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Instruction Manual for the Classic LEB Series

LEB Series Despatch Ovens are bench ovens to 204°C (400°F) with gravity convection airflow.

Model	Volts	Heater watts	Amps	HZ	Phase
LEB 1-21	120*	1,200	10.0	50/60	1
LEB 1-28	120*	1,200	10.0	50/60	1
LEB 1-47	120*	1,600	13.3	50/60	1
LEB 1-76	120*	2,400	20.0	50/60	1
LEB 2-20	240	3,600	15.0	50/60	1
LEB 2-30	240	4,800	20.0	50/60	1

* A 240V conversion kit is available.

Notice

Users of this equipment must comply with operating procedures and training of operation personnel as required by the Occupational Safety and Health Act (OSHA) of 1970, Section 6 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 86 of 1990.

Caution

Setup and maintenance of the equipment should be performed by qualified personnel who are experienced in handling all facets of this type of system. Improper setup and operation of this equipment could cause an explosion that may result in equipment damage, personal injury or possible death.

Dear Customer,

Thank you for choosing Despatch Industries. We appreciate the opportunity to work with you and to meet your heat processing needs. We believe that you have selected the finest equipment available in the heat processing industry.

At Despatch, our service does not end after the purchase and delivery of our equipment. For this reason we have created the Service Products Division within Despatch. The Service Products Division features our Response Center for customer service. The Response Center will direct and track your service call to ensure satisfaction.

Whenever you need service or replacement parts, contact the Response Center at 1-800-473-7373: FAX 612-781-5353.

Thank you for choosing Despatch.

Sincerely,

Despatch Industries

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PREFACE

This manual is your guide to the Despatch oven. It is organized to give you the information you need quickly and easily.

The INTRODUCTION section provides an overview of the Despatch oven.

The THEORY OF OPERATION section details the function and operation of assemblies and subassemblies on the Despatch oven.

The INSTRUCTIONS section provides directions on unpacking, installing, operating and maintaining the Despatch oven.

The APPENDIX section contains Special Instructions for operating the control instrument, a Troubleshooting Table, a list of Accessories and a Warranty.

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 you practical hands-on experience with information in the manual and the oven.

Before operating the equipment, be sure you understand all of the technical information contained in this manual. Information skipped, not understood or misunderstood could create the possibility of operating the equipment in an unsafe manner. This can cause damage to the oven or personnel or reduce the efficiency of the equipment.

NOTE:
Read the entire INTRODUCTION and THEORY OF OPERATION before installing the oven.

WARNING:
Failure to heed warnings in this instruction manual and on the oven could result in personal injury, property damage or death.

INTRODUCTION

This section provides an overview of the Despatch Classic LEB Series gravity control oven. The LEB Series Ovens have the most effective heat distribution and the fastest processing time of any lab oven its size. Air is discharged from the floor plate of the oven and distributes through the chamber.

Special Features

The sturdy construction and high grade insulation of the Despatch LEB Series ovens contribute to excellent high temperature performance. Other special features include the following.

- Dual functioning (Proportional or ON-OFF) digital CONTROL instrument to control temperature fluctuations.
- Digital Control and manual reset HI-LIMIT instrument to protect the chamber workload as well as the oven.
- Unique Despatch design with a system of perforated stainless steel walls for the ultimate in temperature performance.
- Welded double wall construction and fiberglass insulation to reduce heat loss. Silicone rubber gaskets further minimize heat leakage.
- Rapid response heater with a five year warranty.
- Scratch-resistant Silver-Clay baked enamel exterior and stainless steel interior for easy cleaning.
- Space-saving, stackable design.

Specifications

Dimensions

Table 1 Dimensions

LEB Model	Chamber Size in (cm) W	D	H	Capacity feet³ (liters)	Overall Size in (cm) W	D	H	Shelves Provided on Shelf Centers	Maximum Number of Shelf Positions	Chamber Doors
1-21	18 (46)	14 (36)	14 (36)	2.1 (60)	21 (53)	19 (48)	24 (61)	2 on 2"	5	1
1-28	24 (61)	14 (36)	14 (36)	2.8 (79)	27 (69)	19 (48)	24 (61)	2 on 2"	5	1
1-47	24 (61)	14 (36)	24 (61)	4.7 (133)	27 (69)	19 (48)	35 (89)	2 on 2"	10	1
1-76	30 (76)	18 (46)	24 (61)	7.6 (215)	34 (86)	23 (58)	36 (91)	2 on 2"	10	2
2-20	37 (94)	24 (61)	37 (94)	20 (566)	40 (102)	29 (74)	49 (122)	2 on 2"	16	2
2-30	37 (94)	37 (94)	37 (94)	30 (850)	40 (102)	42 (107)	49 (122)	2 on 2"	16	2

Capacities

Table 2 Capabilities

LEB Model		1-21	1-28	1-47	1-76	2-20	2-30
Maximum load capacity (lbs)		75	75	75	100	150	200
Maximum shelf load (lbs)		25	30	25	20	50	50
Approximate net weight	lbs	75	90	110	165	275	385
	KG	25	31	50	55	111	145
Shipping weight	lbs	90	105	130	200	350	460
	KG	41	48	59	91	159	209

Temperature

Table 3 Temperature

LEB Model		1-21	1-28	1-47	1-76	2-20	2-30
Time to Temperature	25°C - 100°C	4	4	7	5	6	6
(approximate minutes with	25°C - 150°C	8	8	11	9	11	12
no load)	25°C - 204°C	17	18	19	20	22	25
Recovery Time	100°C	2	2	3	3	2	3
Door Open 1 Minute	150°C	3	4	4	4	4	4
(approximate minutes with no load)	204°C	4	6	7	7	6	7
Operating Range with 20°C Ambient		35°C - 204°C					

Power

Line voltages may vary in some geographical locations. If your line voltage is much lower than the oven voltage rating, warm up time will be longer and motors may overload or run hot. If your line voltage is higher than name plate rating, the motor may run hot and draw excessive amps.

