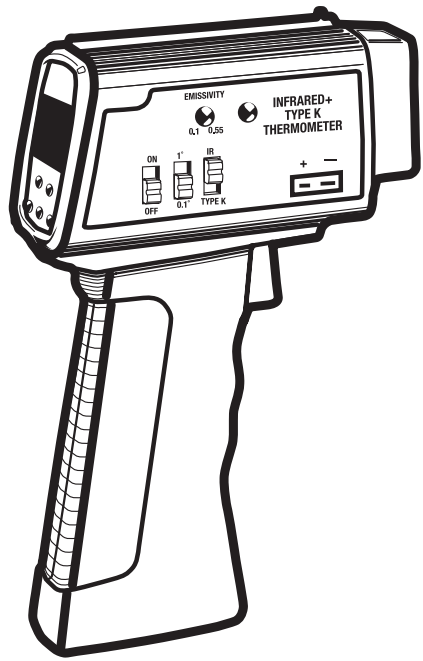
User's Manual

EXTECH INSTRUMENTS

InfraRed Thermometer with Laser Pointer

MODEL 42525

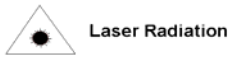


Introduction

Congratulations on your purchase of Extech's 42525 IR Thermometer. This device offers non-contact infrared temperature measurement capability. The built-in laser pointer increases target accuracy. Type K thermocouple functionality is built-in also. Proper use and care of this meter will provide years of reliable service.

Safety

1. Use extreme caution when the laser beam is ON
2. Do not point the beam toward anyone's eye
3. Be careful not to let the beam strike the eye from a reflective surface
4. Do not use the laser near explosive gases or in other potentially explosive areas



Specifications

General Specifications

Display	0.43" (11mm) 4-digit LCD display
Measurement Ranges	14 to 662°F (-10 to 350°C) with 1° resolution 14.0 to 230.0°F (-10 to 110.0°C) 0.1 ° resolution
Sample rate	1 sec. approx.
Laser power	Laser power less than 1mW (red)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Operating Humidity	Max. 80% RH.
Power Supply	9V battery
Power Current	12mA DC (with laser approx. 23mA DC)
Weight	0.6 lbs. / 265g
Size	7.7 x 4.7 x 2.3" (195 x 120 x 58 mm)

Infrared Thermometer Specifications

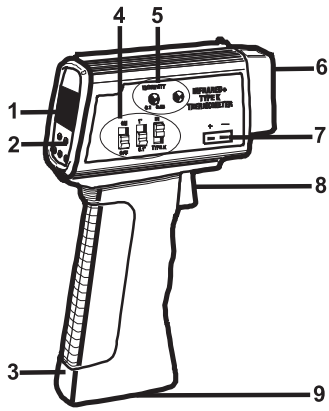
Range / Resolution	14 to 662°F (-10 to 350°C)	1°C/F
	14.0 to 230.0°F (-10 to 110.0°C)	0.1°C/F
Accuracy < 572°F(300°C)	± 3% of reading or ± 6°F (3°C) whichever is greater	
Accuracy notes	1. Accuracy specified for ambient temperature 2. Accuracy specified for emissivity of 0.95	
Emissivity settings	0.95 default value (0.1 to 0.95 adjustable)	
Distance Factor	D/S = Approx. 6:1 ratio (D = distance, S = spot)	
Measurement Field and Target Size	Refer to the chart on top of the meter or the diagram in the section entitled "Infrared Measurement Procedure"	
Wavelength	6 to 12 μm	

Type K Thermocouple Specifications

Range / Resolution	-50 to 1999°F (-50 to 1230°C)	1°C/F
Accuracy	± (1% reading + 2°F); ± (1% reading + 1°C)	
Sensor type	Type K (NiCr – NiAl) Thermocouple (sold separately)	

Meter Description

1. LCD Display
2. Function buttons
3. Handle grip
4. Function switches
5. Adjustment potentiometers
6. IR sensor and laser source
7. Type K input jack
8. Laser Trigger
9. Battery Compartment

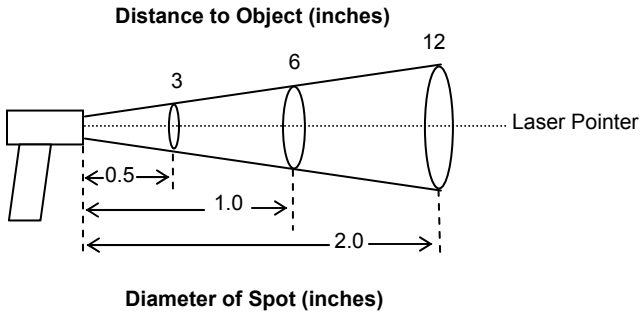


Emissivity Considerations

The amount of IR energy emitted by an object is proportional to an object's temperature and its ability to emit energy. This ability is known as emissivity and is based upon the material of the object and its surface finish. Emissivity values range from 0.1 for a very reflective object to 1.00 for a flat black finish. The 42525 senses IR energy and calculates the temperature based upon the amount of IR energy it receives using a factory default emissivity setting of 0.95 (this setting covers 90% of applications). The user can manually adjust the emissivity setting if desired. This procedure is described later in this manual.

