FLUKE®

59 MAX/59 MAX +

Infrared Thermometer

Users Manual

PN 4311999
March 2013

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke's behalf. To obtain service during the warranty period, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that Service Center with a description of the problem.

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Fluke Corporation
P.O. Box 9090
Everett, WA 98206-9090
U.S.A.

Fluke Europe B.V.
P.O. Box 1186
5602 BD Eindhoven
The Netherlands

11/99

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Introduction

The Fluke 59 MAX and 59 MAX + Infrared Thermometers (the Product) can determine the surface temperature by measuring the amount of infrared energy radiated by the target's surface.

⚠Warning

Read all safety information before you use the Product.

How to Contact Fluke

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-03-6714-3114
- Singapore: +65-6799-5566
- Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at www.fluke.com.

To register your product, visit http://register.fluke.com.

To see, print, or download the latest manual supplement, visit http://us.fluke.com/usen/support/manuals.

Safety Information

A **Warning** identifies conditions and procedures that are dangerous to the user. A **Caution** identifies conditions and procedures that can cause damage to the Product or the equipment under test.

Table 1 tells you about symbols used on the Product and in this manual.

Warning

To prevent possible electrical shock, fire, or personal injury:

- **Read all safety Information before you use the Product.**
- **Do not use the Product if it operates incorrectly.**
- **Use the Product only as specified, or the protection supplied by the Product can be compromised.**
- **Examine the case before you use the Product. Look for cracks or missing plastic. Carefully look at the insulation around the terminals.**

- **See emissivity information for actual temperatures. Reflective objects result in lower than actual temperature measurements. These objects pose a burn hazard.**
- **Do not look directly into the laser with optical tools (for example, binoculars, telescopes, microscopes). Optical tools can focus the laser and be dangerous to the eye.**
- **Do not look into the laser. Do not point laser directly at persons or animals or indirectly off reflective surfaces.**
- **Replace the batteries when the low battery indicator shows to prevent incorrect measurements.**
- **Do not use the Product around explosive gas, vapor, or in damp or wet environments.**
- **Use the Product only as specified or hazardous laser radiation exposure can occur.**
- **Carefully read all instructions.**

Table 1. Symbols

Symbol	Meaning	Symbol	Meaning
	Risk of danger. Important information. See Manual.		Conforms to relevant North American Safety Standards.
	Warning. Laser.		Conforms to European Union directives.
	Battery		Conforms to relevant Australian standards.
	This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9 "Monitoring and Control Instrumentation" product. Do not dispose of this product as unsorted municipal waste. Go to Fluke's website for recycling information.		

Maintenance

⚠⚠Warning

To prevent possible electrical shock, fire, or personal injury, have an approved technician repair the Product.

⚠Caution

To avoid damage to the Product, do not leave the thermometer on or near objects of high temperature.

How to Change the Battery

To install or change the AA IEC LR06 battery, open the battery compartment and replace the battery as shown in Figure 16.

How to Clean the Product

Use soap and water on a damp sponge or soft cloth to clean the Product case. Carefully wipe the surface with a moist cotton swab. The swab may be moistened with water. See Figure 17.

Specifications

	59 MAX	59 MAX +
Temperature Range	-30 °C to 350 °C (-22 °F to 662 °F)	-30 °C to 500 °C (-22 °F to 932 °F)
Accuracy (Calibration geometry with ambient temperature 23 °C ±2 °C)	≥0 °C: ±2.0 °C or ±2.0 % of reading, whichever is greater (≥32 °F: ±4.0 °F or ±2.0 % of reading, whichever is greater) ≥ -10 °C to <0 °C: ±2.0 °C (≥14 °F to <32 °F: ±4.0 °F) < -10 °C: ±3.0 °C (<14 °F: ±6.0 °F)	≥0 °C: ±1.5 °C or ±1.5 % of reading, whichever is greater (≥32 °F: ±3.0 °F or ±1.5 % of reading, whichever is greater) ≥ -10 °C to <0 °C: ±2.0 °C (≥14 °F to <32 °F: ±4.0 °F) < -10 °C: ±3 °C (<14 °F: ±6.0 °F)
Response Time (95 %)	<500 ms (95 % of reading)	<500 ms (95 % of reading)
Spectral Response	8 µm to 14 µm	
Emissivity	0.10 to 1.00	

