LINDBERG/BLUE M

HTF55000 Series
Hinged Tube Furnaces

Installation and Operation Manual

L-87118-55122-1

⚠ WARNING

This product contains refractory ceramic fiber and/or firebrick (silica) insulation and, after services at temperatures greater than 1800°F, may form, and therefore may contain, cristobalite (crystalline silica). The following hazards pertain to exposure to insulation dusts:

DUST CAN CAUSE SEVERE RESPIRATORY DISEASE (SILICOSIS).
DUST MAY BE IRRITATING TO SKIN, EYES, AND RESPIRATORY TRACT.
SUSPECT CANCER HAZARD BY INHALATION.

Refractory Ceramic Fibers MAY CAUSE CANCER BASED ON ANIMAL DATA and Cristobalite (Crystalline Silica) MAY CAUSE CANCER.

Risk of cancer depends on duration and level of exposure.

BEFORE USING OR MAINTAINING THIS EQUIPMENT, READ THE MATERIAL SAFETY DATA SHEET (MSDS) ON THIS INSULATION.

WHEN INSTALLING, MAINTAINING, OR REMOVING THIS REFRACTORY INSULATION, TAKE THE FOLLOWING PRECAUTIONS TO MINIMIZE EXPOSURE TO THE DUST AND/OR CERAMIC FIBERS.

Avoid breathing dust. Keep personel exposure to airborne dust and particles from the insulation as low as possible. Use engineering controls where feasible.

Avoid unnecessary cutting and tearing of the material to minimize generation of airborne dust.

Insulation surfaces should be lightly sprayed with water or other suitable wetting agents before removal to suppress dust. Spray additional water or wetting agents to replace liquids which evaporate during removal. A surfactant may aid the wetting process.

Dust suppressing cleaning methods, such as wet sweeping or vacuuming should be used to clean the work area. If dry vacuuming is used, the vacuum must be equipped with a HEPA filter. Air blowing or dry sweeping should not be used. Do NOT use compressed air. Dust suppressing compounds may be used to clean up light dust.

As minimum protection, use a high efficiency air purifying half-face respirator equipped with HEPA filter cartridges if airborne fiber levels or cristobalite concentrations are not known.

Avoid contact with eyes, skin, and clothing. Wear long sleeve clothing, gloves, hat, and eye protection to minimize skin and eye contact. Contact lenses should not be worn when handling.

Wash thoroughly immediately after completing work.

Launder work clothing separately from other clothes and thoroughly clean laundering equipment after use. Clothing which contains a large amount of dust and/or refractory ceramic fiber should be disposed.

Promptly place used refractory ceramic fiber parts and dusts in plastic bags or other suitable containers and dispose according to local, state, and federal waste disposal (environmental) regulations.

55000 SERIES
MOLDATHERM® HINGED TUBE FURNACES

SPECIFICATIONS

Furnace Model #	Maximum Usable O.D. Tube	Heated Length	Maximum Operating Temperature	AC Volts Single Phase 50/60 HZ	Power (Watts)	Control Console Model #
SINGLE ZONE						
55122	1"	12"	1200°C	120	1330	58114
55322	3"	12"	1200°C	120/240	2675	58114
55332	3"	18"	1200°C	240	4240	58114
55342	3"	24"	1200°C	240	5440	58114
55642	6"	24"	1200°C	240	8710	58124
55662	6"	36"	1200°C	240	12195	58124
THREE ZONE						
55347	3"	24"	1200°C	240	5355	58434
55367	3"	36"	1200°C	240	8025	58434
55647	6"	24"	1200°C	240	7840	58434
55667	6"	36"	1200°C	240	11760	58434

NOTE: Heated Zone Length: Model #55347 & 55647 - 8"
Model #55367 & 55667 - 12"

UNPACKING

1. Carefully unpack and inspect the furnace for damage. If there is any damage, report it to the appropriate carrier and retain packing materials.

2. Locate the furnace on a level surface free from vibration.

3. Allow a minimum of three (3) inches of space for air flow around the unit.

DESCRIPTION

All Lindberg Hinged 55000 series laboratory tube furnaces feature Moldatherm®, Lindberg's vacuum formed ceramic fiber insulation and patented LGO™ (light gauge overbend) heating elements. Available in standard single-zone and three-zone heated chambers for process tubes from 3/4 to 6 inches, these versatile tube furnaces are adaptable to a wide variety of processes. In addition, these furnaces are designed to operate in either a horizontal or vertical position. Please contact Lindberg for information on available vertical stands. All 55000 series tube furnaces are designed for use with standard Lindberg 58000 series control consoles.

