Service Manual for the Lang Models:

ECCO-LMDR

CINNABON

TABLE OF CONTENTS

IMPORTANT READ FIRST IMPORTANT

CAUTION: **EACH UNIT WEIGHS 430 LBS. FOR SAFE HANDLING, INSTALLER SHOULD OBTAIN HELP AS NEEDED, OR EMPLOY APPROPRIATE MATERIALS HANDLING EQUIPMENT (SUCH AS A FORKLIFT, DOLLY, OR PALLET JACK) TO REMOVE THE UNIT FROM THE SKID AND MOVE IT TO THE PLACE OF INSTALLATION.**

CAUTION: **ANY STAND, COUNTER OR OTHER DEVICE ON WHICH OVEN WILL BE LOCATED MUST BE DESIGNED TO SUPPORT THE WEIGHT OF THE OVEN.**

CAUTION: **SHIPPING STRAPS ARE UNDER TENSION AND CAN SNAP BACK WHEN CUT.**

DANGER: **THIS APPLIANCE MUST BE GROUNDED AT THE TERMINAL PROVIDED. FAILURE TO GROUND THE APPLIANCE COULD RESULT IN ELECTROCUTION AND DEATH.**

WARNING: **INSTALLATION OF THE UNIT MUST BE DONE BY PERSONNEL QUALIFIED TO WORK WITH ELECTRICITY AND PLUMBING. IMPROPER INSTALLATION CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT. UNIT MUST BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES.**

NOTICE: **The data plate is located above control panel behind wire mesh screen. The oven voltage, wattage, serial number, wire size, and clearance specifications are on the data plate. This information should be carefully read and understood before proceeding with the installation.**

NOTICE: **The installation of any components such as a vent hood, grease extractors, fire extinguisher systems, must conform to their applicable National, State and locally recognized installation standards.**

NOTICE: **During the first few hours of operation you may notice a small amount of smoke coming off the oven, and a faint odor from the smoke. This is normal for a new oven and will disappear after the first few hours of use.**

CAUTION: **ALWAYS KEEP THE AREA NEAR THE APPLIANCE FREE FROM COMBUSTIBLE MATERIALS.**

CAUTION: **KEEP FLOOR IN FRONT OF EQUIPMENT CLEAN AND DRY. IF SPILLS OCCUR, CLEAN IMMEDIATELY, TO AVOID THE DANGER OF SLIPS OR FALLS.**

IMPORTANT READ FIRST IMPORTANT

WARNING: **KEEP WATER AND SOLUTIONS OUT OF CONTROLS. NEVER SPRAY OR HOSE CONTROL CONSOLE, ELECTRICAL CONNECTIONS, ETC.**

CAUTION: **MOST CLEANERS ARE HARMFUL TO THE SKIN, EYES, MUCOUS MEMBRANES AND CLOTHING. PRECAUTIONS SHOULD BE TAKEN TO WEAR RUBBER GLOVES, GOGGLES OR FACE SHIELD AND PROTECTIVE CLOTHING. CAREFULLY READ THE WARNING AND FOLLOW THE DIRECTIONS ON THE LABEL OF THE CLEANER TO BE USED.**

NOTICE: **Service on this, or any other, LANG appliance must be performed by qualified personnel only. Consult your authorized service station directory or call the factory at 1-800-224-LANG (5264), or WWW.LANGWORLD.COM for the service station nearest you.**

WARNING: **BOTH HIGH AND LOW VOLTAGES ARE PRESENT INSIDE THIS APPLIANCE WHEN THE UNIT IS PLUGGED/WIRED INTO A LIVE RECEPTACLE. BEFORE REPLACING ANY PARTS, DISCONNECT THE UNIT FROM THE ELECTRIC POWER SUPPLY.**

CAUTION: **USE OF ANY REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY LANG OR THEIR AUTHORIZED DISTRIBUTORS CAN CAUSE BODILY INJURY TO THE OPERATOR AND DAMAGE TO THE EQUIPMENT AND WILL VOID ALL WARRANTIES.**

LANG MODEL: ECCO-LMDR (ELECTRIC FULL SIZE CONVENTION OVEN)

EXTERIOR

- The oven exterior dimensions are 40" (100 cm) Wide, 27" (67.5 cm) High, 38" (95 cm) Deep. The Top, Front, Back, and Sides are constructed of stainless steel with an aluminized bottom.
- The oven doors come standard with a double pane window.
- The door handle is constructed of Stainless Steel and Phonolic Tubing.
- The oven cavity is insulated with high temperature insulation for efficiency and reduced heat loss.

INTERIOR

- The oven cavity dimensions are 29" (72.5 cm) Wide, 20" (50.84 cm) High, 21" (53.38 cm) Deep.
- The oven is designed for three shelves and comes with three Chrome Plated Racks.
- The interior of the oven is constructed of porcelainized stainless steel.

OPERATION

- The ECCO oven is a forced air convection oven with a vented oven cavity.
- The air is driven by a 1/3 HP fan motor.

CONTROLS

- **ECCO-LMDR**
  - Complete Computerized Controls with a Manual Override system.
  - Independent Shelf Timers for each Shelf.
  - Load Control through use of Cooking Curves.
  - Shelf Compensation Timing for uniform baking.
  - Single speed fan.

ECCO-LMDR

Convection Oven Start-Up

1) Verify connections at plug and terminal block ☐

2) Incoming Volt - Single Phase L1-L2_____
Three Phase L1-L2_____ L2-L3_____ L3-L1_____

3) Amp draw L1_____
L2_____
L3_____

4) Motor amp draw _____

5) Are programs correct? Yes ☐ No ☐

6) Verify actual temperature at 310 °F _____ °F.
Note:
Install thermocouple wire in center of oven cavity.
Let oven cycle off and on 3 times before recording temperature.

Model #_____ Date_____ Serial #_____

Store #_____ Tech Name_____
Contact_____ Company _____
Store Phone #_____ Service Company Phone #_____

Address_____
_____
_____

INSTALLATION

Receiving the Oven

- Upon receipt, check for freight damage, both visible and concealed. Visible damage should be noted on the freight bill at the time of delivery and signed by the carrier's agent. Concealed loss or damage means loss or damage that does not become apparent until the merchandise has been unpacked. If concealed loss or damage is discovered upon unpacking, make a written request for inspection by the carrier's agent within 15 days of delivery. All packing material should be kept for inspection. Do not return damaged merchandise to Lang Manufacturing Company. File your claim with the carrier.

Location

- Prior to un-crating, move the oven as near its intended location as practical. The crating will help protect the unit from the physical damage normally associated with moving it through hallways and doorways.

Un-crating

- The oven will arrive completely assembled inside a wood frame covered by cardboard box and strapped to a skid. Remove the cardboard cover, cut the straps and remove the wood frame. Remove oven from skid and place in intended location

Installing the Legs

- Legs are available for both the single and double deck installations. Single deck installations require a 27-inch leg. Double deck installations require 6-inch legs or casters.
- To install the 27-inch legs, place some cardboard on the floor and gently tip the oven onto its back. Fasten two legs to the ovens front corners using the four 5/16 inch bolts provided in the leg kit. Lift the oven onto its front legs and block the back up using one of the 27-inch legs set upside down in the center rear of the oven body. Install the last 27-inch leg onto the oven body on the control side rear. Gently lift the oven rear, remove the leg set to support the oven center and install it on the last rear corner.
- To install the 6-inch legs or casters, attach the leg or caster to the leg supports supplied in the oven by following the instructions in the box, then attach the leg support to the oven.
- The adjustable feet on the bottom of each leg may be screwed in or out as necessary to level the oven.
- A torpedo level placed on an oven rack will assist in leveling the oven

Stacking the Ovens

- Remove all the plug buttons from the top of the lower oven.
- Remove the stacking kit from the oven compartment of one oven and install the 1 1/4 inch plastic bushing into the top of the lower oven.
- Tip the top oven backwards and install two 3/8 inch socket head bolts, found in the stacking kit, into the two front leg holes that match the holes in the top of the lower oven. Install the socket head bolts with the heads of the bolt pointing away from the oven.
- Lift the top oven and gently set on top of the lower oven so that the heads of the socket head bolts nest into the holes in the top of the lower oven.