Optical Resolution	8:1 (calculated at 90 % energy)	10:1 (calculated at 90 % energy)
Display Resolution	0.1 °C (0.2 °F)	
Repeatability (% of reading)	±1.0 % of reading or ±1.0 °C (±2.0 °F), whichever is greater	±0.8 % of reading or ±1.0 °C (±2.0 °F), whichever is greater
Power	1 AA IEC LR06 Battery	
Battery Life	12 hours with laser and backlight on	
Weight	220 g (7.76 oz)	
Size	(156 x 80 x 50) mm (6.14 x 3.15 x 2) inches	
Operating Temperature	0 °C to 50 °C (32 °F to 122 °F)	
Storage Temperature	-20 °C to +60 °C (-4 °F to 140 °F), (without battery)	
Operating Humidity	10 % to 90 % RH non-condensing @ 30 °C (86 °F)	
Operating Altitude	2000 meters above mean sea level	
Storage Altitude	12,000 meters above mean sea level	
Drop Test	1 m	

Standards and Agency Approval

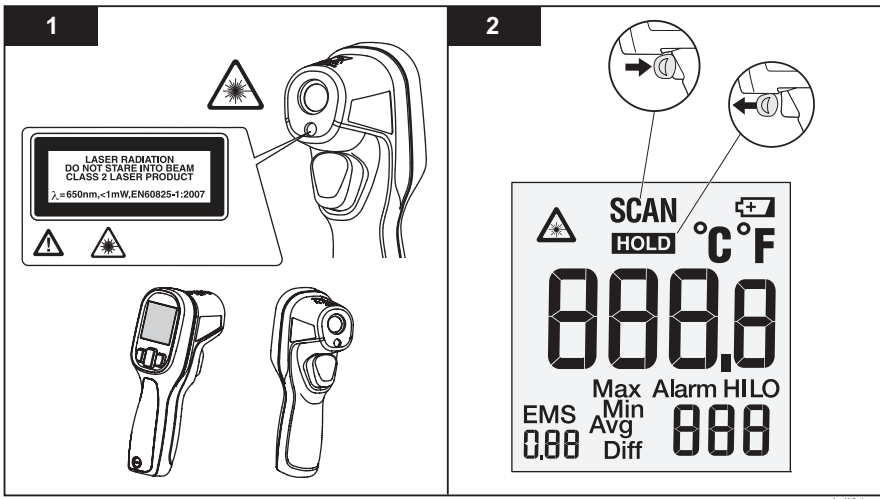
Ingress Protection Rating	IP40 per IEC 60529
Vibration and Shock	IEC 68-2-6 2.5 g, 10 to 200 Hz, IEC 68-2-27, 50 g, 11 ms
Compliance	EN/IEC 61010-1
Laser Safety	FDA and EN 60825-1 Class II
Electromagnetic Compatibility	61326-1 EN 61326-2

Nominal Surface Emissivity

Material	Value		Material	Value
Default****	0.95		Glass (plate)	0.85
Aluminum*	0.30		Iron*	0.70
Asbestos	0.95		Lead*	0.50
Asphalt	0.95		Oil	0.94
Brass*	0.50		Paint	0.93
Ceramic	0.95		Plastic**	0.95
Concrete	0.95		Rubber	0.95
Copper*	0.60		Sand	0.90
Food - Frozen	0.90		Steel*	0.80
Food - Hot	0.93		Water	0.93
			Wood ***	0.94

* Oxidized
** Opaque, over 20 mils
*** Natural
**** Factory Setting
Highlighted items may also be found in the emissivity table built into the Thermometer.

