OPERATING AND INSTRUCTION MANUAL

LDB1-18, LDB1-23, LDB1-67, LDB2-17, LDB2-28
LEB1-20, LEB1-27, LEB1-75, LEB2-19, LEB2-29

Manual C-21 Rev 3/72

Despatch Industries

1-800-473-7373

WARNING

1. THE USER(S) OF THIS EQUIPMENT MUST COMPLY WITH OPERATING PROCEDURES AND TRAINING OF OPERATING PERSONNEL AS STATED IN THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) OF 1970, SECTION 5, AND THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), 86A OF 1973 (ARTICLE 100, SECTION 2D, 5 AND APPENDIX I).

2. DO NOT USE ANY ENCLOSED CONTAINERS, FLAMMABLE SOLVENT, OR OTHER FLAMMABLE MATERIALS IN THIS EQUIPMENT. (EXAMPLES: SPRAY CAN, SEALED JAR OF WATER, ALCOHOL, KEROSENE, OIL, PAPER, ETC.). (SEE DESIGN SPECIFICATION SHEET).

3. DO NOT ATTEMPT ANY SERVICE ON THIS EQUIPMENT WITHOUT OPENING MAIN POWER DISCONNECT SWITCH.

4. DO NOT USE IN DUSTY, WET, CORROSIVE OR EXPLOSIVE ATMOSPHERE.

5. DO NOT OPERATE UNTIL THE RUBBER FEET ARE ATTACHED TO THE BOTTOM CORNERS OF THIS EQUIPMENT. THEY ARE REQUIRED FOR PROPER COOLING OF THE CONTROL COMPARTMENT.

6. DO NOT INSERT ANY OBJECTS INTO THE PERFORATED FLOOR PLATE.

7. DO NOT EXCEED THE MAXIMUM TEMPERATURE OF 204 C. (400 F.)

FAILURE TO HEED THESE WARNINGS CAN RESULT IN EITHER PROPERTY DAMAGE, INJURY, OR DEATH.

RESISTANCE OF BACTERIA TO DRY HEAT

The unusual resistance of bacteria, particularly spores, to dry heat temperatures, has long been recognized. The early findings of Robert Koch and his conferees clearly demonstrated that the spores of Bacillus anthracis required a hot air temperature of 284°F. (140°C.) for three hours in order to insure their destructions. A review of the literature has shown that there is a lack of systematic study on death time temperatures of dry heat (hot air) as compared to moist heat or steam. From the available data, it is reasonable to conclude that an exposure to dry heat at 320°F. (160°C.) for 60 minutes is approximately the equivalent of an exposure to moist heat at 250°F. (121°C.) for 10 to 15 minutes.

The resistance of both vegetative bacteria and spores varies considerably with different species, some being killed more rapidly than others. The spores of molds appear to be intermediate in resistance between vegetative and sporulating bacteria in that they require a temperature of 230°F. - 240°F. (110°C. - 115°C.) for 90 minutes for their destruction. The data summarized in Table 1 is descriptive of the finds of various investigators in determining the time-temperature ratios required for destruction of bacterial spores by means of dry heat.

It is of special importance to note that the microbiological action of dry heat is markedly influenced by the nature of the fluid or substance surrounding the organism. In the presence of organic matter such as film or oil or grease the organism is definitely protected or insulated against the action of dry heat. The importance of this factor is dry heat sterilization, particularly in the case of surgical instruments, which, if properly cleaned beforehand, may be sterilized in one hour at 320°F. (160°C.). If oil or grease is present on the instrument, safe sterilization calls for four hours exposure at 320°F. (160°C.).

The thermal death time-temperatures of resistance dry spores in anhydrous oil have been carefully studied by Rodenbeck. The findings of this investigator are deserving of serious consideration in the establishment of safe exposure periods for dry heat sterilization of oils, fats or other anhydrous fluids. For example, it has been determined that at a temperature of 320°F. (160°C.) a period of 160 minutes is required for destruction of resistant spores in anhydrous oil or fat. If the oil is hydrated or contains a small amount of water, as little as 0.5 percent, sterilization may be accomplished in approximately 20 minutes at this temperature. Most oils contain a small amount of water (less than 1 percent) unless subjected to a specific dehydration process.

MINIMUM REQUIREMENTS FOR DRY HEAT STERILIZATION

Due to the various factors involved in dry heat sterilization, it is difficult and somewhat impractical to attempt to establish one time and temperature entirely suitable for all type of loads. Not only must the characteristics of the material undergoing sterilization be known, but strict attention must also be given to the method of preparation, packaging or wrapping, and unloading of the sterilizer to insure that the exposure period selected will be adequate for the destruction of the most resistant and least accessible organisms.

For certain materials, such as glassware, it becomes possible to employ a higher temperature for a shorter period of time than when sterilizing powders which may undergo physical or chemical change unless the temperature is maintained below the critical point of the substance. Instruments represent the ideal for dry heat sterilization because of the heat conducting properties of the metal, but here again the maximum temperature employed for sterilization must be restricted to a safe range beyond which the temperature may be drawn. Everyone concerned with sterilizing techniques should constantly keep in mind that the time required to heat a quantity of one material to sterilizing temperature may differ markedly from that required to heat another material to the same temperature.

The most widely used temperature for dry heat sterilization of hospital supplies is 320°F. (160°C.) for a period of not less than one hour, preferably two hours. This requirement refers to the actual temperature of the load and does not compensate for any appreciable time lag characteristic of a particular load after the sterilizer has reached this temperature. In establishing reliable methods for dry heat (hot air) sterilization, the following time-temperature ratios are recommended:

340°F.	(170°C.)	60 Minutes
320°F.	(160°C.)	120 Minutes
300°F.	(150°C.)	150 Minutes
285°F.	(140°C.)	180 Minutes
250°F.	(121°C.)	Overnight