INSTALLATION

SPECIAL NOTE

The heating element and tube adapters consist of Moldatherm insulation. This thermal efficient insulating material possesses sufficient strength and durability to withstand minor mechanical shock. However, care should be taken when installing a process tube and performing other maintenance, so as not to damage the Moldatherm insulation components.

Each furnace is designed for the electrical and temperature ratings shown on the data plate. Do not exceed these power and temperature specifications.

Locate the furnace on a level surface that provides sufficient operating space around the unit, allows easy access for routine maintenance and is convenient to a power source. The distance between the furnace and the control console is limited to six (6) feet which is the approximate length of the thermocouple leadwire. Leadwires CANNOT be spliced. If a longer thermocouple leadwire or extension is needed, please contact Lindberg.

CAUTION

IMPROPER OPERATION OF THIS APPARATUS COULD RESULT IN DANGEROUS CONDITIONS. TO PRECLUDE HAZARD AND MINIMIZE RISK FOLLOW ALL INSTRUCTIONS.

FURNACE ASSEMBLY

The furnace is shipped assembled with all heating elements and thermocouple(s) installed. The customer must install furnace L-shaped support legs, tube adapters, and wire the furnace to the control console and the power source.

Support Leg Installation

(Horizontal Furnace Position)

Close, latch and tilt furnace forward. Remove bolt and two flat washers located in the base of the furnace. Position L-shaped support legs between the two washers and over black plastic feet. Tighten bolts and reset furnace in horizontal position. These L-shaped support legs are designed to support the furnace top assembly when opened.

(Vertical Furnace Position)

The 55000 series tube furnace can be mounted in the vertical position with no modifications to the furnace. Lindberg offers standard vertical mounting stands designed to support the furnace in an upright position.

CAUTION
TO AVOID HAZARDOUS CONDITIONS DISCONNECT ELECTRICAL POWER FROM APPARATUS BEFORE ATTEMPTING ANY REPAIR.

POWER WIRING

The 1200°C tube furnaces are designed to operate on 240 VAC 50/60 Hz, single phase. The customer is to provide the following according to local electrical codes; an on/off main power switch or circuit breaker, correct size power and ground wires to control console and interconnecting power and ground wires to the furnace. The wires should correspond with those carrying similar loads already installed by Lindberg in the control console and furnace. Reference Wiring Diagram.

NOTE: If other than a Lindberg control console is used to control the furnace, it is necessary to verify the feasibility of using an alternate control system with Lindberg prior to installation.

Model 55122 - 120 VAC Operation

Model 55122 is designed to operate only on 120 VAC, 50/60 Hz, single phase. Power wiring instructions are included in the wiring kit which is provided with the furnace. Model 55122 will draw approximately 11.1 amps on a 120 VAC line.

240 VAC Operation

1. Since interconnecting power and ground wires are not provided with the furnace and control console, suitable lengths of properly sized wires must be acquired prior to installation. Determination must be made regarding the length of wire needed depending on the distance between the furnace and control console. Minimum recommended wire gauge sizes are as follows:

Furnace Model	Furnace to Control Wire Size	Ground Wire Size
Single Zone		
55322	12 ga	14 ga
55332	14 ga	16 ga
55342	12 ga	14 ga
55642	12 ga	14 ga
55662	10 ga	12 ga
Three Zone		
55347	14 ga	16 ga
55367	14 ga	16 ga
55647	14 ga	16 ga
55667	14 ga	16 ga

   Wire rated at 50°C minimum is suggested to be used for all connections between furnace and control console.

2. Wires should be labeled at each end A1 & B1 (single zone) or A1 & B1, A2 & B2, A3 & B3 (three zone) and ground per wiring diagram.

3. Remove access panel located in the lower back panel by removing appropriate screws.

4. Push out plastic hole plug from inside the plastic bushing.

5. Thread power wires and ground wire through the bushing. This hole may be used to mount a standard 1/2 inch electrical conduit connector when black plastic bushing is removed.

6. Connections between furnace and the control console are to be made as follows:

   A. Single-zone furnace connect wire labeled A1 to terminal #A1, wire B1 to terminal #B1, and ground wire to ground lug near the terminal block.

   B. Three-zone furnace connections are to be done as listed below:

      A1 & B1 to terminal A1 & B1
      A2 & B2 to terminal A2 & B2
      A3 & B3 to terminal A3 & B3

7. As a final inspection step, check that all electrical connections are secure. Reference Power and Wiring Drawings.

8. Replace the access panel.

208 Volt Operation

The Moldatherm hinged tube furnace is wired for operation on a 240 volt power source. If your facility has 208 volt line, the furnace is to be connected in the same manner as a 240 VAC. Heat-up and recovery times may be slightly longer when operated on 208 VAC.

