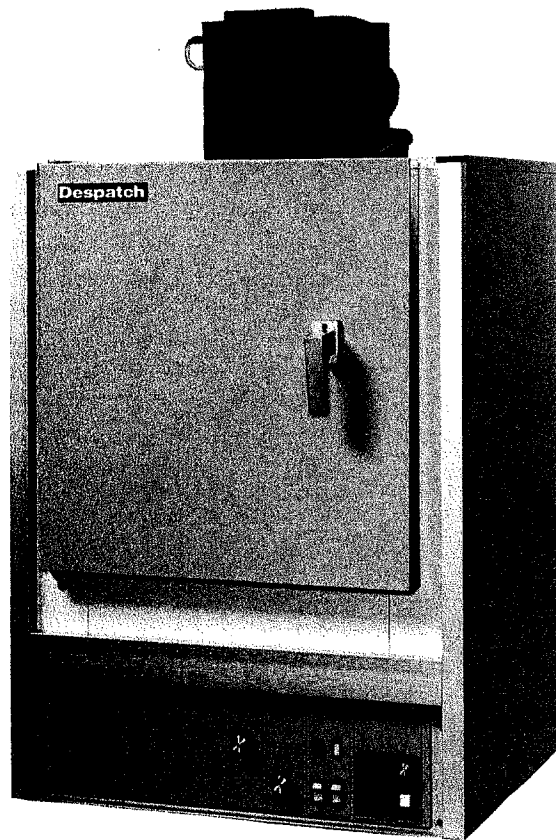


C-93
P/N 107116

Rev 6/88

Operator's Manual for LFD series ovens



Despatch LFD series ovens are bench ovens with a maximum operating temperature of 316°C (600°F) and with forced convected airflow.

MODEL	VOLTS	PHASE	HZ	HEATER WATTS	TOTAL AMPS
LFD 1-42	240	1	60	6,000	31.0

TABLE OF CONTENTS

Warnings	4
Introduction	4
Unpacking & Inspection	5
Installation	5
Pre-Start Up	5
Start-Up	5
Operation	6
Check Safety Controls	6
Practice Safety	6
Starting The Oven	6
Loading the Oven	7
Shutting Down The Oven	7
Service And Maintenance	7
Recalibrating Hi-Limit	8
Recalibrating Control	10
Troubleshooting	11
Electric Schematics	13
Optional Accessories	14
Warranty	15

Warnings

FAILURE TO HEED WARNINGS IN THIS INSTRUCTION MANUAL AND ON THE OVEN COULD RESULT IN DEATH, PERSONAL INJURY OR PROPERTY DAMAGE.

DANGEROUS ATMOSPHERE

Do not use oven in wet, corrosive or explosive atmospheres unless this oven is specifically designed for a special atmosphere.

FLAMMABLES

Do not exceed the maximum amount of flammable solvent or other flammable material in the oven.

Do not process closed containers of any substance or liquid in this oven because they may explode under heat.

OPERATOR TRAINING REQUIREMENTS

The users and operators of this oven must comply with operating procedures and training of operating personnel as required by the Occupational Safety and Health Act (OSHA) of 1970, Section 5 and relevant safety standards, as well as other safety rules and regulations of state and local governments. Refer to the relevant safety standards in OSHA and National Fire Protection Association (NFPA), Section 86A or 1977, Chapter 1, Section 1-6 and Appendix F or any subsequent editions.

SERVICING OVEN

Do not attempt any service on this oven before opening main power disconnect switch.

OVEN TEMPERATURE LIMIT

Do not attempt to exceed the maximum operating temperature of this oven.

PRODUCT TEMPERATURE LIMIT

If the product on which the oven is being used has a critical high temperature limit, the high-limit control should be used as a "Process" high-limit rather than as an "Oven" high-limit control. When used as a "Process" high-limit, the high-limit control should be set to a temperature somewhat below the temperature at which the product would be damaged. The oven controller or a pyrometer could be used to determine the "Process" high-limit setting. If the destructive temperature of the product is already known, this could be used as a point below which the "Process" high-limit could be set.

NOTICE: Despatch Industries, Inc. cannot be responsible for either the process or process temperature used, or for the quality of the product being processed. It is the responsibility of the purchaser and operator to see that the product undergoing processing in a Despatch oven is adequately protected from damage. Carefully following the instructions in this manual will assist the purchaser and operator in fulfilling that responsibility.

WARNING SIGNS MISSING

If it appears that any warning, danger, caution or information label or sign has been damaged or lost, contact Despatch Industries, Inc. for replacements. Call or write:

Customer Service
Despatch Industries, Inc.
P.O. Box 1320
Minneapolis, MN 55440
Call Toll Free 800-328-5476
(in Minnesota 800-462-5396)

Introduction

The users of this oven must comply with operating procedures and training of operating personnel as required by the Occupational Safety and Health Act (OSHA) of 1970, Section 5 and relevant safety standards, as well as other safety rules and regulations of state and local government. Refer to the relevant safety standards in OSHA and National Fire Protection Association (NFPA), Section 86A of 1977, Chapter 1, Section 1-6 and Appendix F, or any subsequent editions.

WARNING: This equipment is designed for a specified amount of solvent. Exceeding this specified amount could result in an explosion.

NOTE: Read the entire introduction to this manual before installing the oven.

This instruction manual covers installation, operation, and maintenance of the "LFD" series ovens.

An efficient way to learn about the oven would be to read the manual while working with the corresponding oven control system. This will give a practical hands-on relationship between the information in the manual and the physical oven.

While reading this manual, if a term or section of information isn't fully understood, look up that item in the appropriate section to familiarize yourself with that item. Then go back and reread that section again. Information skipped, not understood or misunderstood could create the possibility of operating the equipment in an unsafe manner, cause damage to the oven or personnel, or reduce the efficiency of the equipment.

- If anything is found to be out of order, check the rest of the oven very carefully for some other damage that could have occurred at the same time.

IF THERE IS DAMAGE, AND IT COULD HAVE HAPPENED DURING SHIPMENT, CONTACT THE SHIPPER IMMEDIATELY, AND FILE A FORMAL, WRITTEN DAMAGE CLAIM.