TABLE I

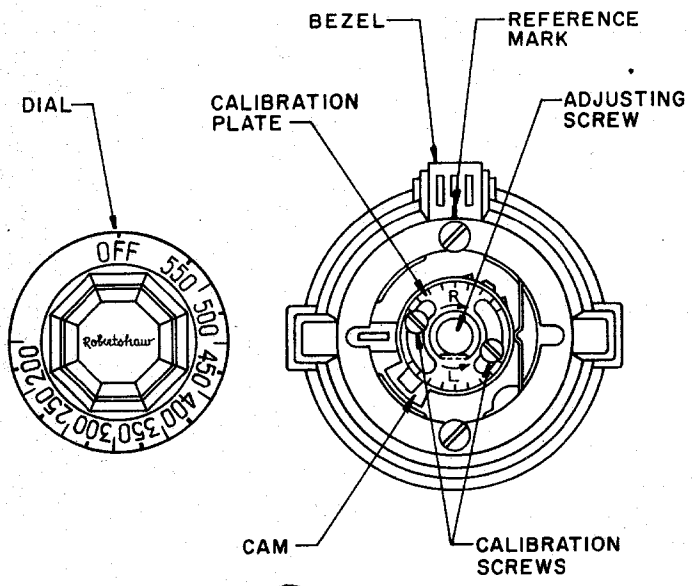
DESTRUCTION OF BACTERIAL SPORES BY DRY HEAT AT DIFFERENT TEMPERATURES

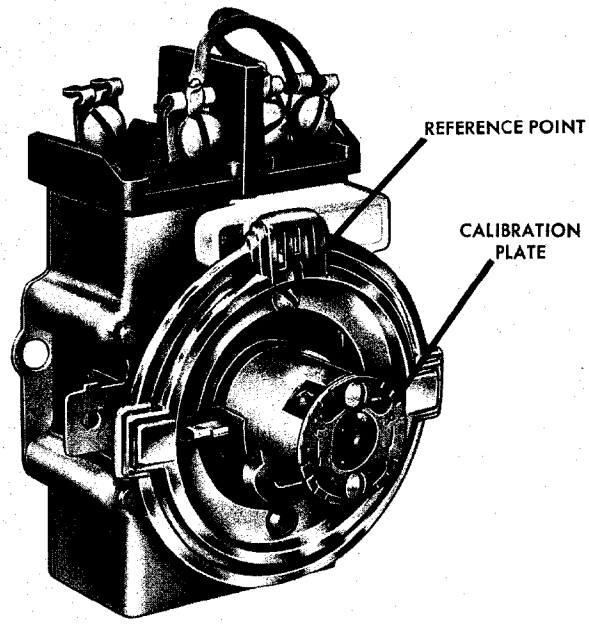
Time-Minutes								
Organism (Dry Spores	248°F (120°C)	266°F (130°C)	284°F (140°C)	302°F (150°C)	320°F (160°C)	338°F (170°C)	356°F (180°C)	Investi-gator
B. anthracis	45	20						Murray
B. anthracis			180					Koch et al.
B. anthracis				60				Stein & Rogers
B. anthracis			180					Park & Williams
B. anthracis	60				9			Oag
B. subtilis				60				Perkins & Underwood
Cl. botulinum	120	60	60	25	25	15	10	Tanner & Dack
Cl. septicum						7		Oag
Cl. tetani		35	15					Murray & Headlee
Cl. welchii	50	15	5					Headlee
Cl. welchii						7		Oag
Garden Soil					30	15		Ecker & Smith

CALIBRATING

Robertshaw electric controls with hub type adjustment

Model
D-Series F-Series
E-Series H-Series





All Robertshaw Electric Thermostats are adjusted at the factory and calibrated on precision instruments to control temperatures accurately. Adjustment or recalibration is not needed unless the thermostat has been mishandled in transit, or changed or abused while in service.

NOTE: — For CENTER STEM type electrics, see RT-329-A.

▶ TO CHECK CALIBRATION

1. Use a Robertshaw test instrument or a good grade oven thermometer and place thermocouple or mercury thermometer in center of the medium.
2. With thermostat dial in the OFF position, make certain OFF mark on the dial agrees with reference point of the bezel or panel; misalignment will affect calibration, then turn the dial to a medium temperature setting.
3. **Allow oven to heat until control snaps "ON and OFF" thermostatically at least three times.** This will allow oven temperature to stabilize and eliminate possible error resulting from initial oven temperature overshoot and/or undershoot.
4. After the control has cycled thermostatically three or more times, note the oven temperature when the electric unit snaps off, and the oven temperature when the unit snaps on. **Recalibrate only** if the average of these two temperature readings varies more than the number of degrees shown in table below for a given temperature range.

▶ TO CALIBRATE

5. Turn control to OFF position and remove dial.
6. Loosen the two calibration screws (about two turns is sufficient).
7. Hold the cam stationary and rotate the calibration plate and adjusting screw clockwise to increase temperature or counterclockwise to decrease temperature.
8. Because of the many temperature ranges available in electric thermostats the spacing between calibration marks represents different values. To determine the value for a particular temperature range refer to table below.

   Example — The spacing between calibration marks amounts to approximately 25° for thermostats with a temperature range of 200° to 550°.

TYPE THERMOSTAT	TEMP. RANGE IN DEGREES F.	RECALIBRATE WHEN OUTSIDE THESE LIMITS	EACH MARK ON CALIB. PLATE EQUALS DEGREES F.
OVEN	200° to 550°F.	±20°	25°F.
OVEN	300° to 650°F.	±20°	25°F.
FRYER	200° to 400°F.	±10°	13°F.
STERILIZER	100° to 200°F.	±10°	9°F.
COFFEE URN	Boil 3-2-1-Hold	±10°	9°F.
SPECIAL	60° to 250°F.	±10°	12°F.
SPECIAL	100° to 300°F.	±10°	13°F.

9. Tighten calibration screws carefully.
10. Replace dial.

After a calibration is made let the appliance operate until the temperature has stabilized, then recheck to determine whether or not the calibration has been corrected.

Robertshaw MR. CONTROLS
NEW STANTON DIVISION
ROBERTSHAW CONTROLS COMPANY
YOUNGWOOD, PENNSYLVANIA 15697

Printed in U.S.A. RT 329 4-67

INSTRUCTIONS FOR OPERATING A DESPATCH STERILIZER

(MODELS LEB1-20, LEB1-27, LDB1-18, LDB1-23)

Remove all packing from inside sterilizer. Attach rubber feet to bottom corners of sterilizer. Install shelf clips inside work chamber. Fit aluminum vent cap over exhaust stack on top of sterilizer. Slide rubber retaining washer part way up thermometer body. Insert thermometer through hole in aluminum vent cap.

