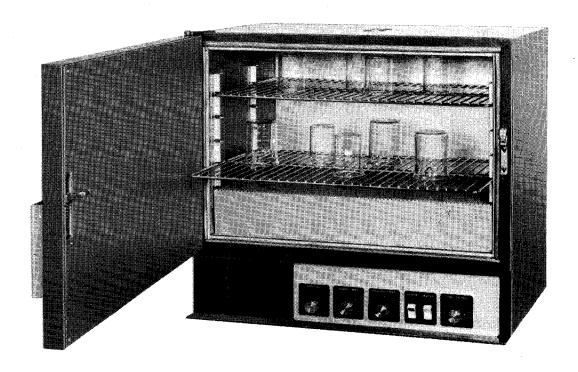
Instruction Manual for LDB series ovens



LDB series Despatch ovens are bench ovens to 204°C (400°F) with forced convection airflow. (Oven shown with optional accessories)

DEL	VOLTS	HEATER WATTS	AMPS	HZ	PHASE
3 1-17	120	1200	11.6	60	1
3 1-24	120	1200	11.6	60	1
3 1-69	120	2400	21.6	60	1
3 2-18	240	3600	16.6	60	1
3 2-27	240	4800	21.6	60	1

Read this instruction manual carefully before operating your Despatch oven.

WARNING: Failure to heed these restrictions can result in property damage, serious bodily injury or death.

DO NOT use any flammable solvent or other flammable materials or enclosed containers in the oven.

DO NOT use oven in wet, corrosive or explosive atmosphere.

DO NOT attempt any service on this equipment without disconnecting the main power switch or power cord.

DO NOT exceed maximum operating temperature, 204°C.

For best service, please complete the warranty card and return to Despatch promptly.

Unpacking, inspection and packing list

Remove all packing materials and inspect the oven and accessories for damage. If damage is due to shipment, contact your shipper immediately. If oven parts or accessories are damaged, or if you are missing parts or accessories, contact Despatch Customer Service Department at 612/331-1873.

You should have in this box: one oven, two shelves in the oven, one package of rubber feet, one thermometer taped to the shelf, one silicone washer, one instruction manual and warranty card. Any optional accessories ordered will be shipped separately.

Installation

Attach the rubber feet to the bottom corners of the oven by peeling and sticking. Feet are required for proper cooling of control compartment and to prevent damage to counter surfaces.

Slide the rubber retaining washer part way up the thermometer body. Insert thermometer through hole in the vent cap. (If you plan to install the optional pyrometer, the thermometer is not needed.)

Place oven on bench top or convenient location with minimum of 1" clearance in the rear to provide proper control cabinet ventilation. The oven can be placed next to another cabinet or oven with 1/2" clearance (the doors will still open).

If you have an LDB 1-17 or LDB 1-24, plug the oven into an appropriate 120 volt power source.

If you have an LDB 1-69, 2-18 or 2-27, check the oven power requirements for amperage and voltage on the cover of this manual and follow local codes for proper wiring.

Despatch ovens are designed for certain designated voltages. If you wish to use different voltage, see the electrical schematics in this manual.

A note on line voltage: According to your geographical location, line voltage may vary. If line voltage is significantly lower than oven voltage rating, heat up time will be extended.

Ovens designed for 240 volts (see spec plate on back of oven) will operate satisfactorily on a minimum of 200 volts. If your power characteristics are lower, consult factory.

Operation

Heating oven to operating temperature

- Turn power switch to "on" (indicator light in rocker switch will light). This activates fan and control circuits.
- Set temperature control to desired operating temperature by dialing the knob. Do not exceed 204°C (400°F). Although the control dial will turn to 275°C, the oven is not designed to operate above 204°C. If your LDB oven has the optional solid state Digitronic control with LED readout, follow the separate operating instructions included with it.
- Turn heater switch to "on" (indicator light in rocker switch should light). This activates the heating elements. When desired temperature is reached, temperature control device will turn off and on to maintain temperature and heater switch indicator light will flash on and off.
- For fastest oven heat-up time, close the top vent, which is adjustable for varying degrees of ventilation. After desired temperature is reached, vent may be adjusted as needed. Examples: 1) for drying operations, open vent to prevent buildup of moisture within the oven; 2) for sample heating, close the vent when no ventilation is required.
- When operating temperature is near 65°C, the vent(s) should be wide open.

