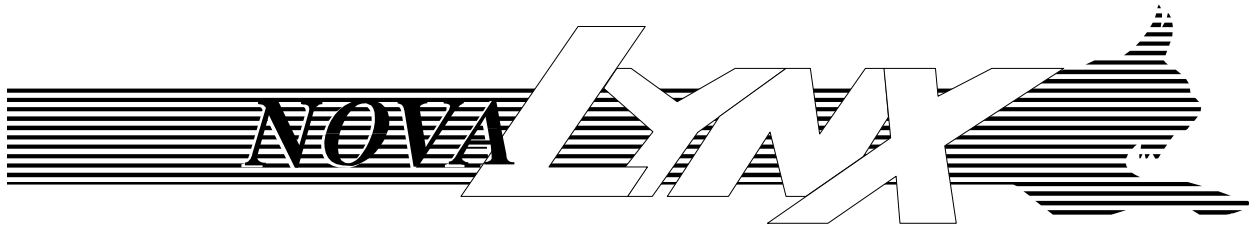


# NOVALYNX CORPORATION

MODEL 210-4417  
GLOBE THERMOMETER

INSTRUCTION MANUAL



REVISION DATE: JULY 2010

## **Receiving and Unpacking**

Carefully unpack all components and compare to the packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

## **Returns**

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage during the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with the packaging. Please write the RA# on the outside of the box.

## **Warranty**

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

## **Address**

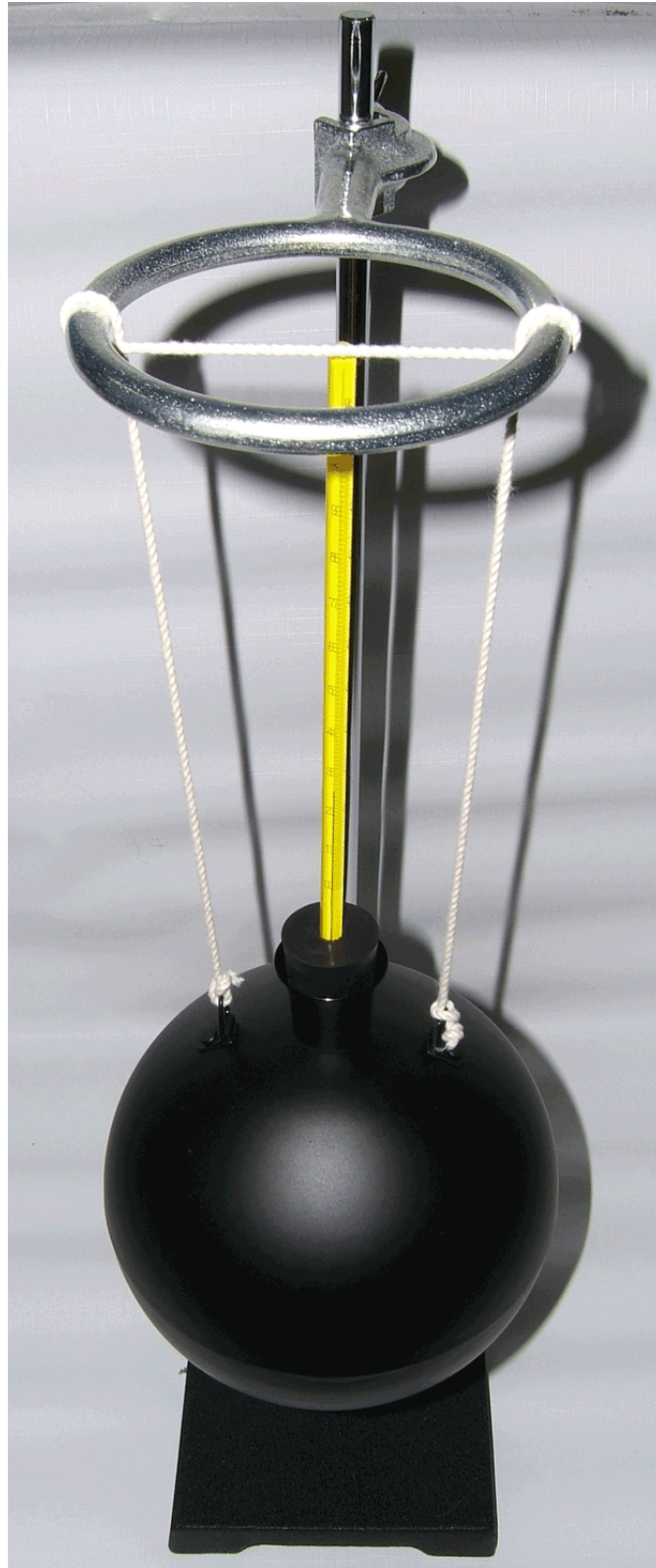
**NovaLynx Corporation**  
**4055 Grass Valley Highway, Suite 102**  
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**MODEL 210-4417  
EQUIPMENT CONFIGURATION AND IDENTIFICATION**