Tube Adapter Installation

Each 55000 series tube furnace is designed for use with one pair of Moldatherm Tube Adapters, and customer supplied process tube. Additional adapters with varying inner diameters for use with different diameter process tubes are available from Lindberg. Refer to the Parts Specification Sheet for tube adapters that are compatible with your model furnace.

1. Shut off power at control console and allow furnace to cool to room temperature before installing or replacing tube adapters.

2. Loosen chrome plated tube support by unscrewing Allen head set screw through square hole on end of furnace.

3. Place adapter onto heating element and position tightly against end of chamber insulation. Filing or sanding outside of circular portion of adapter may be necessary.

4. Install process tube (customer supplied).

5. Position chrome plated tube support bracket against outside of tube adapter and slide up or down to support the process tube. Care must be taken not to apply excessive pressure against the tube adapter when adjusting the support bracket. It may be necessary to install additional washers between the frame and support bracket.

6. Bulk ceramic fiber may be used to seal any gaps that may exist between the Moldatherm tube adapter and process tube to reduce heat loss.

INITIAL START-UP

It is recommended the furnace be initially operated for approximately one hour at 550°C. This will varify proper operation of the furnace and control system. Also, refer to the 58000 Series Control Console Operation and

Maintenance Manual for instructions of the control system.

Observe the following safety precautions during furnace operations.

A. DO NOT EXCEED recommended maximum outside diameter of process tube.

B. Wear heat protective gloves and use tongs or a push rod to position or remove loads.

TEMPERATURE PROFILING

The three-zone tube furnace has been designed with equally sized zones in both length and power output. Typically a three-zone furnace is utilized, when greater linear temperature uniformity is required, than can be obtained with a single-zone furnace. The uniform temperature zone normally extends beyond the center zone length into each end zone. Factors which affect temperature uniformity include process load, atmosphere flow, operating temperature and an open or sealed process tube.

To profile a three-zone furnace for the best flat zone, it is necessary to use a separate monitoring thermocouple in conjunction with an appropriate recording instrument. It is recommended that temperature measurements be taken in 1" increments in order to profile the chamber. By recording the temperature at various points inside the process tube, a plot of temperature versus furnace heated length may be made illustrating uniformity within the chamber. Individual temperature adjustment of each end zone and additional profile temperature measurements will finally produce the best profile and largest uniform temperature zone.

IDLING OR NONPRODUCTIVE PERIODS

Since furnaces designed with Moldatherm heating units have rapid heat-up rates, it is recommended that the furnace be turned off completely when not in use. No damage to the Moldatherm heating unit will be caused by rapid heating and cooling cylces.

HEATING ELEMENTS

The chamber of these furnaces is comprised of two semi-cylindrical heating modules. Each module is a composite unit of Moldatherm, Lindberg's high temperature ceramic fiber insulation, and a LGO embedded alloy heating element. The unit is rated for a maximum operating temperature of 1200°C. After prolonged use, hairline cracks may develop in the Moldatherm insulation. Minor cracks will not affect the furnace performance.

THERMOCOUPLES

The furnaces are equipped with a Platinel II thermocouple. Platinel II thermocouples have longer life and greater stability than base metal thermocouples such as Chromel-Alumel (Type K).

All thermocouples are subject to aging and deterioration over a period of time. Thermocouple deterioration is usually indicated by pit marks in the wire immediately behind the welded junction. This condition will be indicated by a gradual drop in millivolt output for any given temperature, and result in furnace operation at a higher temperature than the controlling instrument indicates. The amount of deviation will vary with operating temperatures and thermocouple life. For critical processes, it is advisable to

periodically check (every 6 months) the furnace chamber temperature with a reference thermocouple and instrument to determine the amount of error.

The most obvious thermocouple failure is complete breakage. The break usually occurs at the welded junction tip and is recognized by a complete lack of output by the controlling instrument. Occasionally the ceramic support tube will crack or break. The thermocouple will continue to function until the broken end twists or bends causing the two wires to touch in the broken area. This situation causes another reference junction. The thermocouple should then be replaced.

MAINTENANCE

> **CAUTION**
> TO AVOID HAZARDOUS CONDITIONS, ALWAYS DISCONNECT ELECTRICAL POWER FROM APPARATUS BEFORE ATTEMPTING ANY REPAIR.

Thermocouple Replacement

1. Remove the top center cover of the furnace to provide access to the thermocouple.
2. Take note of polarity and wire location. Red is always negative. Loosen the terminal screws and remove the thermocouple lead wires.
3. Remove the thermocouple mounting screws. Gently pull the thermocouple out and away from the furnace.
4. Carefully install the replacement thermocouple by reversing the above procedure. Use care in sliding the thermocouple through the insulation so as not to bend thermocouple wire.

NOTE: When reconnecting the lead wire to the thermocouple, observe the proper polarity. Red is ALWAYS negative. (If the extension leads are black and white, white is negative.)