Loading the oven

- Avoid spills of anything onto the heater elements or floor of the oven.
- Two non-tip shelves are provided with the oven, which can be pulled out about half way without tipping.
- Support capacity of these shelves is about 25 pounds. Overloading the shelves is not recommended.
- Do not place the load on the perforated floor plate. This will cause poor temperature uniformity within the work chamber and the weight may cause shorting out of the heater elements.
- Distribute your work load as much as possible so airflow is not restricted. Allow room for circulated air around the load. (For more details, refer to the section in our catalog on how to select an oven.)
- Do not overload your oven. Work load should not take up more than two-thirds of any dimension of the inside cavity.

Shutting down the oven

- When heating cycle is complete, turn the heater switch to "off"
- When oven is below 100°C (212°F), turn power switch to "off." If oven is turned off before properly cooled, fan shaft and motor bearings may be overheated, which will diminish the life of the motor.

How to replace parts

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

Replacing control unit (Tools needed: screwdriver)

- Remove perforated floor plate from oven interior by removing screws and sliding floor forward.
- Unclip control bulb from retainer clip.
- Turn oven on its back and remove bottom plate.
- Feed contol bulb from inside of oven down into control compartment.
- Disconnect the two wires from the controller, noting the wire terminal locations. Remove knob from outside. Remove two screws under the decal holding controller unit to control panel. Remove control unit.
- To install new controller, attach screws onto control.
 Put on new square scale sticker. Replace knob. Replace the two wires to the same terminal from which you removed them.
- Extend capillary tube, being careful not to kink or crimp it.
 Carefully feed control bulb into oven chamber.
- Replace bottom and turn oven right side up.
- Clip new bulb into retainer clip.
- Replace interior floor and screws.

NOTE: The control has been calibrated at the factory but recalibration may be necessary. Refer to the section in this manual on recalibration.

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

- Remove perforated floor plate by removing screws and sliding floor forward.
- Disconnect heater leads from heater element with wrench.
 Note which wires go on which terminals.
- Unscrew the screws holding the frame to the oven body.
 Remove the heater and discard.
- Screw down new heater frame.
- Attach heater leads to appropriate terminals.
- Replace interior floor and screws.

Replacing the fan motor (Tools needed: screwdriver, 1/8" Allen wrench)

- Remove perforated floor plate by removing screws and sliding floor forward.
- Loosen two set screws on fan wheel in middle of oven bottom by going through the heater or by disconnecting the heater and removing it to gain access.
- Turn oven on its back and remove bottom plate.
- Unscrew the four screws holding motor mounts to body.
- Remove motor. (Note: After fan wheel runs at temperature for awhile, it will stick to the shaft. Some force may be required to separate the two.)

- Disconnect motor leads from terminal strip on control panel.
- Take motor mounts off motor.
- Put motor mounts onto new motor.
- Reattach fan wheel to shaft by inserting shaft into shaft collar. (Put wheel onto shaft from inside of oven.)
- Reattach motor mounts to oven body making sure grommets are in place.
- Attach motor lead wires to terminal strip (See wiring diagram.)
- Replace oven bottom and turn oven right side up.
- Adjust fan wheel for 3/16" clearance between wheel and inlet ring.
- Tighten set screws. (Make sure set screws hit the flats machined onto the motor shaft.)
- If heater was removed, replace it.
- Replace interior floor and screws.