Electrical Connection

- The electrical service entrance is provided by a 1 1/4 inch knockout in the bottom right front corner of each oven, or at the oven back directly behind the control compartment. Grounding lugs are provided at both the front and rear service entrances.
- The 208/240-volt oven is a dual voltage oven and is shipped from the factory as 208 volt. The oven must be field converted to operate on a 240 volt power supply.
- To convert the oven to 240 volt, remove the jumper wire located on a terminal strip located inside the lower portion to the control compartment, or on newer units switch toggle switch in rear of oven to 240.
- With 480-volt installations check to be sure that the motor rotates in a clockwise direction as viewed from the front of the oven.
- To reverse the motor rotation in 480-volt units, switch any two incoming power supply leads and recheck the rotation.
- Supply wire size must be large enough to carry the amperage load for the number of ovens being installed. Wire size information can be found on the oven DATA PLATE.
- This oven can be installed on both single and three phase supplies and is shipped from the factory for three phase.
- To phase the oven to match the power supply, follow the charts on page 10 for proper wire size and grouping.

Clearances

- Standard minimum clearance from **combustible** construction is as follows:

  2 inches from sides
  4 inches from back
  6 inches from floor

INITIAL START-UP

PRE-POWER ON

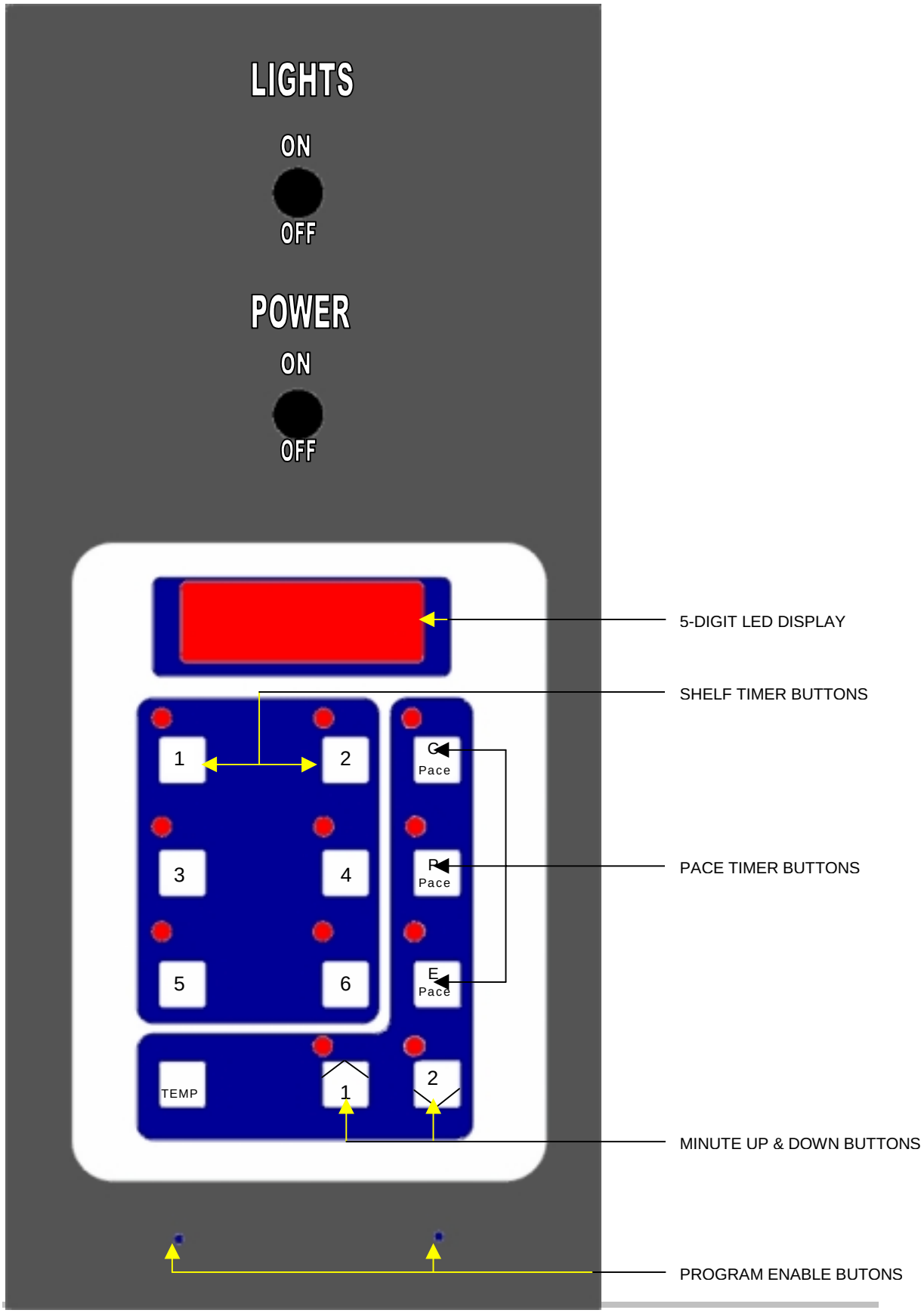
After the oven is installed and connected to power, prior to turning on, verify the following:

- The doors open and close freely.
- All five racks are in the oven correctly.
- All packing materials have been removed from the inside of the oven.

POWER ON

- When the oven is first turned on the display will read “Preheat”. The oven will begin to heat up at this point. When the oven reaches the correct temperature for the product selected, the display will read “Ready”.
- Once the oven has reached it’s programmed temperature, select the shelf position you would like to cook on, press shelf button once for “C” product, twice for “P” product, or three times for “E” product.

CONTROL PANEL ECCO-LMDR



OPERATION

GENERAL

- Convection ovens constantly circulate air over and around the product. This strips away the thin layer of moisture and cool air from around the product allowing heat to penetrate more quickly.
- Cooking times can be shortened.
- Check the product near the end of the initial cooking cycle by turning on the oven light and looking through the oven door windows.
- Do not open the oven doors during baking, as this will change the baking characteristics of the oven.
- Load each shelf evenly. Spaces should be maintained equally between the pan and oven walls, front and back.

BAKING

- Most baking should be done with the vent closed. Open the vent only with high moisture products to avoid seepage around the front of the door.
- Always weigh your product. This will give you a more consistent size, color and quality.
- Center the pan in the oven. The better the air flow around the product, the better the bake.
- The convection oven is a mechanical piece of equipment. The same control settings will always give the same results. If the results vary, problems may be because of preparation, not the oven.

LOADING

- Place product as close to oven as practical. Open oven doors and load quickly but carefully.
- If only one pan is required, load on center shelf. If two pans are required, load on top and bottom shelf. If three pans are required, load on top shelf, bottom shelf, and center shelf.

UNLOADING

- It is a characteristic of all convection ovens to unload the top shelf before the bottom shelves. The rising of heat and the hot oven ceiling causes the top shelf to bake quicker. This characteristic is more pronounced when baking at higher temperatures and/or for prolonged periods of time.

CONTROL PANEL

The control panel consists of the following items. Detailed operational descriptions are given later in this section.

POWER SWITCH Turns the oven on and off.

LIGHT SWITCH Turns the oven lights on. The switch is spring loaded so the lights will automatically turn off when the switch is released.

STATUS DISPLAY Displays the oven status (Ready, done etc.) and is the count down timer.

SHELF BUTTONS Numbered 1 to 6, these buttons represent different shelf positions.

Button #	Shelf Position
1	Top Left
2	Top Right
3	Middle left
4	Middle Right
5	Bottom Left
6	Bottom Right

PACE TIMERS Labeled C, P, and E these buttons are adjustable from one to thirty minutes.

MINUTE TIMERS There are two "minute" timers. "1" is programmed for one minute, "2" is programmed for two minutes.

TEMP BUTTON When pressed this button will display the temperature of the oven .

PROGRAMMING ENABLE BUTTONS

These are "hidden" buttons that allow the times of the shelf position buttons to be set.

STATUS DISPLAY

The Status Display (Display) informs the operator of the oven's status.

The Display informs the operator when the oven is ready to bake, or if the oven is above or below the programmed temperature.