After you have filed a written damage claim with the shipper, contact Despatch Industries, Inc. to report your findings and to order replacement parts for those that were damaged or missing. Please send a copy of your filed damage claims to Despatch.

To return parts contact Despatch Industries to obtain an MRA (material return authorization) number. This number must be attached to the returned part for our identification. If required, a new part will be sent and invoiced to you. When the return part is received, credit will be given, if in warranty.

Unpacking, Inspection and Packing List

Remove all packing materials and inspect the oven for damage. If damaged, and damage is due to shipment, contact the shipper immediately. If oven parts are damaged, or if parts are missing, contact Despatch Customer Service at 800/328-5476. (In MN 800-462-5396)

You should have in this box:

- One oven
- Two shelves
- One package containing four rubber feet
- One operators manual
- Warranty card

Any optional accessories ordered will be shipped separately.

Installation

Remove the adhesive backing sheet from the rubber feet and attach the rubber feet to the bottom corners of the oven.

Place the oven on a bench top or an optional cabinet base. The oven must have a minimum of 2" clearance in the rear to provide proper ventilation but may be placed next to another cabinet or oven (the doors will still open).

Make sure oven is level and plumb, this will assure proper heat distribution and operation of all mechanical components.

Check the oven power requirements for amperage and voltage (this is listed on the cover of the manual). Connect the electric supply directly to your oven (see electrical schematic in back of manual) with all required grounding and safety equipment, in compliance with applicable codes, ordinances and accepted safe practices.

A note on line voltage: Line voltages may vary according to your geographical location. If line voltage is significantly lower than oven voltage rating, heat up times will be extended, and motor may overheat. If line voltage varies $\pm 10\%$ from the oven voltage rating, temperature control will operate erratically.

Ovens designed for 240 volts (see name plate on oven) will operate satisfactorily on a minimum of 208 volts, but with a reduction in heater power. If your power characteristics are lower, contact Despatch Industries, Inc.

The exhaust fan discharge stack is a 2"x6" rectangular opening. If a round stack will be used to run the exhaust outside the building a minimum of a 4" diameter is required. The flashing through the roof or wall must be capable of handling the exhaust stack temperature which can be as high as 316°C (600°F). All stacks must comply with state and local building codes to insure that surrounding combustible surfaces are below 71°C (160°F).

The exhaust fan is designed to handle 93 CFM without a stack. The exhaust stack must be designed to limit the amount of restrictions to insure proper airflow. The maximum number of elbows must be limited to two (2). The overall airflow will be reduced if more elbows or restrictions are placed in the exhaust stack. Reduced airflow will also reduce the amount of solvent that can safely be used with this equipment.

A. PRE-START-UP

1. KNOW THE SYSTEM:

Read this manual carefully. Make use of its instructions and explanations. The "Know How" of safe, continuous, satisfactory, trouble free operation depends primarily on the degree of your understanding of the system and of your willingness to keep all parts in proper operating condition.

2. CHECK LINE VOLTAGE

This must correspond to nameplate requirements of motors and controls. A wrong voltage can result in serious damage.

3. FRESH AIR AND EXHAUST AIR DAMPERS/STACKS

Do not be careless about restrictions in and around the fresh air and exhaust openings and stacks. Under no condition, permit them to become so filled with dirt that they appreciably reduce the air quantity.

B. START-UP

1. START FANS AND CHECK ROTATION

Check rotation to insure the fans are running.

2. CHECK AIRFLOW SWITCH

Check for proper make and break of the contacts when the exhaust fan is started and stopped.

3. ADJUST HI-LIMIT TO OPERATING POSITIONS

The hi-limit thermostat can be used for the protection of the equipment or the product against excessive temperatures when set properly.

Hi-limit thermostats of the non-indicating type (ones which do not show the temperature) can be properly set only after oven is in operation. Until then, such thermostats should be set at their maximum positions so all preliminary testing and adjusting can be done. Before putting oven into production, adjust this type of thermostat as follows: Set the temperature control thermostat at 14°C (25°F) above the desired operating temperature. Operate oven until the control thermostat is regulating. Carefully adjust the hi-limit downward until it trips. Reset the temperature control thermostat at the desired operating temperature. The two instruments are now set in their correct positions. Reset the hi-limit to resume operation.

NOTE: Never operate oven at a temperature in excess of the maximum operating temperature which is 316°C (600°F).

NOTE: All ovens are tested at the factory; however, shipping may cause damage or deviation. Therefore, before oven is put into regular service, the following items should be inspected and adjusted if necessary: thermostat calibration, doors, hinges, latches and other miscellaneous parts.

C. OPERATION

1. **This unit is designed for a specific amount of solvent. NOTE: See warnings page 4 in introduction.**

2. KEEP EQUIPMENT CLEAN

Gradual dirt accumulation retards air flow. A dirty oven can result in unsatisfactory operation such as unbalanced temperatures in the work chamber, reduced heating capacity, reduced production, overheated components, etc.

Keep the walls, floor and ceiling of the oven work chamber free of dirt and dust. Floating dust or accumulated dirt may produce unsatisfactory results.

Keep all equipment accessible. Do not permit other materials to be stored or piled against it.

3. PROTECT CONTROLS AGAINST EXCESSIVE HEAT

This is particularly true of controls, motors or other equipment containing electronic components. Temperatures in excess of 51.5°C (125°F) should be avoided.

4. ESTABLISH MAINTENANCE AND CHECK-UP SCHEDULES

Do this promptly and follow them faithfully. Careful operation and maintenance will be more than paid for in continuous, safe and economical operation.

5. MAINTAIN EQUIPMENT IN GOOD REPAIR

Make repairs immediately. Delays may be costly in added expense for labor and materials and in prolonged shut down.

6. LUBRICATION

Fan motor bearings are permanently lubricated.

All door latches, hinges, door operating mechanisms, bearing or wear surfaces should be lubricated to ensure easy operation.

7. CHECK SAFETY CONTROLS

This should be done as indicated.