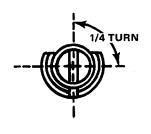
Recalibrating the temperature control device

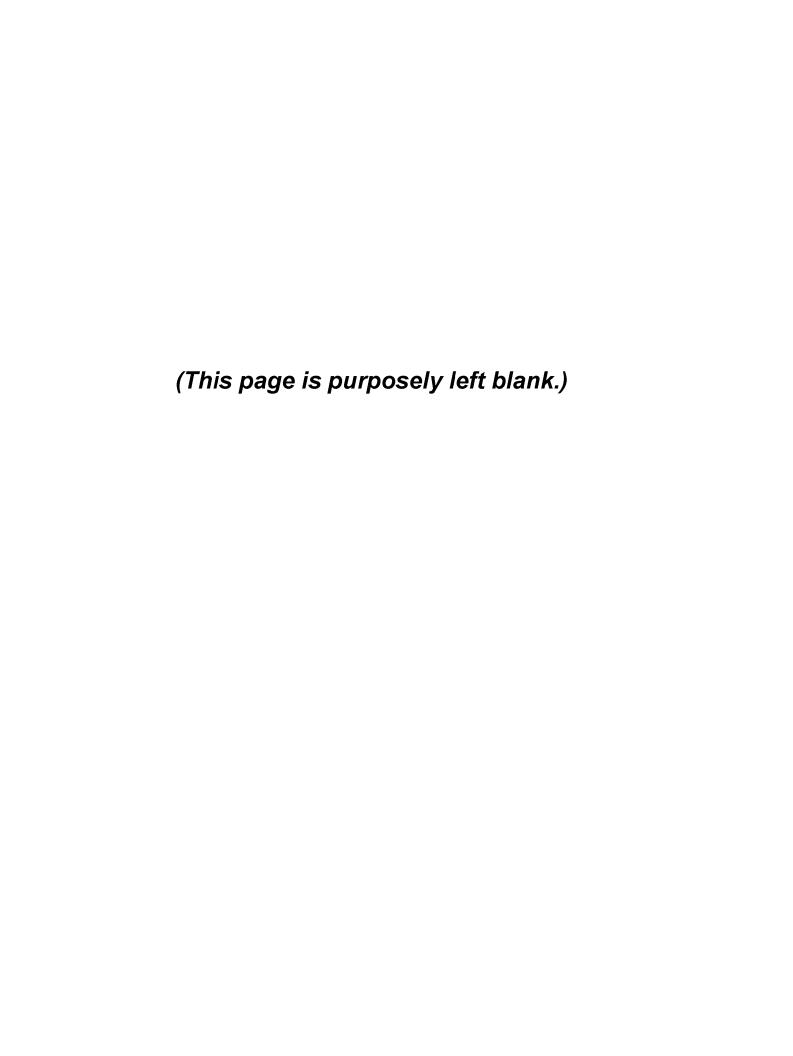
(Tools needed: small screwdriver)

NOTE: If oven temperature and control dial setting disagree by more than 25°, the control needs recalibration.

- Turn oven on and set controller at 100°C. It should be stabilized at temperature for about 1 hour before adjustments are made.
- Pull control knob off. Calibration screw is located in center of thermostat shaft. (See photo below.)
- 1/4 turn of the screw equals approximately 20°C. (See diagram.)
- If controller set point is higher than actual oven temperature, turn calibration screw counterclockwise. If set point is lower than actual temperature, turn screw clockwise.
- Replace knob on shaft.
- If readings do not coincide within 30 minutes, repeat operation.







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, call Despatch at 612/331-1873.

DIFFICULTY	PROBABLE CAUSE	SUGGESTED REMEDY
Failure to heat	No power	Check power source and/or oven and wall fuses
	Broken or frayed cord	Replace with new cord and plug set
	Burned out heating element	Replace element (see warranty statement, back page)
	Control malfunction	Replace controller
	Loose wire connections	Disconnect power and check connections behind control panel
Slow heat up	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 are burned out	Replace burned out element (see warranty statement, back page)
	240 volt oven is connected to a 208 volt line	Raise line voltage
	Fan motor failure	Replace fan motor
Frequent heater element burn out	Harmful fumes generated by load	Increase vent opening or discontinue process
	Spillage or splattering of material on heating elements	Disconnect power and clean oven chamber and elements
	Overheating oven	Do not operate over 204°C (400°F)
Erratic temperatures	Control malfunction	Replace control unit
Inaccurate temperatures	Control miscalibration	Recalibrate control (see section on control recalibration)
	Optional Hi-limit setting	Hi-limit should be 10-25° higher than control set point
Excess surface temperature on door	Door seal deterioration	Replace door seal
Improper airflow	Fan motor failure	Replace fan motor
	Unbalanced fan wheel	Replace fan wheel

How to install LDB optional accessories.

