WAHL INSTRUMENTS, INC.

High Performance Infrared Thermometer with High DS, Adjustable Emissivity, Built-in Laser Sighting

DHS135XEL

Instruction Manual

CE

Table Content

1. Introduction

Thank you for purchasing the Wahl model DHS135XEL, non-contact infrared thermometer. To measure a temperature, simply point the unit at the object, pull the trigger and read the display. Releasing the trigger will put the unit into hold mode, which will display the captured reading for approximately six seconds and then power off. Make sure the target area is larger than the unit's spot size. For large target objects assure you are within target distance.

1-1 Features

DHS135XEL features wide temperature range and high D:S ratio. These allow the user to measure high temperature objects from a safe distance.

- High D:S ratio.
- Adjustable emissivity from 0.1 to 1.00 in 0.01 steps.
- Ultra low power consumption in shutdown mode.
- Extended long time measuring reliability.
- User selectable laser sighting.
- Backlit Liquid Crystal Display (LCD).
- ℃ or ℉ selectable.
- Electronic trigger lock.

1-2 Applications

- Electrical troubleshooting.
- Automotive & transportation repair and maintenance.
- HVAC repair and audits.
- Science experiment.
- Manufacturing processes.
- Plant / Facility maintenance.
- Food safety and processing.

2.Safety Information ⚠

2-1 Warning

2-1.1 Do not point laser directly at eye.
Use caution around reflective surfaces.
Keep out of reach of children.

2-2 Cautions

2-2.1 DO NOT submerge the instrument in water.

2-2.2 This product is not designed for use in medical evaluations.
This product is intended for use in industrial, scientific and educational purposes only.

2-3 Safety symbols

2-3.1 ⚠ Dangerous, refer to this manual before using the meter.

2-3.2 CE Certification.

2-3.3 This instrument conforms to the following standards:

EN61326 : Electrical equipment for measurement, control and laboratory use.
IEC61000-4-2 : Electrostatic discharge immunity test.
IEC61000-4-3 : Radiated , radio-frequency, electromagnetic field immunity test.
IEC61000-4-8 : Power frequency magnetic field immunity test.

Tests were conducted using a frequency range of 80-1000MHz with the instrument in three orientations. The average error for the three orientations is ±0.5℃ (±1.0 ℉) at 3V/m throughout the spectrum. However, between 781-1000MHz at 3V/m, the instrument may not meet its stated accuracy.

3.Specifications

Items	DHS135XEL
Temperature Range	-58~1832°F (-50~1000°C)
Accuracy	±5.4°F(±3°C) From-58~-4°F (-50~-20°C) ±3°F (±2°C) From -4~212°F (-20~100°C) ±2% From 212~1832°F (100~1000°C)
Spectral Range	8~14 μm
Repeatability	±2°F or ±1°C
Resolution	0.1°F or 0.1°C
Response Time	500 ms.
Emissivity	Adjustable 0.10~1.00
Distance/Spot Ratio	30:1
Supply Voltage	9V
Operating Temp.	32~122°F (0~50°C),10~90%RH
Storage Temp.	14~140°F (-10~60°C)
°C/°F Switchable	YES
Auto Power Off	Automatically after approx 6sec.
Backlight	YES
Laser Sight Switchable	YES
Max/Min/Avg/△T	YES
10 Point Memory	YES
Audio Alarm	YES
Trigger Lock	YES
Dual Display	YES 1 main temperature display and 1 secondary display.
Tripod mount	YES
Battery Type / Life	Alkaline 9V, IEC6LR61, 2IEC6F22, 1604/15 hours w/o laser
Size	7.9×5.0×1.9 inch(200×127×47mm)
Weight	11.6 oz. (330g) Approx.

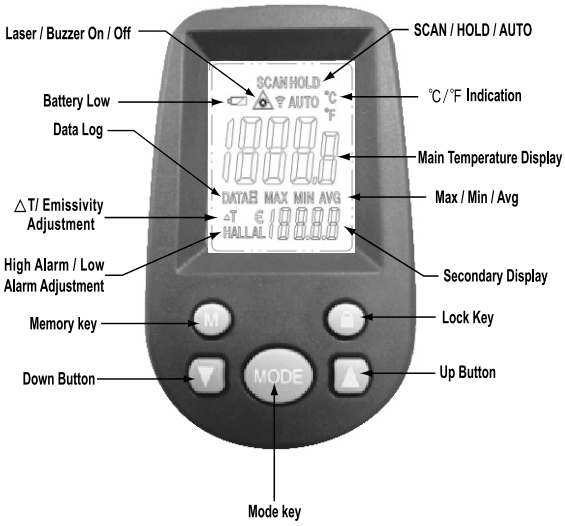
4. Operation Instructions

4-1 Quick Start

To measure a temperature, point the unit at the desired target, pull the trigger and hold. Be sure to consider the target area inside the angle of vision of this instrument. The laser spot is used for aiming purposes only.

