KPC-Master's Craft

Instruction Manual For:

Model# *KPC 123016*

Shrink Tunnel

Table of Contents

Introduction

Thank you for choosing a Battery Shrink System from KPC-Master's Craft. KPC-Master's Craft has been serving the battery industry since 1985 by providing quality shrink packaging equipment. KPC-Master's Craft Shrink Systems are designed to handle the broadest range of sizes, whether you are wrapping small motorcycle batteries or large truck batteries.

There are many advantages to switching to shrink packaging. Just a few include: (1) better eye appeal because the battery can be seen through the clear film, (2) the package is tamper-proof (it is very evident if the package has been opened), (3) unlike cardboard boxes, polyethylene film is impervious to battery acid, which makes a durable package that is easier to handle. The battery can also be tested without having to remove the package. The list could go on and on, but you will soon see for yourself how shrink packaging greatly benefits your industry.

KPC-Master's Craft offers toll-free support for any trouble-shooting needs from 8:00 a.m. to 4:30 p.m. E.S.T. ***If you have any questions regarding installation or operation of the machinery, please call (800)594-2205***.

Unpacking and Inspection

Remove the machine and conveyors from their shipping containers and remove all packing material. Carefully examine the equipment for possible damage that may have occurred in transit. If there is any damage, please contact the delivering carrier ***immediately*** and file a claim. Retain all packing material pending inspection and satisfaction of your claim.

Tunnel Stand & Conveyor Assembly

1. Remove and unpack conveyor sections. Be sure that no hardware or gray plastic shaft cover caps are thrown away with packing materials. Unpack and separate the two smaller stainless steel angle braces.

2. Assemble 180 degree curve conveyor. Bolt the leg stand to the middle stand mount brace of the curve with the 5/16" hardware provided in the stand.

3. Attach curve to tunnel stand. Set the tunnel stand upright, place the tallest end of the curve on top of the angled mounting bracket, and fasten the two together with the 5/16" hardware provided in the tunnel stand bracket.

4. Attach straight length conveyor to curve conveyor. Bolt the 48" straight length section to the lower end of the curve with the 5/16" hardware provided in the bent flanges of the curve conveyor. It is easier to do this if the last roller of the curve and the first roller of the straight length are removed. (These are spring retained rollers)

5. Connect lower angle braces. First connect the smaller brace with the bent end The bent end of this brace is attached to the lower tunnel stand brace with the hardware provided in the stand. Second, line up the hole on the opposite end of the brace with the hole in the curve stand (do not fasten yet). Take the second small brace and fasten one end to the curve stand - through the first brace. Last, remove the bolt from the first stand of the straight length. Line up the hole on the other end of the second small brace with the hole of the straight length brace, and fasten the braces to the stand with the bolt.

6. Tighten up and level out. Make sure that all stands are firmly connected to the conveyors. Tighten all bolts that connect the angle braces to the stands. Once all components are assembled, be sure that all adjustable leveling feet are firmly touching the floor. Especially make sure that the tunnel stand is level.

7. Place tunnel on tunnel stand. Lift and position the shrink tunnel on it's stand. The exit end of the tunnel (the end with the motor) should be placed closest to the curve. When positioned properly, the control panel will be on the side closest to the straight conveyor (unless a curve conveyor with opposite flow is ordered).

8. Attach infeed conveyor. On one end of the infeed conveyor there is a "dead" roller that does not roll. This is to keep a battery from rolling off of the conveyor and on to the floor, or the operator's foot. The infeed should be placed on the tunnel stand with this roller furthest away from the tunnel. Fasten the infeed to the tunnel stand with the bolts provided in the tunnel stand.

Additional conveyor sections may be purchased to meet your specific requirements.

Power Requirements

Follow local electrical and safety codes, as well as the National Electrical Code (NEC) and Occupational Safety and Health Act (OSHA) guidelines. All 220V tunnels should be installed by a qualified electrition.

The KPC 143016 shrink tunnel is equipped with a breaker box on the back wall of the unit. Wire a proper 220V line to this breaker box with a proper ground wire connection. This tunnel requires 208/240 VAC, 30 Amp, case-grounded service.

ALL GUARANTEES AND WARRANTIES ARE MADE VOID IF THE MACHINE IS USED WITH AN UNGROUNDED CONNECTION.

Getting Started

Battery Shrink Packaging Sequence

1. The KPC 123016 Shrink Tunnel takes approximately 15-20 minutes to heat up to the appropriate temperature for shrinking the battery bags. Begin by setting the temperature control to 475 degrees, and the speed control to 40. When the tunnel chamber has come up to the temperature that is set on the controller dial the amber light above the dial will turn off. When this occurs, the tunnel is ready to put the first batteries through.