The twelve prong receptacle at the rear of the sterilizer is wired for 120/240 dual voltage operation. The operating voltage of the sterilizer is determined by the internal wiring of the power cord socket. The correct power cord for customer's operating voltage is shipped with each new sterilizer. To convert sterilizer from one voltage to the other, purchase power cord wired for the desired voltage from Despatch Industries. See "Power Cord Selection Guide" for part number.

Set thermostat for desired operating temperature. Turn fan motor on (LDB1-18 and LDB1-23 only). Red pilot light goes on and off with thermostat. To shut heater off, turn thermostat to "off" position.

If the temperature indicated on the dial of the Robertshaw thermostat is not the same as the temperature indicated on the thermometer, the thermostat should be recalibrated. Before making any adjustments, sterilizer should be at operating temperature for two hours. Pull knob and dial from thermostat shaft. Calibrating screw is located in center of thermostat shaft. If the temperature indicated on the dial of the Robertshaw is higher than the temperature indicated on the thermometer, turn calibrating screw counter-clockwise. If the temperature indicated on the dial of the thermostat is lower than the temperature indicated on the thermometer, turn calibrating screw clockwise. Replace knob and dial on the thermostat shaft. Repeat operation if necessary.

The heating elements are attached to the bottom side of the floor plate which is located at the bottom of the work chamber. A row of fresh air inlet holes is located along the front edge of the floor plate. Do not allow these fresh air inlet holes to become obstructed. The amount of air exhausted from the sterilizer is regulated by turning the aluminum vent cap on the top of the sterilizer. Do not open vent more than necessary to exhaust moisture or fumes from the sterilizer.

When placing material in sterilizer, allow the maximum amount of air space around the various parts being processed. This will tend to equalize the temperature throughout the work chamber.

Important Recommendations

1. Rubber feet are required for proper cooling of control compartment. Do not operate sterilizer until feet are installed.

2. Do not attempt to operate sterilizer unless power cord designation corresponds with part number listed in "Power Cord Selection Guide."

3. Do not place any material on floor plate. The uneven distribution of heat may result in excessive warping of the floor plate and subsequent failure of heating elements. Use shelves provided.

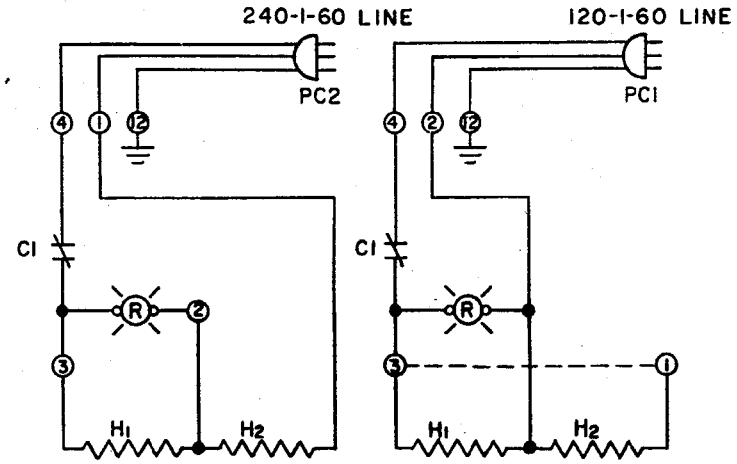
Power Cord Selection Guide

Model	Voltage	Cord Designation
LEB1-20, LEB1-27	120-1-60	AA-120V
	240-1-60	AB-240V
LDB1-18, LDB1-23	120-1-60	AC-120V
	240-1-60	AD-240V

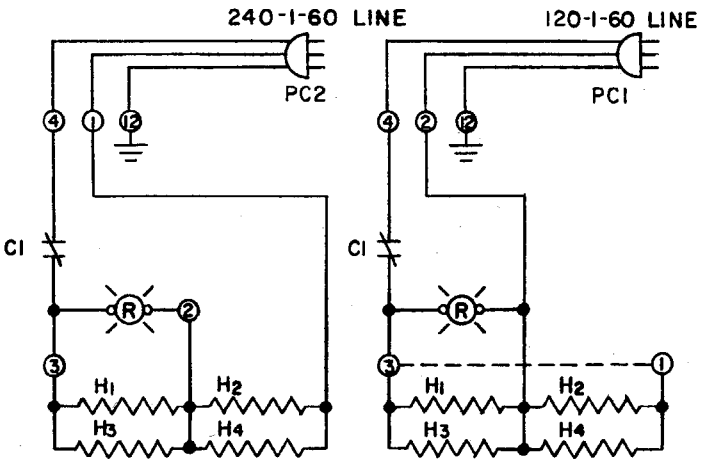
Specifications

Model	LDB1-18	LEB1-20	LDB1-23	LEB1-27
Voltage	120-1-60 or 240-1-60			
Amps	9.3/4.7	7.5/3.8	12.6/6.3	10.8/5.4
Heater Capacity	900 watts		1300 watts	
Maximum Temperature	400°F			