Below is a list of displays and their definitions:

Preheat Stands for PREHEAT. A product has been selected and the oven is heating to the set temperature.

Ready A product has been selected and the oven has preheated to the programmed temperature. The oven is ready to load a product.

COOL The oven's internal temperature is below what is programmed.

Hot The oven's internal temperature is above what is programmed.

Help" There is a fault in the control system, the computer will not operate until service is performed.

Control Panel Buttons

Shelf Buttons

- Place the product into the oven on one of the six shelf positions. Close the oven doors. Press the shelf position button that corresponds to the shelf position once for "C" product, twice for "P" product, three times for "E" product, or four times for off. A beeper will sound once the product is done, and "DONE" will be displayed. Press the flashing shelf position button to cancel the beeper.

Minute and Pace Timers

- The "1" button is preset to one minute, the "2" button is preset to two minutes, and the "Pace" buttons are adjustable from one to thirty minutes. Press the button once to start the timer. The display will read out the programmed time and then revert to the previous read out. The timer will countdown internally. Time remaining can be recalled by pressing the button again.

Canceling a Timer

- Any timer can be cancelled at any time. Press and hold the timer to be cancelled until "CANCL" appears in the display.

PRE-HEAT

- The display will read "PREHEAT" once the power switch is turned on. At this point the computer board signals to turn on the heat element on. This is done at the interface board by the "heat on signal" which applies 24 volts from the interface board to the element relay coil, through the brown wire number 4A. The current path for the element relay then goes to the door switch through the blue wire, number 11. With the door closed the heat on signal energizes the element relay, and turns on the element. The element will remain on until; the computer turns off the heat on signal, the door is opened or the power is turned off.
- There is also a safety temperature thermostat in the circuit of the element relay. If the oven should get too hot the thermostat will open causing the element relay to open and turn off the element. The fan in this case would continue to run.

TEMPERATURE & TIME CONTROL

- The time and temperature are controlled by the computer according to the product programs stored in the computer memory. An RTD probe in the oven is used by the computer to determine the oven temperature. The resistance of the probe will increase as the temperature increases. The computer compares the probe reading with the programmed temperature and turns the "heat on signal" on when the oven temperature drops below the programmed temperature set point, and off when the oven temperature exceeds the programmed temperature set point.

Pace Timers

- The pace timers can be set at any time. Press and hold the "PACE" button for three seconds. The display will read out the set time then begin to flash. Press the "1" minute button to increase the time, or the "2" minute button to decrease the time. Once the corrected time is set, press and hold the "PACE" button for three seconds to exit the programming mode.

Program Enable Buttons

- The control can not be put into the programming mode if any of the timers are running. The two blue dots above the "CINNABON" logo are the program enable buttons. Press the left dot then the right dot within 3 seconds to put the control into a programming mode. Once the shelf position buttons are set, press the left dot then the right dot within 3 seconds to exit the programming mode. There will be no beeper sound when the buttons are pressed.

Shelf Position Buttons

- Put the control into the programming mode. Press the shelf button to be adjusted once for "C" product, twice for "P" product, or three times for "E" product. The display will read out "00:00" then begin to flash. Press the one-minute timer button to increase the time, or the two minute timer button to decrease the time. Once the correct time is set move on to another shelf position button or exits the programming mode.

SEQUENCE OF OPERATION

Power switch turned on

- 240/208 VAC across Common terminals on power switch and **"A"** terminal of 24 pin. **Terminal block**.
- 240/208 VAC across any **"A"** and **"B"** terminal of 24 pin **Terminal block**.
- 240/208 VAC to Common terminals of **Motor relay**.
- 240/208 VAC across common terminals of **Back-up toggle switch**.
- 120 VAC to coil of **Back-up relay**.

240/24 volt transformer energized.

- 24 VAC across **"C"** and **"D"** (common) of 24 pin **Terminal block**.
- 24 VAC across **"D"** and coil of **Motor relay**.(Through door switch)
- 24 VAC across **"D"** and of **Heat contactor**. (Through door switch and high limit thermostat)
- 24 VAC across **"D"** and Common terminals of **Back-up relay**.
- 240/12 volt transformer energized.

Back-up toggle switch Off.

- 24 VAC across **"D"** and **TP4, TP5** and **TP6**.
- 12 volts to **TP1** on **microprocessor**.
- 24 VAC across coil of **motor contactor**.
- Motor contactor closes.
- 240/208 VAC across NO (Normally open) contacts of **Motor relay**.

Motor starts.

- 24 VAC across coil of **Heat contactor**.
- **Heat contactor** closes.
- 208/240 volts to elements.
- Oven heats.

Back-up toggle switch Off.

- 208/240 VAC across coil of **Back-up relay**.

Back-up relay closes.

- 24 VAC across and **Back-up Thermostat** (With door switch energized.)
- 24 VAC across coil of **Motor relay**.
- Motor contactor closes.
- 240/208 VAC across NO (Normally open) contacts of **Motor relay**.

Motor starts.

- Temperature set on back up thermostat.
- 24 VAC across **"D"** and each terminal of back-up thermostat.
- 24 VAC across coil of **Heat contactor**.
- Heat contactor closes.
- 208/240 volts to elements.

CLEANING

- Always start with a cold oven.
- The stainless interiors can easily be cleaned using most domestic or commercial oven cleaners.
- Always follow the cleaner manufacturer's instructions when using any cleaner.
- Care should be taken to prevent caustic cleaning compounds from coming in contact with the blower wheel.
- The oven racks and rack slides may be cleaned by removing them from the oven and soaking them in a solution of ammonia and water.
- The stainless steel door liners and oven front should normally be cleaned with a soap and water solution.
- Discoloration or heat tint may be removed with any of the following cleaners: Penny Brite, Copper Brite, Du-Bois Temp, or Past Nu-Steel.
- Always apply these cleaners when the oven is cold and rub in the direction of the metal's grain.

- To help troubleshoot the oven you should perform the following “Manual Override” test:
- Open drop down door located on the lower right side, directly below front panel.
- Turn back up toggle (on/off) switch to “on” position.
- Turn main power switch to “on” position.
- Check oven for normal operation.

NO DISPLAY

PROBABLE CAUSE	CORRECTIVE ACTION
Power switch is not turned on Defective power switch Defective back-up relay	➢ Turn power switch on. ➢ Check power switch for normal operation. Replace as necessary. ➢ Check relay for normal operation. ➢ Check coil for 24 VAC. **If 24 VAC is measured**. Turn oven off and: ➢ Check coil for 7.2 KΩ. ➢ Replace as necessary. **If 24 VAC is not measured**. ➢ Verify that manual override switch is in “off” position. ➢ Check manual override switch for normal operation. ➢ Check wires for any shorts.

TROUBLESHOOTING ECCO-LMDR CONT'D

PROBABLE CAUSE	CORRECTIVE ACTION
Defective control transformer (12 VAC).	➢ Check transformer for normal operation. **NOTE:** **Unplug secondary side of control transformer from CPU before performing any tests.** **WARNING:** **TURN UNIT OFF BEFORE CHECKING ANY RESISTANCE.** ➢ Check primary coil for 208/240 VAC and 630 Ω. Check secondary coil for no less than 10.5 VAC and 1 Ω. **If voltage is measured on primary:** ➢ Check for voltage on secondary. ➢ Replace transformer. **If voltage is not measured on primary:**
Defective rectifier	➢ Check wires for any shorts. ➢ Check for no less than 10.5 VAC on **TP1** and 5 VDC on **TP2**. ➢ If correct voltage is present at **TP1** and present, but low at **TP2** unplug both ribbon connections from CPU and re-measure at **TP2**. ➢ If voltage remains low at **TP2** replace CPU (40102-311). ➢ If voltage at **TP2** increased to 5 VDC when ribbon was unplugged, plug ribbon back in to CPU and disconnect from Interface board. ➢ Re-measure at **TP2**. ➢ If voltage dropped to below 5 VDC replace ribbon cable (31110-01). ➢ If voltage remains at 5 VDC, plug ribbon back into Interface board and measure for 5 VDC at **TP3.** ➢ If voltage is present at **TP3** and display is still not on, press and hold the **R/C** button on board if LED's come on replace Interface board. ➢ If LED segment does not illuminate or the LED is blank, replace LED.