Heating Element Replacement - Furnace Shell

Replacement of lower or upper Moldatherm heating units are the same except for removal of the thermocouple(s). A level work surface as large as the furnace when opened like a book is needed. Depending on the furnace size, it may take two persons at different times to assist in the replacement of the Moldatherm heating element(s).

1. Shut off power at main power circuit breaker and control console circuit breaker.
2. Remove process tube and tube adapters.
3. Close, latch, and tilt furnace forward. Remove the two L-shaped support legs. Reposition furnace.

(RETAIN ALL HARDWARE for reassembly.)

4. Remove the lower two end caps from each end of the furnace, four total; two screws and two washers per cap.
5. Remove wiring access panel from back bottom panel.
6. Remove back bottom and front bottom cover panels, two screws per each end of panel. It is not necessary to remove louvered end center covers.

Heating Element Replacement Moldatherm

7. While holding bottom half secure, carefully open furnace top and tilt fully back until furnace is in an open book form.

8. Loosen the end bracket by entering through the large round hole on the end of the furnace frame, loosen hex head screws, two screws per end.

9. On the front and back sides of the heating element aluminum shell, loosen only round head screws; turn screws clockwise to loosen. These screws are used to adjust the square pressure pads that secure and align the Moldatherm unit.

10. On the front and back sides of the aluminum shell, remove completely the two (2) hex head screws located inside the vertical channel shaped support brace.

11. Note the position of ridges and terminal location within the Moldatherm unit in relationship to the furnace. Label wires and terminals if necessary. Remove wires from terminals.

12. Raise Moldatherm unit and three piece shell up and out. The vertical channel shaped braces need to be pulled away from the shell to allow the round head screws to pass by.

13. Position Moldatherm heating unit and shell on a level surface. While removing the remaining hex head screws, mark with a pencil the screws and the adjacent holes on the aluminum shell. This is done for reassembly. Remove side panels.

14. Remove heating unit. Seal Moldatherm unit and dispose of properly. (Reference: Material Safety Data Sheet)

Heating Element Replacement Alignment

15. Lay aluminum shell bottom panel flat and rotate all square pressure pads to be approximately the same height, 5/8" from panel.

16. Position and center new Moldatherm heating unit onto the bottom panel. Unit will rest on the pads; screws will impale into the Moldatherm.

17. Rotate all square pressure pads on each side panel to be approximately the same height, 5/8" from panel.

18. Reverse step 13. Pads may or may not touch Moldatherm sides and screws will impale into Moldatherm. Note: When returning screws into previously marked holes in shell screw only until snug. Bent edge of side panel should seat in outer most ledge of Moldatherm.

19. Before repositioning the heating unit into the frame, refer to step 11 and loosen the horizontal spacers that the unit will rest upon. Reverse step 12.

20. Reverse step 10. Do not over tighten screws.

21. Position horizontal spacers firmly against bottom aluminum shell.

22. Using a straight edge as long as the furnace, span the Moldatherm unit touching the center ledge of the unit and the top edge of both ends of the furnace frame.

23. To adjust Moldatherm unit to align with straight edge, rotate the round head screws on the bottom of aluminum shell.

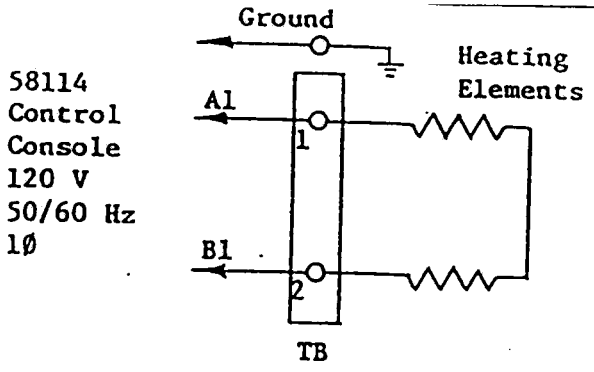
24. Access to bottom screws is done by removing perforated bottom guard off furnace frame. Turn screws counter clockwise to adjust Moldatherm unit. Or remove top center cover to access screws for top Moldatherm unit.