2. Place a pedestal block on the infeed conveyor with the anti-slip surface facing up. Center the battery on top of the block.

3. Select the proper size bag for the battery. Pull the bag over the top of the battery. Be sure that the gusseted fold is fully open and the bottom of the bag extends down beyond the bottom of the battery without any folds in the film.

4. In order to achieve the best results, follow these simple guidelines.

A. Always place each battery in the center of the tunnel conveyor belt.

B. If there are too many wrinkles in the film after the battery has come out of the battery and cooled, slightly decrease the conveyor speed.

C. Do not run bagged batteries through the tunnel if it is too hot because the film will stick to the curtains. If this does happen, clean off the molten film immediately.

Tip: If your bags begin to stick to the curtains on a regular basis, dust the curtains with white line chalk. If the problem is not resolved with chalk, then it may be necessary to replace the curtains.

D. Check the tracking of the conveyor belt periodically to make sure it is not rubbing the edge of the frame. If it is rubbing, adjust the tracking until the belt tracks away from the edge. (See conveyor tracking procedure)

E. Never allow fans to blow directly towards the tunnel entrance or exit. This would cause heat to be pulled away from the tunnel and decrease it's efficiency.

F. When finished for the day, simply flip the toggle switch on the panel to the off/cool-down position. In this position the blower motors will continue to run until the interior of the chamber to a sufficiently cool temperature. When it has it has reached that cool temperature, the machine will shut itself off.

Package Trouble Shooting

The following table lists common shrink problems and their solutions. Problems associated with machine malfunctions are listed later in this manual.

Symptom	Analysis	Corrective Action
Film does not shrink around product; film has "fish eyes"	Conveyor speed setting too high	Lower speed setting
	Temperature setting too low	Raise temperature setting
	Too much film slack	Use a smaller bag
	Curtains not closing or gap in curtain	Clear and adjust
Film opening up on top of package	Temperature setting too high	Lower temperature
	Conveyor speed too low	Raise speed setting

General Component Information

Heat System

KPC-Master's Craft shrink tunnels use spirally wound calrod heaters. Unlike wirewound heating elements, calrods do not cool quickly when turned off. Because the calrods continue to radiate residual heat, there is no need for an energy-consuming, constant heat source to prevent large fluctuations in tunnel temperature.

The blowers in the shrink tunnel recirculate air from the shrink chamber, pass it over the heaters and back to the chamber. This allows the tunnel to operate with a minimum expenditure of energy at a low cost. (Approximately 28 kwh/shift)

Temperature Control

The KPC 123016 shrink tunnels use Robertshaw temperature controllers. The temperature sensing probe is located inside the tunnel chamber across an inlet to one of the blower motors. The controller responds to signals sent by the sensor, via a capillary tube, and either opens or closes the heater circuit.

High Temperature Limit

KPC-Master's Craft shrink tunnels are equipped with a high temp. limit switch. This devise uses a temperature sensing probe similar to that of the temperature controller. This protection switch will disconnect power to the heaters if the sensing probe detects a temperature in the shrink chamber of 500-525 degrees (F). When this switch activates, the tunnel will begin to cool down, but the *HEAT* lamp will remain on. The switch, located on the underside of the control panel, can be reset when the chamber cools to approximately 450 degrees. NOTE: **The high temp. limit switch does not automatically reset itself. It must be manually reset before the tunnel can come up to temperature again.**

Blowers

The KPC 123016 is equipped with two blowers. These blowers are operated by air-cooled motors which protrude through the top of the tunnel. Vents in the tops of the motors admit cool air, which is drawn through the motor and expelled at the bottom. For this reason, debris and other objects should no be allowed to accumulate on or around the motors. The motor shaft extends into a blower housing attached to the bottom of the motor. An impeller wheel attached to the shaft recirculates the air over the heaters.

Conveyor Tracking

The KPC 123016 shrink tunnel has a teflon-coated fiberglass conveyor belt. This belt is driven by a drive roller that is directly coupled to the drive motor at the end of the tunnel.

After the tunnel has been in operation for a week, the fibers in the belt may stretch a little and require minor tracking in order to bring the belt back to proper tension. There are two tracking adjustment bolts located at the entrance end of the tunnel. If the belt tracks to the left (facing the entrance end), the belt can be centered by either turning the left bolt clockwise, or by turning the right bolt counter-clockwise. Adjust the bolts only 1/4 or 1/2 of a turn at a time, and allow several revolutions of the belt before adjusting again. **Be careful not to over-tighten the bolts because if too much tension is applied to the conveyor belt, it will cause strain to the fibers and greatly shorten the life of the belt.**

Due to expansion in the belt as a result of heat, the belt may track to one side while the tunnel is cool and track to the opposite side when the tunnel is hot. This is normal, however, **at no time should the belt touch either side of the tunnel frame**.