Make these tests carefully and do them regularly. The safety of personnel as well as the equipment may depend upon the proper operation of any one of these controls at any time.

a. TEMPERATURE CONTROL (40 hours)

Observe heater indicator light flashes every 1 to 2 seconds when the control is operating at set point temperature.

b. HI-LIMIT (40 hours)

With the oven operating at a given temperature, gradually turn the hi-limit control knob down to the set point operating temperature. The hi-limit should trip and shut off the heater and the heater indicator light. Reset the hi-limit to resume operation.

c. AIR FLOW SWITCH (160 hours)

Check that the "On-Off" indicator moves when starting the unit. Set the temperature control higher than the indicated oven temperature. Remove the air flow lines from the Air Flow Switch. This may be accomplished by loosening the tube fitting nuts and sliding the tubing out to disconnect from the airflow. The heater will shut down when the air flow lines are disconnected. Replace the air flow lines to the switch.

8. PRACTICE SAFETY

Make it a prime policy to "know what you are doing before you do it." Make CAREFULNESS, PATIENCE and GOOD JUDGEMENT the safety watchwords for the operation of your oven.

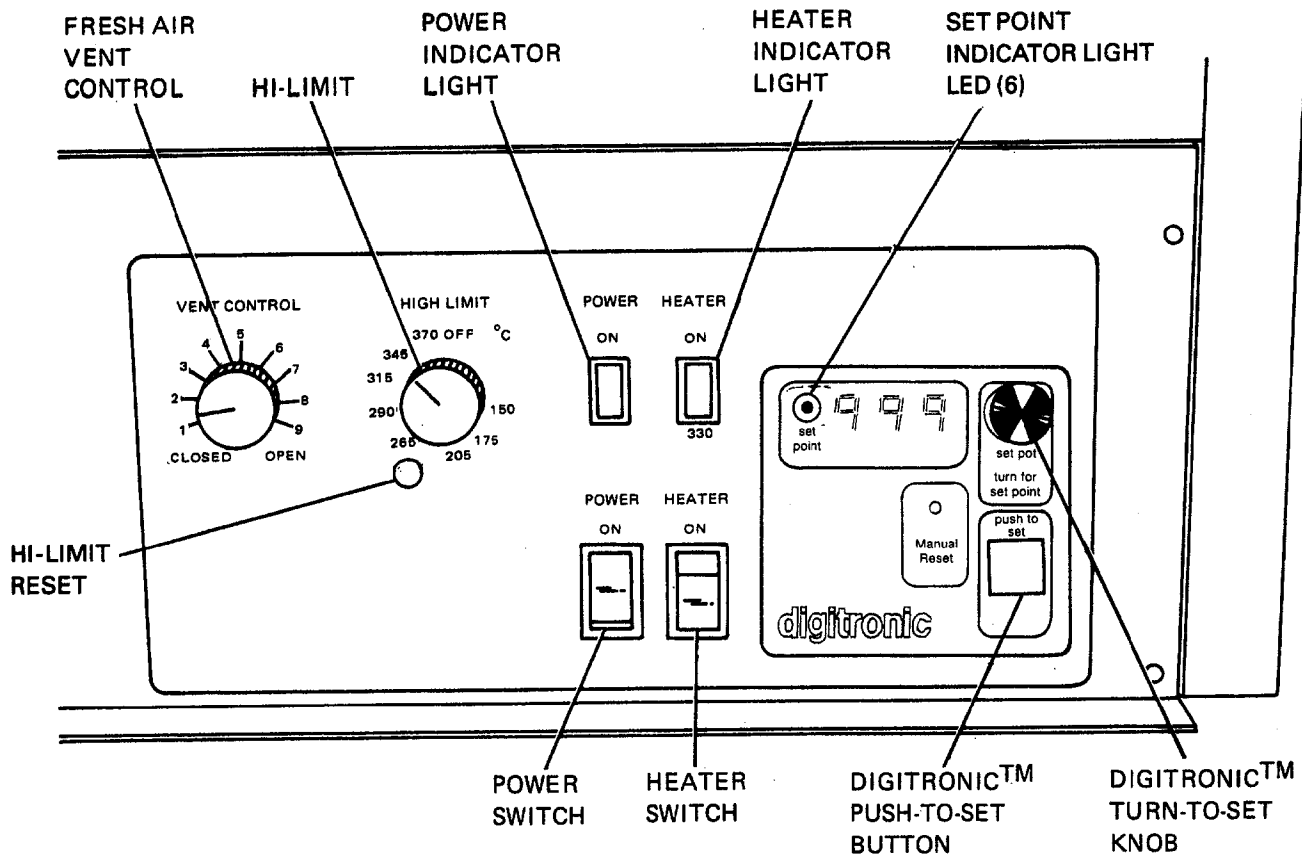
9. MINIMUM TEMPERATURE

The unit will not control below room ambient plus 10°C (18°F) with the vents open or 40°C (72°F) with vents closed.

Starting the Oven

1. Push power switch to "ON" (indicator light should light). This activates the fans and control circuit.
2. Press and hold "push-to-set" button on the Digitronic™ temperature control. The display will be in the set point mode and the set point indicator light is on as long as the button is depressed.
3. Rotate "turn-to-set" knob until the desired chamber temperature is displayed. Release the "push-to-set" button. Note that the set point will be changed if knob is turned when button is not depressed.
4. Set hi-limit device by rotating hi-limit control knob to 10-15°C (18-27°F) above process temperature. Set point should be low enough to prevent damage to the workload but high enough to allow the Digitronic to control at set point. Hi-limit will trip and shut off the heater if chamber temperature exceeds high limit set point. The hi-limit must be manually reset.

Operation



5. Push heater switch to "ON" (indicator light should light after two minute time delay). This activates the heating elements, after purge. The purge timer will prevent the heater from functioning until it is timed out. This is fixed at a two minute delay. When the desired temperature is reached, the Digitronic will proportion power to the heater as needed and the heater indicator light will flash on and off.
6. The readout area will alternately display set point and actual chamber temperature. Set point is on display when the small light shows above the "set point" label.
7. Oven set point can be displayed at any time by manually depressing and holding the "push-to-set" button. This will not disengage the control function.
8. When the operating temperature is approximately 65°C (149°F) or lower, the vent(s) should be wide open to assure these low temperatures can be achieved. The fresh air vent control is located on the control panel and the exhaust vent control is on top of the oven adjacent to the exhaust fan.