At this point you should have a display.

NO FAN-Manual Mode

PROBABLE CAUSE	CORRECTIVE ACTION
Defective 240/24 VAC transformer	➢ Check for 24 VAC on "C" and "D" of the terminal block. **If 24 VAC is not measured:** Turn off and: ➢ Check secondary coil for 1 Ω. ➢ Check primary coil for 77 Ω. ➢ Replace transformer. **If 24 VAC is measured:** Turn off and: ➢ Check back-up relay for normal operation.
Back-up relay not energizing	➢ Check for 240 VAC on relay coil. **If 240 VAC is measured:** Turn unit off and: ➢ Check back-up relay coil for 7.2 K Ω. ➢ Replace if defective. **If 240 VAC is not measured:** ➢ Check back-up switch (SPDT) for normal operation. ➢ Replace if defective.
Motor contactor not energized	➢ Check for 24 VAC at contactor or relay coil. **If 24 VAC is not measured:** Turn oven off and: ➢ Check door switch for normal operation. ➢ Check door switch for continuity. ➢ Replace or adjust door switch. **If 24 VAC is measured:** Turn unit off and: ➢ Check contactor coil for continuity. ➢ Replace if defective.

PROBABLE CAUSE	CORRECTIVE ACTION
No voltage across contactor points	➢ Check 208/240 VAC across "**C**" terminals of contactor. **If 208/240 VAC is not measured:** ➢ Check connection to main contactor (heat contactor). ➢ Check circuit breaker. **If 208/240 VAC is measured:** ➢ Check across "**NO**" contacts. Should have 208/240 VAC. ➢ Replace if defective.

Note**: Motor should now be operating.**

NO MOTOR COMPUTER MODE

PROBABLE CAUSE	CORRECTIVE ACTION
No 24 VAC on Interface board	➢ Check for 24 VAC at **TP4** to common (**"D"**). **If 24 VAC is not measured:** ➢ Check for 24 VAC at "**NC**" contacts on back-up relay. **If 24 VAC is measured:** ➢ Check for 24 VAC at **TP5**. ➢ Replace Interface board if defective.

NO HEAT Manual Mode

NOTE: Fan must be operating before trouble shooting No heat.

PROBABLE CAUSE	CORRECTIVE ACTION
Back-up relay not energizing	➢ Check for 240 VAC on relay coil. **If 240 VAC is measured.** Turn unit off and: ➢ Check back-up relay coil for 7.2 Ω. ➢ Check "**NO**" contacts for 24 VAC. ➢ Replace if defective. **If 240 VAC is not measured:** ➢ Check back-up switch (SPDT) for normal operation. ➢ Replace if defective.
Defective thermostat	➢ Turn unit off and check for continuity while cycling thermostat on and off. ➢ Replace if defective.
Defective contactor	➢ Check for 24 VAC at heater coil. **If 24 VAC is measured.** Turn oven off and: ➢ Check for continuity through coil. ➢ Replace if defective. **If 24 VAC is not measured.** Turn oven off and: ➢ Check for continuity through hi-temp wires going to over-temp thermostat. ➢ Replace over-temp thermostat if defective.
Defective elements	➢ Check elements for continuity. ➢ Replace if defective.

PROBABLE CAUSE	CORRECTIVE ACTION
Defective over-temp thermostat	➢ Check for 24 VAC on #55 red wire to common **"D"**. **If 24 VAC is not measured:** Turn oven off and: ➢ Check for continuity through over-temp thermostat. ➢ Replace if defective.

NO HEAT Computer Mode

PROBABLE CAUSE	CORRECTIVE ACTION
No 24 VAC on Interface board	➢ Check for 24 VAC at **TP4** to ground. **If 24 VAC is not measured:** ➢ Check for 24 VAC at "**NC**" contacts on back-up relay. **If 24 VAC is measured:** ➢ Check for 24 VAC at **TP6**. ➢ Replace Interface board if defective.

DISPLAY LOCKS UP

PROBABLE CAUSE	CORRECTIVE ACTION
"Help" in display	➢ Check probe for proper resistance. ➢ Check that probe connections are secure. ➢ Push "TEMP" button on control board and check to see if temperature rapidly descends. If temp does descend rapidly, replace ribbon cable. ➢ Check to see that contactors/relays are not stuck in the closed position. ➢ Replace contactor if defective. ➢ Check for foreign objects keeping contactor closed.

PROBABLE CAUSE	CORRECTIVE ACTION
"88888" stuck in display	➢ Check for stuck button by pressing any button. **If computer beeps or chirps:** ➢ Check control panel transformer (12 VAC) for proper operation. ➢ Check **TP1** for at least 10.5 VAC. ➢ Check **TP2** for at least 4.99 VDC. ➢ Check **TP3** for at least 4.97 VDC. **If computer does not beep or chirp:** ➢ Check each button for movement. ➢ Check that panel label has not been damaged in any way. ➢ Replace button if defective. ➢ Replace panel label.
Display has shelf "A"	➢ Read Programming Codes.

ANOMALIES

PROBABLE CAUSE	CORRECTIVE ACTION
Oven temp is not the same as Display temp.	➢ Check probe for correct resistance. **IF PROBE RESISTANCE IS MORE THAN 10 Ω +/-, REPLACE PROBE.** **IF CORRECT RESISTANCE IS MEASURED:** ➢ Check across **TP3** for 5 VDC (Must be at least 4.98). **IF 5 VDC IS MEASURED:** ➢ Replace CPU. **IF 5 VDC IS NOT MEASURED:** ➢ Dissconnect ribbon from CPU board and measure for 5 VDC at **TP2**. **IF 5 VDC IS NOT MEASURED:** ➢ Replace CPU.

TECHNICAL DATA

ELEMENT RESISTANCE

➢ 208 Volt	16 Ω
➢ 480 Volt	60 Ω

TRANSFORMER RESISTANCE

TRANSFORMER	Input	Primary	Secondary	Output
➢ 208/24 Volt	208/240 Volt	77 Ω	1Ω	24 Volt
➢ 240/12 Volt	208/240 Volt	630 Ω	1 Ω	12 Volt
➢ 208/240-24/12	208/240 Volt	208V 64 Ω / 240V 75 Ω	12V .6 Ω / 24V 1 Ω	24/12 Volts

CONTACTOR RESISTANCE

CONTACTOR	Coil
➢ 3 Pole 24 Volt coil	6 Ω
➢ 2 Pole 24 Volt coil (P & B) (PP & PT motor)	35 Ω

RELAY RESISTANCE

RELAY	Coil
➢ 240 VAC	7.2 KΩ

OVER-TEMP THERMOSTAT

OVER-TEMP	
➢ Wires	Normally closed

DOOR SWITCH

- Check switch between “COM” (common) and “NO” (normally open) contacts, insure switch closes approximately 3 to 4 inches before door closes.

BLOWER FAN

- Blower fan will rotate clockwise and should have a 5/8“ gap between it and the back wall of the can.

AUTO/BYPASS SWITCH

The Auto / Bypass and Energy switch are located below the controls behind a pull down access panel

- Auto/Bypass switch — Normally in **"OFF"**. The **"ON"** position will interrupt power to the computer and allow use of the back-up thermostat.
- Energy switch — Normally in **"HIGH"** for 11 kW heats. **"LOW"** WILL PROVIDE 8.25 kW heat. Not provided on Steam convection ovens.