25. To adjust unit left or right rotate round head screw on the sides of the unit. Reverse step 9.

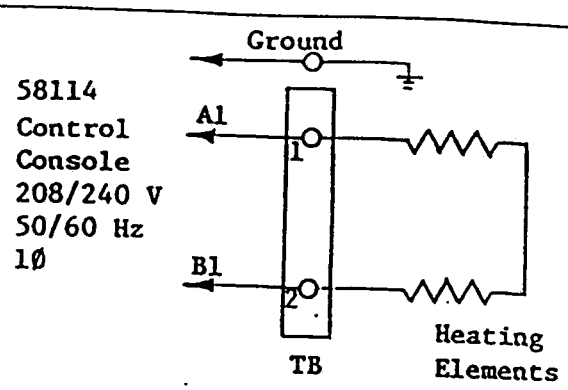
    NOTE: The two Moldatherm heating elements should seal completely over the entire length of the unit assembly when the furnace is in the closed position. A slight taper on the ends of the Moldatherm heating units may exist, which will create a small gap between top and bottom heating units. This small gap will not be detrimental to the performance of this furnace.

26. Reverse steps 8 through 3.

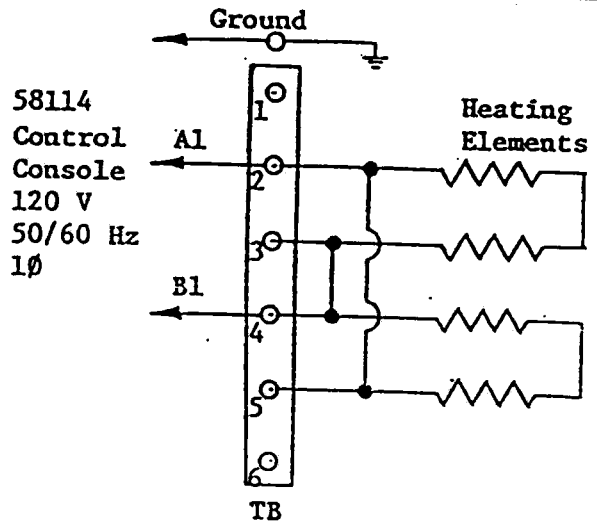
27. Check that all electrical connects are secure. Reference Wiring Diagram.



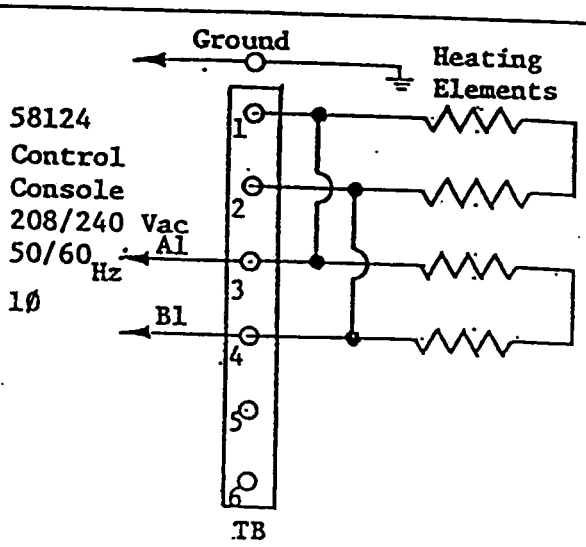
120 VAC
Model #55122



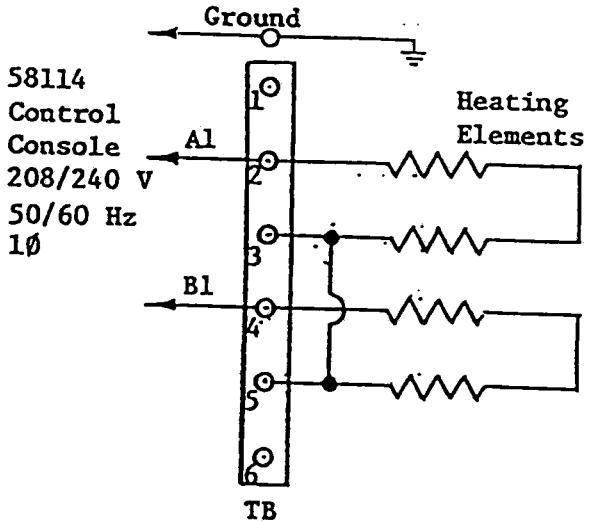
208/240 VAC
Model #55332 & #55342



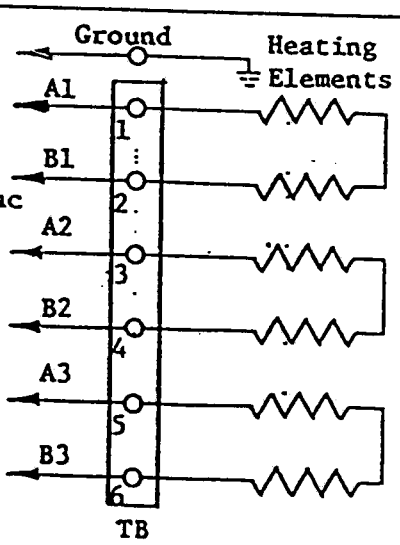
120 VAC



208/240 VAC
Model #55642 & #55662



208/240 VAC
Model #55322



208/240 VAC
Models #55347 & #55367
Models #55647 & #55667

55000 Series Furnaces
Wiring Diagrams

A UNIT OF GENERAL SIGNAL GS
LINDBERG
304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