Cool-Down Cycle

The toggle switch on the control panel not only opens and closes the control circuit, but also starts the cool-down cycle from the operating temperature. When this switch is placed in the *OFF/COOL DOWN* position, power continues to be supplied to the blowers through a ceramic cool-down thermal switch that is located in the shrink chamber ceiling. When the internal temperature comes down to approximately 140 degrees, the thermal switch will open and shut off the blowers. The cool-down cycle assures the movement of air through the blower motors and over the heaters.

CAUTION: Failure to allow the tunnel to complete the cool-down cycle will greatly shorten the life of the blower motors and heaters.

Service Trouble Analysis

As aids to correcting malfunctions, refer to the following table and the electrical schematic.

Symptom	Analysis	Corrective Action
Low Heat	One or both heaters inoperative	Check voltage to heaters. Check heaters for continuity. Check for poor or open connections in the heater circuit. Repair circuit or replace heater(s)
	One or both blowers inoperative	Check voltage to blower motors. Check motors for continuity. Check for poor or open connections in the blower motor circuit. Check that impeller wheel turns freely. Repair circuit or replace motor. Remove debris jamming impeller shaft and spray some silicone lubricant on bearings.
	Excessive air flow around machine	Check for air conditioner, floor fan or open window creating an excessive draft around machine. Reduce or eliminate the draft.
	Excessive air flow entering shrink chamber	Check curtains for condition and proper installation. Replace or adjust as necessary.
	Less than ideal voltage	Check for excessive line loss. Check for low line voltage. Consult electrician.
No Heat	Overrun Protection Switch blown.	Reset the switch. (See picture on page 16). The switch is located on the bottom right side of the control box. It is not necessary to remove the box lid.

(Service Trouble Analysis Continued)

Symptom	Analysis	Corrective Action
No Heat	Temperature control circuit defective	Check voltage to temperature control. Check continuity through control. Check for poor or open connection in control circuit. Check condition of sensor probe. Repair circuit or replace control.
Heat Uncontrollable	Temperature control defective	Replace.
Conveyor Speed can not be varied	Speed control defective or not calibrated or miswired	Check for variable D.C. output across terminals A1 & A2. Adjust Max & Min trim pots as necessary. Ensure that leads to conveyor motor are attached to terminals A1 & A2. Replace speed control.
Conveyor does not run	Conveyor jammed	Clear jam
	Conveyor fuse blown	Replace with a 1amp fuse. ***Warning:*** *The use of a higher amp fuse may cause extensive damage to speed controller, conveyor motor, and wiring.* This will also void warranty in regards to these parts. Before replacing fuse, diagnose the reason for the blown fuse and correct it before continuing.
	Defective conveyor circuit	Check transformer for 220V input. Check transformer for 110V output.

(Service Trouble Analysis Continued)