The Product



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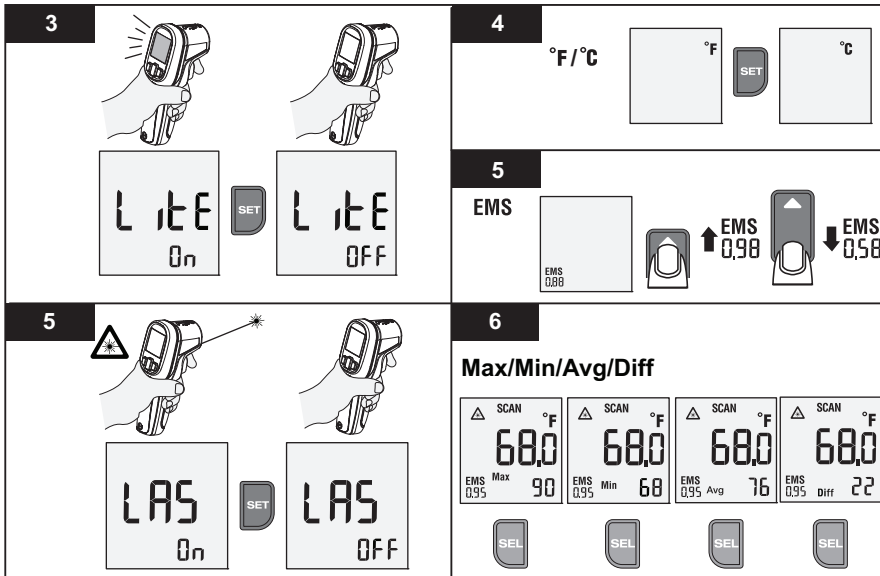
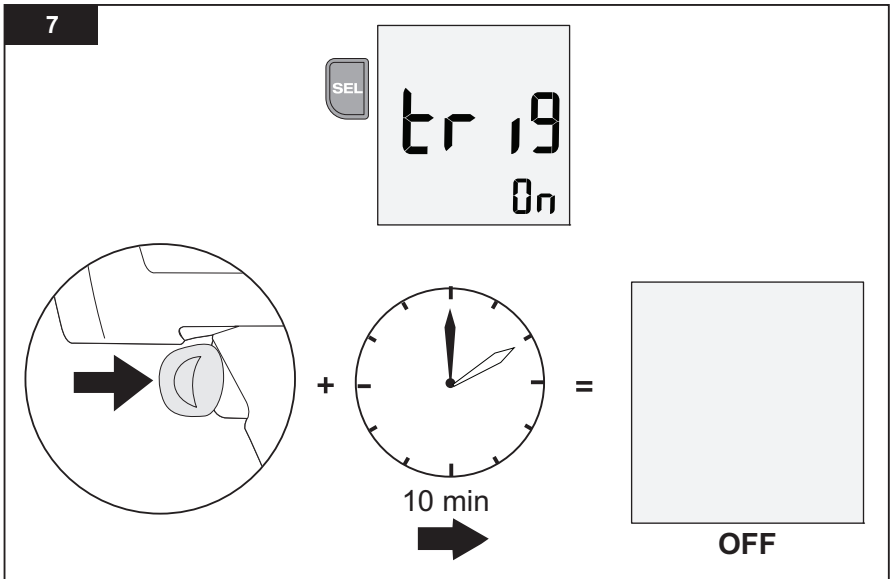

3
L itE
On
SET
L itE
OFF
4
°F/°C
°F
SET
°C
5
EMS
EMS
0,88
EMS
0,98
EMS
0,58
5
LAS
On
SET
LAS
OFF
6
Max/Min/Avg/Diff
SCAN
°F
68,0
EMS
0,95
Max
90
SCAN
°F
68,0
EMS
0,95
Min
68
SCAN
°F
68,0
EMS
0,95
Avg
76
SCAN
°F
68,0
EMS
0,95
Diff
22
SEL
SEL
SEL
SEL

