JET™

# OPERATION MANUAL

## INFRARED THERMOMETER

310016

310018

www.jetequipment.com

## Features:

- Precise temperature measurement without contact
- Selectable laser pointer for accurate aim
- User selectable °C / °F
- Automatic data hold
- Auto shut off
- Backlit LCD display

## Applications:

Ideal for use in inaccessible areas and where moving parts or high heat make contact measurement dangerous. A variety of uses including automotive applications, food and beverage industries, chemical industries, cement plants, road building, HVAC, pool maintenance, etc.

## Field of view:

The meter's field of view is 8:1 (310016) and 12:1 (310018), meaning that if the meter is 8" (310016) or 12" (in case of 310018) away from the target, the diameter of the object under test must be at-least 1".

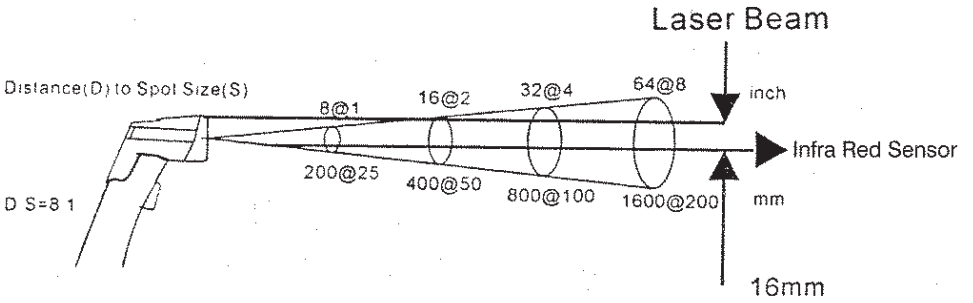



Figure 1 (**310016**)

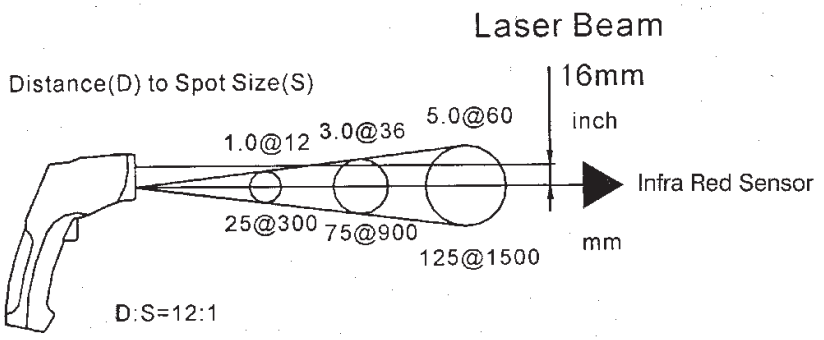



Figure 2 (**310018**)

## Safety:

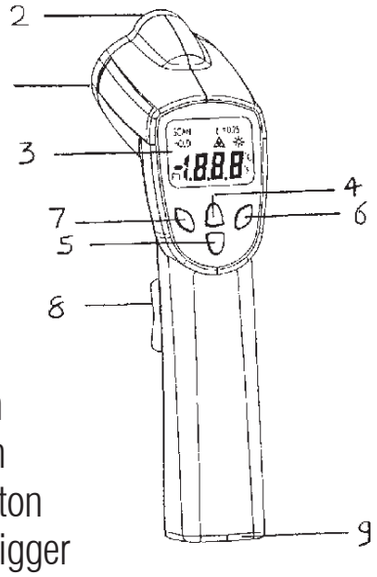
- Use extreme caution when the laser beam is turned on.
- Do not let the beam enter your eye, another person's eye or the eye of an animal.
- Be careful not to let the beam on a reflective surface strike your eye.
- Do not allow the laser light beam impinge on any gas which can explode.

