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› Thermo Scientific STF55346C Lindberg/Blue M 1,100 Degree C Digital Tube Furnace with 24-Inch Heated Zone and 1 to 3-Inch Tube O.D, Includes Integrated Three Zone Programmable, Single Program/16 Segment Programmable Digital Controller with LED Display, Temperature Range: 100 Degree to 1,100 Degree C, 240V/60Hz

Thermo Scientific STF55346C-1

Thermo Scientific STF55346C Lindberg/Blue M Digital Tube Furnace User Manual

Model: STF55346C-1

1. INTRODUCTION

This manual provides essential information for the safe and efficient operation of the Thermo Scientific STF55346C Lindberg/Blue M 1,100 Degree C Digital Tube Furnace. This advanced laboratory furnace is designed for precise heating applications, offering three independently controlled heated zones and a wide temperature range.

1.1 Product Overview

The STF55346C tube furnace features three heated zones, allowing for precise temperature control across a 61.0 cm (24-inch) total heated length. Each zone is managed by a separate digital programmable controller, enabling complex heating profiles with up to sixteen ramp and dwell segments. Its robust design incorporates thermal-efficient ceramic fiber insulation for energy efficiency and thermal shock resistance, making it ideal for applications such as annealing, crystallizing, calibration, and heat treating.

1.2 Key Features

- Three independently controlled heated zones (15.2cm, 30.5cm, 15.2cm) for precise temperature distribution.
- Temperature range of 100 to 1,100 degrees C.
- Single-program/multi-segment programmable digital controllers with PID control.
- Dual-LED display for continuous monitoring of chamber and setpoint temperatures.
- Graduated density thermal-efficient ceramic fiber insulation (moldatherm) for reduced heat loss.
- Accommodates tubes with 1 to 3 inch (2.5 to 7.6cm) outer diameters.
- Adjustable over-temperature protection (OTP) for enhanced safety.

1.3 What's in the Box?

- STF55346C Lindberg/Blue M 1,100 Degree C Digital Tube Furnace with 24-Inch Heated Zone and 1 to 3-Inch Tube O.D.

- (1) Set of 2" diameter moldatherm tube adapters.
- Instructions (this manual).

2. SAFETY INFORMATION

Always read and understand all safety precautions before operating the furnace. Failure to comply with safety instructions may result in personal injury or damage to the equipment.

- **Electrical Safety:** Ensure the furnace is connected to a properly grounded electrical supply matching the specified voltage (208V or 240V, single-phase). Installation should be performed by qualified personnel.
- **High Temperature Hazard:** The furnace operates at extremely high temperatures. Always wear appropriate personal protective equipment (PPE), including heat-resistant gloves and eye protection, when handling the furnace or its contents. Allow the furnace to cool completely before performing any maintenance or handling internal components.
- **Ventilation:** Operate the furnace in a well-ventilated area to dissipate any fumes or gases that may be released during heating processes.
- **Over-Temperature Protection (OTP):** The furnace is equipped with an adjustable OTP system. Set the OTP limit appropriately to protect samples and the furnace from overheating. If the OTP alarm sounds, a mechanical relay will cut power to the heating elements. A manual reset is required to resume operation.
- **Flammable Materials:** Do not place flammable or combustible materials near the furnace.
- **Maintenance:** Disconnect power before performing any maintenance or cleaning. Refer to the Maintenance section for detailed instructions.

3. SETUP

3.1 Unpacking and Inspection

Carefully unpack the furnace and inspect it for any signs of shipping damage. Report any damage to the carrier and supplier immediately. Retain all packing materials until the unit is confirmed to be in working order.

3.2 Placement

Place the furnace on a stable, level, non-combustible surface, away from flammable materials and sources of moisture. Ensure adequate clearance around the unit for ventilation and access.

3.3 Electrical Connection

The Thermo Scientific STF55346C is wired for both 240V and 208V operation. It requires a single-phase 208V or 240V hardwired electrical connection. This connection is not included and must be installed by a qualified electrician. Operation at 208V may result in longer heat-up and recovery times compared to 240V operation.

3.4 Tube Installation

The furnace accommodates tubes with an outer diameter of 1 to 3 inches (2.5 to 7.6 cm). Tubes are inserted from the side. Use appropriate tube adapters to ensure a secure fit and proper alignment. One set of 2-inch diameter moldatherm tube adapters is included with the furnace.



Figure 1: Image of the Thermo Scientific STF55346C Lindberg/Blue M Digital Tube Furnace. (Note: This is a placeholder image as no

4. OPERATING INSTRUCTIONS

This section details the operation of the digital programmable controllers and the furnace's heating functions.

4.1 Controller Overview

Each of the three heated zones is controlled by a separate single-program/multi-segment programmable digital controller. These controllers feature a dual-LED display that continuously shows both the current chamber temperature and the setpoint temperature in degrees C or F.