hdi14.eps



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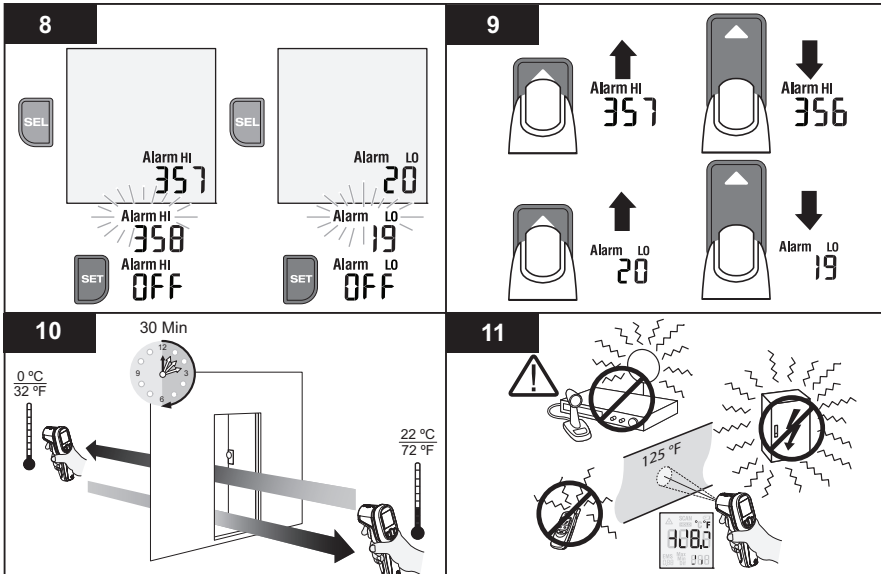
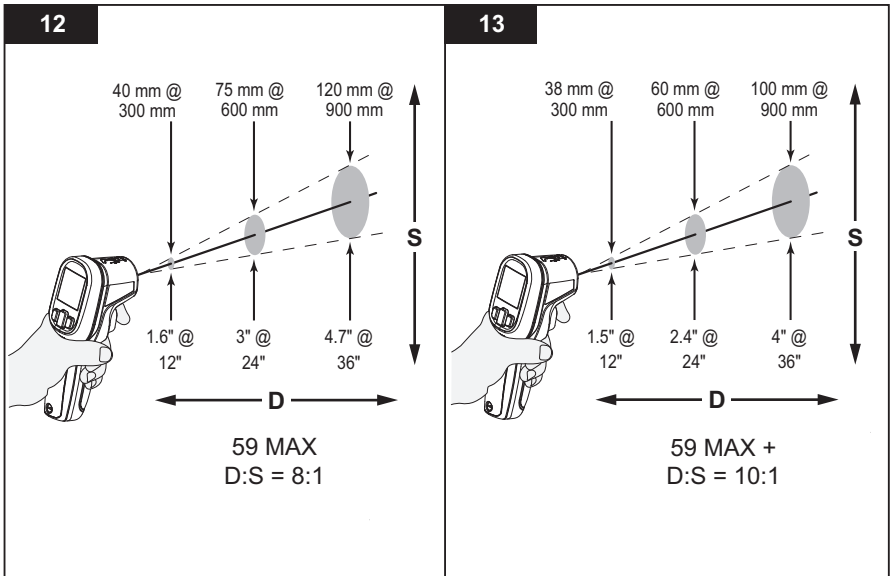
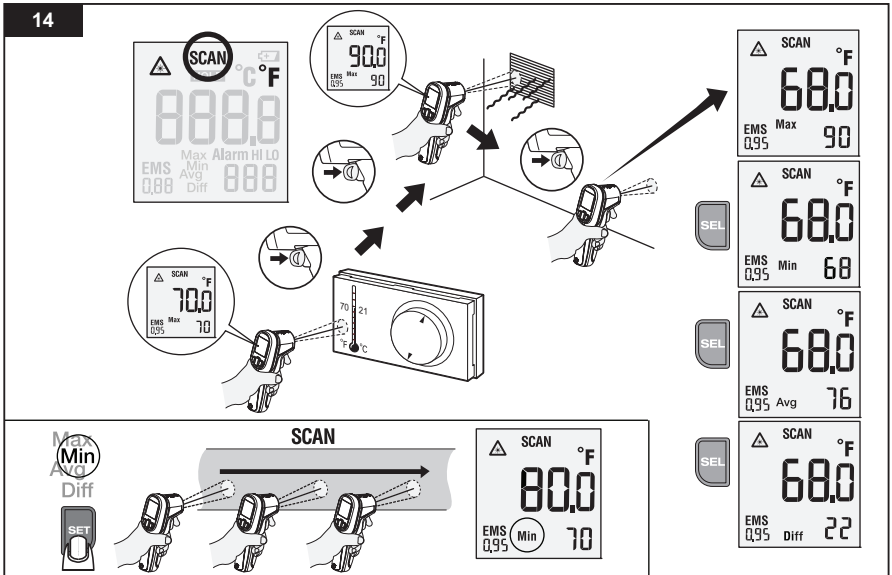

