held
Ingress protection .....:	IP20
Rated ambient temperature range (°C).....:	-20º to +40ºC

General remarks:

The test results presented in this ExTR package relate only to the item or product tested.

- "(see Attachment #)" refers to additional information appended to the ExTR package.
- "(see appended table)" refers to a table appended to the ExTR package.
- Throughout this ExTR package, a point is used as the decimal separator.
- Throughout this report the date format yyyy-mm-dd is used
- Where the term "N/A" appears in any part of an ExTR package, it indicates that the associated issue was considered "Not applicable" to the involved evaluation.
- In accordance with IECEx 02, a Receiving ExCB may request a sample of the Ex equipment and copies of the documentation referred to in an ExTR Cover.

Abbreviations used within this report:

- OGI – Optical Gas Imaging
- ITAR – International Traffic in Arms Regulations
- LED – Light-emitting diode
- OLED – Organic Light-emitting diode
- IDCA – Infrared Detector Cooler Assembly

The technical content of this ExTR package shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

General remarks pertaining to this programme of test and assessment are detailed at the end of each section of the ExTR.

Photographs of the Test Item are contained in are contained in the Attachments appended within this report.

A list of test equipment used is contained in the Attachments appended within this report.

A list of ExTAG decision sheets (DS) and TC31 Interpretation sheets (I-SH) used in the conduct of the tests and assessments within this ExTR package is given in the Attachments appended to this report.

ATEX only – a list of Essential Health and Safety Requirements from the ATEX directive is contained in the Attachments appended within this report.

Test and assessment dates: 2016-05-20 to 2016-10-28.

The equipment tested complied with the requirements of the test standards listed on page 1 of this report. The manufacturers documentation provided in support of this application satisfied the requirement of the relevant product evaluation annexes of the ATEX directive.

General product information:

The FLIR GFx320 is an IR camera designed for optical gas imaging (OGI) for Zone 2 hazardous area applications. The camera has a LCD flip-out display, OLED viewfinder, visual camera to complement the IR image, GPS module, LASER pointer and LED lighting. The equipment is powered by a rechargeable Li-ion battery pack. The equipment enclosure is metallic, however it has an anti static silicone sleeving in black colour. There are two lens configurations which are 14.5° fixed lens and 24° fixed lens with differing lens sizes, but have identical electronic and mechanical assemblies.

Compliance strategy:

The FLIR GFx320 Optical Gas Imaging Camera consists of 13 printed circuit boards and including 6 different electronic modules (6 'bought-in' components of the camera that are not manufactured by FLIR AB, Sweden). The 6 modules are the GPS module, LASER module, Visual Camera module, Viewfinder module, the LCD Display board and the IDCA component. The IDCA component is manufactured by FLIR Inc. in Santa Barbara, USA. All other internal boards are manufactured by FLIR Sweden.

The equipment is intended for gas environment applications only. Protection concept 'intrinsic safety', level of protection "ic" has been applied throughout majority of electronics of the camera for use in Zone 2 hazardous environments.

However sealed device 'nC' (IEC/EN 60079-15) compliance route has been applied to one of the modules called IDCA module, or known as Infrared detector cooler assembly. The IDCA module is ITAR classified, but its associated electronics that interface within it are not part of ITAR classification and has been covered within this report.

The LASER optical device complies with the requirements of IEC 60825-1: 2014 (Third Edition) & EN 60825-1:2014 with maximum output power limited to 1mW. This is based on IEC 60825-1 report issued by Intertek, report reference number 1611196STO-001, date of issue: 2016-06-29. Wavelength of LASER is 650nm, colour: Red Laser Model. See IEC 60079-28:2015 section of this ExTR for details.

IDCA Cooling Assembly:

The assembly is a metallic enclosure that is completely welded except for wire cable entries and considered as a sealed device. It will be subject to tests for sealed devices in IEC/EN 60079-15 and hence falls under the 'nC' concept.

The module has been assessed and tested as a 'sealed device' in accordance with IEC 60079-15 'nC' by MET Labs. Inc in the USA, the tests and assessment results of which are included as part of this report (partial application of IEC 60079-15, clause).

Sparking/Arcing parts:

All sparking/arcing parts (identified as all the buttons and joysticks on the camera) assessed under the protection concept 'ic' are resistively limited therefore meeting the requirements for resistive spark ignition in accordance with Annex A of IEC/EN 60079-11.