Six optional accessories are available for LDB series ovens. They are available at any time from Despatch Industries' Customer Service Department, 612/331-1873.

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.

Process timers. Available for 60 minute or 6 hour cycles, these timers are electrically connected into oven control and will shut off the heater at end of cycle. (Tools needed: screwdriver, utility knife.)

Disconnect power and remove control panel.

- From back of panel, locate pre-punched holes. Process 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.
- Put shaft and mounting screws through holes and screw timer into place.
- Remove one of the connectors (see photo) on back of control panel and replace it with the wired connector from the timer. (Connector is keyed to fit only one way.)



Replace control panel.

- Peel top part of backing off black "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.
- Push knob onto shaft.

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.)

Disconnect power and remove control panel.

- 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.
- Put shaft and mounting screws through the holes and screw timer into place.

Replace control panel.

- Peel top part of backing off black "Signal Timer" sticker and apply it to front of control panel, using the two locating marks and shaft hole as location guides. Peel remaining backing and smooth sticker down.
- Push knob onto shaft.

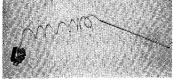
Over-temperature protection device (hi-limit). This controlling hi-limit is variably settable to 204°C. Should oven temperature exceed hi-limit set point, due to heater or controller malfunction, the device will assume control to keep temperature at proper level, protecting your load and the oven. (Tools needed: screwdriver, utility knife.)

Disconnect power and remove control panel.

- From back of control panel, locate pre-punched holes. Hi-limit may 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.
- Put shaft and mounting screws through holes and screw device into place, taking care that wire terminals are facing upwards.

Replace control panel.

- Peel top part of backing off black "High Limit" sticker and apply it to front of control panel, using the two locating marks and shaft hole as location guides. Peel remaining backing and smooth sticker down.
- Push knob onto shaft.
- Remove floor plate from inside of oven.
- Tip oven on its back and remove bottom.
 - Carefully uncoil capillary tube (see photo) taking care not to kink it. Feed capillary up from the bottom into oven chamber and clip it into bulb mounting clips. Note that temperature control bulb



is already clipped into half of the double clip.

The end of the capillary tube closest to the hi-limit body is electrically insulated, but be sure that the uncoiled portion of the tube is **not** near any wire terminals.

- Replace oven bottom. Tip oven right side up. Replace chamber floor.
- To operate hi-limit, set knob at maximum desired temperature.

Pyrometer. Scaled in both ^oC and ^oF, this pyrometer indicates actual oven temperature. (Tools needed: adjustable wrench, hammer, utility knife.)

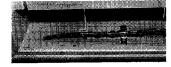
Disconnect power and remove control panel.

- Locate pre-punched knock-out on back of panel. Pyrometer can be mounted only in the position immediately left of the power switch. Using knock-out lines as guides, cut hole in silver overlay with utility knife.
- Punch out knock-out, tapping gently with hammer.
- Put pyrometer into hole and screw into place.

Replace control panel.

Remove oven floor. Tip oven on its back and remove oven bottom.

Feed pyrometer thermocouple from bottom into oven chamber and attach by twisting around control bulb (see photo). Be sure that the junction (tip end) is not touching metal.



Replace bottom. Tip right side up. Replace oven floor.

Digitronic solid state temperature control with LED readout. See separate instructions for installation procedure.

When replacing parts on your oven be sure you obtain the proper item by ordering genuine Despatch parts from your nearest Despatch dealer or from our Customer Service Department, 612/331-1873.

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.

Warranty on heating elements varies. Most oven heaters are warranted for five (5) years from date of delivery. See specific model description for element warranty. Life of furnace heating elements is affected to a large degree by overheating or failure due to contamination. Furnace elements are warranted only against manufacturing defects and a single sample element must be returned to the factory if a defect is claimed. When failure of elements is caused by a factory defect, credit for replacement elements provided in interim will be issued.

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.