## General Specifications:

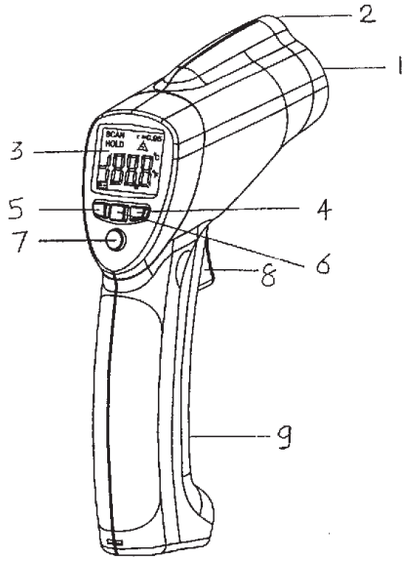
| | 310016 | 310018 |
|---|---|---|
| Display | 3-1/2 digit (1999 count) LCD with backlighting | 3-1/2 digit (1999 count) LCD with backlighting |
| Measuring range | -20°C to 450°C / -4°F to 842°F | -50°C to 750°C / -58°F to 1382°F |
| Resolution | 1°C / °F | 0.1°C / °F up to 200°C / °F<br>1°C / °F over 200°C / °F |
| Accuracy | +/- 2°C or 2% of reading | +/- 2°C or 1.5% of reading |
| Operating temperature | 0°C to 50°C / 32°F to 122°F | 0°C to 50°C / 32°F to 122°F |
| Response time | 1 sec app. | 1 sec app. |
| Field of view (distance:spot size) | 8:1 | 12:1 |
| Spectral response | 6 – 14um | 8 – 14um |
| Emissivity | 0.95 fixed | 0.95 fixed |
| Relative humidity (operating) | Max. 80% | 10% – 90% |
| Over range indication | LCD will show "OVER" and meter will beep | LCD will show "1" |
| Power OFF | Automatic shut-off after 7 sec. | Automatic shut-off after 7 sec. |
| Power supply | 9V battery | 9V battery |
| Weight | 180 gram | 290 gram |
| Size | 159 x 79 x 57.2 mm | 100 x 56 x 230 mm |

## Front Panel Description:

1. Infrared sensor
2. Laser beam
3. LCD display
4. °F select button
5. °C select button
6. Backlight button
7. Laser select button
8. Measurement trigger
9. Battery compartment



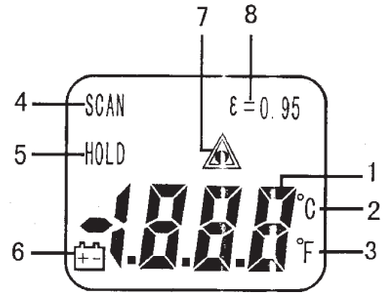

310016




310018

## Indicator:

1. Digital readout
2. Temperature °C
3. Temperature °F
4. Measuring indication
5. Data hold
6. Low battery indicator
7. Laser Pointer
8. Fixed Emissivity (0.95)



## Measurement Operation:

(**1**) Hold the meter and point it towards the surface to be measured.

(**2**) Press and hold the Measurement Trigger to turn the meter ON. LCD will show a reading. If there is NO display or reading, the battery may have depleted. Replace the battery and try again.

(**3**) Push the Laser select button while pressing and holding the Measurement Trigger to turn ON the laser beam. Laser icon will appear on LCD above temperature. Aim the red laser beam approximately 1/2" above the point of test. (**Note:** pressing the Laser select button again turns the laser beam OFF).

(**4**) Select the unit of temperature (°C or °F) by first pressing and holding Measurement Trigger and then using °C select button or °F select button.

(**5**) Press the Backlight button to turn ON the LCD backlighting function.

(**6**) Release the Trigger and the HOLD display icon will appear on the LCD indicating that the reading is being held.

(**7**) The meter turns OFF automatically 7 seconds (app.) after Measurement Trigger is released.

## Measurement Considerations:

Holding the meter by its handle, point the Infrared (IR) sensor towards the object whose temperature is to be measured. The meter automatically compensates for temperature deviations from ambient temperature. Keep in mind that it will take up to 30 minutes to adjust to a wider range of ambient temperatures.

## Battery Replacement:

When battery power is not sufficient, LCD will display. [+ -] You will need a new 9V battery.

## Notes:

## How it works

Infrared thermometers measure the surface temperature of an object. Meter's optics sense the energy emitted, reflected or transmitted from an object and collects and focuses onto a detector. The electronics then translate the information into a temperature reading, which is displayed on the LCD. In thermometers with a laser beam, it is used for aiming purposes only.

## Field of view

Make sure that the target is larger than the meter's spot size. 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.

## Distance & Spot Size

As the distance (D) from the object increases, the spot size (S) of the area measured by meter becomes larger (see fig. 1 & 2).

## Locating a Hot Spot

To find a hot spot, aim the meter outside the area of interest, then scan across with an up and down motion until you locate hot spot.

## Reminders:

Not recommended for use in measuring any shiny or polished metal surfaces (stainless steel, aluminum etc.).
The meter cannot measure through transparent surfaces such as glass. It will measure the surface temperature of the glass instead. Steam, dust, smoke etc. can prevent accurate measurement by obstructing the meter's optics.

## Emissivity:

Most (90% of typical applications) organic materials and painted or oxidized surfaces have an emissivity of 0.95 (pre-set in the unit). Inaccurate readings will result from measuring shiny or polished metal surfaces. To compensate, cover the surface to be measured with a masking tape or flat black paint. Allow time for the tape to reach the same temperature as the material underneath it. Measure the temperature of the tape or painted surface.

## Emissivity Values:

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