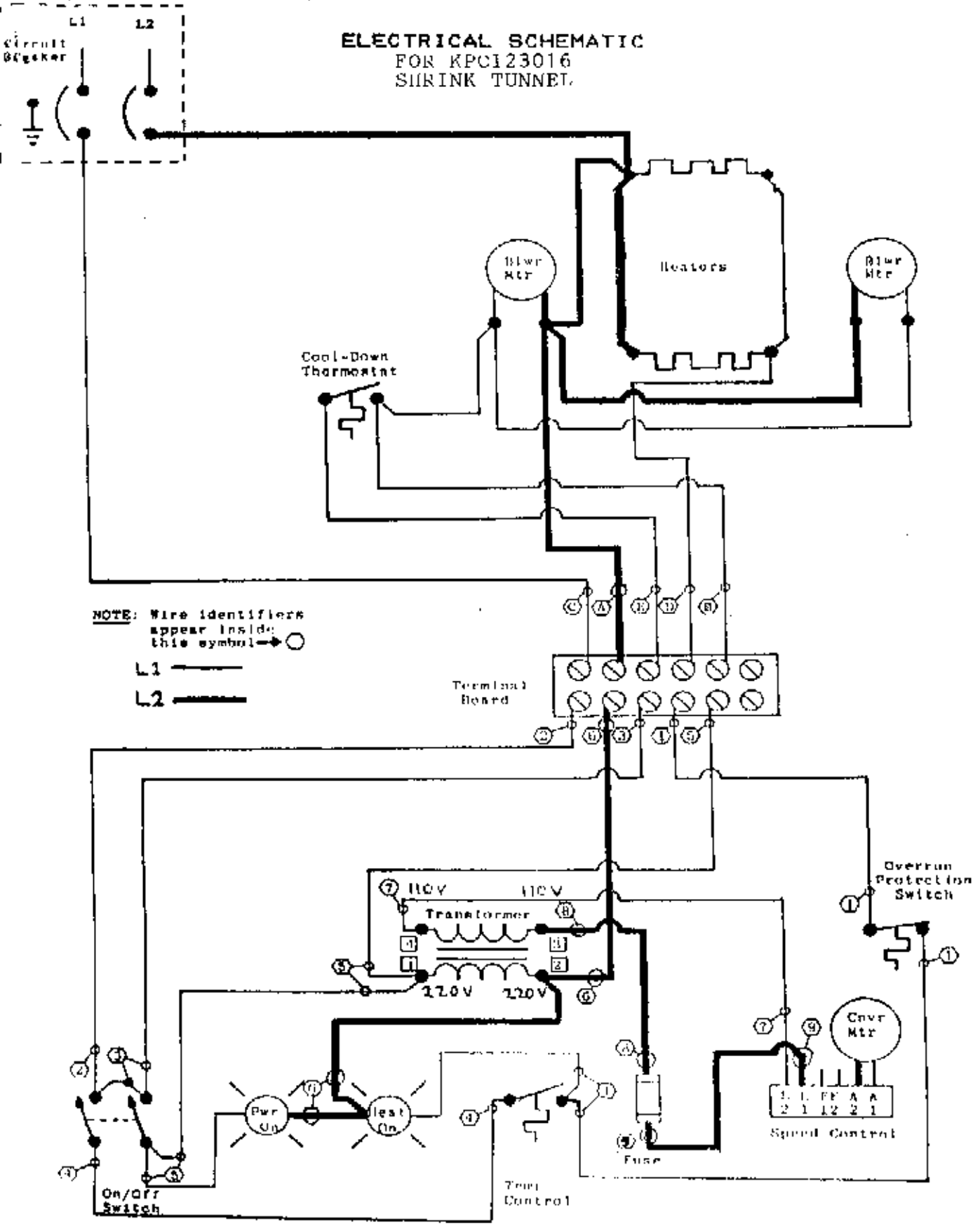
	Defective conveyor circuit	Check speed control for 110V input across terminals L1 & L2. Check speed control for variable DC output voltage across terminals A1 & A2. Check motor for variable DC input voltage. Check motor brushes. Replace as necessary.
	Conveyor fuse blows	Check transformer for 220VAC input and 110VAC output with the input (terminals L1 & L2) to the speed control disconnected. Replace as necessary. Check speed control for 110VAC input (terminals L1 & L2) and 0-90 VDC output (terminals A1 & A2) with the output of the controller disconnected. Replace as necessary. Check motor for 0-90 VDC input. Motor should run. If it does not, check for worn brushes and replace as necessary. If brushes are not worn, replace motor.
Bag sticks to curtain	Temperature too high	Lower temperature.
	Curtain is tacky	Dust with white line chalk.
	Curtain excessively worn	Replace curtain.

Preventative Maintenance

Inspection and preventative maintenance schedules are suggested in the following table. Intervals indicated are recommendations based on moderate use. More frequent maintenance may be necessary if the machine is subjected to heavy or continuous use.

