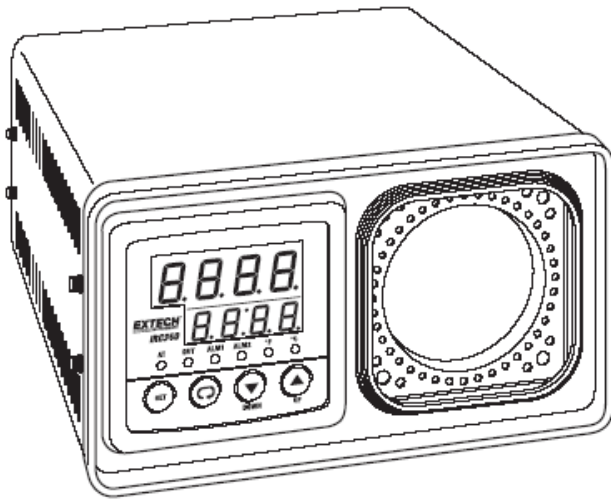User Guide

EXTECH® INSTRUMENTS
A FLIR COMPANY

Infrared Calibrator

Model IRC350

Introduction

Congratulations on your purchase of the Extech IRC350 Infrared Calibrator. This easy to use portable calibrator can be used to accurately calibrate Infrared (IR) thermometer devices. This instrument is shipped fully tested and calibrated and, with proper use, will provide years of reliable and accurate calibration of temperature sensors and devices.

Features

- 2.3" (58mm) diameter target assembly and dry-well temperature system controlled by microcomputer

- Metal cone external reference thermometer with nominal heat-conducting ability

- Oxide film, surface thermometer with an Emissivity of 0.95.

- Class-A, platinum 100 ohm (PT100) RTD temperature sensor

- Rapid heating and cooling (fan) functions

- °C /°F selectable units

- Calibration temperature range of 122°F to 662°F (50°C to 350°C).

- 0.1° temperature display and stability resolution

Warranty

EXTECH INSTRUMENTS CORPORATION *(A FLIR COMPANY) warrants this instrument to be free of defects in parts and workmanship for* **one (1) year** *from date of shipment (a six month limited warranty applies to 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 www.extech.com for contact information. 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.*

Safety

- **BURN HAZARD** – Use extreme caution when the unit is powered on. Do not touch the IR target surface; the IR target surface temperature is the same temperature as that shown on the display.The sheet metal at the top of the instrument may also exhibit extreme temperatures for areas close to the IR target surface

- **DO NOT** turn off the instrument at temperatures higher than 212°F (100°C).

- **DO NOT** connect and operate this unit without a properly grounded, properly polarized power cord

- **HIGH VOLTAGE** is used in the operation of this equipment. Severe injury or death may result if personnel fail to observe safety precautions. Before working inside the equipment, turn the power off and disconnect the power cord

- **DO NOT** place this instrument under a cabinet or other structure. Overhead clearance is required

- **DO NOT** operate near flammable materials

- **DO NOT** leave this instrument unattended when in use

- This instrument is intended for indoor use only

- **DO NOT** use this instrument for any applications other than those described in this User Guide

Cautions

- Components and heater lifetime can be shortened by continuous high temperature operation

- **DO NOT** use liquids to clean the target surface

- **DO NOT** adjust the values of the calibration constants from the factory set values. The correct setting of these parameters is important to the safety and proper operation of the calibrator. Call the Customer Care department if inadvertent changes to the programming have been made

- Operate the instrument between 5 and 35°C (41 to 95° F)

- Allow at least 6 inches of space between the instrument and nearby objects

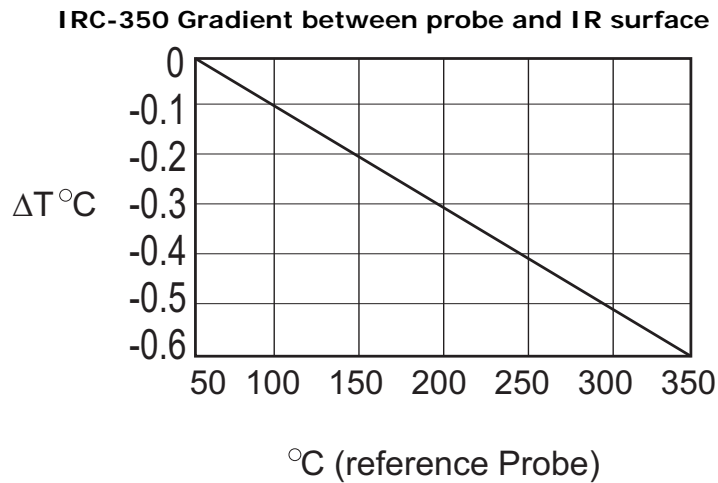- Avoid vibrations in the calibration environment