4.2 Programming a Heating Cycle

The controller allows you to create and save a heating program with up to sixteen ramp and dwell segments. *Ramp* defines how quickly the furnace heats to a setpoint, while a *dwell* determines how long the furnace maintains that temperature. The controller utilizes PID (Proportional, Integrative, Derivative) control to prevent temperature overshoot and ensure stable temperature maintenance.

1. **Power On:** Ensure the furnace is properly connected to power. Turn on the main power switch.
2. **Access Program Mode:** Refer to the detailed controller manual (included in the box) for specific button presses to enter program mode.
3. **Define Segments:** For each segment, input the desired ramp rate (e.g., degrees per minute), the target temperature (setpoint), and the dwell time (how long to hold that temperature).
4. **Save Program:** Save the program to the controller's memory for future use.
5. **Start Program:** Initiate the heating cycle. The furnace will follow the programmed ramp and dwell segments.
6. **Monitor Operation:** Continuously monitor the dual-LED display for current temperature and setpoint.

4.3 Over-Temperature Protection (OTP)

The adjustable OTP system provides an independent safety mechanism. It should be set slightly above your maximum desired operating temperature. If the furnace temperature exceeds this set limit, the OTP circuit will sound an alarm, and a mechanical relay will automatically cut power to the heating elements. To resume operation, the OTP must be manually reset after the furnace has cooled sufficiently and the cause of the over-temperature condition has been addressed.

5. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your furnace. Always disconnect the furnace from the power supply before performing any maintenance.

5.1 Cleaning

- **Exterior:** Clean the exterior surfaces with a soft, damp cloth. Do not use abrasive cleaners or solvents.
- **Interior:** Periodically inspect the furnace interior for debris or residue. Use a soft brush or vacuum to remove loose particles. Avoid damaging the ceramic fiber insulation.

5.2 Inspection

- **Heating Elements:** Inspect heating elements for signs of damage or wear. Replace if necessary (contact qualified service personnel).

- **Insulation:** Check the moldatherm insulation for cracks or deterioration.
- **Electrical Connections:** Periodically check all electrical connections for tightness and signs of corrosion. This should be done by a qualified electrician.

5.3 Storage

If storing the furnace for an extended period, ensure it is clean, dry, and stored in a climate-controlled environment to prevent damage from moisture or extreme temperatures.

6. TROUBLESHOOTING

This section provides solutions to common operational issues. For problems not listed here, contact Thermo Scientific customer support.

Problem	Possible Cause	Solution
Furnace does not power on.	No power supply; tripped circuit breaker; faulty wiring.	Check power connection and circuit breaker. Verify wiring with a qualified electrician.
Furnace not heating or heating slowly.	Incorrect program settings; OTP tripped; faulty heating element.	Verify program settings (ramp/dwell). Check if OTP alarm is active and reset if needed. Contact service for element inspection.
OTP alarm sounds.	Temperature exceeded OTP setpoint; sensor malfunction.	Allow furnace to cool. Manually reset OTP. Review program settings. If problem persists, contact service.
Inconsistent temperature readings.	Improper tube insertion; sensor issue; insulation damage.	Ensure tube is properly seated. Inspect insulation. Contact service for sensor calibration/replacement.

7. SPECIFICATIONS

Detailed technical specifications for the Thermo Scientific STF55346C Lindberg/Blue M Digital Tube Furnace.

Parameter	Value
Model Number	STF55346C-1
ASIN	B005SVD1IY
Temperature Range	100 to 1,100 degrees C
Electrical Requirements	Single-phase 208V 50/60Hz or 240V 50/60Hz
Power Consumption	3,800 watts
Weight	102 kg (225 lb.)
Total Heated Length	61.0 cm (24 inches)
Heated Zone Sizes	15.2 cm (6 inches) / 30.5 cm (12 inches) / 15.2 cm (6 inches)
Tube Outer Diameter (O.D.)	2.5 cm (1 inch) to 7.6 cm (3 inches)

Parameter	Value
Exterior Dimensions (H x W x D)	53.3 x 88.9 x 43.2 cm (21 x 35 x 17 inches)
Manufacturer	Thermo Scientific (Thermo Fisher Scientific)
Date First Available	September 29, 2011

8. WARRANTY AND SUPPORT

8.1 Manufacturer's Warranty

The Thermo Scientific STF55346C Lindberg/Blue M Digital Tube Furnace comes with a manufacturer's warranty of **12 months** from the date of purchase. This warranty covers defects in materials and workmanship under normal use. Please retain your proof of purchase for warranty claims.

8.2 Customer Support

For technical assistance, troubleshooting beyond this manual, or warranty inquiries, please contact Thermo Scientific customer support. Visit the official Thermo Fisher Scientific website for contact information and additional resources.
Note: Specific contact details are not provided in this manual. Please refer to the product packaging or the manufacturer's official website for the most current support information.

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Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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