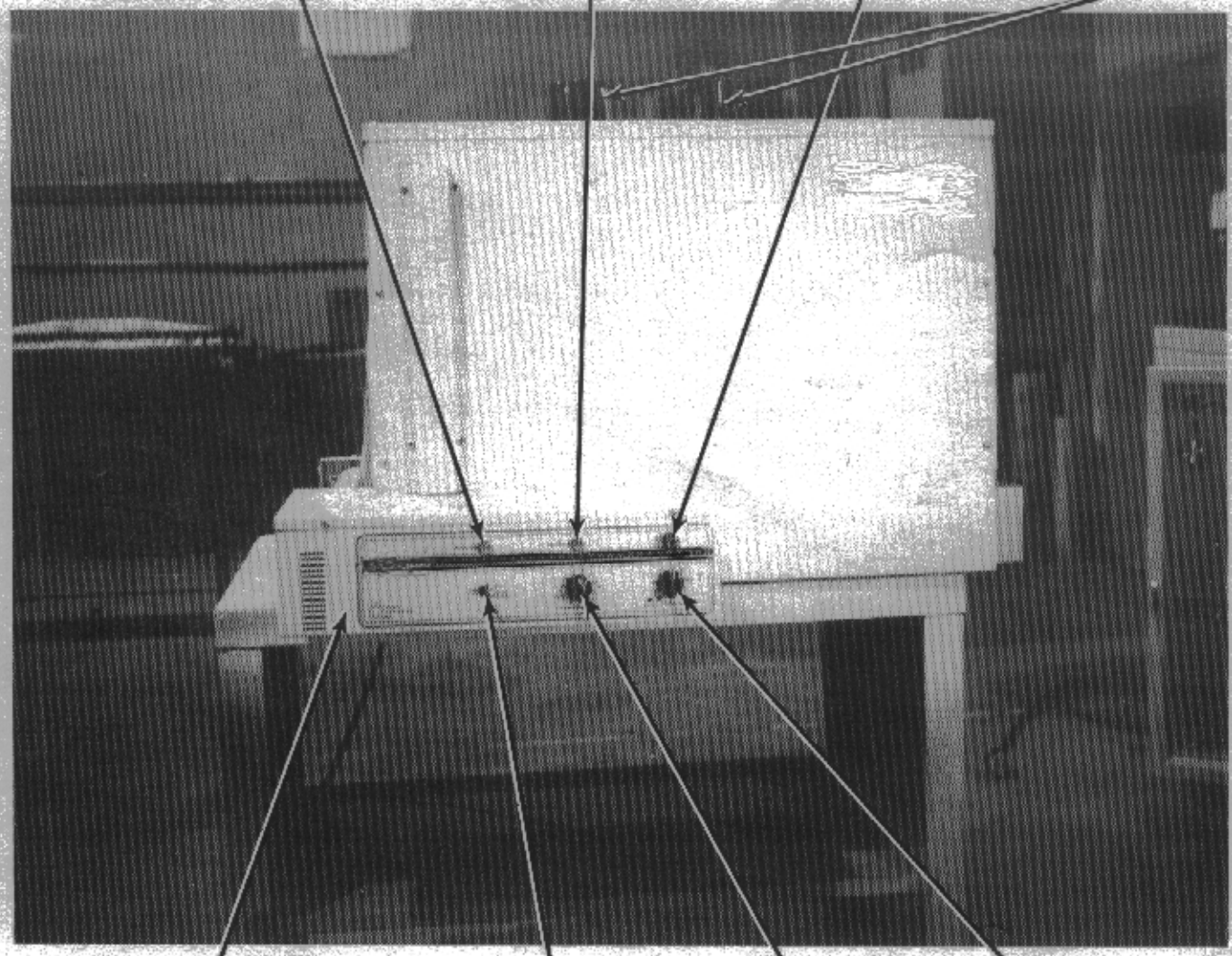
Interval	Item	Service
Daily	Conveyor Belt	Adjust tracking control screw if belt is not tracking properly. Wipe belt with clean, soft cloth. *Do not use solvents.*
	Shrink Chamber and conveyor pan	Remove dirt, grease, and debris.
	Blower motor air intake	Remove lint, dust, debris, or anything that is blocking air intake.
Weekly	Blower Impeller	Remove film scraps, paper, etc. Blow out dirt with compressed air.
	Curtains	Adjust if necessary. Replace if torn or overly worn. Dust with white line chalk.
Monthly	Idler and Drive roller bearings	Clean and grease as needed.
Six Months	Conveyor motor brushes	Inspect and replace if worn excessively.

