

OWNER'S MANUAL

for

Equipment Serial Number 7377
Furnace Model 1K25-125C69-10A

Manufactured for

GE FANUC AUTOMATION

**Rt 606 and Rt 29 North
Charlottesville, VA 22911**

Equipment Ship Date: January 21, 1998

SIERRATHERM

PRODUCTION FURNACES INC.

200 Westridge Drive
Watsonville, CA 95076

PROCUREMENT SPECIFICATION

SierraTherm SERIES 1500

MODEL 1K25-125C69-10A

FAST RESPONSE

THICK FILM FIRING CONVEYOR FURNACE

1. General Description

This specification describes a multiple zone, electrically heated, conveyor furnace capable of operating to 1050 degrees centigrade. The furnace includes a controlled air atmosphere system for the primary application of processing various thick film materials.

2. General Specification Overview

	Inch
A. Belt Width:	25
B. Heated Length:	125
C. Graduated Cooling Length:	69
D. Product Clearance Above Belt:	2.0
E. Dimensions:	
Entry/Exit Tables:	24
Overall Length:	262
Height:	57
Width:	56
Conveyor Height:	36
Leveling Range:	± 1
F. Belt Speed Range:	
Minimum	1.0/min
Maximum	15.0/min
G. Number Of Heated Zones:	10
H. Atmosphere:	Air
I. Input Power:	480 VAC 3 Phase, 3 Wire 60 Hz 90 KVA Max
J. Approximate Weight:	7,500 lbs



SierraTherm Locations

- SierraTherm Production Furnaces, Inc. Headquarters

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- Local Area Representative

Mr. Erik Scheer

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3. Heated Section

- A. **Nominal operating temperature:** Ambient to 1000 degrees centigrade.
- B. **Heating method:** Kanthal A-1 (or equivalent) wire coils embedded and fully enclosed in highly responsive, low mass ceramic fiber element modules located above and below the conveyor belt. High temperature glazing is applied to all interior chamber surfaces to ensure a clean, stable processing environment.
- C. **Insulation:** Multi-Layered, thermally optimized, graded, insulation provides efficient thermal stability, cool external panel surfaces and minimal heat loss. Low mass refractory materials are utilized throughout the heated chamber resulting in rapid heat-up and cool-down times and maximum thermal responsiveness.

4. Furnace Layout

	Inch	
A. Entrance, including Air Curtain and baffle door assembly	18	
B. Zone 1	12.5	KVA 12
Zone 2	12.5	12
Exhaust Burnout Extractor	2.0	
Zone 3	12.5	12
Zone 4	12.5	12
Zone 5	12.5	6
Zone 6	12.5	6
Zone 7	12.5	6
Zone 8	12.5	6
Zone 9	12.5	6
Zone 10	12.5	12
C. Insulated Cooling	19	
D. Graduated Cooling Module, including exit Air Curtain and baffle door assembly	50	

Note:

The standard cooling method for the Graduated Cooling Module is facility water, @ 3 GPM/40 PSI. The water cooling system includes temperature regulating valve, readout and process alarms through the MicroTherm controller and a flow switch which activates an audible and visual alarm in the event of low flow conditions.

5. Loading/Unloading Tables		Inch
A.	Load/Unload Table	
	Width:	55
	Length:	24
	End Pulley Diameter	4

6. Conveyor System

- A. Belt Type: Columbium Stabilized, Nichrome V, 25 inch wide
- B. Belt Mesh: Balanced Spiral 42-27-14-16
- C. Belt Loading: 1 pound per square foot
- D. Belt Speed: 1-15 inches/min
- E. Speed Control: Microprocessor controlled, closed loop, digital feedback, $\pm 0.1\%$ accuracy

Note :

The belt speed range specified above refers to adjustability of belt speed only and does not imply compliance with load and temperature requirements over the entire range of belt speed adjustability.

7. Temperature Control System

The furnace is controlled with a MicroTherm computerized temperature control system. The MicroTherm is a high performance, single board computer with full PID and control for up to 16 furnace channels. Each furnace zone is monitored and controlled using a type 'K' thermocouple in the center of each heated zone. The MicroTherm incorporates closed loop conveyor speed control accurate to $\pm 0.1\%$.

(See separate MicroTherm specification for a comprehensive list of temperature control system features.)

8. User Interface System

A Pentium based PC with a 14" Super VGA Color Monitor is provided for user interface. The User Interface Computer communicates with the Temperature Controller on a high speed serial link. A complete description of the User Interface features is described in a separate specification.

Uniformity Control

An adjustable side to center to side uniformity control system is provided in all 10 zones. Sectional heating elements in conjunction with the MicroTherm controller, will provide Three-Way Power/Temperature adjustment across the width of the conveyor belt.

9. Overtemperature Safety Protection

The furnace is supplied with a redundant overtemperature safety protection system which incorporates an additional type K thermocouple in the center of each controlled zone.

10. Atmosphere Control System

A. The following flowmeters supply air to the process chamber:

	SCFH
1. Entry Gas Curtain	0-600
2. Burnout Atmosphere Distributor	0-600 (2)
5. Firing Atmosphere Distributor	0-600 (2)
6. Exit Gas Curtain	0-600
B. Exhaust Extractor:	0-80 PSIG

Note 1:

The furnace is supplied with a variable flow, air powered, exhaust burnout extractor located between Zone 2 and 3. An exhaust condition monitor is provided for the extractor.

11. Operating Instruction Manuals

A. The furnace is supplied with two copies of instruction manuals covering all phases of installation, operation, and maintenance procedures.