Environmental conditions

Although the instrument has been designed for optimum durability and trouble-free operation, there are some precautions that should be taken. The instrument should not be operated in an excessively dusty or dirty environment. Maintenance and cleaning recommendations can be found in the Maintenance section of this User Guide.
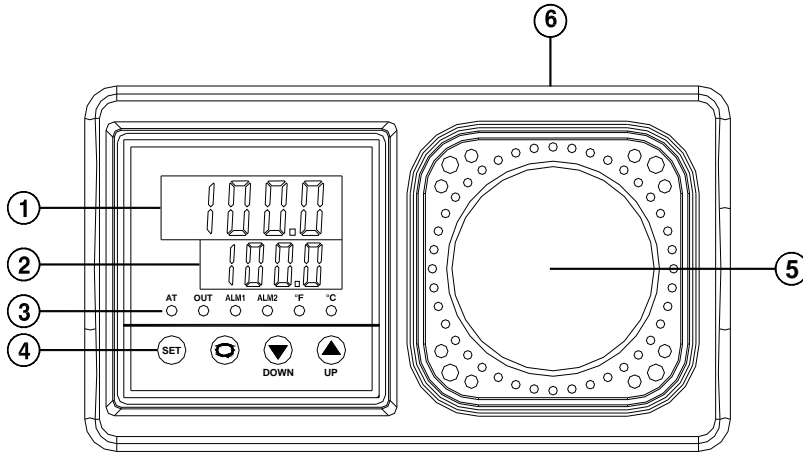
Specifications

Range	122 to 662°F (50 to 350°C)	
Accuracy	122 to 250°F (50 to 121°C)	±1.2°F/0.5°C
	251 to 500°F (122 to 260°C)	±2.0°F/1.0°C
	501 to 662°F (261 to 350°C)	±3.0°F/1.5°C
Stability	122 to 250°F (50 to 121°C)	±0.2°F/0.1°C
	251 to 500°F (122 to 260°C)	±0.4°F/0.2°C
	501 to 662°F (261 to 350°C)	±0.6°F/0.3°C
Target Emissivity	0.95 fixed	
Resolution	0.1°	
Heating Time	30 minutes to maximum temperature	
Cooling Time	30 minutes from maximum to 212°F (100°C)	
Aperture Diameter	2.3" (58mm)	
Power	115VAC (±10%), 3A	
Operating Ranges		
Temperature	41 to 95° F (5 to 35°C)	
Relative Humidity	15 to 80%	
Altitude	Less than 2,000 Meters	
Aperture Diameter	2.3" (58mm)	
Size	7.1 x 4.5 x 9.2" (180 x 114 x 233 mm)	
Weight	6.6 lbs. (3 kg)	

Temperature differences between the IR surface and the reference probe are calculated as shown in the graph below:

IRC-350 Gradient between probe and IR surface

$\Delta T \, °C$ vs. °C (reference Probe)

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Front Panel

1. The top display (red LED digits) shows the actual temperature
2. The bottom display (green LED digits) shows the desired (set-point) temperature value
3. Status LEDs:
   - **AT** – This is a factory-only diagnostic function and will not switch on during normal operation
   - **OUT** – Illuminates when the instrument is actively heating
   - **ALM1** - Overload Alarm No. 1 illuminates when the target assembly temperature exceeds the set point temperature by the programmed value (default = 9ºF / 4.5ºC). The fan will increase to maximum velocity when the alarm limit is reached
   - **ALM2** – Unused
   - **°C** - Unit of measure temperature indicator (Celsius)
   - **°F** - Unit of measure temperature indicator (Fahrenheit)
4. **Controller Keypad** – For setting the desired temperature (set-point) and for selecting the unit of measure
   - **SET** – Used to enter into the programming mode, enter the temperature set points or to store the ºF or ºC selection.
   - ⊙ - Used to scroll through the programming selections.
   - **DOWN** –Used to decreases the set-point value and also to select the desired unit of measure (ºF or ºC)
   - **UP** – Used to increases the set-point temperature and also to select the desired unit of measure (ºF or ºC)
5. **Target assembly**
6. **Test aperture** for placing a temperature sensor.