LINE AMPERAGE, WATTAGE, AND PROPER PHASING

MODEL NUMBER	TOTAL K.W. CONNECTION	NORMAL AMPS PER LINE THREE PHASE									SINGLE PHASE	
		208 VOLT			240 VOLT			480 VOLT			208 V	240V
		L1	L2	L3	L1	L2	L3	L1	L2	L3		
ECCO	11.66	37.0	37.0	22.9	28.9	28.9	26.5	16.5	16.5	10.2	56.0	48.6
2ECCO	23.33	60.0	74.2	60.0	55.3	57.7	55.3	26.0	33.0	26.0	112.0	97.2

SERVICE CONNECTIONS					
FRONT WIRE CONNECTIONS					
	3 PHASE			1 PHASE	
	LINE 1	LINE 2	LINE 3	LINE 1	LINE 2
1st OVEN	1,4	2	3	1,3	2,4
2nd OVEN	1,4,7	2,5,8	3,6	1,3,5,7	2,4,6,8
REAR CONNECTION WIRE NUMBERS					
1st OVEN	5,8	6	7	5,7	6,8
2nd OVEN	7	5,8	6	5,7,5,7	6,8,6,8

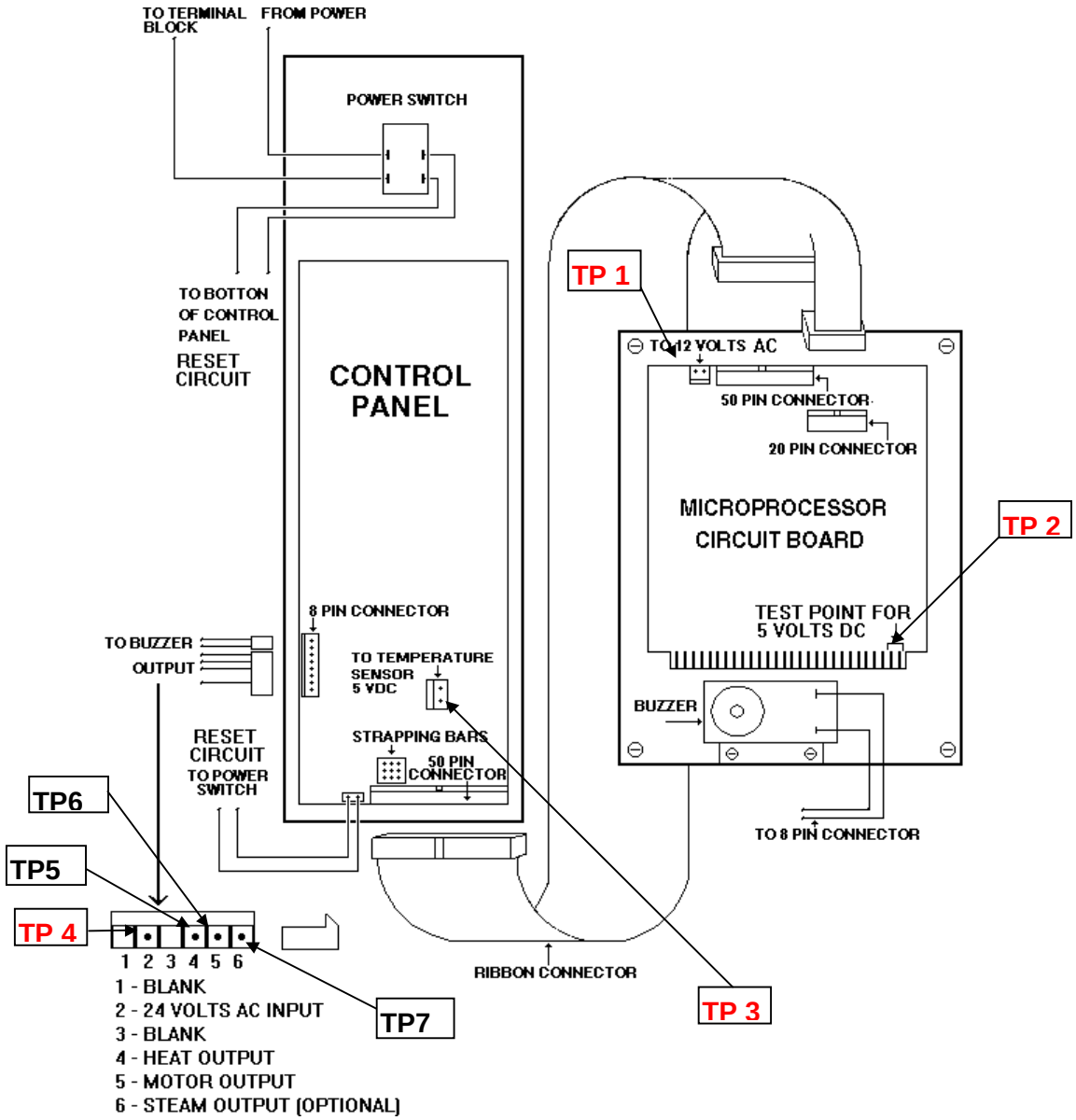
PROBE RESISTANCE

TEMP	RESISTANCE	VOLT DROP	TEMP	RESISTANCE	VOLT DROP
70°	556 Ω	1.11	290°	881 Ω	1.76
80°	569 Ω	1.14	300°	897 Ω	1.79
90°	583 Ω	1.17	310°	914 Ω	1.83
100°	596 Ω	1.19	320°	931 Ω	1.86
110°	610 Ω	1.22	330°	948 Ω	1.90
120°	623 Ω	1.25	340°	965 Ω	1.93
130°	637 Ω	1.27	350°	983 Ω	1.97
140°	651 Ω	1.3	360°	1000 Ω	2.00
150°	665 Ω	1.33	370°	1018 Ω	2.04
160°	678 Ω	1.36	380°	1036 Ω	2.07
170°	694 Ω	1.39	390°	1054 Ω	2.11
180°	709 Ω	1.42	400°	1072 Ω	2.14
190°	724 Ω	1.45	410°	1090 Ω	2.18
200°	739 Ω	1.48	420°	1109 Ω	2.22
210°	754 Ω	1.51	430°	1127 Ω	2.25
220°	769 Ω	1.54	440°	1146 Ω	2.29
230°	785 Ω	1.57	450°	1165 Ω	2.33
240°	800 Ω	1.60	460°	1184 Ω	2.37
250°	816 Ω	1.63	470°	1204 Ω	2.41
260°	832 Ω	1.66	480°	1223 Ω	2.45
270°	848 Ω	1.70	490°	1243 Ω	2.49
280°	864 Ω	1.73	500°	1263 Ω	2.53

NOTE

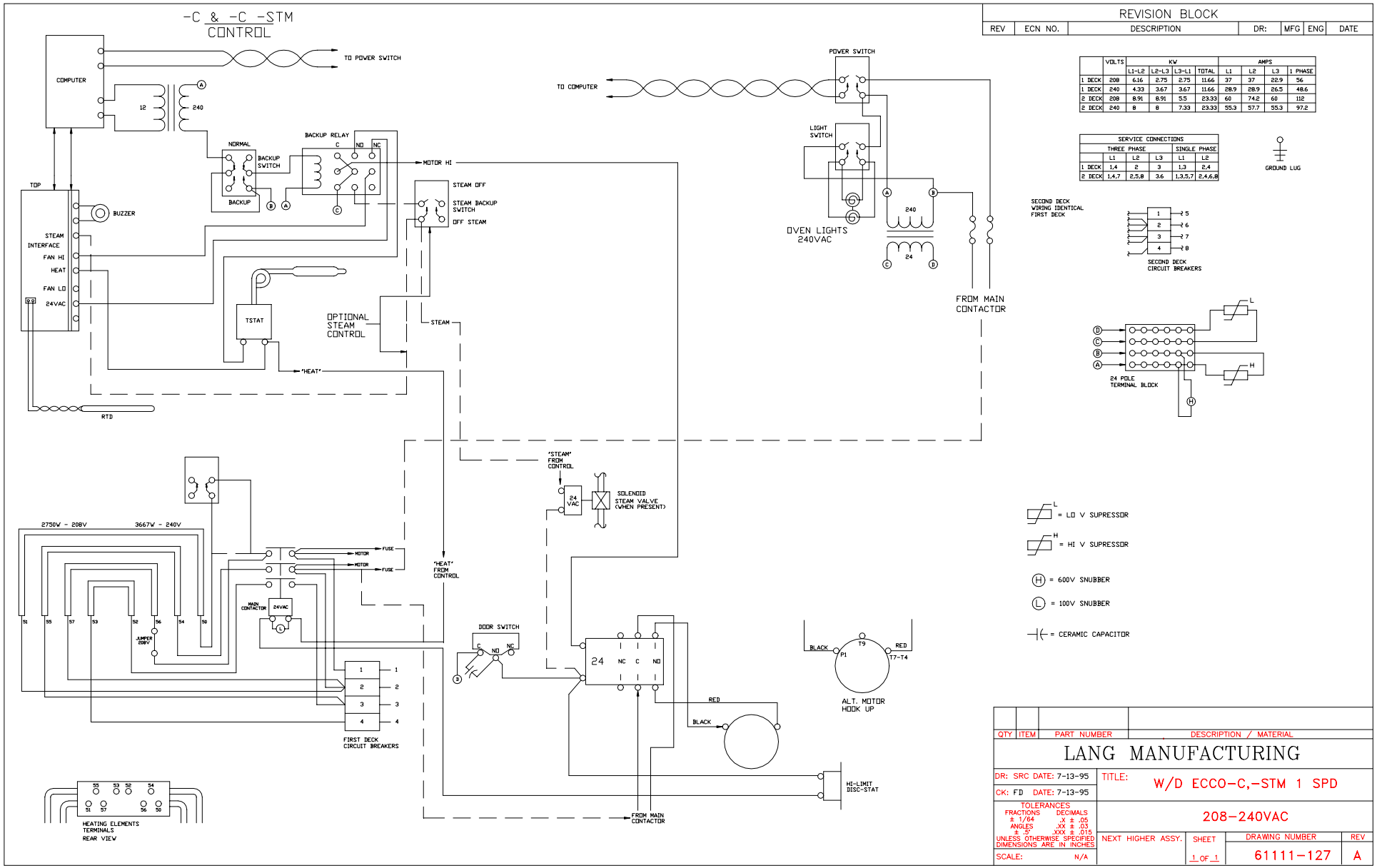
Probe is factory checked at 350 °F. Must be completely disconnected from circuit board when measuring probe resistance. Display will read "**HELP**" if probe is open or unplugged. Any probe resistance can be multiplied by 2 milli-amps (.002) to determine voltage drop.