Loading the Oven

1. Avoid spills of anything onto the heater elements or floor of oven.
2. The two shelves are designed to be pulled out about half-way without tipping.
3. The support capacity of the shelves is 25 pounds. Do not overload the shelves.
4. Do not place the load on the oven floor plate. Placing the load on the oven floor plate may cause the load to heat unevenly. Use the shelves provided.
5. Distribute workload evenly so that airflow is not restricted.
6. Do not overfill your oven. The workload should not take up more than two-thirds of any dimension of the inside cavity.

Shutting down the oven

1. Push the heater switch to "OFF" after the heating cycle is complete.
2. Do not turn the power off until the oven temperature is below 150°C (302°F). If the oven is turned off before it is properly cooled, the fan shaft and motor bearings may become overheated, shortening the life of the motor.

Service and Maintenance

WARNING — Disconnect main power switch or power cord before attempting any repairs or adjustments.

Replacing control unit (Tools needed: screwdriver, either an adjustable wrench or a nut driver, pliers)

1. Disconnect power. Remove screws from the face of the control panel and slide it forward.
2. Locate the Digitronic printed circuit (PC) board.
3. Remove wires from terminal strip, noting which numbered wires connect to which terminals. Refer to wiring diagram in this manual.
4. Remove the screws holding the terminal board onto sub-panel. Replace old PC board with new PC board. Attach board to sub-panel.
5. Reattach wires to terminal strip making sure the correct ones are connected.
6. Replace control panel.

Replacing heater unit (Tools needed: crescent wrench, screwdriver)

1. Disconnect power. Remove floor plate by removing screws and lifting it out.
2. Disconnect heater leads from heater element with wrench. Note which wires go on which terminals.
3. Unscrew the screws holding the frame to the oven body. Remove the heater and discard.
4. Screw down new heater frame.
5. Attach heater leads to appropriate terminals.
6. Replace interior floor.

Replacing fan motor (Tools needed: screwdriver, 5/32" Allen wrench, and crescent wrench)

1. Disconnect power. Remove chamber floor by removing screws and lifting it out.
2. Remove the screws from heater frame then tip up and to the right.
3. Loosen set screws on fan wheel inside fan housing.
4. Remove the screws from the face of the control panel and slide it forward to uncover motor.
5. Tip oven on its back.
6. Unbolt the four bolts holding the motor to the motor mount.
7. Remove motor (NOTE: After fan wheel has run at temperature for a while, it will stick to the shaft. Some force may be required to separate the two). Suggest holding the fanwheel against the insulated wall while using a mallet and center punch to loosen the shaft from the fan.
8. Disconnect motor leads from terminal block.
9. Hold new motor in place while you remount fan wheel to motor shaft. Reattach motor to motor mount.
10. Attach motor lead wires to terminal block (see wiring diagram).
11. Replace oven control panel and bottom, then tip oven upright again.
12. Adjust fan wheel for 3/16" clearance between wheel and inlet ring.
13. Tighten set screws making sure set screws hit the flats machined into the motor shaft.
14. Bolt heater back in place.
15. Replace interior floor.

Replacing the hi-limit (Tools needed: small screwdriver)

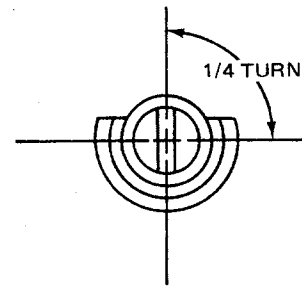
1. Disconnect power. Remove the screws from the face of the control panel and slide it forward.
2. Locate control thermocouple and hi-limit bulb along the left side of the control chamber.
3. Loosen the nut on the brass fitting holding the hi-limit capillary in place.
4. Pull hi-limit capillary out of the fitting. NOTE: Avoid rough handling.
5. Carefully uncoil the new capillary tube, taking care not to kink it.
6. Feed the new hi-limit capillary through the nut and ferrule and place back into the fitting.
7. Retighten the fitting nut.
8. Detach the old hi-limit body by unscrewing the screws that hold it to the mounting bracket.
9. Remove the hi-limit and discard.
10. Attach the new hi-limit. Reattach the knob.
11. Replace control panel of oven.

Recalibrating the hi-limit

(Tools needed: small screwdriver)

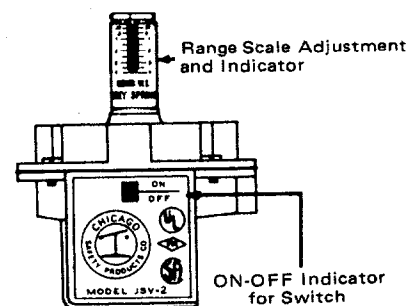
The hi-limit device was calibrated at our factory; however it may need periodic checking and recalibration. If the hi-limit is tripped when the hi-limit is set above Digitronic set point, the hi-limit needs recalibration. Recalibrate using the following procedures:

1. Turn oven on and set controller at 260°C (500°F). It should be stabilized at temperature for about one hour before adjustments are made.
2. Set hi-limit to 260°C (500°F). Pull hi-limit control knob off. Calibration screw is located in the center of the thermostat shaft.
3. 1/4 turn of the screw equals approximately 20°C (68°F).
4. If hi-limit set point is HIGHER than actual oven temperature, (Digitronic readout) turn calibration screw counter-clockwise.
5. Turn the screw until the heater shuts off.
6. If set point is LOWER than actual temperature, turn screw clockwise.
7. Turn the screw and reset the hi-limit until the heater turns on.
8. If readings do not coincide within 30 minutes, repeat operation.
9. Replace knob on shaft.



Airflow switch

1. The airflow switch is located on the exhaust housing.
2. Turn the power switch on and observe the on-off indicator (see figure). The indicator should be above the line. If the indicator is about even with the line, observe the range scale screw (top of the screw is indicator). The screw should be at .15 inches W.C.
3. The fan should be checked to make sure it is running the proper direction. Check against arrow on housing. This is important if the motor has been replaced.
4. Replace switch if the on-off indicator indicates the switch is on and there is no power to wire #5 (providing there is 120V on the terminal #4 or power light is on). See electrical schematic.