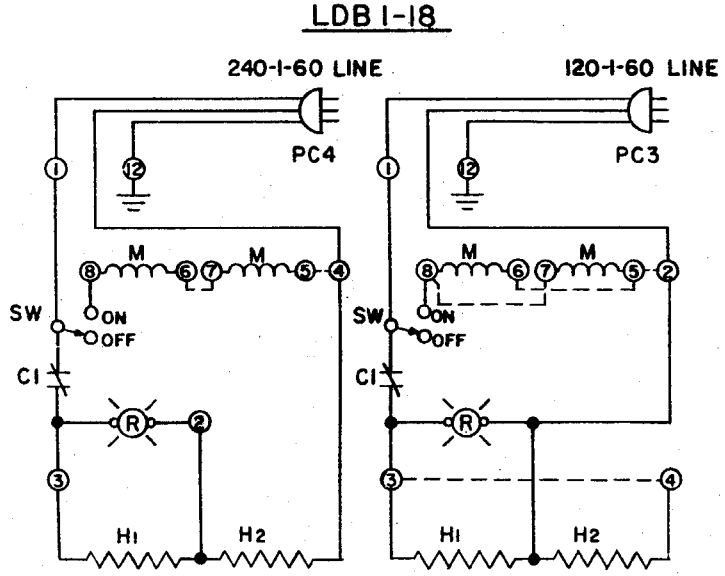
LEB1-20



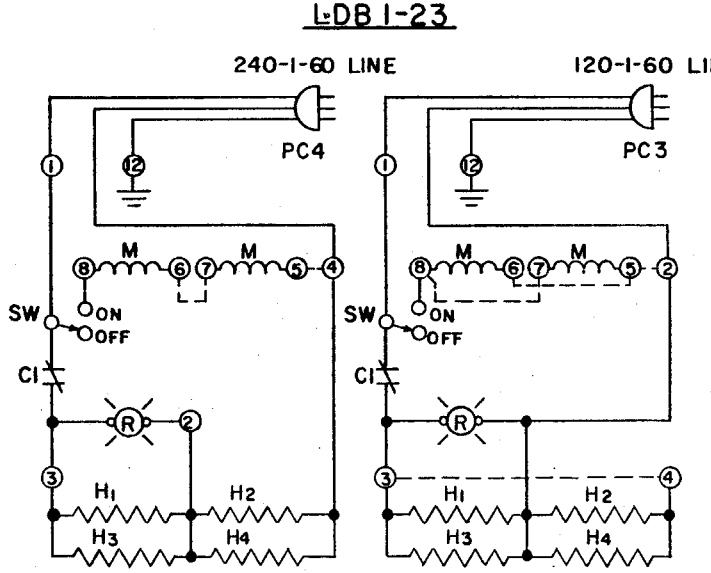
LEB1-27



LDB1-18



LDB1-23



SW- MOTOR SWITCH
C1- CONTROL
R - RED PILOT LIGHT
M - MOTOR WINDINGS
H1, H2-450 WATT HEATER
H3, H4-200 WATT HEATER
PC1-AA-120V POWER CORD
PC2-AB-240V POWER CORD
PC3-AC-120V POWER CORD
PC4-AD-240V POWER CORD

NOTES ○ PLUG POINT NUMBER
--- JUMPER INSIDE POWER CORD

CUST. NO.	
SERIAL NO.	
DESPATCH OVEN COMPANY MINNEAPOLIS, MINNESOTA	
DESIGNED FOR SCHEMATIC	
ENGINEER RCA	SCALE -1 FT. DATE 4-14-70
CHECKED	BE-6580
APPROVED	

Material List

LEB1-20, LEB1-27, LDB1-18, LDB1-23

Item	Part Number	Description
1-2H	007829	450 Watt Strip Heater 115V
3-4H	007828	200 Watt Strip Heater 115V
M	205692	Motor Kit ***(LDB MODELS ONLY)***
	007281	Fan Wheel 05.75X1.00X.31
PC*	N/A	PC Power Cord 1 thru 4
SW	012176	Heater Switch
R	008661	#36EN21111-24 Red Light
TC	012387	DI-32-036-01-26 Thermostat 100-550F
HL	097356	Hi-limit Kit
Thermometer	019484	Thermometer –10 to 205C
Grommet	053006	Thermometer Silicone Grommet ½"OD by 15/64" ID
Seal	018663	Door Seal
Hinge	007857	Hinge Piano 1.5 Ft Long
Handle	271491	#1000A Lever Handle
Strike Plate	N/A	Strike Plate for Handle
Feet	016700	Rubber Feet

LEB1-75, LDB1-67

INSTRUCTIONS FOR OPERATING A DESPATCH STERILIZER WITH AUTOMATIC TEMPERATURE CONTROL

Remove all packing from inside sterilizer. Attach rubber feet to bottom of sterilizer. Install shelf clips inside work chamber. Fit aluminum vent cap over exhaust stack on top of sterilizer. Slide rubber retaining washer part way up thermometer body. Insert thermometer through hole in aluminum vent cap.

Oven is designed for operation on either 120 or 240 volts.

FOR 240/1/60 OPERATION
Jumper terminals 4 and 6
Jumper terminals 5 and 7
Connect line to terminals 1 and 2

FOR 120/1/60 OPERATION
Jumper terminals 1 and 2
Jumper terminals 3, 4 and 5
Jumper terminals 6 and 7
Connect hot line to terminal 1
Connect ground line to terminal 3

Turn circuit breaker "on." Set thermostat for desired operating temperature. Pilot light goes on and off with thermostat. To shut heater off turn thermostat to "off" position.

If the temperature indicated on the dial of the Robertshaw thermostat is not the same as the temperature indicated on the thermometer, the thermostat should be recalibrated. Before making any adjustment, sterilizer should be at operating temperature for two hours. Remove the calibrated dial from the thermostat. There is a circular disc under the dial. Loosen the two screws in the slotted holes which hold the disc in place and turn disc. After turning, tighten the two screws and replace the thermostat dial. Repeat operation if necessary.

The heating elements are attached to the bottom side of the floor plate which is located at the bottom of the work chamber. A row of fresh air inlet holes are located along the front edge of the floor plate. Do not allow these fresh air inlet holes to become obstructed. The amount of air exhausted from the sterilizer is regulated by turning the aluminum vent cap on the top of the sterilizer. Do not open vent more than necessary to exhaust moisture or fumes from the sterilizer.

When placing material in sterilizer, allow the maximum amount of air space around the various parts being processed. This will tend to equalize the temperature throughout the work chamber.

Important Recommendations

1. Rubber feet are required for proper cooling of control compartment. Do not operate sterilizer until feet are installed.

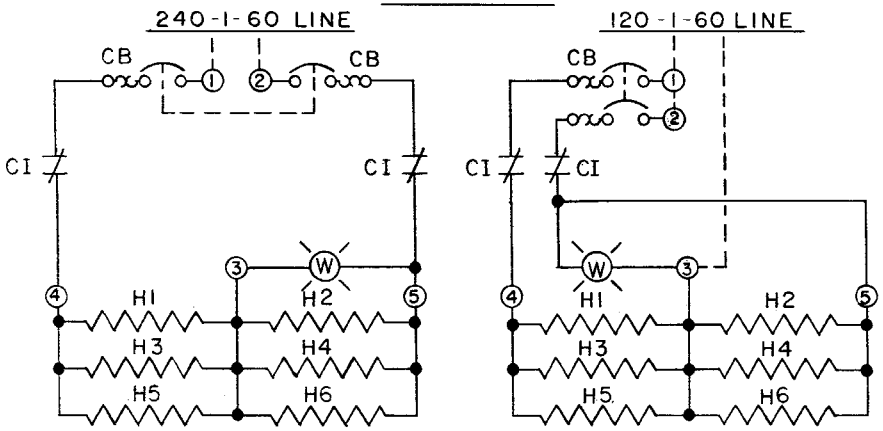
2. Do not place any material on floor plate. The uneven distribution of heat may result in excessive warping of the floor plate and subsequent failure of heating elements. Use shelves provided.