PARTS SPECIFICATIONS

General Assembly: 7212-0012-00B
Wiring: 7212-2091-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55122

HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2070-00A	2
+ 2.	Thermocouple, Platinel II		1
	a) Single	7299-1110-0AY	-
	b) Double	7299-1202-0AA	-
	c) Triple	7299-1303-0AF	-
3.	Thermocouple Head		1
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
	1/2 Lb. Bag Bulk Fiber	35066-001	.5
	Tube Adapter 3/4"	59510	2
6.	Tube Adapter 1"	59511	2
	Tube Adapter Blank	59519	2
8.	TC Extension Wire, Platinel II	33940-006	as required
	Terminal Block, Power	33407-001	1

A UNIT OF GENERAL SIGNAL GS
LINDBERG
304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

PARTS SPECIFICATIONS

General Assembly: 7212-0010-00B
Wiring: 7212-2092-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55322

HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2079-00A	2
+ 2.	Thermocouple, Platinel II		1
	a) Single	7299-1110-0DB	-
	b) Double	7299-1202-0BV	-
	c) Triple	7299-1303-AAG	-
3.	Thermocouple Head		1
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
4.	1/2 Lb. Bag Bulk Fiber	35066-001	5
5.	Tube Adapter 1"	59521	2
6.	Tube Adapter 1-1/2"	59522	2
7.	Tube Adapter 2"	59523	2
8.	Tube Adapter 2-1/2"	59524	2
9.	Tube Adapter 3"	59525	2
10.	Tube Adapter Blank (Solid)	59529	2
11.	TC Extension Wire, Platinel II	33940-006	as required
12.	Terminal Block, Power	33407-003	1

+ SUGGESTED SPARES THAT SHOULD BE HELD IN YOUR STOCK FOR NORMAL AND EMERGENCY REPAIRS

A UNIT OF GENERAL SIGNAL GS
LINDBERG
304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

PARTS SPECIFICATIONS

General Assembly: 7212-0011-00A
Wiring: 7212-2093-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55332

HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2077-00A	2
+ 2.	Thermocouple, Platinel II		1
	a) Single	7299-1110-0DB	-
	b) Double	7299-1202-0BV	-
	c) Triple	7299-1303-0AG	-
3.	Thermocouple Head		1
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
4.	1/2 Lb. Bag Bulk Fiber	35066-001	.5
5.	Tube Adapter 1"	59521	2
6.	Tube Adapter 1-1/2"	59522	2
7.	Tube Adapter 2"	59523	2
8.	Tube Adapter 2-1/2"	59524	2
9.	Tube Adapter 3"	59525	2
10.	Tube Adapter Blank (Solid)	59529	2
11.	TC Extension Wire, Platinel II	33940-006	as required
12.	Terminal Block, Power	33407-001	1

+ SUGGESTED SPARES THAT SHOULD BE HELD IN YOUR STOCK FOR NORMAL AND EMERGENCY REPAIRS

A UNIT OF GENERAL SIGNAL GS

LINDBERG

PARTS SPECIFICATIONS

304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

General Assembly: 7212-0009-00B
Wiring: 7212-2094-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55342

HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2076-00A	2
+ 2.	Thermocouple, Platinel II		1
	a) Single	7299-1110-0DB	-
	b) Double	7299-1202-0BV	-
	c) Triple	7299-1303-0AG	-
3.	Thermocouple Head		1
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
4.	1/2 Lb. Bag Bulk Fiber	35066-001	5
5.	Tube Adapter 1"	59521	2
6.	Tube Adapter 1-1/2"	59522	2
7.	Tube Adapter 2"	59523	2
8.	Tube Adapter 2-1/2"	59524	2
9.	Tube Adapter 3"	59525	2
10.	Tube Adapter Blank (Solid)	59529	2
11.	TC Extension Wire, Platinel II	33940-006	as required
12.	Terminal Block, Power	33407-001	1

A UNIT OF GENERAL SIGNAL GS

LINDBERG

PARTS SPECIFICATIONS

304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

General Assembly: 7212-0008-00B
Wiring: 7212-2089-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55347