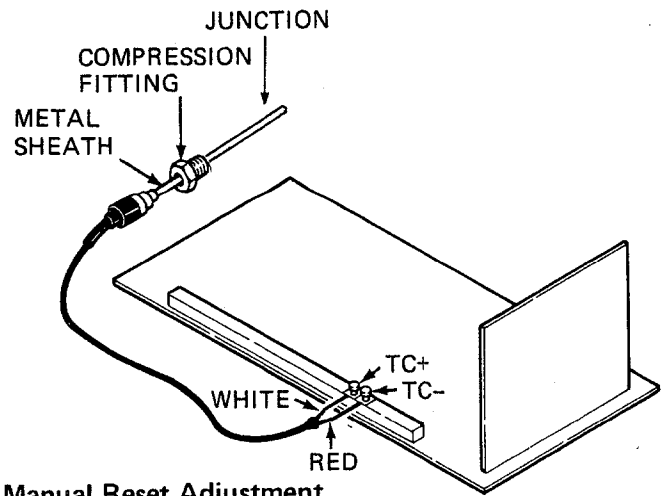
DIGITRONIC CONTROL

Thermocouple break protection

If the thermocouple breaks, the Digitronic will shut off power to the heater, preventing excessive temperature in the chamber. This condition will be indicated on the Digitronic digital display area by decimal points between the numerals.

The Controller thermocouple is type "J" (iron/constantan) and is replaceable using the following procedure:

1. Disconnect power and remove screws from the face of the control panel and slide it forward.
2. Locate thermocouple and hi-limit bulb along the left side of the control chamber.
3. Loosen the nut on the fitting holding the thermocouple in place.
4. Pull thermocouple out of brass fitting.
5. Feed new thermocouple through the nut and ferrule and place back into the fitting.
6. Retighten the fitting nut.
7. Remove old thermocouple from terminals marked "TC+" and "TC-" on PC board.
8. Attach new thermocouple to "TC+" and "TC-" making sure that white lead is attached to the "+" terminal and the red lead is attached to the "-".
9. Replace oven control panel.
10. If decimal points still appear between numerals, repeat procedure.



Manual Reset Adjustment

When operating the oven at different temperatures and damper settings, the setpoint may vary from the oven temperature. Align these two readings as follows:

1. Turn oven ON and allow the oven to cycle off and on at the desired setpoint for 15 minutes.
2. If the oven temperature is below the setpoint on the display, turn the trim pot marked manual reset located on the front of the control (figure 1B) clockwise. If the oven temperature is above the setpoint, turn reset pot counter clockwise. 1/16 turn of the pot is equal to approximately 1°C (2°F). Wait 5 minutes before making another adjustment. Continue until both read the same.

Digitronic trouble shooting

DIFFICULTY

Erratic Sensor Readout

PROBABLE CAUSE

Broken T/C
Control Malfunction

SUGGESTED REMEDY

See Thermocouple Test
Verify LED (41) is Cycling On and Off, if Not See Control Output Test

Erratic Setpoint Readout

Bad Slide Wire on 5K Potentiometer
Control Malfunction

See Potentiometer Test
See Potentiometer Test

Inaccurate Temperatures

Control Miscalibration

See Calibration Test

Variable Between Readout and Setpoint

Incorrect Manual Reset Setting

See Manual Rest Adjustment

Decimal Points Between the Numerals or EEE

Sensor Readout

Thermocouple is Open or Broken

See Thermocouple Break Protection

Setpoint Readout

Overrange

Lower Setpoint Potentiometer or Input Signal Voltage

Calibration procedure

1. Disconnect line power to the control.
2. Attach an accurate potentiometer with an ambient compensated millivolt of Type "J" thermocouple output to the "TC+" and "TC-" terminals on the control.
3. Set Digital Voltmeter (DVM) to 30 VDC range.
4. Turn the line voltage on.
5. Set reset and soak adjust pots to mid range. See Figure 1A & 1B.
6. Set °C/°F switch to °C. Allow unit to warm up 15 minutes before calibration.
7. Connect digital voltmeter (DVM) from COM (-) J69 Plug Pin #4 to W113 (+). Set millivolt source to 0°C (0.00 mv). Adjust °C lo pot for 0.00V +/- .005V on DVM. Adjust zero pot for 000 on display when LED (6) indicator on the control is off.
8. Set millivolt source to 540°C (29.64 mv). Adjust °C hi for 2.700V +/- .005V on DVM. Adjust F.S. pot for 540 on display when LED (6) indicator is off.
9. Repeat steps 7 and 8 as necessary.
10. Set millivolt source to 260°C (14.11 mv), display should read 260 +/- 1 with LED (6) indicator off.
11. Set °C/°F switch to °F.
12. Set millivolt source to 32°F (0.00 mv). Adjust °F lo pot for 32 on the display when LED (6) indicator is off.
13. Set millivolt source to 990°F (29.20 mv). Adjust °F hi pot for 990 on the display when LED (6) indicator is off.
14. Repeat steps 12 and 13 as necessary.
15. Set millivolt source to 500°F (14.11 mv), display should read 500 +/- 1 when LED (6) indicator is off.
16. Connect DVM from COM (-) J69 Plug Pin #4 to W116 (+). Adjust set pot (see figure 1B) for 2.500V on DVM. With set point switch depressed, adjust the balance pot for 500 on display.
17. Adjust the reset pot until the load is cycling 50 percent. The cycle time should be about 1 second +/- ¼ second. LED (41) should cycle with the load.
18. Disconnect all power and leads if necessary.
19. Place nail polish on the zero, °C/°F Hi & Lo, FS adjust, and bal. adjust pots.
20. Place °C/°F selection switch to desired setting.

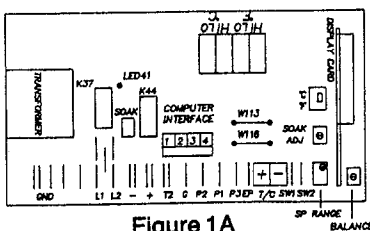


Figure 1A

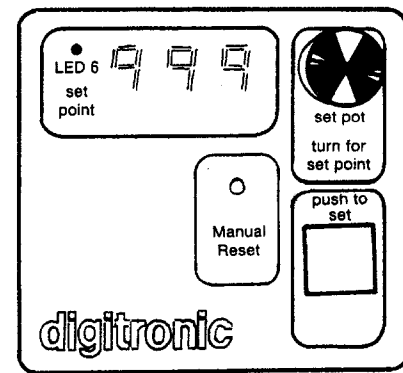


Figure 1B

Tests

WARNING – HIGH VOLTAGE IS PRESENT ON TERMINALS. VOLTAGE CHECKS TO BE MADE ONLY BY QUALIFIED ELECTRICAL MAINTENANCE PERSONNEL: E.G., ELECTRICIAN OR TECHNICIAN. FAILURE TO HEED THIS WARNING CAN RESULT IN SERIOUS BODILY INJURY, PROPERTY DAMAGE, OR DEATH.