Oven frame should be grounded electrically to prevent danger of injury to the operator.

Any other information will be gladly furnished upon request.

POWER REQUIREMENTS
Volts - 120/240; Cycles - 60; Phase - 1
Heater Capacity - 2700 Watts; Amps - 24.3/12.2
Maximum Operating Temperature - 400°F.

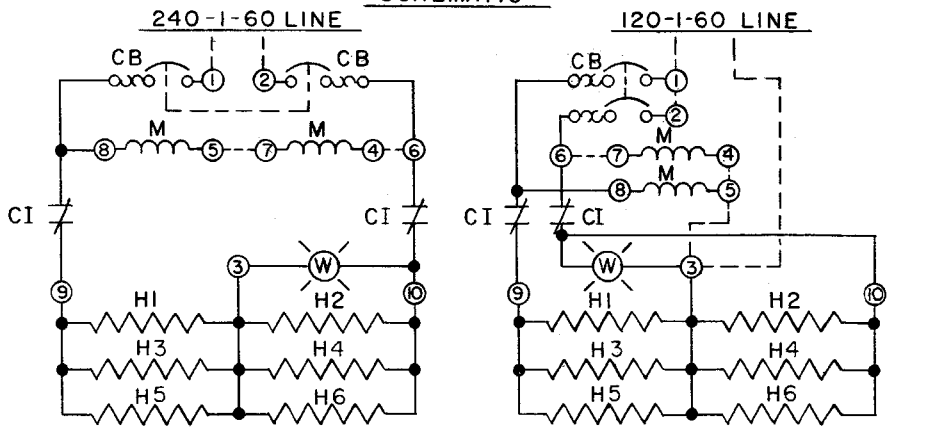
LEBI-75
SCHEMATIC



FOR 240-1-60 LINE
CONNECT LINE TO ① & ②

FOR 120-1-60 LINE
JUMPER ① & ②
CONNECT HOT TO ①; GND. TO ③

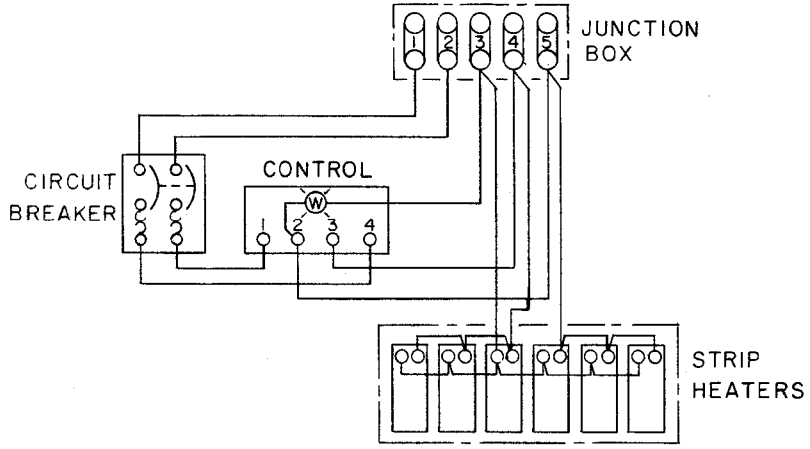
LDBI-67
SCHEMATIC



FOR 240-1-60 LINE
JUMPER ④ & ⑥; ⑤ & ⑦
CONNECT LINE TO ① & ②

FOR 120-1-60 LINE
JUMPER ① & ②; ③, ④ & ⑤; ⑥ & ⑦
CONNECT HOT TO ①; GND. TO ③

WIRING DIAGRAM



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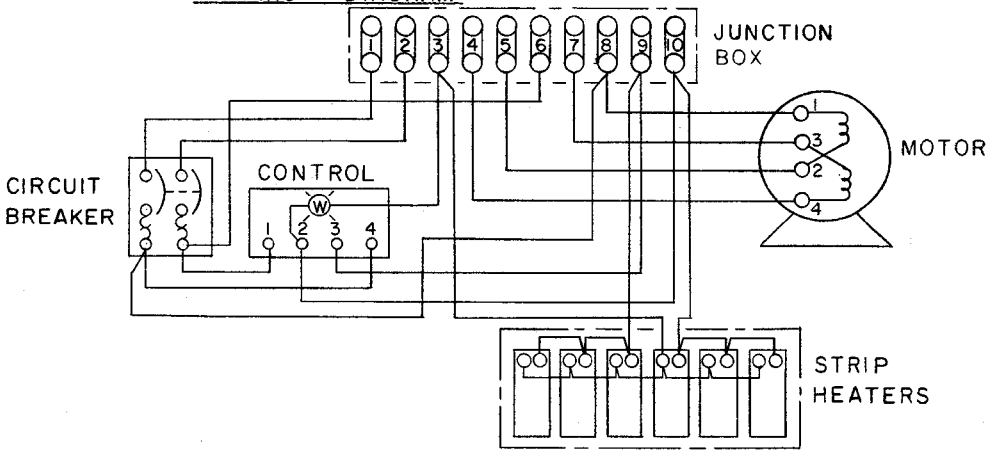


NOTES: ○ TERMINAL NUMBERS

——— CUSTOMERS CONNECTIONS

CI- CONTROL

CB- CIRCUIT BREAKER

M - MOTOR WINDINGS

HI-6 - 450 WATT STRIP HEATERS

CUST. No.

SERIAL No.