HINGED TUBE FURNACE

TEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2227-00A	2
2.	Thermocouple, Platinel II		3
	a) Single	7299-1110-0DB	-
	b) Double	7299-1202-0BV	-
	c) Triple	7299-1303-0AG	-
3.	Thermocouple Head		3
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
4.	1/2 Lb. Bag Bulk Fiber	35066-001	5
5.	Tube Adapter 1"	59521	2
6.	Tube Adapter 1-1/2"	59522	2
7.	Tube Adapter 2"	59523	2
8.	Tube Adapter 2-1/2"	59524	2
9.	Tube Adapter 3"	59525	2
10.	Tube Adapter Blank (Solid)	59529	2
1.	TC Extension Wire, Platinel II	33940-006	as required
12.	Terminal Block, Power	33407-003	1

A UNIT OF GENERAL SIGNAL GS
LINDBERG
304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

PARTS SPECIFICATIONS

General Assembly: 7212-0013-00B
Wiring: 7212-2147-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55642

HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2127-00A	2
+ 2.	Thermocouple, Platinel II	-	1
	a) Single	7299-1110-0DB	-
	b) Double	7299-1202-0BV	-
	c) Triple	7299-1303-0AG	-
3.	Thermocouple Head	-	1
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
4.	1/2 Lb. Bag Bulk Fiber	35066-001	5
5.	Tube Adapter 3"	59535	2
6.	Tube Adapter 4"	59536	2
7.	Tube Adapter 5"	59537	2
8.	Tube Adapter 6"	59538	2
9.	Tube Adapter Blank	59539	2
10.	TC Extension Wire, Platinel II	33940-006	as required
11.	Terminal Block, Power	33407-003	1

+ SUGGESTED SPARES THAT SHOULD BE HELD IN YOUR STOCK FOR NORMAL AND EMERGENCY REPAIRS

A UNIT OF GENERAL SIGNAL
LINDBERG
304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

PARTS SPECIFICATIONS

General Assembly: 7212-0014-00B
Wiring: 7212-2148-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55662

HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2128-00A	2
+ 2.	Thermocouple, Platinel II	-	1
	a) Single	7299-1110-0DB	-
	b) Double	7299-1202-0BV	-
	c) Triple	7299-1303-0AG	-
3.	Thermocouple Head	-	1
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
4.	1/2 Lb. Bag Bulk Fiber	35066-001	5
5.	Tube Adapter 3"	59535	2
6.	Tube Adapter 4"	59536	2
7.	Tube Adpater 5"	59537	2
8.	Tube Adapter 6"	59538	2
9.	Tube Adapter Blank (Solid)	59539	2
10.	TC Extension Wire, Platinel II	33940-006	as required
11.	Terminal Block, Power	33407-003	1

A UNIT OF GENERAL SIGNAL GS
LINDBERG
304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

PARTS SPECIFICATIONS

General Assembly: 7212-0007-00A
Wiring: 7212-2090-00A

Serial #
August, 1987

Revised 8-23-90

MODEL 55367

HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Thermocouple, Platinel II	-	3
	a) Single	7299-1110-0DB	
	b) Double	7299-1202-0BV	
	c) Triple	7299-1303-0AG	
2.	Thermocouple Head	-	3
	a) Single	7214-2051-00A	
	b) Double	7299-1403-00B	
	c) Triple	7299-1403-00B	
+ 3.	Heating Unit	7212-2040-00A	2
4.	1/2 Lb. Bag Bulk Fiber	35066-001	5
5.	Tube Adapter 1"	59521	2
6.	Tube Adapter 1-1/2"	59522	2
7.	Tube Adapter 2"	59523	2
8.	Tube Adapter 2-1/2"	59524	2
9.	Tube Adapter 3"	59525	2
10.	Tube Adapter Blank (Solid)	59529	2
11.	TC Extension Wire, Platinel II	33940-006	as required
12.	Terminal Block, Power	33407-003	1

+ SUGGESTED SPARES THAT SHOULD BE HELD IN YOUR STOCK FOR NORMAL AND EMERGENCY REPAIRS

A UNIT OF GENERAL SIGNAL GS
LINDBERG
304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

PARTS SPECIFICATIONS

General Assembly: 7212-0015-00B
Wiring: 7212-2145-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55647

HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2110-00A	2
+ 2.	Thermocouple, Platinel II	-	3
	a) Single	7299-1110-0DB	-
	b) Double	7299-1202-0BV	-
	c) Triple	7299-1303-0AG	-
3.	Thermocouple Head	-	3
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
4.	1/2 Lb. Bag Bulk Fiber	35066-001	.5
5.	Tube Adapter 3"	59535	2
6.	Tube Adapter 4"	59536	2
7.	Tube Adapter 5"	59537	2
8.	Tube Adapter 6"	59538	2
9.	Tube Adapter Blank (Solid)	59539	2
10.	TC Extension Wire, Platinel II	33940-006	as required
11.	Terminal Block, Power	33407-003	1