# **NovaLynx Corporation**

## **Model 210-4417 Globe Thermometer Instruction Manual**

### **1.0 INTRODUCTION**

The 210-4417 Globe Thermometer is used to measure radiant heat. It consists of a mercury-in-glass thermometer with its bulb located at the center of a matt-black metal globe (or sphere). Mean radiant temperature can be calculated from this instrument.

#### **1.1 Applications**

For use by heating and ventilating engineers, factory inspectors, medical health officers, and others concerned with the environmental health conditions in factories, offices, hospitals, and laboratories, etc.

In some environmental conditions, for example in factories where hot processes are carried out, it is necessary to measure the mean temperature of solid surroundings when attempting to control or improve working conditions. This information will show whether excessive radiant heat is reaching workers. Conversely, such measurements would also show whether cold surroundings are causing undue heat loss by radiation from the human body.

#### **1.2 Principle of Operation**

A hollow metal globe coated on the outside with matt-black paint absorbs the radiant heat from surrounding objects so that, after a time lag, the temperature at the center of the globe is a measure of the radiant heat and not of the air surrounding it. A temperature sensor inserted into the globe measures this temperature.

#### **1.3 Construction**

The 210-4417 consists of a hollow 6" (16 cm) metal globe, coated with matt-black paint. A rubber stopper supports a 12" (30 cm) mercury-in-glass thermometer with the thermometer bulb at the center of the globe. The thermometer is specially calibrated for a 5" (12.5 cm) immersion to correct for stem-emergent errors.

### **2.0 SPECIFICATIONS**

Range: 0-100 °C

Graduations: 0.5 °C

Dimensions:

Thermometer and globe: 6" diameter x 16" high (152 x 405 mm)

Mounting stand: 22" high (559 mm)

Weight/Shipping: 5 lbs/10 lbs (2.3 kg/4.5 kg)

### 3.0 OPERATION

Insert the glass thermometer into the rubber stopper and position the thermometer bulb in the center of the globe. Soapy water may be used to lubricate the thermometer when inserting and removing it from the rubber stopper.

Assemble the mounting stand and suspend the thermometer and globe as shown in the photograph on page iii.

Place the instrument in position, without any objects between the heat source and the globe. Avoid placing the instrument where relatively large air currents are expected.

Wait at least 15 or 20 minutes before taking an observation.

The difference between the temperature inside the globe and the temperature outside the globe is called the actual radiant temperature.

The mean radiant temperature (mrt) can be calculated using the globe thermometer's temperature using the following formula:

$$\text{mrt } (^{\circ}\text{C}) = \text{tg} + 2.42\text{V} (\text{tg} - \text{ta})$$

V: air current cm/sec

ta: temperature of the air outside of the globe

tg: globe thermometer temperature

Radiation (R) can be estimated using the following formula:

$$R = 0.173/10^{-8} (\text{MRT})^4 \text{ Btu/ft}^2\text{h}$$

MRT:  $\text{mrt} + 460$

Btu: British Thermal Unit, a unit of heat equal defined as the amount of heat required to raise one pound of water one degree Fahrenheit at one atmosphere pressure, equivalent to approximately 252 calories