ELECTRICAL SCHEMATIC
FOR KPC123016
SHRINK TUNNEL



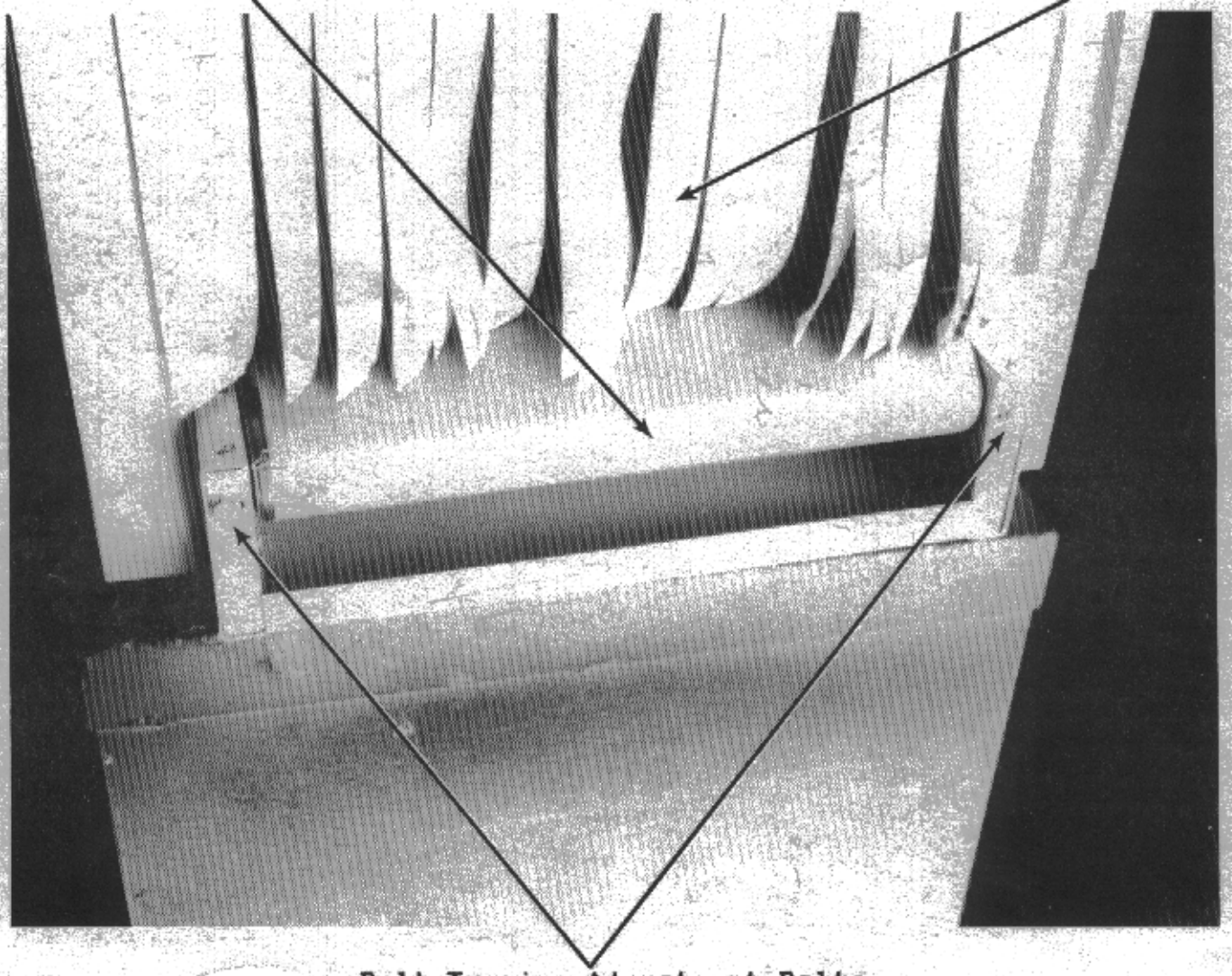
KPC123016BC "POLY WRAP" TUNNEL

This view from operator side.