ECCO-LMDR TEST POINT LAYOUT



WIRING DIAGRAM ECCO-LMDR 208/240

Prior to Serial # X-35736



REVISION BLOCK

REV	ECN NO.	DESCRIPTION	DR:	MFG	ENG	DATE

	VOLTS	KW				AMPS			
		L1-L2	L2-L3	L3-L1	TOTAL	L1	L2	L3	1 PHASE
1 DECK	208	6.16	2.75	2.75	11.66	37	37	28.9	56
1 DECK	240	4.33	3.67	3.67	11.66	28.9	28.9	26.5	48.6
2 DECK	208	8.91	8.91	5.5	23.33	60	74.2	60	112
2 DECK	240	8	8	7.33	23.33	55.3	57.7	55.3	97.2

SERVICE CONNECTIONS					
	THREE PHASE			SINGLE PHASE	
	L1	L2	L3	L1	L2
1 DECK	1,4	2	3	1,3	2,4
2 DECK	1,4,7	2,5,8	3,6	1,3,5,7	2,4,6,8

QTY	ITEM	PART NUMBER	DESCRIPTION / MATERIAL

LANG MANUFACTURING

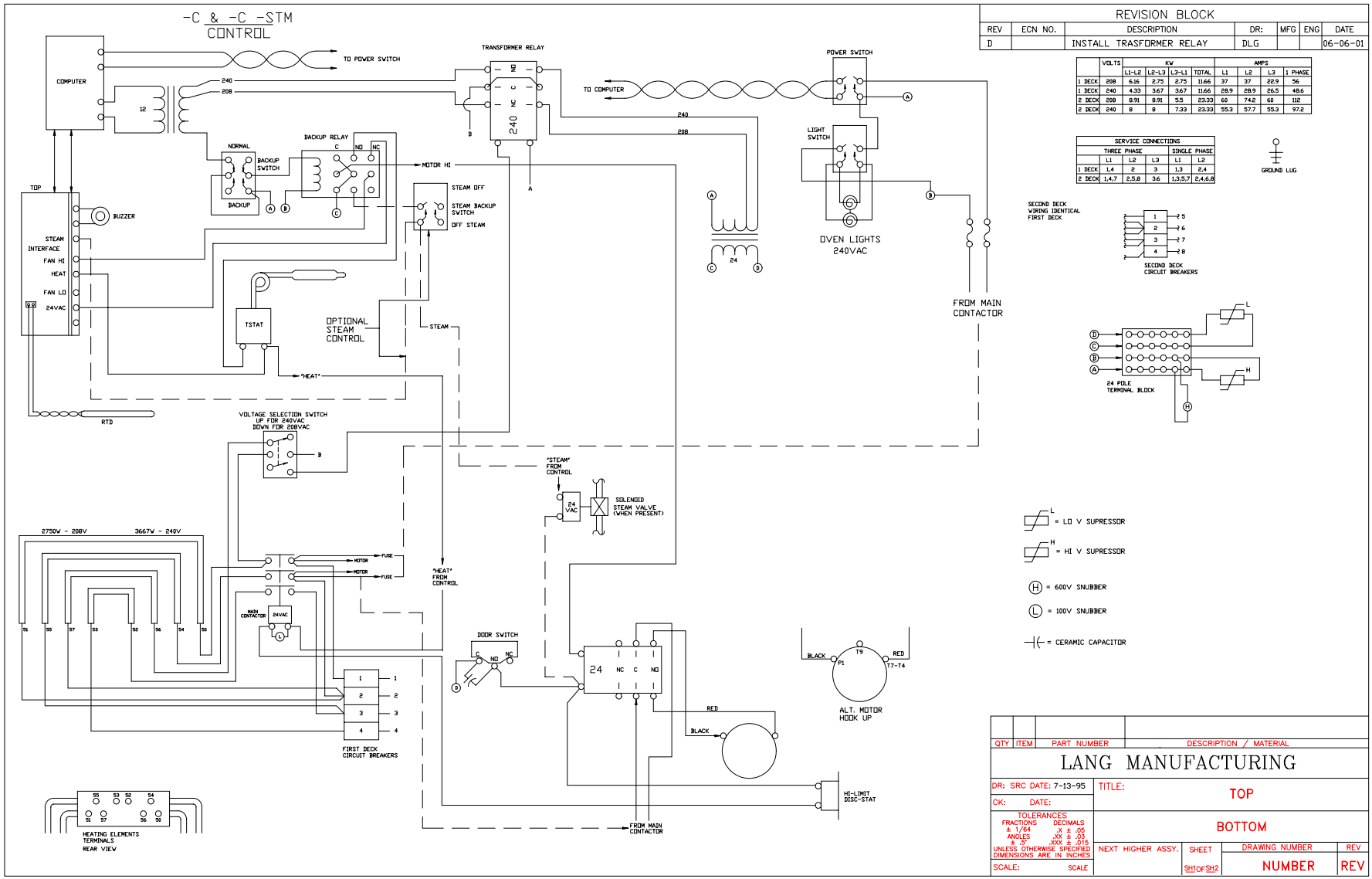
DR: SRC DATE: 7-13-95
CK: FD DATE: 7-13-95
TOLERANCES
FRACTIONS ± 1/64
DECIMALS .X ± .05 .XX ± .03 .XXX ± .015
ANGLES ± .5°
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
SCALE: N/A

