

LASER[®]

Part No. 6430

Digital Infrared Thermometer with Min/Max Data Function

Instructions



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Introduction

The Laser 6430 is an infrared laser thermometer designed for a large range of garage and workshop applications, for example, checking vehicle heating and air-conditioning systems, engine radiator and thermostat function, exhaust manifolds, brakes, etc.

Infrared thermometers use infrared technology to quickly measure the surface temperature of objects. They provide fast temperature readings without physically touching the object. Infrared thermometers can safely measure hot, hazardous, or hard-to-reach surfaces without contaminating or damaging the object. Also, infrared thermometers can provide several readings per second, as compared to contact methods where each measurement can take several minutes.

Especially suited for work where space is at a premium and where accurate focus on the target is required such as in engine bays and on circuit boards.

Temperature is displayed on a switchable back-lit LCD display and features hold function for ease of use.

Temperature can be shown in either °C or °F. Powered by 9 volt battery.

Safety

The 6430 uses a Class II laser that emits low levels of visible radiation which are safe for the skin but may not be safe for the eyes. Class 2 lasers are limited to a maximum output power of 1 milliwatt (abbreviated to mW, one thousandth of a watt) and the beam must have a wavelength between 400 and 700 nm. A person receiving an eye exposure from a Class 2 laser beam, either accidentally or as a result of someone else's deliberate action (misuse) will be protected from injury by their own natural aversion response. This is a natural involuntary response that causes the individual to blink and avert their head thereby terminating the eye exposure. Repeated, deliberate exposure to the laser beam may not be safe.



- **DO NOT** look or stare into the laser beam as permanent eye damage could result.
- **DO NOT** direct the laser beam at any person's (or animal's) eyes as eye damage could result.
- **BE AWARE** that the reflections of the laser beam from mirrors or other shiny surfaces can be as hazardous as direct eye exposure.
- The user should be familiar with the 6430 Thermometer's operation, application, limitations and potential hazards. These instructions should be fully read and understood before using the 6430 Thermometer.

Controls & Display

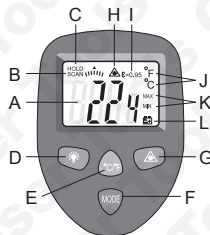


Figure 1

Key for Figure 1:

A	LCD Display
B	SCAN (Temp measuring in progress)
C	Measurement HOLD
D	Display backlight switch
E	°C or °F selector
F	Mode (Max & Min measurement record)
G	Laser on/off switch
H	Laser on indicator
I	Fixed emissivity (0.95)
J	°F or °C indicators
K	Max & Min measurements recorded
L	Low battery indicator

Access to Battery

Battery low symbol will be displayed when it is necessary to replace the 9V battery.

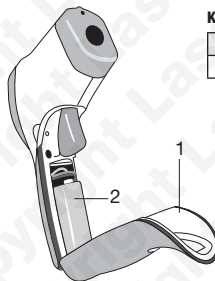


Figure 2

Key for Figure 2:

1	Battery Cover
2	Battery (9V)

Distance & Spot Size

As the distance (D) from the object increases, the diameter (S) of the area measured becomes larger.

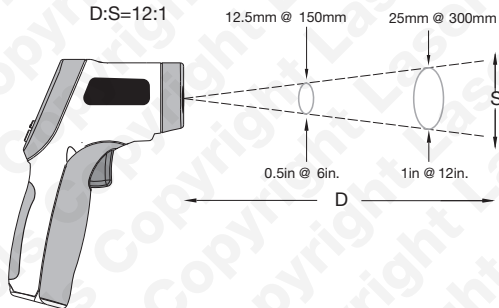


Figure 3

Field of View: Refer to **Figure 3**, ensure that the target is larger than the spot size (S); the smaller the target, the closer you should be to it. When accuracy is critical, make sure the target is at least twice as large as the spot size.