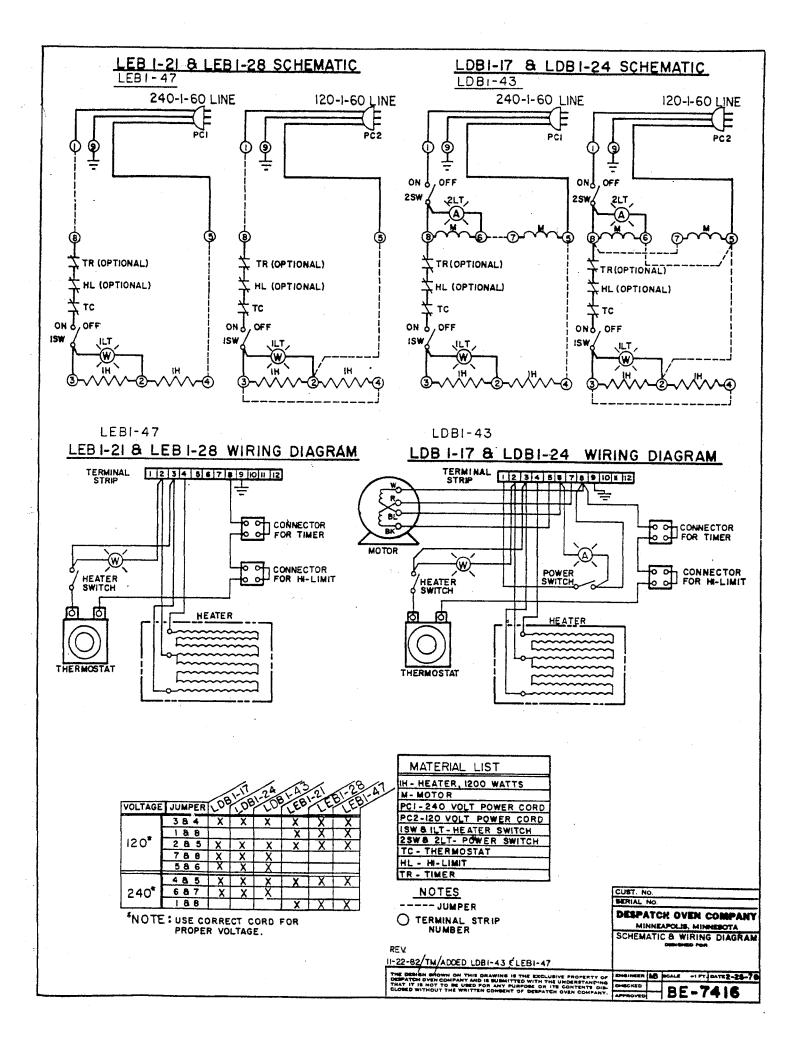
The foregoing warranty shall not apply to equipment repaired or altered by others, unless such repairs or alterations were specifically agreed to in writing by an officer of Despatch Industries, Inc.

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.