TITLE: W/D ECCO-C,-STM 1 SPD
208-240VAC

NEXT HIGHER ASSY.
SHEET 1 OF 1
DRAWING NUMBER 61111-127
REV A

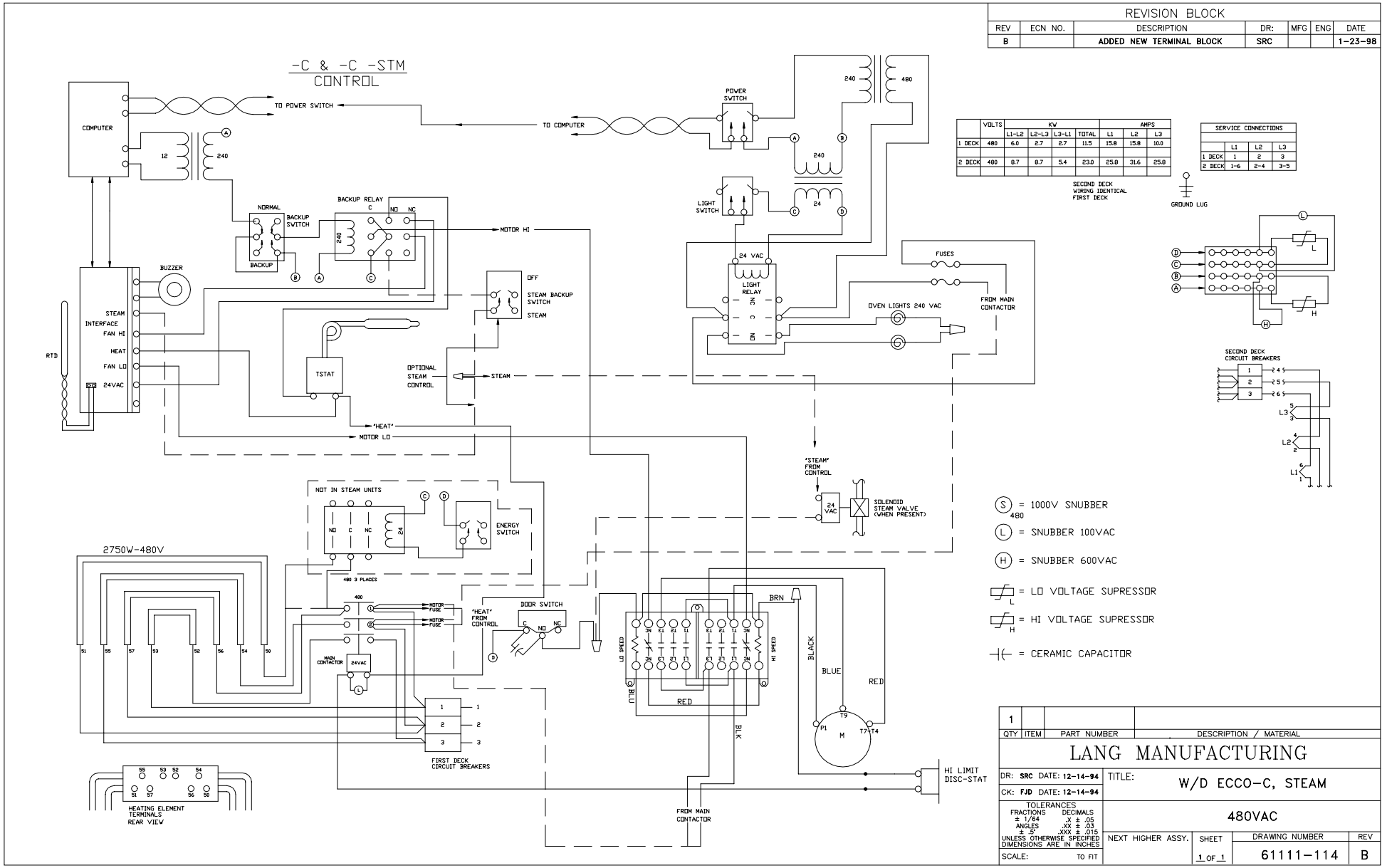
WIRING DIAGRAM ECCO-LMDR 208/240

After Serial # X-35736



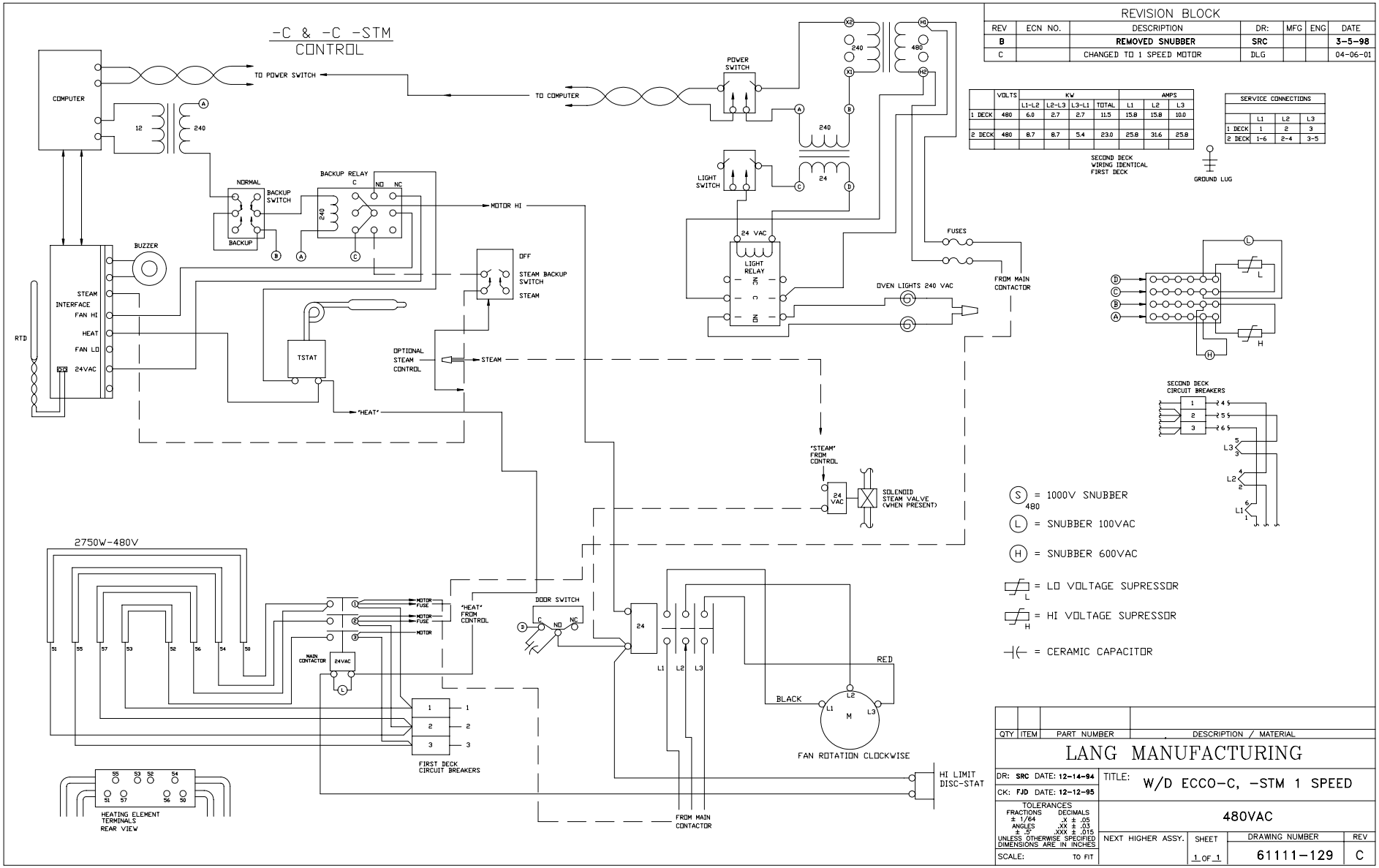
WIRING DIAGRAM ECCO-LMDR 480

Prior to Serial # V-35118



WIRING DIAGRAM ECCO-LMDR 480

After Serial # X-35118



REVISION BLOCK

REV	ECN NO.	DESCRIPTION	DR:	MFG	ENG	DATE
B		REMOVED SNUBBER	SRC			3-5-98
C		CHANGED TO 1 SPEED MOTOR	DLG			04-06-01

	VOLTS	KW				AMPS		
		L1-L2	L2-L3	L3-L1	TOTAL	L1	L2	L3
1 DECK	480	6.0	2.7	2.7	11.5	15.8	15.8	10.0
2 DECK	480	8.7	8.7	5.4	23.0	25.8	31.6	25.8

SERVICE CONNECTIONS			
	L1	L2	L3
1 DECK	1	2	3
2 DECK	1-6	2-4	3-5

QTY	ITEM	PART NUMBER	DESCRIPTION / MATERIAL

LANG MANUFACTURING

DR: SRC DATE: 12-14-94
CK: FJD DATE: 12-12-95

TITLE: W/D ECCO-C, -STM 1 SPEED

480VAC

TOLERANCES
FRACTIONS ± 1/64
ANGLES ± .5°
DECIMALS .X ± .05, .XX ± .03, .XXX ± .015
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