4-2 Instrument Diagram

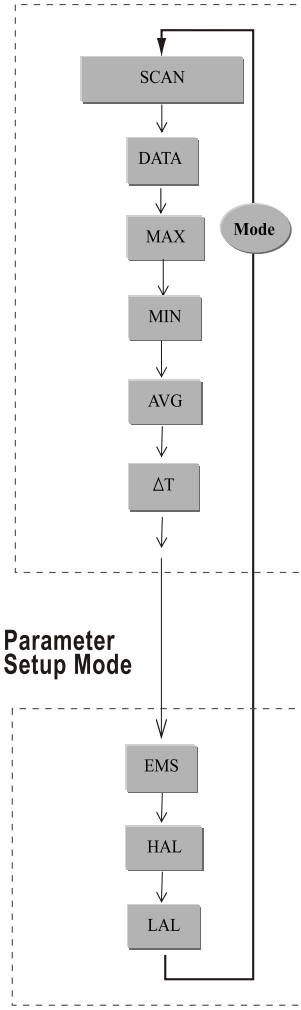
LCD & Control Panel



4-3 Advanced Functions

To operate advanced functions, use the **MODE** button to select the desired function. All other data is displayed on the Secondary Display. The sequential operations and their explanations are shown in the following flow-chart.

4-3.1 Operation Flow Chart



- Scan and display the current temperature.
- Store data when flashing. Recall data when steady. Use ▲ or ▼ button to select.
- Displays the maximum temperature obtained in current measurement cycle.
- Displays the minimum temperature obtained in current measurement cycle.
- Displays the average temperature of current measurement cycle (approx 73 seconds.)
- Displays the maximum temperature difference obtained in current measurement cycle.

- Allows Emmissivity adjustment for correction of different materials.
- Adjust High Alarm temperature setpoint.
- Adjust Low Alarm temperature setpoint.

* Alarm setpoints are adjusted by using ▼ or ▲

4-4 Displays and Controls

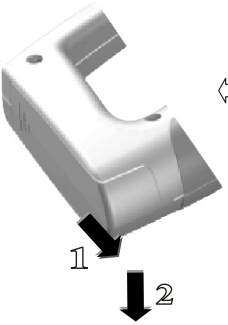
4-4.1 Displays - In SCAN mode, the instrument displays the current temperature, in Celsius or Fahrenheit, on the Main Temperature Display. Selected Advanced Function Data is displayed on the Secondary Display. The unit will HOLD the last reading for 6 seconds after the trigger is released.

4-4.2 Lock - Push the ⌓ button to continuously measure and display the temperature without pulling the measuring trigger.

4-4.3 ℃/℉ Switch - The ℃/℉ switch is located in the battery compartment and is accessed by following steps 1 and 2 below.

⚠ **4-4.4** Laser On/Off Switch - The Laser On/Off Switch is located in the battery compartment and is accessed by following steps 1 and 2 below.

4-4.5 Battery - Battery is located in the battery compartment and is accessed by following steps 1 and 2 below. It is suggested to replace the battery upon indication of the low battery symbol.



⇦ **Battery Compartment, ℃/℉ Switch, Laser Switch**

4-5 Memory

4-5.1 Memory Read - Press **MODE** switch until **DATA (0-A)** is on steady. Unit is now in Data Read mode for memory locations **DATA (1-A)** or Memory Erase mode when displaying **DATA0** (See Memory Erase section below). Pressing the Δ or ∇ arrows will scroll the DATA location and display the corresponding data on the secondary display. The specific parameter, such as Actual, Max, Min, etc., will also be displayed. No parameter displayed indicates the data is the Actual measurement.

4-5.2 Memory Erase - When **DATA 0** is selected, the secondary display will display "-**CL**-". This is only used for erasing all the memory locations. To Erase press and hold the **M** button until you hear a quick double beep.

NOTE: Data cannot be saved into **DATA0** location.

4-5.3 Memory Record - Any one of the following temperature parameters may be saved into memory: Actual reading, MAX, MIN, AVG, ΔT.