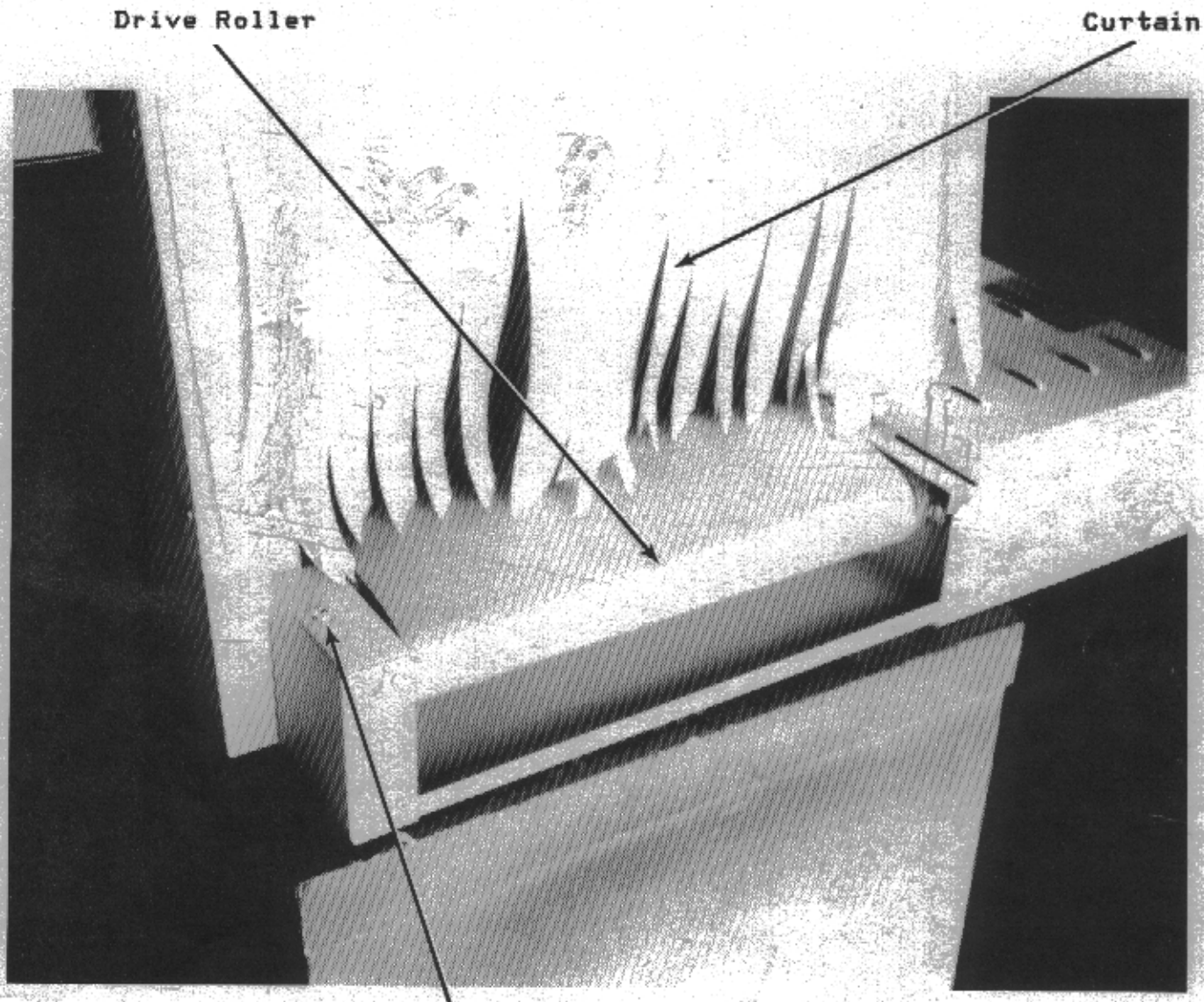
KPC123016BC "POLY WRAP" TUNNEL

This view from entrance end.