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Back Panel
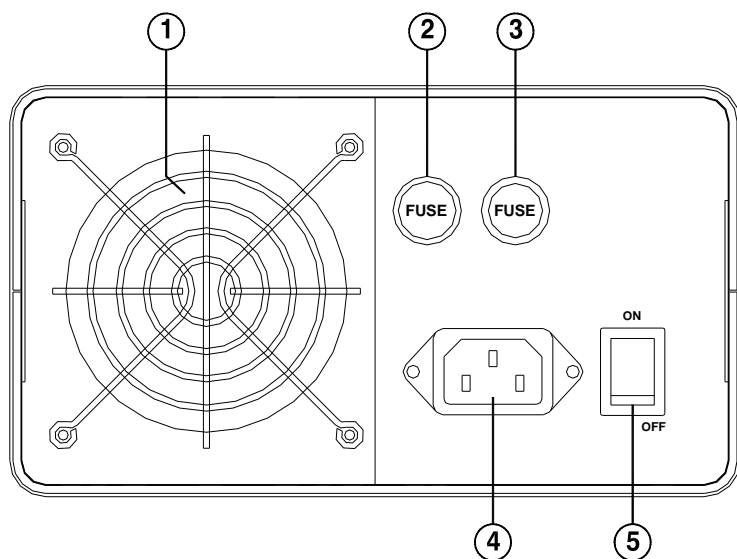
1. Fan
2. Fuse for heater
3. Fuse for temperature control system
4. Power input
5. Power switch

Note: The fan inside the calibrator has two speeds and runs continuously when the unit is being operated to provide cooling for the instrument. The fan runs slow for heating and maintaining operation and runs fast for rapid cooling. Slots are provided for airflow. The area around the calibrator must be kept clear to allow adequate ventilation. The airflow is directed out the front and can be extremely hot.

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Setup

1. Place the calibrator on a flat surface with at least 8 inches of free space around the instrument.

2. Plug the power cord into a grounded 115V outlet.

3. Turn on the power to the calibrator by toggling the power switch on. The fan will begin quietly blowing air through the instrument and the instrument will display a brief self-test. If the unit fails to operate please check the power connection.

4. The heater will begin operating to bring the temperature of the calibrator to the set-point temperature.

Changing Display Units

> **NOTE:** When changing the display units or when adjusting the set-point value, do not adjust factory-only programming parameters. If a factory menu is inadvertently accessed, press the 'SET' button to return to the main display screen.

The IRC-350 can display temperature in degrees Celsius (C) or Fahrenheit (F). To change the display units:

1. Unlock the unit by pressing and holding the "SET" and " ⬭ " buttons at the same time.

2. When the display changes, release both buttons. The top display line (red LED digits) will display " $tPUn$ ", and the bottom display line (green LED digits) will display "(ºF or ºC)".

3. Use the Up and Down arrow buttons to select the desired temperature units. The temperature unit letter will flash at a fast rate while programming.

4. Press the "SET" button to store the change. The green LED display will stop flashing.

5. Press "SET" again if both temperature displays are not present.

Setting the Temperature

The temperature set-point can be set to any value within the instrument's specified range. Do not, for any reason, exceed the specified temperature range.

1. Use the up and down arrow buttons to change the set-point value (shown on the bottom, green LED digit display). The display will flash at a fast rate when the set-point is changed.

2. Press "SET" and the digits will stop flashing. The calibrator will automatically adjust the target assembly's temperature to match the set-point temperature. The red LED display will indicate the temperature of the target assembly.

3. When the set-point temperature is changed the controller switches the well heater on or off to raise or lower the temperature. The displayed well temperature gradually changes until it reaches the set-point temperature. The well may require 5 to 10 minutes to reach the set-point. Another 5 to 10 minutes is required to stabilize within the stated limits of the set-point. Ultimate stability may take an additional 15 to 20 minutes.

4. Reduce the temperature to a value below 212°F (100°C) before turning the instrument off.

Warning: Turning off the power at higher temperatures can damage the instrument.

Maintenance

With proper care the instrument should require very little maintenance.

If the outside of the instrument becomes soiled, it may be wiped clean with a damp cloth and mild detergent. Do not use harsh chemicals or compounds.

Do not clean the surface of the well with liquids. Simply wipe with a dry cloth.

The calibrator should be handled with care. Avoid dropping or bumping the calibrator.

Calibration and Repair Services

Extech offers repair and calibration services for the products we sell. Extech also provides NIST certification for most products. Call the Customer Care Department for information on calibration services available for this product. Extech recommends that annual calibrations be performed to verify meter performance and accuracy.

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Support line (781) 890-7440

Technical support: Extension 200; E-mail: support@extech.com

Repair & Returns: Extension 210; E-mail: repair@extech.com

Product specifications subject to change without notice

For the latest version of this User's Guide, Software updates, and other up-to-the-minute product information, visit our website: www.extech.com

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