SCALE: TO FIT

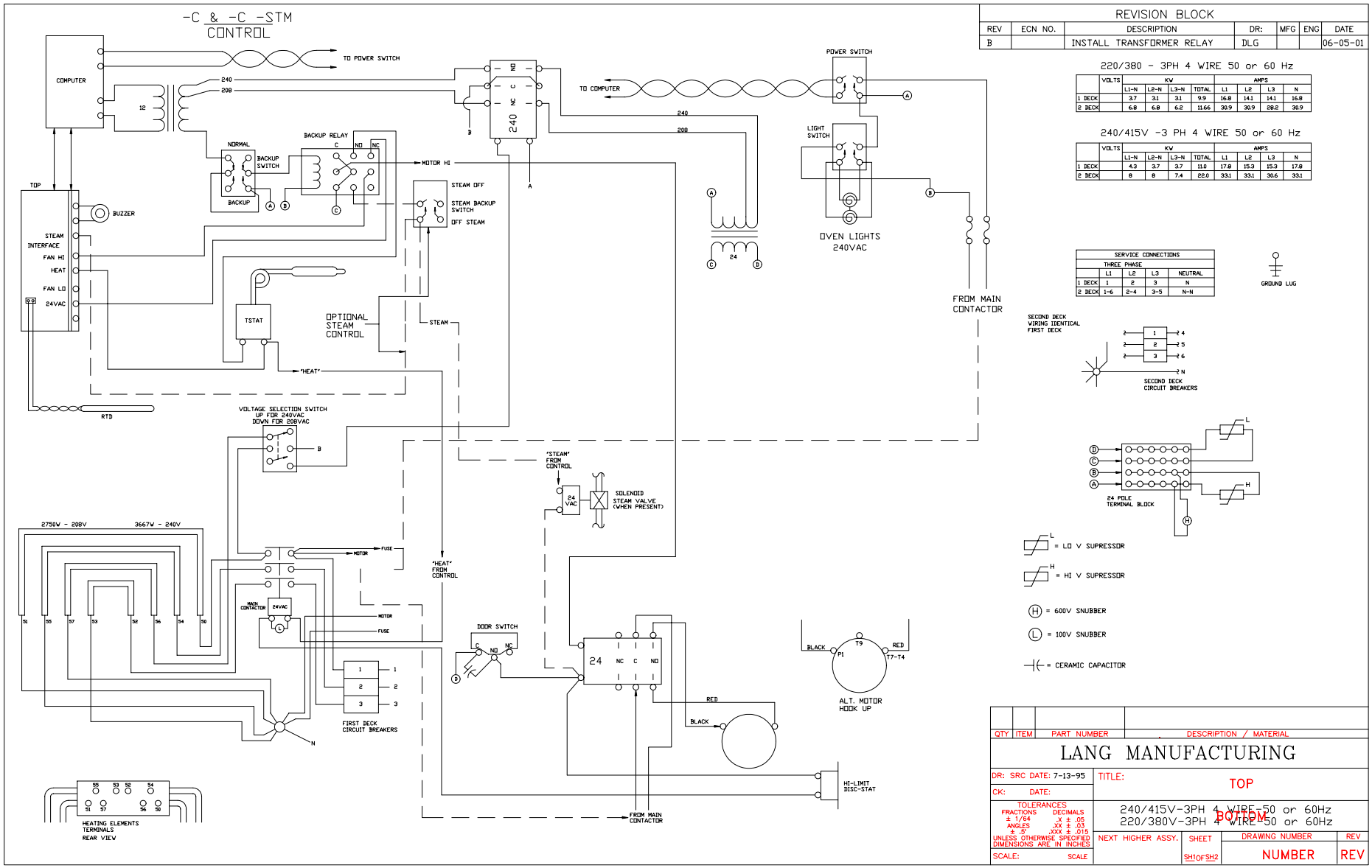
NEXT HIGHER ASSY.

SHEET 1 OF 1

DRAWING NUMBER 61111-129

REV C

WIRING DIAGRAM ECCO-LMDR 220/ 380



REVISION BLOCK

REV	ECN NO.	DESCRIPTION	DR:	MFG	ENG	DATE
B		INSTALL TRANSFORMER RELAY	DLG			06-05-01

220/380 - 3PH 4 WIRE 50 or 60 Hz

	VOLTS	KW				AMPS			
		L1-N	L2-N	L3-N	TOTAL	L1	L2	L3	N
1 DECK		3.7	3.1	3.1	9.9	16.8	14.1	14.1	16.8
2 DECK		6.8	6.8	6.2	11.66	30.9	30.9	28.2	30.9

240/415V -3 PH 4 WIRE 50 or 60 Hz

	VOLTS	KW				AMPS			
		L1-N	L2-N	L3-N	TOTAL	L1	L2	L3	N
1 DECK		4.3	3.7	3.7	11.0	17.8	15.3	15.3	17.8
2 DECK		8	8	7.4	22.0	33.1	33.1	30.6	33.1

SERVICE CONNECTIONS THREE PHASE				
	L1	L2	L3	NEUTRAL
1 DECK	1	2	3	N
2 DECK	1-6	2-4	3-5	N-N

QTY	ITEM	PART NUMBER	DESCRIPTION / MATERIAL

LANG MANUFACTURING

DR: SRC DATE: 7-13-95
CK: DATE:
TOLERANCES
FRACTIONS ± 1/64
DECIMALS .X ± .05 .XX ± .03 .XXX ± .015
ANGLES ± .5
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
SCALE: SCALE

TITLE: TOP
240/415V-3PH 4 WIRE 50 or 60Hz
220/380V-3PH 4 WIRE 50 or 60Hz
BOTTOM

NEXT HIGHER ASSY. | SHEET SH1 OF SH2 | DRAWING NUMBER NUMBER | REV REV

ECCO-LMDR

ELECTRIC COMPUTERIZED CONVECTION OVEN

DESCRIPTION	PART NO.
Element ECCO Oven 208/240 Volt 11000 Watts	11090-16
Element ECCO Oven 480 Volt 11000 Watts	11090-18
Motor 1/3 HP 480 Volt	30200-03
Motor 1/3 HP 115/208/240 Volt	30200-12
Switch Micro Convection Oven Door	30301-02
Switch Toggle On-Off	30303-06
Switch Toggle Lights	30303-16
Thermostat Safety 490°F Open	30401-09
Thermostat 450°F Oven	30402-27
Terminal Block 24 Position Quick Disconnect	30503-01
Relay 240 VAC	30600-02
Contactor 2 Spd.	30705-03
Contactor 3 Pole 24 VAC	30700-06
Contactor 2 Pole 30 Amp 24 VAC (After Serial V-90436)	30701-05
Fuse 15 AMP 300 Volt	30900-10
Fuse Holder 15 Amp	30901-08
Cable Ribbon Assembly	31110-01
Transformer 480/240 VAC	31400-04
Transformer 208-240 / 24-12 VAC	31400-26
Lamp Socket	31602-04
Lamp Incandescent 250 Volt Clear	31603-04
Oven Lamp Lens (Watch Glass)	31604-01
Oven Lamp Lens Gasket	31604-02
Circuit Breaker 208/240 Volt 1-Pole	31800-01
Circuit Breaker 480 Volt 3-Pole	31800-04
Circuit Board Assembly Buzzer	40102-10
Circuit Board Front Panel	40102-15
Circuit Board Microprocessor	40102-16
Probe Temperature Sensor	41100-08
Door Handle Bracket – Chrome (Single Handle Ovens)	50800-49-1
Door Handle Screw (Single Handle Ovens)	20104-07
Door Handle Washer (Single Handle Ovens)	20104-50
Turnbuckle Assembly (Single Handle Ovens)	50312-02
Door Left Hand (Single Handle Ovens)	51100-45
Door Right Hand (Single Handle Ovens)	51100-46
Handle Assembly, Single Handle Oven	70603-15
Knob Thermostat 450°F Oven (not used before D-57000)	70701-19
Knob Damper Black (not used before D-57000)	70701-25
Window Assembly, Oven Door	71301-04
Blower Wheel	71500-05