Thermocouple Test:

1. Place a jumper or short the terminals "TC+" and "TC-" on the control. The display should read ambient temperature and be very stable.
2. Replace the control if the unit is not stable

Control Output Test:

1. Disconnect line power from the control.
2. Locate terminals + and - on the control next to power input terminals.
3. Attach a multimeter with internal impedance greater than 10,000 OHMS/volt DC across these terminals.
4. Set meter to 30 VDC range.
5. Reconnect line power to the control.
6. The meter should read approximately 10 VDC when the sensor readout is 10°C below setpoint and 0 VDC when the readout is 10°C above setpoint. The voltage should be fluctuating when both the sensor and setpoint readouts are the same. The LED (41) should be on when the 10 VDC is being read.
7. Replace control if the unit does not respond as above

Potentiometer Test:

Control:

1. Remove potentiometer leads P₁, P₂, and P₃ from their corresponding terminals. Short terminals P₂ and P₃ together. The resulting display should be steady and indicate 000.
2. Replace control if the readout is not stable.

Setpoint Potentiometer:

1. Turn the pot all the way clockwise and then all the way counter clockwise several times. This should remove any dust or dirt from the slidewire. The setpoint should be stable.
2. Replace pot if the readout is still not stable.

Range Adjustment:

1. Turn setpoint adjustment pot fully clockwise, this will cause the display to indicate the maximum temperature. Locate the "SP RANGE" potentiometer on the digitronic

board. Turn this potentiometer adjusting screw clockwise to increase the maximum setpoint temperature.

Trouble shooting.

Any equipment operating for as many hours a day as lab ovens often do is likely to have problems now and then. Below are possible problems and suggested solutions. If you have a problem not listed and don't know what to do, contact Despatch at our toll free "Help Line" 800-328-5476 (In MN 800-462-5396).

DIFFICULTY	PROBABLE CAUSE	SUGGESTED REMEDY
Failure to heat	No power	Check power source and/or oven and wall fuses
	Burned out heating element	Replace element (see warranty statement)
	Control malfunction	See trouble shooting information on Digitronic
	Loose wire connections	Disconnect power and check connections behind control panel
	Forced Exhaust Motor	Exhaust fan is not turning dropping airflow switch out (see section on airflow switch)
	Airflow Switch	Check switch (see section on airflow switch)
	Purge Timer	Timer has not timed out, there is a normal two minute delay after turning power switch on
Slow heat up	Hi-Limit Tripped	Reset Hi-Limit
	Improperly loaded	Reduce load or redistribute load in chamber
	Low line voltage	Supply sufficient power and proper connections. Check to see if circuit is overloaded
	1 or 2 heating elements burned out	Replace burned out element (see warranty statement)
	240 volt oven is connected to a 208 volt line	Boost voltage from 208V to 240V
Frequent heater element burn out	Fan motor failure	Replace fan motor
	Harmful fumes generated by load	Increase vent opening or discontinue process
Erratic temperatures	Overheating Oven	Do not operate over 316°C (600°F)
	Control malfunction	See trouble shooting section on control
Temperature readout is several degrees above or below setpoint after control has cycled for 15 minutes (heater indicator light is flashing).	Incorrect manual reset setting on control	Adjust manual reset (see direction on manual reset adjustment)
Inaccurate temperatures	Control miscalibration	Recalibrate control (see section on control recalibration)

DIFFICULTY

Excess surface temperature around door

Improper airflow

Excessive Vibration

Oven will not control at set point

Heater does not shut off until the temperature reaches the hi-limit setting

PROBABLE CAUSE

Door seal deterioration
Clogged stack
Dirty exhaust fan

Fan motor failure

Unbalanced fan wheel

Dirty fan wheel
Unbalanced fan wheel

Hi-limit set too low

Hi-limit is out of calibration

Solid state relay

Control malfunction

Air friction of recirculation fan

Solid state relay

Control malfunction

SUGGESTED REMEDY

Replace door seal
Clean stack
Clean exhaust fan

Replace fan motor

Replace fan wheel

Clean Fan
Replace fan wheel

Set the hi-limit higher

Recalibrate the hi-limit (see directions on recalibrating the hi-limit)

Replace relay

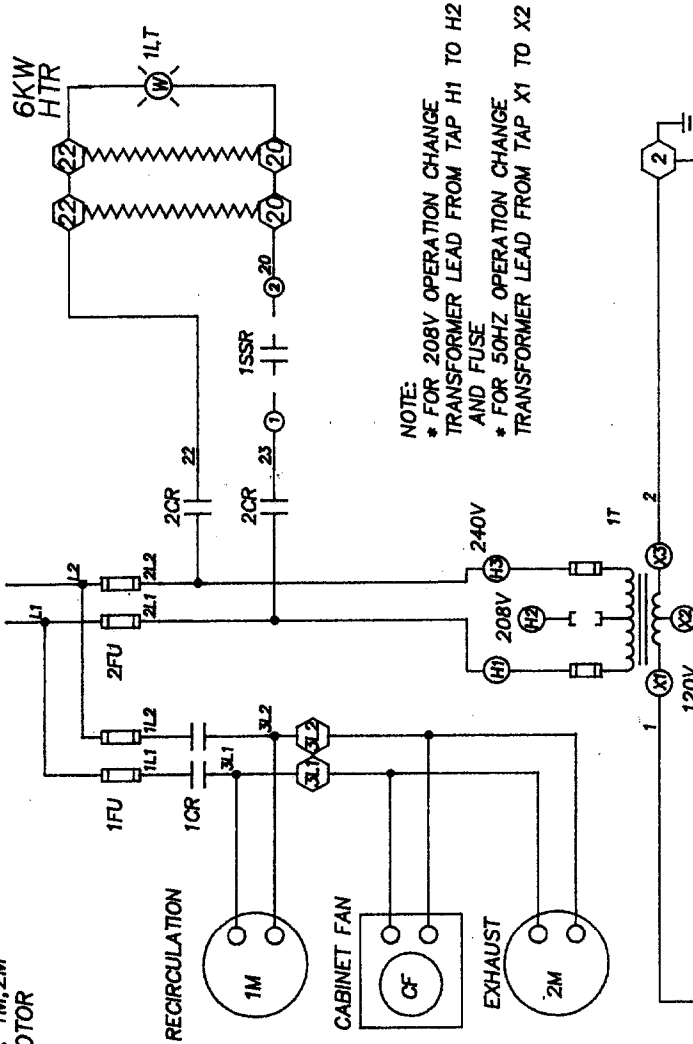
See trouble shooting information on Digitronic
Open fresh air & exhaust vents. Unit will not control below room ambient plus 10°C (18°F) with vents closed.