Infrared Measurement Procedure

1. Power the meter by setting the POWER OFF/ON switch to the ON position.
2. Set the IR / TYPE K switch to the IR position.
3. Set the temperature units (degrees C or F) using the C/F button.
4. Set the resolution (1 or 0.1) using the resolution select switch.
5. Point the IR sensor toward the object under test.
6. The object under test should be larger than the spot size calculated by field/distance chart (see diagram below).
7. Read the LCD display for the temperature measurement.



Infrared Measurement Considerations

1. The 42525 automatically compensates for ambient temperature deviations, however it may take up to 30 minutes to adjust to extremely wide ambient temperature changes.
2. When low temperature measurements are taken followed by high temperature measurements, several minutes are required for stabilization before the high temperature measurements can be made accurately.
3. Measurement Field / Distance: The object under test should be larger than the spot size shown in the diagram on the previous page. For optimum accuracy, the object should be 1.5 to 2 times larger than the spot size shown in the diagram on the previous page.
4. Measurement Interference: Objects having low emissivity or objects with low temperature yet high emissivity emit little IR energy. Such objects are adversely affected by IR energy radiated from nearby objects having high emissivity and temperature. For example, when such objects are measured in sunlight, erratic readings occur because of the powerful radiation (sunlight) reflected off of the object's surface into the 42525 sensor.
5. If the surface of the object under test is covered with frost, oil, grime, etc. clean before taking measurements.
6. If an object's surface is highly reflective, apply masking tape or flat black paint (emissivity 0.95) before measuring.

Manually Adjusting Emissivity

The emissivity is factory set to 0.95, which covers 90% of all applications. However, the closer the meter's emissivity setting is to the actual emissivity of the object under test, the more accurate the temperature measurements will be. To calculate the emissivity of an object: Measure an object's temperature using a Type K Thermocouple and note the reading. Measure the object again using the IR sensor. Now, adjust the emissivity pot (located under the rubber grommet on the meter's side) using a small screwdriver until the IR measurement matches the thermocouple reading. Note that the use of a surface-mount thermocouple works best for this purpose. Turn the pot counter-clockwise to lower the emissivity value. With the pot set fully clockwise the emissivity will be 0.95, which is the factory default setting.

Offset Adjustment Potentiometer

The OFFSET function allows the user to adjust the temperature readings in fine detail to match an external calibrator, to compensate for display drift, or for other diagnostic uses. Turn the pot (located under the rubber grommet on the side of the meter) using a small screwdriver to adjust the displayed temperature to the desired setting.

Data Hold

Press the HOLD button to freeze the displayed measurement. The “HOLD” icon will appear on the LCD to indicate that the Data Hold mode is activated. Press the HOLD button again to exit the Data Hold mode and return to normal operation.

Relative Measurements

While measuring, press the "%" button to activate the Relative Mode. The measurement on the LCD at the time of the button press will be displayed as 100%. Subsequent readings will be displayed as a percentage of the reference value. Press the "%" button again to return to normal operation.

Data Recording (Maximum/Minimum Readings)

The Data Recording feature offers maximum and minimum reading record/recall. Press the RECORD button once to activate this feature (the REC symbol will appear on the LCD). Press the RECALL button once to view the maximum reading (MAX). Press the RECALL button again to view the minimum reading (MIN). Press the RECORD button again to return to normal operation.

Laser Pointer Operation

This 42525 is equipped with a laser pointer that is used to aim the IR sensor more accurately. Be extremely cautious when directing the laser beam, shining the laser beam into someone's eye can cause serious injury. Point the laser beam toward the device under test whose temperature is to be measured.

Type K Thermocouple Measurement Procedure

1. Connect the Type K Thermocouple to the temperature input jack on the meter.
2. Power the meter by setting the POWER OFF/ON switch to the ON position.
3. Set the IR / TYPE K switch to the Type K position.
4. Set the temperature units (degrees C or F) using the C/F button.
5. Set the resolution to "1" using the resolution select switch (0.1 cannot be used in this mode).
6. Place the Thermocouple in the area where the temperature is to be measured.
7. Read the LCD display for the temperature measurement.

Type K Measurement Considerations

When a Type K Thermocouple is first connected to the meter and the thermocouple and meter temperatures are different, several minutes should be allotted so that the temperature of the socket matches the temperature of the thermocouple. The cold junction compensation circuitry can then operate efficiently, allowing the meter to provide measurements with optimum accuracy.

Maintenance

Battery Replacement

When the low battery symbol appears on the LCD, replace the meter's 9V battery. The battery compartment is located on the bottom of the meter's handle. Open the compartment by sliding the battery compartment cover off. Replace battery and re-install the battery compartment cover.

Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website at www.extech.com (click on 'Contact Extech' and go to 'Service Department' to request an RA number). A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

Calibration and Repair Services

Extech offers complete repair and calibration services for most products we sell. For periodic calibration, NIST certification or repair of most Extech products, call customer service for details. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

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