To select which one will be saved, press the **MODE** switch until the desired parameter is selected with the **DATA (1-A)** icon flashing. The flashing **DATA (1-A)** icon indicates the unit is in Data Save mode and which memory location is currently selected.

To select a specific memory location, press the Δ or ∇ arrows until the desired location is displayed.

To save the displayed data into memory, press the M button until a single beep is heard.

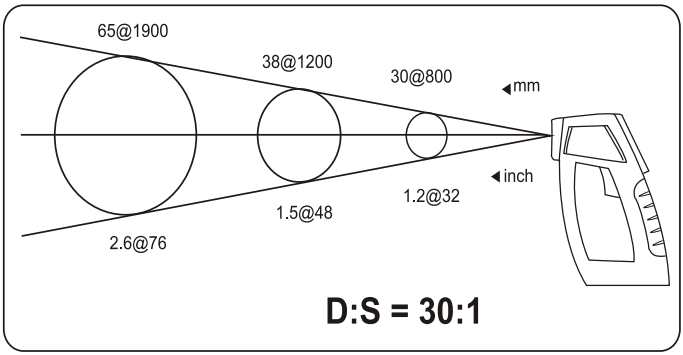
The unit will:

- Save the data that is displayed on the lower secondary display.
- Write new data over any previously saved data in that memory location.
- Increment the memory location to the next location.

5. Technical Information

5-1 Distance to Spot Ratio

The D:S Ratio is the ratio of the distance from the target to the target diameter. This is determined by the optics of the unit. The smaller the target, the closer you should be to it. For an accurate measurement, the target must completely fill the spot. Failure to fill the spot will result in an inaccurate measurement, due to the averaging of the target with the surrounding areas.



5-2 Emissivity

Emissivity is the ability of an object to emit or absorb energy. Perfect emitters have an emissivity of 1.00, absorbing 100% of incident energy. An object with an emissivity of 0.80 will absorb 80% and reflect 20% of the incident energy. Emissivity is defined as the ratio of the energy radiated by an object at a given temperature to the energy emitted by a perfect radiator at the same temperature. All values of emissivity fall between 0.00 and 1.00.

Emissivity Table

Material	Temp ℃/℉	Emissivity
Gold(pure highly polished)	227/440	0.02
Aluminum foil	27/81	0.04
Aluminum disc	27/81	0.18
Aluminum household(flat)	23/73	0.01
Aluminum (polished plate 98.3%)	227/400	0.04
	577/1070	0.06
Aluminum (rough plate)	26/78	0.06
Aluminum (oxidized @599C)°	199/390	0.11
	599/1110	0.19
Aluminum surfaced roofing	38/100	0.22
Tin(bright tinned iron sheet)	25/77	0.04
Nickel wire	187/368	0.1
Lead(pure 99.95-unoxidized)	127/260	0.06
Copper	199/390	0.18
	599/1110	0.19
Steel	199/390	0.52
	599/1110	0.57
Zinc galvanized sheet iron(bright)	28/82	0.23
Brass(highly polished):	247/476	0.03
Brass(hard rolled-polished w/lines):	21/70	0.04
Iron galvanized(bright)	-	0.13
Iron plate(completely)	20/68	0.69
Rolled sheet steel	21/71	0.66
Oxidized iron	100/212	0.74
Wrought iron	21/70	0.94
Molten iron	1299-1399/3270-2550	0.29
Copper(polished)	21-117/70-242	0.02
Copper(scraped shiny not mirrored)	22/72	0.07
Copper(Plate heavily oxidized)	25/77	0.78
Enamel(white fused on iron)	19/66	0.9
Formica	27/81	0.94
Frozen soil	-	0.93
Brick(red-rough)	21/70	0.93
Brick(silica-unglazed rough)	1000/1832	0.8
Carbon(T-carbon 0.9% ash)	127/260	0.81
Concrete	-	0.94
Glass(smooth)	22/72	0.94
Granite(polished)	21/70	0.85
Ice	0/32	0.97
Marble(light gray polished)	22/72	0.93
Asbestos board	23/74	0.96
Asbestos paper	38/100	0.93
	371/700	0.95
Asphalt(paving)	4/39	0.97

6.Maintenance

6-1 Lens - Clean the lens by blowing off loose particles using clean compressed air. Gently brush remaining debris away with a camelhair brush. Use a cotton swab moistened with distilled water to carefully wipe the lens surface.

NOTE:

DO NOT use solvents to clean the lens.

6-2 Housing - Clean by wiping with a damp soft cloth. Mild detergent may by used as needed.

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