Replace relay

Verify that LED (41) located on PC control board is off (see section on control)

208/240V-1PH-50/60HZ

NOTE: SEE MOTOR 1M,2M FOR COMPLETE MOTOR HOOK-UP



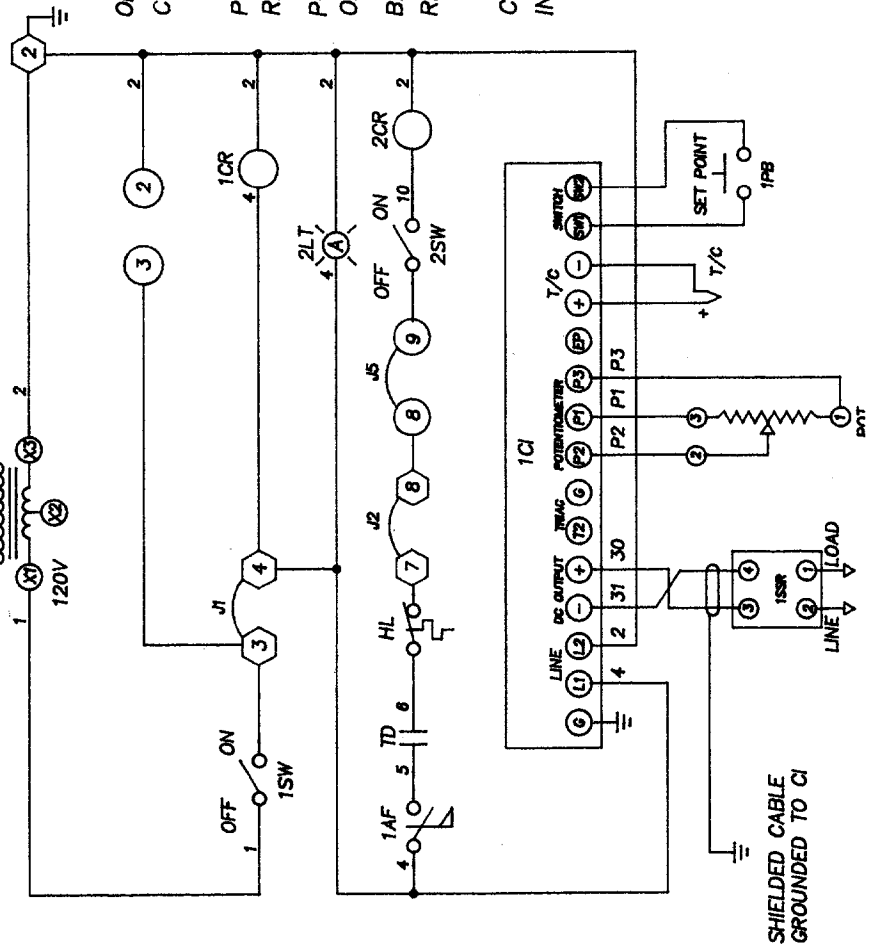
OPTION CONNECTION

POWER RELAY

POWER ON

BACK-UP RELAY

CONTROL INSTRUMENT



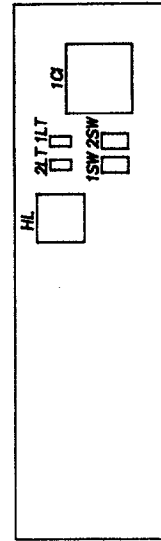
MATERIAL LIST

ITEM	PART #	QTY	DESCRIPTION
1CI	080822	1	61-06-AR DESPATCH DIGITRONIC 540°C TYPE JT/C 120V
HL	012391	1	H-2 300-700°F HI-LIMIT
T/C	051443	1	J39012E-00-16-2036-2 T/C
CF	015229	1	MU3A1 CABINET FAN
1FU	007471	1	F030A2 FUSEBLOCK
	007532	2	FRN 7.0 FUSETRON
2FU	007471	1	F030A2 FUSEBLOCK
	007458	2	A25X30 AMP TRAP FUSE
	013315	1	BX20COMP12153PK TRANSFORMER
1T	007502	2	FNM-2.0AMP FUSETRON
1-2M	008335	2	1/4HP MOTOR
1-2CR	057310	2	301-12T200 RELAY
1SSR	057345	1	50R1D SOLID STATE RELAY
1-2SW	074116	2	TIGK-51-6S SWITCH
1LT	008670	1	LT-C2-NW-N2-MF PILOT LIGHT
2LT	008657	1	LT-C2-NA-N1-MF PILOT LIGHT
HTR	007777	2	3.0KW HEATER
1PB	030525	1	61-06 SWITCH AY
POT	080734	1	61-06 POTENTIOMETER AY
TD	045887	1	TS 14112 TIME DELAY 120SEC.
AF	012138	1	JD-2 AIRFLOW SWITCH

○ - PLUG IN TERMINAL #

◡ - TERMINAL STRIP #

JXX - JUMPER # (YELLOW WIRE)



How to install LFD optional accessories:

Four optional accessories are available for LFD series ovens. They are available at any time from Despatch Industries' Customer Service Department, 800/328-5476 which is our no toll "Help Line". (MN 800-462-5396)

When you order accessories, full instructions for mounting them in the control panel will be enclosed; however, in case they are misplaced, instructions are repeated here.