DESPATCH OVEN COMPANY
MINNEAPOLIS, MINNESOTA

LEBI-75 & LDBI-67
DESIGNED FOR

ENGINEER RCA | SCALE -1 FT. | DATE 4-16-71
CHECKED
APPROVED

BE-6580-2

Material List

LEB1-75, LDB1-67

Item	Part Number	Description
1-6H	007829	450 Watt Strip Heater 115V
M	205692	Motor Kit ***(LDB MODELS ONLY)***
	007281	Fan Wheel 05.75X1.00X.31
CB	005068	Circuit Breaker QCL2020 2 Pole 20 Amp 250V
R	008661	#36EN21111-24 Red Light
TC	012387	DI-32-036-01-26 Thermostat 100-550F
HL	097356	Hi-limit Kit
Thermometer	019484	Thermometer –10 to 205C
Grommet	053006	Thermometer Silicone Grommet ½"OD by 15/64" ID
Washer	012760	Washer Fiber.25"ID x .75"OD x .125 Thick
Seal	018663	Door Seal 0.5" x 0.68" x 9.5 Ft. Long
	008057	Door Seal 1.5" x 25.25" Long
Hinge	007857	Hinge Piano 1.5 Ft Long
Handle	005895	Handle 12: Long
Latch	008199	Latch Adjustable
Feet	016700	Rubber Feet

INSTRUCTIONS FOR OPERATING A DESPATCH STERILIZER WITH AUTOMATIC TEMPERATURE CONTROL

(MODELS LDB2-17, LDB2-28, LEB2-19, LEB2-29)

Remove all packing from inside sterilizer. Attach rubber feet to bottom of sterilizer. Install shelf clips inside work chamber. Fit aluminum vent cap over exhaust stack on top of sterilizer. Slide rubber retaining washer part way up thermometer body. Insert thermometer through hole in aluminum vent cap.

Service connections are made to terminals in junction box in rear of oven.

See additional instructions regarding operation of control instrument.

Turn circuit breaker "on." Set thermostat for desired operating temperature. Pilot light goes on and off with thermostat. To shut motor off turn thermostat to "off" position.

If the temperature indicated on the dial of the Robertshaw thermostat is not the same as the temperature indicated on the thermometer, the thermostat should be recalibrated. Before making any adjustments, sterilizer should be at operating temperature for two hours. Pull knob and dial from thermostat shaft. Calibrating screw is located in center of thermostat shaft. If the temperature indicated on the dial of the Robertshaw is higher than the temperature indicated on the thermometer, turn calibrating screw counter-clockwise. If the temperature indicated on the dial of the thermostat is lower than the temperature indicated on the thermometer, turn calibrating screw clockwise. Replace knob and dial on the thermostat shaft. Repeat operation if necessary.

The heating elements are attached to the bottom side of the floor plate which is located at the bottom of the work chamber. A row of fresh air inlet holes is located along the front edge of the floor plate. Do not allow these fresh air inlet holes to become obstructed. The amount of air exhausted from the sterilizer is regulated by turning the aluminum vent cap on the top of the sterilizer. Do not open vent more than necessary to exhaust moisture or fumes from the sterilizer.

When placing material in sterilizer, allow the maximum amount of air space around the various parts being processed. This will tend to equalize the temperature throughout the work chamber.

Important Recommendations

1. Rubber feet are required for proper cooling of control compartment. Do not operate sterilizer until feet are installed.

2. Do not place any material on floor plate. The uneven distribution of heat may result in excessive warping of the floor plate and subsequent failure of heating elements. Use shelves provided.

Oven frame should be grounded electrically to prevent danger of injury to the operator.

Any other information will be gladly furnished upon request.

Power Requirements

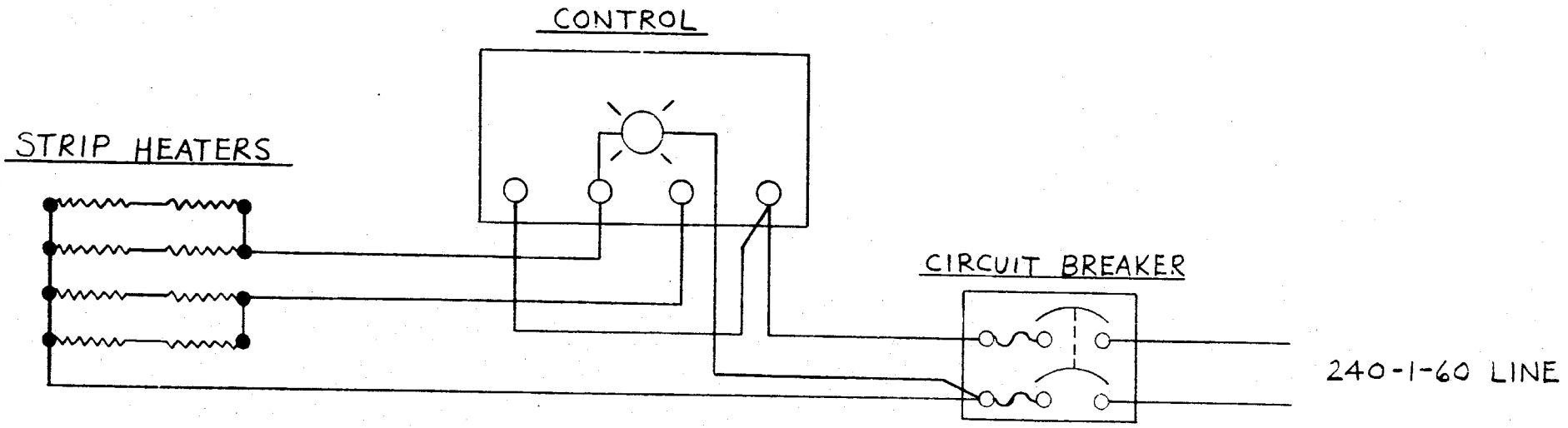
Volts - 240; Cycles - 60; Phase - 1
LDB2-17/LEB2-19 Heating Capacity - 3,600 watts; Amps -15.0
LDB2-28/LEB2-29 Heating Capacity - 4,500 watts; Amps - 20.0
Motor(s) Amps - 1.6
Maximum Operation Temperature - 400°F