The following modules are considered as 'bulk fault' or 'nonincendive' circuits:

Non-incendive circuits
GPS module
LASER module
Visual camera
Viewfinder module

The above circuits are considered as 'bulk fault' within their respective circuitry, and has been assessed in accordance with Annex A of IEC 60079-11, therefore deemed as non-incendive circuits and contains no infallible components or separations.

All the other internal PCBs designed by FLIR and all components mounted on the boards are 'rated' in accordance with clause 7.1 in IEC 60079-11, hence making the components infallible for Level of Protection 'ic'. All PCBs are conformal coated on both sides in accordance with clause 6.1.2.3 b) in IEC 60079-11 (Apparatus complying with Annex F).

The camera is powered by a rechargeable battery pack consisting of 4 Li-ion type 3.6 Vd.c. cell, manufactured by Samsung SDI CO LTD, P/N ICR18650-22F (UL file number: MH21015). The cells can also be re-branded as VARTA, model no. LIC18650-22FC.

The camera equipment also consists of a coin-cell which is of Li-ion type to power the CPU real-time-clock (RTC) circuit.

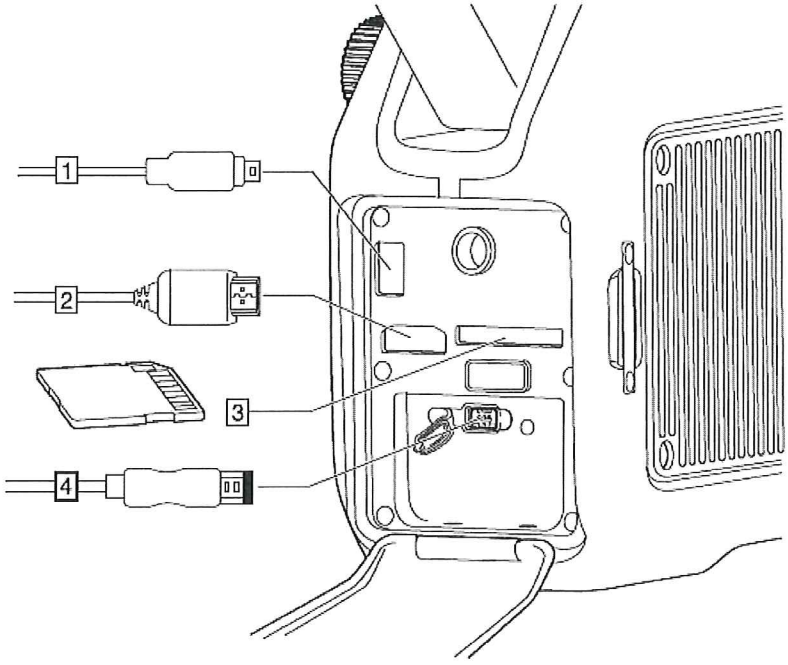
UL file numbers for the types of coin-cells that can be used in the camera:

a) Panasonic ML621: MH12210
b) FDK ML621 (previously Sanyo): MH13421

The camera is not intended to be charged in hazardous area, and also the battery pack is not intended to be removed in hazardous area. The battery pack is intended to be removed from the camera and charged only in safe area using unique charger manufactured by Ten Pao industrial Co. Ltd., IECEE CB reference certificate no. JPTUV-035588-M1 (provided by TUV Rheinland Japan Ltd.).

The equipment consists of the following external interfaces (not permitted for use in hazardous areas):

1. USB mini-B
2. HDMI
3. SD-CARD (or SDHC)
4. Charger (battery charge port)



The user shall only connect ATEX/IECEx approved intrinsically safe equipment to the USB mini-B and HDMI ports. The specific battery charger compatible to charge the battery pack of this camera equipment is a controlled component that is approved to IEC/EN 60950-1.

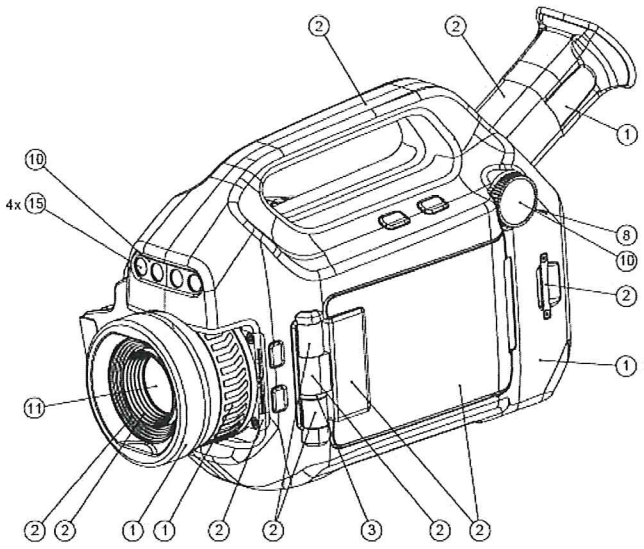
For charging battery pack, only the following charger must be used – Model number: S040EM1200300 manufactured by Ten Pao industrial Co. Ltd., IECEE CB reference certificate no. JPTUV-035588-M1