Digital Process Timer. The timer is electrically connected into oven control circuit and will shut off the heater at end of cycle. (Tools needed: screwdriver, utility knife)

1. Disconnect power, remove screws from the face of the control panel and slide it forward.
2. From back of panel, locate pre-punched holes for process timer and timer switch. From the front of panel, use utility knife to cut holes in the overlay. Remove pre-punched knockout.
3. Mount timer to housing before mounting in the panel. Make sure rubber gasket is flush with timer bezel before tightening the screws.
4. Side timer/housing complete through cut out until the gasket is against panel.
5. Holding the timer in place, install the mounting bracket horizontally around the timer housing and slide it forward until the ends contact the rear of the panel.
6. Using the two screws provided, attach the bracket to the timer housing and tighten screws until timer is held securely in place.
7. Install mylar insulator over rear of bracket by sliding the end tabs between the bracket and the housing and allowing metal extensions on rear of bracket to go through the slots in insulator to hold it securely in place.
8. Remove jumper J5 from the oven wiring harness. Plug the mating connector on the timer into this connector. Plug the other connector on the timer into the other wiring harness connector. The connectors are keyed to prevent incorrect connection.
9. Peel top part of backing off "Timer" sticker and apply it to front of control panel, using the switch hole as location guide. Peel remaining backing off and smooth sticker down.
10. Snap switch into place and connect the two wires from the timer to it.
11. Replace oven control panel.

Spring Wound Process Timers. Available for 60 minutes, 6 or 12 hours, these timers are electrically connected into oven control and will shut off the heater at end of cycle. (tools needed: screwdriver, utility knife.)

1. Disconnect power, remove screws from the face of the control panel and slide it forward.

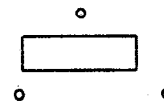
2. From back of panel, locate pre-punched holes. Process timer can be mounted in either of the two sets of holes. From the front of panel, use utility knife to cut holes in the overlay.
3. Put shaft and mounting screws through holes and screw timer into place.
4. Locate connector marked "Process Timers" on the back of the digitronic bracket. Remove jumper. Replace it with connector supplied with the timer.
5. Replace oven control panel.
6. Peel top part of backing off "Process Timer" sticker and apply it to front of control panel, using the two locating marks and shaft holes as location guides. Peel remaining backing off and smooth sticker down.
7. Push knob onto shaft.

Spring Wound Signal Timer. This timer sounds an audible bell at the end of the cycle, up to 60 minutes. It is not electrically connected to oven and does not shut off heater. (Tools needed: screwdriver, utility knife.)

1. Disconnect power, remove screws from the face of the control panel and slide it forward.
2. From back of panel, locate pre-punched holes. Signal timer can be mounted in either of the two far left sets of holes. From the front of panel, use utility knife to cut holes in the silver overlay.
3. Put shaft and mounting screws through the holes and screw timer into place.
4. Replace control panel.
5. Peel top part of backing off "Signal Timer" sticker and apply it to front of control panel, using the two locating marks and shaft holes as location guides. Peel remaining backing and smooth sticker down.
6. Push knob onto shaft.

Running Time Meter. Digital meter counts up to 99,999.9 hours of process time. Runs continuously when oven is on. Not resettable. (Tools needed: screwdriver, utility knife.)

1. Disconnect power, remove screws from the face of the oven control panel and slide it forward.
2. From back of panel, locate pre-punched holes. Use the utility knife to cut four holes in the overlay.



3. Attach meter to panel with screws.
4. Locate connector marked elapse time meter on the back of the Digitronic bracket and connect the wired connector from the meter to it.
5. Replace control panel.
6. Peel top part of backing off "Running Time" sticker and apply it to the front of the control panel using meter hole as location guides. Peel remaining backing off and smooth sticker down.
7. Meter will operate when oven is on.

Industrial Equipment Commercial Warranty

Despatch Industries, Inc. warrants equipment manufactured by Despatch Industries, Inc., to be free from defects in workmanship and materials under normal use and service for a period of one (1) year from the date of delivery or the period of twenty-one hundred (2100) accumulated hours of use, whichever period is shorter.

Components manufactured by others, including but not limited to expendable items, are excluded from this warranty and are warranted (if at all) only in accordance with the warranty, if any, issued by such other manufacturer.

Use or service with corrosive or abrasive chemicals or materials is not deemed normal.

If Purchaser gives written notice specifying the particular defect or defects within 14 days after discovery thereof, Despatch Industries, Inc. will correct without charge any workmanship that is demonstrated to Despatch Industries, Inc. satisfaction to have been defective at time of installation or erection and will repair or replace, at the warrantor's option, without charge, f.o.b. Despatch Industries, Inc. factory, parts covered by this warranty that upon inspection are found defective under normal use within the warranty period above stated.

All work of removal and reinstallation or installation of parts, whether or not found defective, and shipping charges for defective or replacement parts shall be at the sole expense of Purchaser.

The foregoing warranty shall not apply to equipment repaired or altered by others, unless such repairs or alterations were specifically agreed to in writing by an officer of Despatch Industries, Inc.

Despatch Industries, Inc. shall not be liable for incidental or consequential damages of any kind (whether for personal injury, lost profits or otherwise), whether arising from breach of this warranty, negligence or other tort or otherwise, which occur during the course of installation of equipment, or which result from the use or misuse by user, its employees or others of the equipment supplied hereunder, or from any malfunction or nonfunction of such equipment, and Purchaser's sole and exclusive remedy against Despatch Industries, Inc. for any breach of the foregoing warranty or otherwise shall be for the repair or replacement of the equipment or parts thereof affected.

The foregoing warranty shall be valid and binding upon Despatch Industries, Inc. if and only if user loads, operates and maintains the equipment supplied hereunder in accordance with the instruction manual to be provided upon delivery of the equipment.

Despatch Industries, Inc. does not guarantee the process of manufacture by user or the quality of product to be produced by the equipment supplied hereunder and Despatch Industries, Inc. shall not be liable for lost profits.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES AND REPRESENTATIONS WHATSOEVER, INCLUDING BUT NOT LIMITED TO THOSE OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

**For Parts or Service Contact:
Customer Assistance "HelpLine"
800-328-5476 (MN 800 462 5396)**