DESPATCH INDUSTRIES MINNEAPOLIS, MINNESOTA

No. E-5324-8	
SER.	DATE 9-11-65
DRAWN BY CR	CHECKED

DESPATCH OVEN COMPANY
MINNEAPOLIS, MINNESOTA

MODEL LEB2-19



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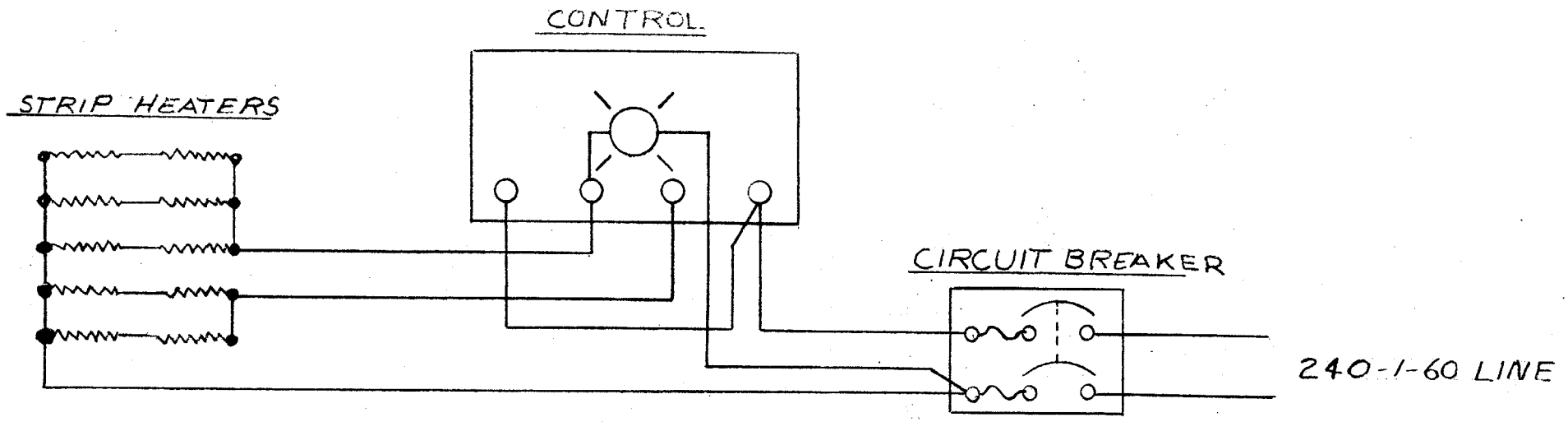
DRAWN BY TNT	CHECKED

DESPATCH OVEN COMPANY
MINNEAPOLIS, MINNESOTA

MODEL LEB2-29



MODEL LDB2-17

No. E-5324-8E	
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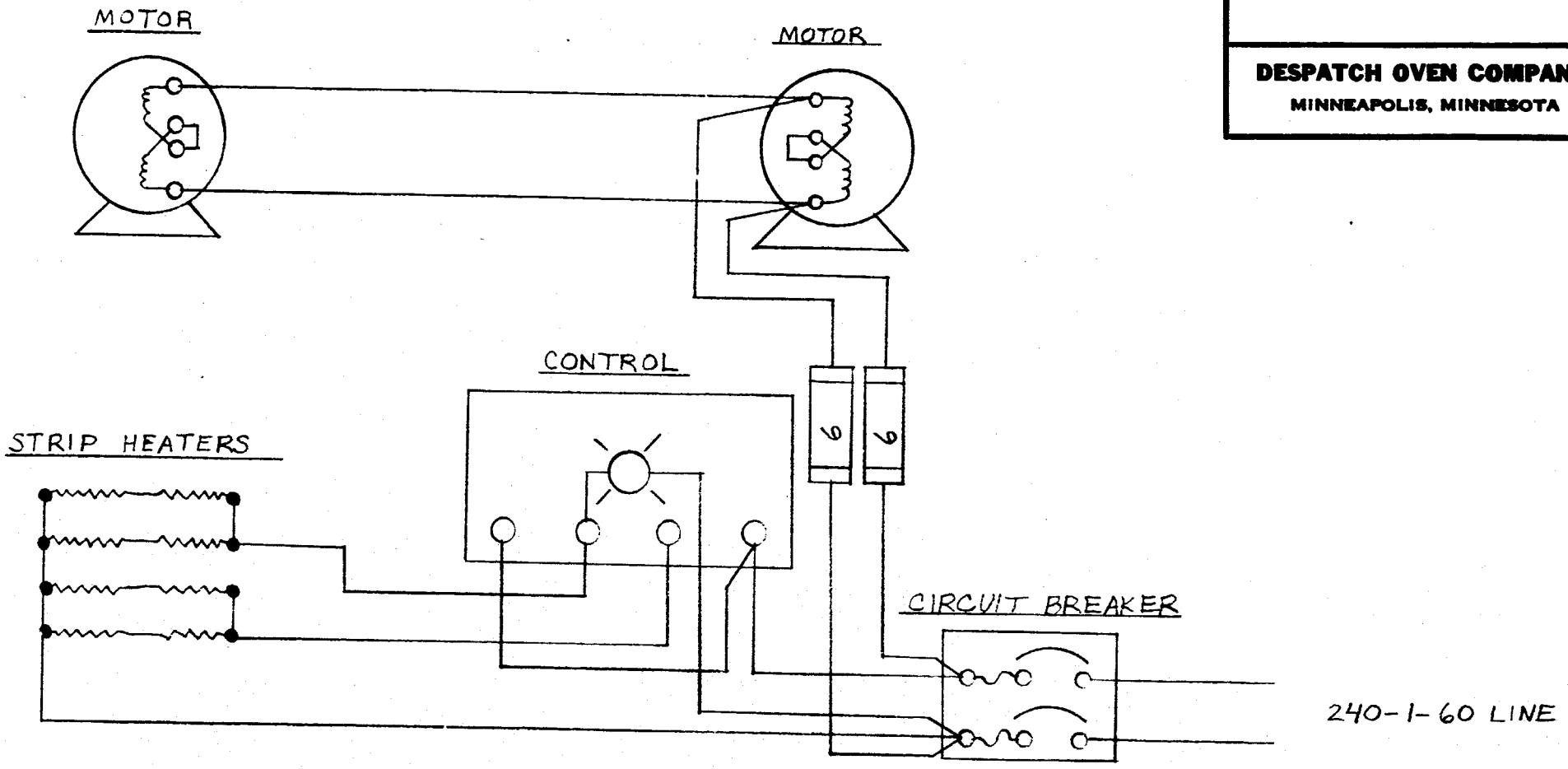
DRAWN BY CW	CHECKED