(provided by TUV Rheinland Japan Ltd.). The charger and battery packs are provided by FLIR with the camera equipment, battery pack provided by FLIR, part number T199183 with this equipment.

The external connectors cannot be accessed in hazardous area. It requires removal of back cover plate that attaches to the body of the camera equipment. There are various special conditions of safe use that have been prescribed with regards to external connection facilities.

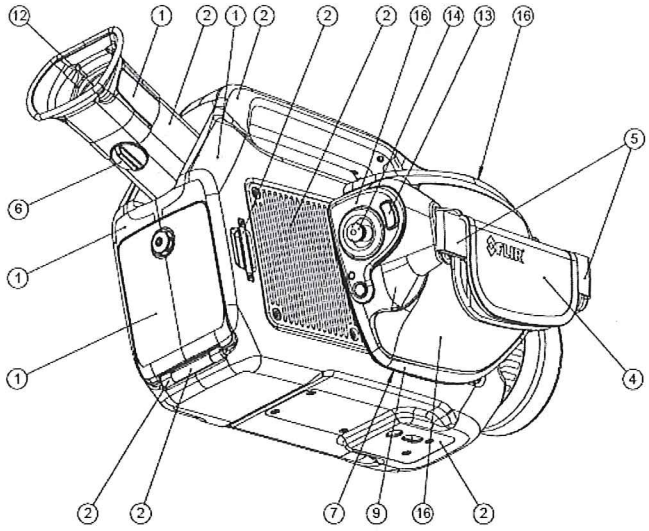
Physical construction

The enclosure of the camera is fully metallic, parts made of anodised aluminium, stainless steel and magnesium, and has an IP rating of minimum IP20. An anti-static silicone cover is used to protect the outer metallic enclosure from impacts and drops.

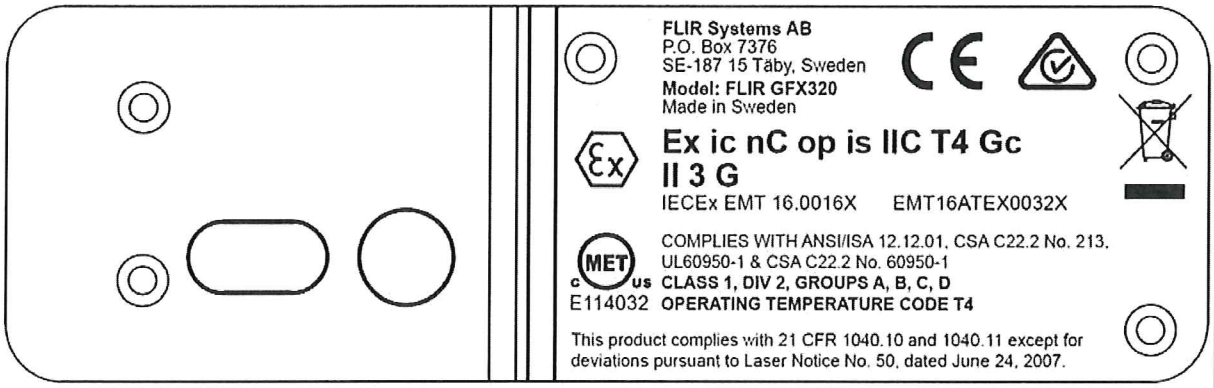


Nbr	Material description
1	Silicone, anti-static
2	Anodised aluminium
3	Stainless steel
4	Leather
5	Textile, anti-static
6	POM
7	Magnesium, coated
8	PA-6
9	PC-ABS, anti-static
10	PC
11	Si
12	PMMA
13	Silicone
14	PC-ABS
15	Glass
16	TPE, anti-static

All screws: Stainless steel



Copy of Marking Plate:



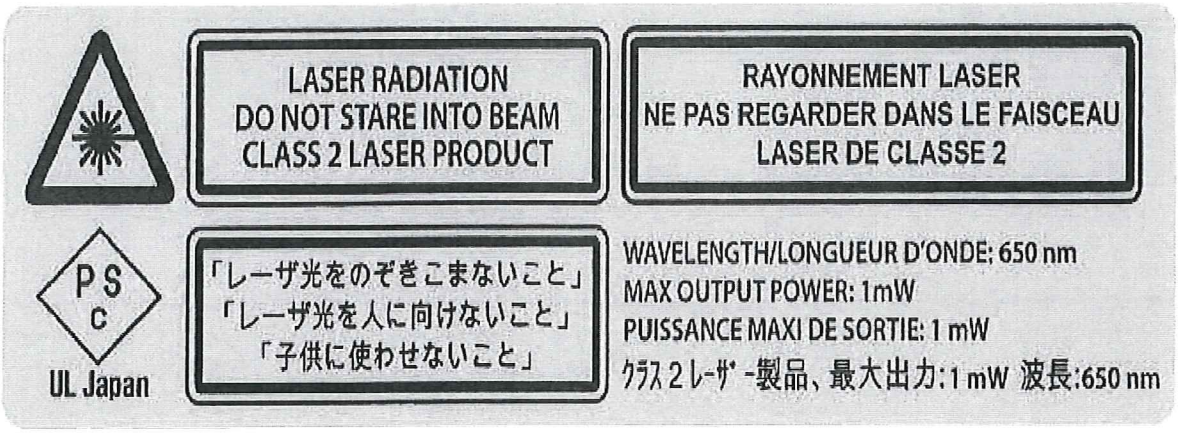
Entity parameters label (behind back cover plate on the rear of camera):

Table of entity parameters			Battery pack charge port
	USB mini-B	HDMI	
U_i	6 V	4 V	-
I_i	5 mA	25 µA	-
U_m	-	-	100 V

WARNING: Please read the user's manual carefully before using this equipment.

ATTENTION: Lisez le manuel d'utilisation attentivement avant d'utiliser cet équipement.

LASER label:



Battery pack Label:

Details regarding 'trade agent' / 'local assembler' application in accordance with OD 203:

Not applicable.

In accordance with OD 024, testing not fully performed by ExTL staff at the above ExTL address:

Thermal rise test was performed on the camera equipment at FLIR, Sweden on 2016-07-07 by Element Materials Technology Project Engineer.

The LASER optical device complies with the requirements of IEC 60825-1 with maximum output power limited to 1mW. This is based on IEC 60825-1 report issued by Intertek Semko AB, Torshamnsgatan 43, Box 1103, SE-164 22 Kista, SWEDEN, report reference number 1611196STO-001, date of issue: 2016-06-29.

The sealed device tests for the IDCA component within the GFx320 was performed by MET Laboratories, Inc., 13501 McCallen Pass, Austin, Texas 78753, in accordance with clause 22.5 in IEC/EN 60079-15:2010 between 2016-05-20 and 2016-06-28.

National differences considered as part of this evaluation:

EU/EEA differences in relation to related EN standards ATEX directive 2014/34/EU.

"Specific Conditions of Use" / "Schedule of Limitations":

1. Connection to the USB mini-B, HDMI and external power/charger shall NOT be made in hazardous area. The equipment must be removed to the safe area before any of these connections are made.
2. Access and removal to SD-CARD is strictly prohibited whilst situated in hazardous area. The equipment must be removed to safe area before accessing SD-CARD.
3. It must be ensured that the equipment back cover is secured before entering and/or using in hazardous areas.
4. It is not intended for the end-user to remove and/or access the equipment battery pack whilst

situated in hazardous areas. The equipment must be removed to the safe area before accessing/removing battery pack.

5. For charging battery pack, only the following charger must be used – Model number: S040EM1200300 manufactured by Ten Pao industrial Co. Ltd., IECEE CB reference certificate no. JPTUV-035588-M1 (provided by TUV Rheinland Japan Ltd.). The charger and battery packs are provided by FLIR with the camera equipment.Use only battery pack provided by FLIR, part number T199183 with this equipment.
6. Use only battery pack provided by FLIR, part number T199183 with this equipment.
7. Access or entry into the camera internals is strictly prohibited in any areas.
8. The user shall only connect ATEX/IECEx approved intrinsically safe equipment to the USB mini-B and HDMI ports.

Routine tests:

None.

Special conditions for manufacture:

None.

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Table of entity parameters

Parameter	USB mini-B	HDMI	Battery pack charge port
Ui	6 V	4 V	—
Ii	5 mA	25 µA	—
U_m	—	—	100 V