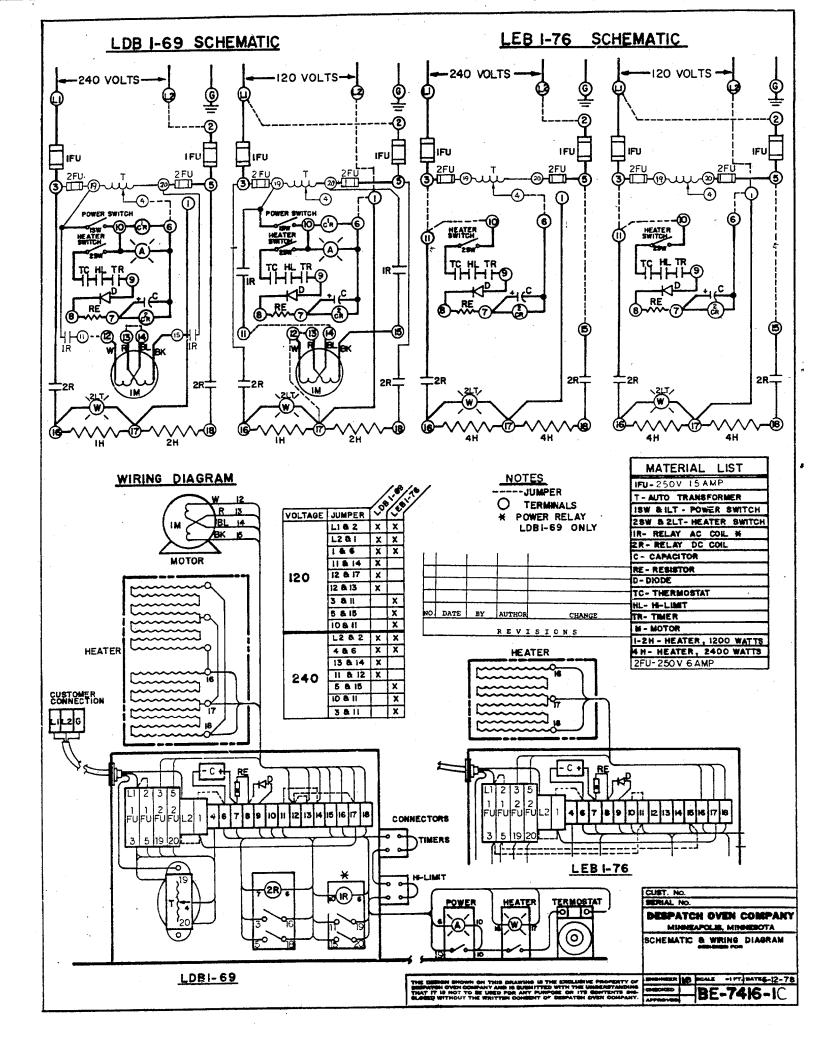
THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES AND REPRESENTATIONS WHATSOEVER, INCLUDING BUT NOT LIMITED TO THOSE OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.



Material List

LEB1-21, LEB1-28, LEB1-47, LDB1-17, LDB1-24, LDB1-43

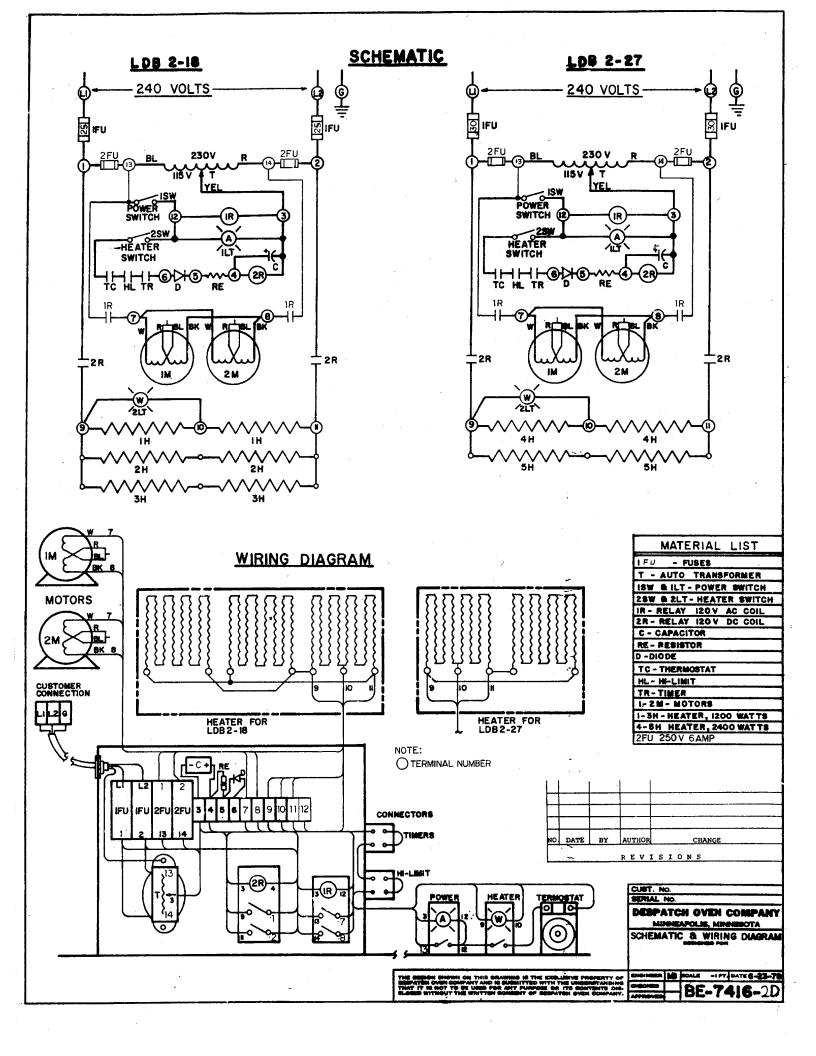
Item	Part Number	Description
1H	007818	1200 Watt Heater 120/240V
	054353	1600 Watt Heater 120/240V
		(LDB1-43 & LEB1-47 MODELS ONLY)
M	205692	Motor Kit (LDB MODELS ONLY)
PC1	N/A	PC1 Power Cord
PC2	N/A	PC2 Power Cord
1SW & 1LT	074183	Heater Switch and White Light
2SW & 2LT	074182	Power Switch and Amber Light
TC	012383	B-10 Thermostat
HL	097356	Hi-limit Kit
TR	105068	6 Hour Process Timer Kit (Spring Wound)
	105069	1 Hour Process Timer Kit (Spring Wound)
	105070	12 Hour Process Timer Kit (Spring Wound)
Seal	018663	Door Seal
	010572	Pop Rivets
Latch	008199	Latch Adjustable