Instructions

1. Hold the thermometer by the handle grip and point towards the object surface to be measured.
2. Pull and hold the trigger to turn the thermometer on (the display will light if battery is good). While continuing to hold the trigger press the Laser on/off switch (G).
3. Begin measuring - the animated SCAN icon (B) will be displayed. (See notes above on 'distance and spot size' and 'field of view').
4. Release the trigger; the HOLD icon (C) will appear on the display indicating that the reading is held.
5. The thermometer will automatically switch off seven seconds after the trigger has been released.
6. To locate a hot spot, aim the thermometer away from the area and then scan across back and forth until you locate the hot spot indicated by the highest temperature reading on the display.
7. To hold the maximum temperature being recorded, press the Mode button (F) and MAX icon will display; similarly, when lowest temperature is displayed, press the Mode button again and MIN icon will display. These measurements will stay recorded until the instrument powers down (seven seconds after the trigger has been released).

Note:

- Not recommended for measuring temperature of shiny or polished metal surfaces (refer to 'Emissivity' section below).
- The thermometer cannot measure through transparent surfaces such as glass; it will measure the surface temperature of the glass instead.
- Smoke, dust or steam can prevent accurate measurement.

Emissivity:

The amount of infrared energy radiated by an object depends on its emissivity and its temperature; the emissivity depends on the material and its surface characteristics.

Emissivity Chart:

The emissivity of a material is the relative ability of its surface to emit energy by radiation. In general, the duller and blacker a material is, the closer its emissivity is to 1. The more reflective a material is, the lower its emissivity. For example, highly polished silver has an emissivity of around 0.02. Most (90% of typical application) organic materials and painted or oxidised surfaces have an emissivity of 0.95 and this is the pre-set default in the 6430 thermometer.

Thus inaccurate readings will result from measuring shiny or polished surfaces; to compensate, the surface could be covered with tape or flat black paint - allow time for the tape to reach the same temperature as the substrate before measuring.

Emissivity Values

Substance	Thermal Emissivity	Substance	Thermal Emissivity
Asphalt	0.90 to 0.98	Cloth (black)	0.98
Concrete	0.94	Human skin	0.98
Cement	0.96	Leather	0.75 to 0.80
Sand	0.90	Charcoal (powder)	0.96
Earth	0.92 to 0.96	Lacquer	0.80 to 0.95
Water	0.92 to 0.96	Lacquer (matt)	0.97
Ice	0.96 to 0.98	Rubber (black)	0.94
Snow	0.83	Plastic	0.85 to 0.95
Glass	0.90 to 0.95	Timber	0.90
Ceramic	0.90 to 0.94	Paper	0.70 to 0.94
Marble	0.94	Chromium Oxides	0.81
Plaster	0.80 to 0.90	Copper Oxides	0.78
Mortar	0.89 to 0.91	Iron Oxides	0.78 to 0.82
Brick	0.93 to 0.96	Textiles	0.90

Specification

Temperature Range: -50° to 650°C (-58° to 1202°F)

Accuracy

(at ambient operation temperature of 23° to 25°C (73° to 77°F))

Target Temperature

-50° to -20°C (-58° to -4°F)

-20° to 650°C (-4° to 1202°F)

Accuracy

± 5°C (9°F)

±2% ±2.0°C (4°F)

Diode Laser Output:

<1mW, wavelength 630-670nm,
Class II Laser Product

Sample rate:

2.5 per second

Emissivity:

0.95 fixed value

Power off:

Automatic shut-off after seven (7) seconds
approximately

Operating Temp:

0 to 50°C (32° to 122°F)

Storage Temp:

-20° to 60°C (-4° to 140°F)

Relative Humidity:

10% to 90% RH operating (<80% storage)

Power Supply:

Battery 9V

Weight:

130g

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If applicable, the applications database and any instructional information provided has been designed to offer general guidance for a particular tool's use and while all attention is given to the accuracy of the data no project should be attempted without referring first to the manufacturer's technical documentation (workshop or instruction manual) or the use of a recognised authority such as Autodata.

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Safety First. Be Protected.



www.lasertools.co.uk



Distributed by The Tool Connection Ltd
Knebton Road, Southam, Warwickshire CV47 5DR
T +44 (0) 1926 816000 F +44 (0) 1926 816989
info@toolconnection.co.uk www.toolconnection.co.uk

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