A UNIT OF GENERAL SIGNAL GS

LINDBERG

PARTS SPECIFICATIONS

304 HART STREET • WATERTOWN, WI. 53094
PHONE 414-261-7000

General Assembly: 7212-0016-00B
Wiring: 7212-2146-00A

Serial #
August, 1987

Revised 8-24-90

MODEL 55667

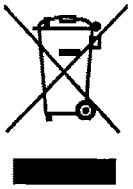
HINGED TUBE FURNACE

ITEM	PART DESCRIPTION	PART NUMBER	QTY PER ASSY
+ 1.	Heating Unit	7212-2109-00A	2
+ 2.	Thermocouple, Platinel II	-	3
	a) Single	7299-1110-0DB	-
	b) Double	7299-1202-0BV	-
	c) Triple	7299-1303-0AG	-
3.	Thermocouple Head	-	3
	a) Single	7214-2051-00A	-
	b) Double	7299-1403-00B	-
	c) Triple	7299-1403-00B	-
4.	1/2 Lb. Bag Bulk Fiber	35066-001	5
5.	Tube Adapter 3"	59535	2
6.	Tube Adapter 4"	59536	2
7.	Tube Adapter 5"	59537	2
8.	Tube Adapter 6"	59538	2
9.	Tube Adapter Blank (Solid)	59539	2
10.	TC Extension Wire, Platinel II	33940-006	as required
11.	Terminal Block, Power	33407-003	1

+ SUGGESTED SPARES THAT SHOULD BE HELD IN YOUR STOCK FOR NORMAL AND EMERGENCY REPAIRS

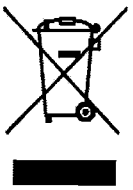
WEEE Compliance

Great Britain



WEEE Compliance. This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96EC. It is marked with the following symbol. Thermo Scientific has contracted with one or more recycling/disposal companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on Thermo Scientific's compliance with these Directives, the recyclers in your country, and information on Thermo Scientific products which may assist the detection of substances subject to the RoHS Directive are available at **www.thermo.com/WEEERoHS**

Deutschland

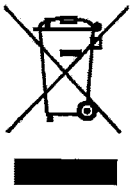


WEEE Konformittät. Dieses Produkt muss die EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2002/96EC erfüllen. Das Produkt ist durch folgendes Symbol gekennzeichnet. Thermo Scientific hat Vereinbarungen getroffen mit Verwertungs-/Entsorgungsanlagen in allen EU-Mitgliederstaaten und dieses Produkt muss durch diese Firmen widerverwetet oder entsorgt werden. Mehr Informationen über die Einhaltung dieser Anweisungen durch Thermo Scientific, die Verwerter und Hinweise die Ihnen nützlich sein können, die Thermo Scientific Produkte zu identizfizieren, die unter diese RoHS Anweisung fallen, finden Sie unter **www.thermo.com/WEEERoHS**

Italia

Conformità WEEE. Questo prodotto deve rispondere alla direttiva dell'Unione Europea 2002/96EC in merito ai Rifiuti degli Apparecchi Elettrici ed Elettronici (WEEE). È marcato col seguente simbolo. Thermo Scientific ha stipulato contratti con una o diverse società di riciclaggio/smaltimento in ognuno degli Stati Membri Europei. Questo prodotto verrà smaltito o riciclato tramite queste medesime. Ulteriori informazioni sulla conformità di Thermo Scientific con queste Direttive, l'elenco delle ditte di riciclaggio nel Vostro paese e informazioni sui prodotti Thermo Scientific che possono essere utili alla rilevazione di sostanze soggette alla Direttiva RoHS sono disponibili sul sito **www.thermo.com/WEEERoHS**

France



Conformité WEEE. Ce produit doit être conforme à la directive européenne (2002/96EC) des Déchets d'Equipements Electriques et Electroniques (DEEE). Il est merqué par le symbole suivant. Thermo Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles-ci. Davantage d'informations sur la conformité de Thermo Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Scientific qui peuvent aider le détection des substances sujettes à la directive RoHS sont disponibles sur **www.thermo.com/WEEERoHS**

Important

For your future reference and when contacting the factory, please have the following information readily available:

Model Number: _____

Serial Number: _____

The above information can be found on the dataplate attached to the equipment. If available, please provide the date purchased, the source of purchase (Lindberg/Blue M or specific agent/rep organization), and purchase order number.

IF YOU NEED ASSISTANCE:

LINDBERG/BLUE M SALES DIVISION

Phone:	704/658-2711 800/252-7100
FAX:	704/645-3368

LABORATORY PARTS and SERVICE

Phone:	704/658-2891 800/438-4851
FAX:	704/658-2576

TECHNICAL SUPPORT

Phone:	800/438-4851

LINDBERG/BLUE

A General Signal Company
275 Aiken Road
Asheville, NC 28804
U.S.A.