Material List

LEB1-76, LDB1-69

Item	Part Number	Description
1FU	007471	Fuse Block 30 Amp 250V
	007617	Fuse 30 Amp 250V
2FU	007471	Fuse Block 30 Amp 250V
	007436	Fuse 6 Amp 250V
T	012479	Transformer 50VA
1SW & 1LT	074183	Heater Switch and White Light
2SW & 2LT	074182	Power Switch and Amber Light
1R	010434	Relay Backup 120VAC
2R	010435	Relay Control 110VDC
C	004903	Capacitor 300 MFD 150WVDC
RE	010470	Resistor 1K ohm 5W
D	010398	Diode IN5060
TC	012383	B-10 Thermostat
HL	097356	Hi-limit Kit
TR	105068	6 Hour Process Timer Kit (Spring Wound)
	105069	1 Hour Process Timer Kit (Spring Wound)
	105070	12 Hour Process Timer Kit (Spring Wound)
M	205692	Motor Kit (LDB MODELS ONLY)
1-2H	007818	1200 Watt Heater 120/240V
4H	007819	2400 Watt Heater 120/240V
Seal	018663	Door Seal
	010572	Pop Rivets
Latch	008199	Latch Adjustable



Material List

LEB2-20, LEB2-30, LDB2-18, LDB2-27,

Item	Part Number	Description
1FU	007471	Fuse Block 30 Amp 250V
	007615	Fuse 25 Amp 250V (LEB2-20 & LDB2-18 ONLY)
	007617	Fuse 30 Amp 250V (LEB2-30 & LDB2-27 ONLY)
2FU	007471	Fuse Block 30 Amp 250V
	007436	Fuse 6 Amp 250V
T	012479	Transformer 50VA
1SW & 1LT	074183	Heater Switch and White Light
2SW & 2LT	074182	Power Switch and Amber Light
1R	010434	Relay Backup 120VAC
2R	010435	Relay Control 110VDC
C	004903	Capacitor 300 MFD 150WVDC
RE	010470	Resistor 1K ohm 5W
D	010398	Diode IN5060
TC	012383	B-10 Thermostat
HL	097356	Hi-limit Kit
TR	105068	6 Hour Process Timer Kit (Spring Wound)
	105069	1 Hour Process Timer Kit (Spring Wound)
	105070	12 Hour Process Timer Kit (Spring Wound)
1-2M	205692	Motor Kit (LDB MODELS ONLY)
1-3H	007818	1200 Watt Heater 120/240V
4-5H	007819	2400 Watt Heater 120/240V
Seal	018663	Door Seal
	010572	Pop Rivets
Latch	008199	Latch Adjustable