DESPATCH OVEN COMPANY
MINNEAPOLIS, MINNESOTA



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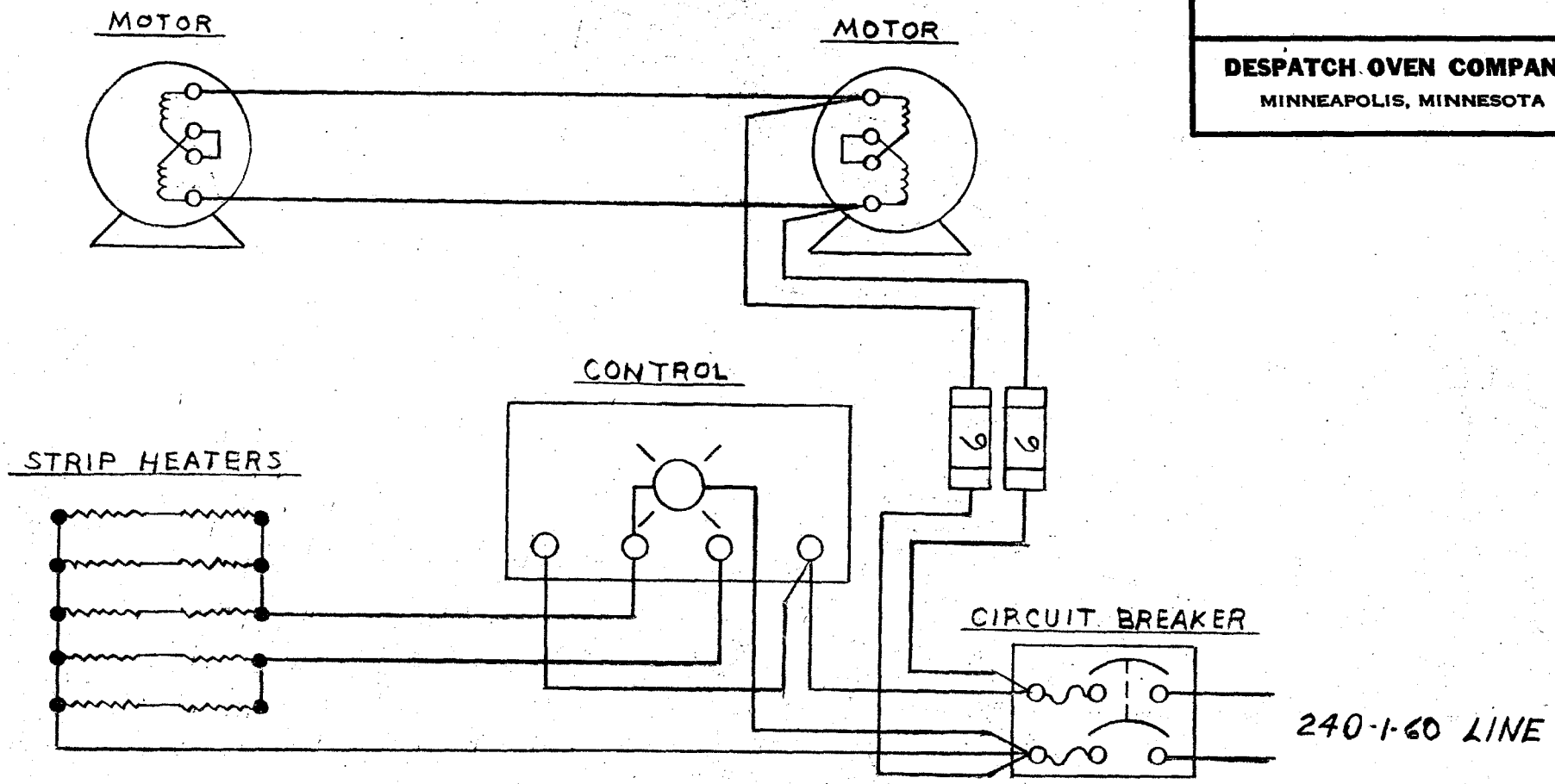
DESPATCH OVEN COMPANY
MINNEAPOLIS, MINNESOTA

MODEL LDB2-28



Material List

LEB2-19, LEB2-29, LDB2-17, LDB2-28

Item	Part Number	Description
1-2FU	007471	HKP Fuse Holder 15 Amp 250V
	007615	Fuse 6Amp 250V ***(LDB MODELS ONLY)***
CB	005068	Circuit Breaker QCL2020 2 Pole 20 Amp 250V ***(LDB2-17 & LEB2-19 ONLY)***
CB	005073	Circuit Breaker QCL2030 2 Pole 30 Amp 250V ***(LDB2-28 & LEB2-29 ONLY)***
CR	208283	Relay 700HB33Z1 110VDC
	250813	Relay Socket
C	004902	Capacitor 200 MFD 150WVDC
RE	010470	Resistor 1K ohm 5W
D	010398	Diode IN5060
TC	012387	DI-32-036-01-26 Thermostat 100-550F
R	008661	#36EN21111-24 Red Light
HL	097356	Hi-limit Kit
1-2M	205692	Motor Kit ***(LDB MODELS ONLY)***
	007281	Fan Wheel 05.75X1.00X.31
1-8H	007829	450 Watt Strip Heater 115V ***(LDB2-17 & LEB2-19 ONLY)***
1-10H	007829	450 Watt Strip Heater 115V ***(LDB2-28 & LEB2-29 ONLY)***
Thermometer	019484	Thermometer –10 to 205C
Grommet	053006	Thermometer Silicone Grommet ½"OD by 15/64" ID
Washer	012760	Washer Fiber.25"ID x .75"OD x .125 Thick
Seal	018663	Door Seal 0.5" x 0.68" x 13 Ft. Long
	008057	Door Seal 1.5" x 38.25" Long
Hinge	007857	Hinge Piano 1.5 Ft Long
Handle	005895	Handle 12: Long
Latch	008199	Latch Adjustable
Feet	016700	Rubber Feet