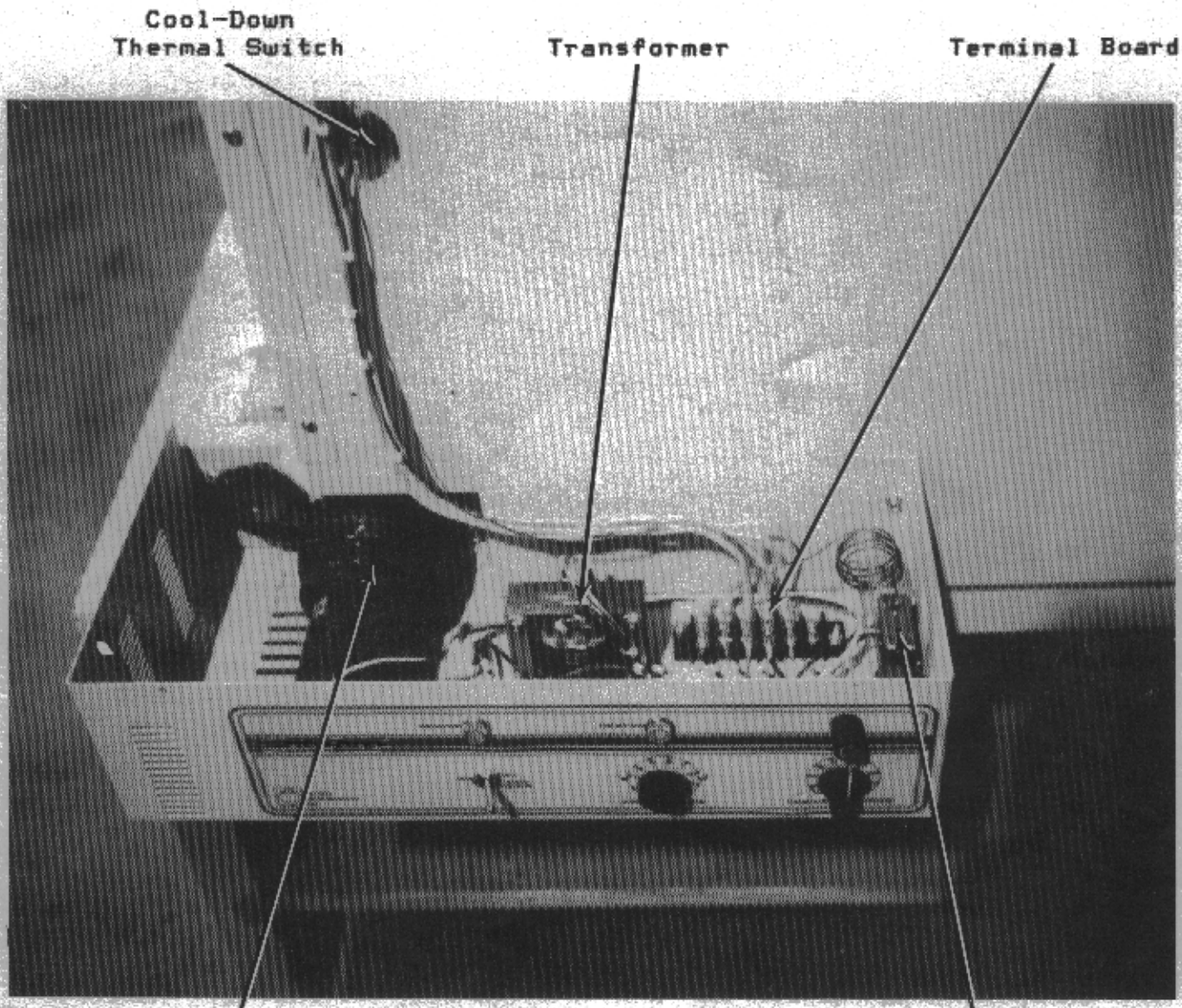
KPC123016BC "POLY WRAP" TUNNEL

This view from exit end



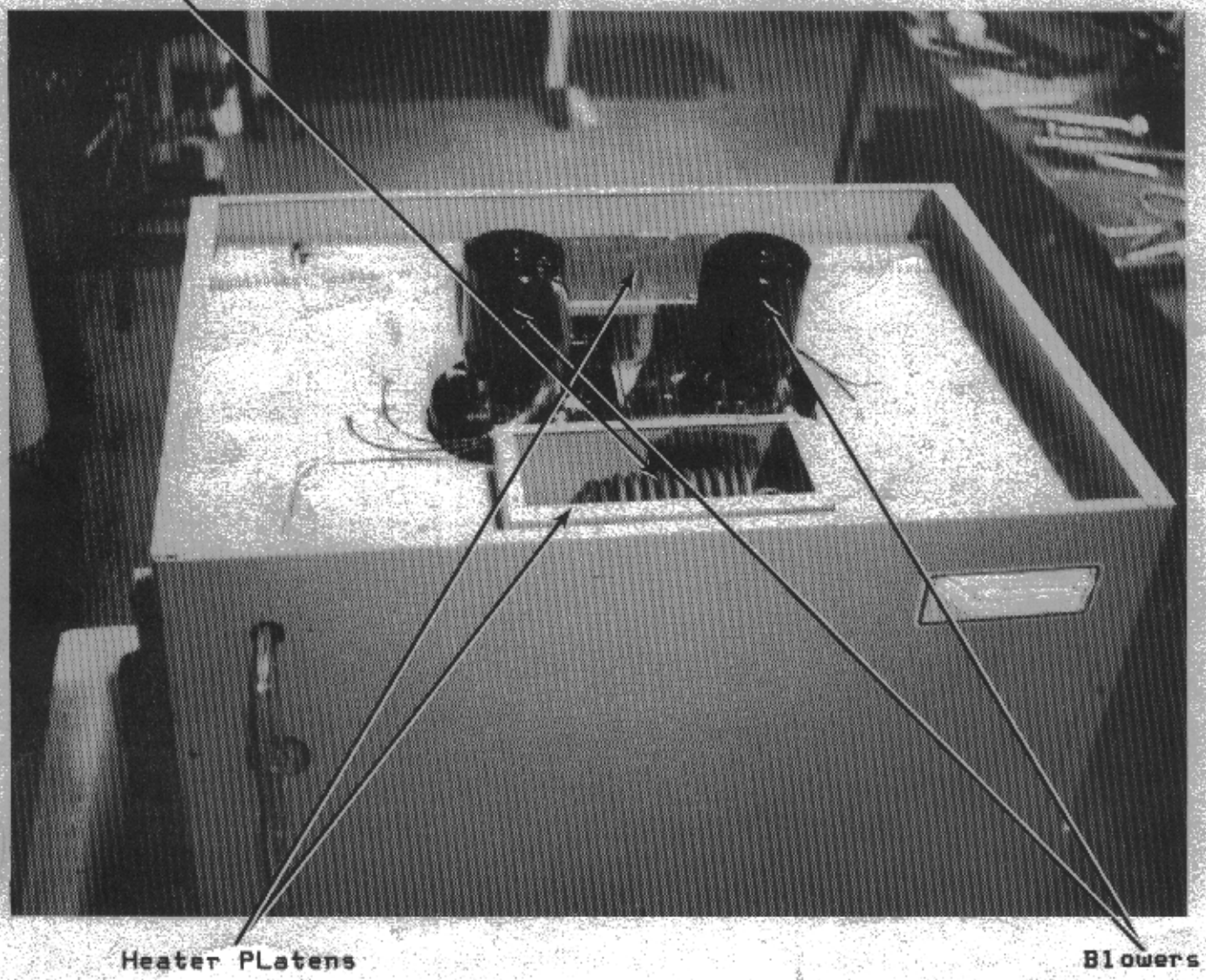
KPC123016BC "POLY WRAP" TUNNEL

This view with top cover of control box removed.



KPC123016BC "POLY WRAP" TUNNEL

This view is with the top cover and top layer of insulation removed. Also, one heater platen cover has been removed to expose the heater.



KPC123016BC "POLY WRAP" TUNNEL

This view from far side.