8
SEL
Alarm HI
357
Alarm HI
358
SET
Alarm HI
OFF
SEL
Alarm LO
20
Alarm LO
19
SET
Alarm LO
OFF
9
Alarm HI
357
Alarm HI
356
Alarm LO
20
Alarm LO
19
10
30 Min
0 °C
32 °F
22 °C
72 °F
11
125 °F

hdi15.eps

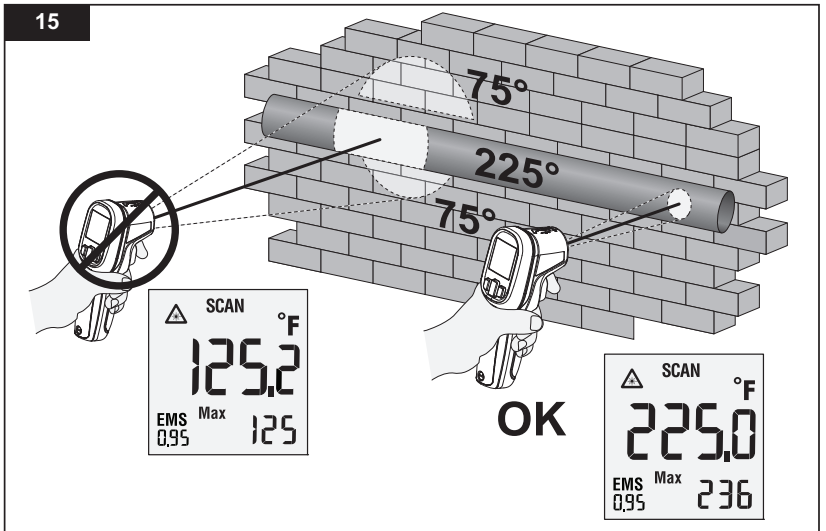

12
40 mm @ 300 mm
75 mm @ 600 mm
120 mm @ 900 mm
S
1.6" @ 12"
3" @ 24"
4.7" @ 36"
D
59 MAX
D:S = 8:1
13
38 mm @ 300 mm
60 mm @ 600 mm
100 mm @ 900 mm
S
1.5" @ 12"
2.4" @ 24"
4" @ 36"
D
59 MAX +
D:S = 10:1

hdi08.eps

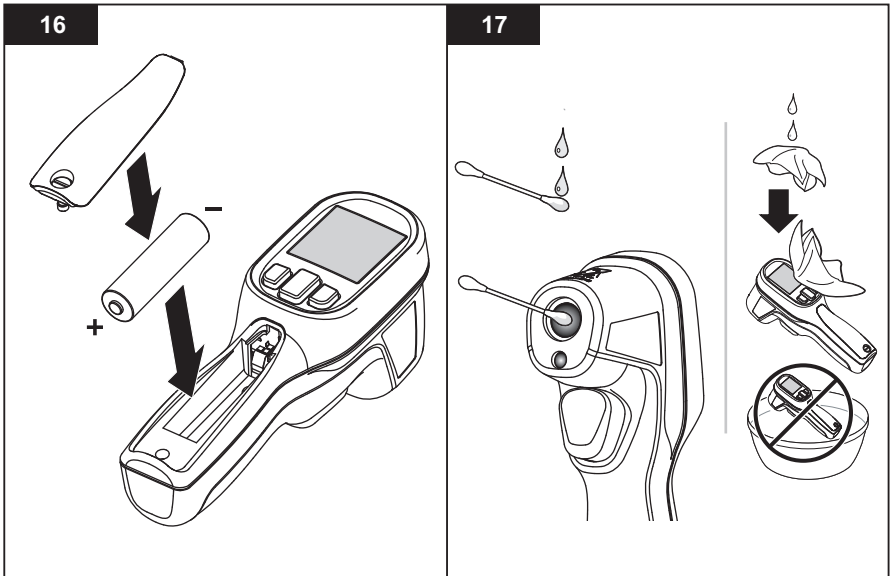

14
SCAN
°C °F
888.8
Max
Min
Avg
Diff
EMS
0.88
Alarm HI LO
888
90.0
Max
90
70.0
70
21
°C
SCAN
68.0
°F
EMS
0.95
Max
90
Min
68
Avg
76
Diff
22
SEL
Max
Min
Avg
Diff
SET
80.0
Min
70

hdi03.eps

15


75°
225°
75°
SCAN
°F
125.2
EMS
0.95
Max
125
OK
SCAN
°F
225.0
EMS
0.95
Max
236

hdi04.eps



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