If the line voltage varies more than 10% from the oven voltage rating, some electrical components such as relays, temperature controls, etc. may operate erratically.

Table 4 Power Requirements

LEB Model	Volts	Amps	Hertz	Phase	Heater (KW)	Cord and Plug
1-21	120	10	50/60	1	1.2	Included, 15 Amp
	240*	5				
1-28	120	10	50.60	1	1.2	Included, 15 Amp
	240*	5				
1-47	120	13.3	50/60	1	1.6	Included, 20 Amp
	240*	6.5				
1-76	120	20	50/60	1	2.4	None, Hardwired
	240*	10				
2-20	240	15	50/60	1	3.6	None, Hardwired
2-30	240	20	50/60	1	4.8	None, Hardwired

Ovens designed for 240 volts (see name plate on oven) will operate satisfactorily on a minimum of 208 volts, but with a 25% reduction in heater power. If your power characteristics are lower, contact Despatch Industries.

*A kit is required for 240V operation.

THEORY OF OPERATION

This section details the function and operation of assemblies and subassemblies on the Despatch Classic LEB Series Ovens. These ovens have the most economical approach when productivity and ease of operation are the deciding factors. They are especially useful for testing, preheating, sterilizing, drying, aging and curing as well as other production applications. Gravity convected airflow with precision digital control delivers fast processing. The overall result is efficient productivity under strenuous conditions. The LEB Series ovens are precise yet practical.

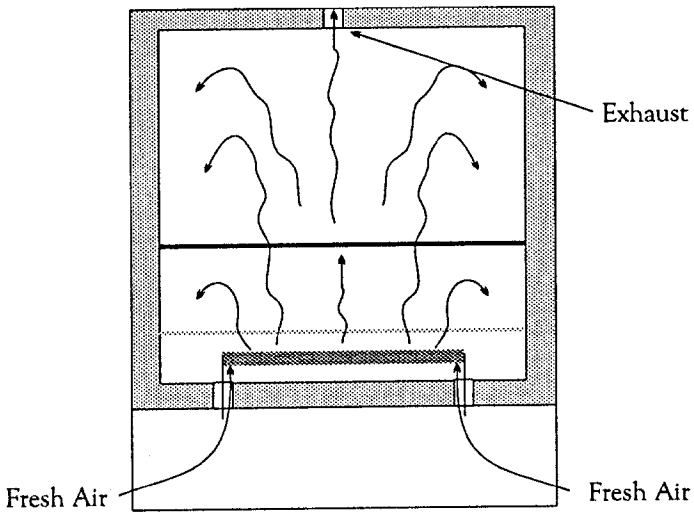


Figure 1 illustrates the gravity convected airflow.

The unique Despatch computerized design, moves gravity convected heat through a perforated stainless steel floorplate. The chamber can be densely loaded without interfering with the process. Air delivery temperature is within 1 °C of the number appearing on the digital display. For your convenience the fresh air intake is fixed. The exhaust rate is regulated by dampers on the top of the unit.

CONTROL Instrument

The oven is equipped with a microprocessor based digital control instrument.

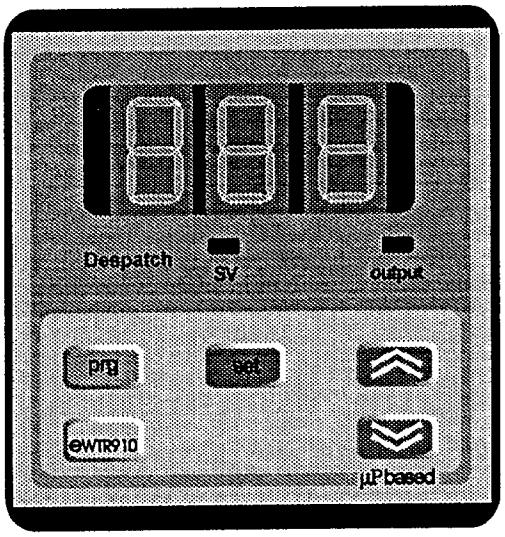


Figure 2 illustrates the CONTROL instrument.

Table 5 CONTROL Instrument Features

Features	Description
Main Display	Displays the actual oven temperature or displays the setpoint when the set key is pressed.
Program Key and ewtr910 Key	Change operating mode parameters from factory preset values. Allow access to program mode when pressed simultaneously with set key.
Set Key	Views the setpoint or, in conjunction with the ▲ and ▼ keys, changes the setpoint.
Down Key (▼)	Decreases a setpoint or mode parameter.
Up Key (▲)	Increases a setpoint or mode parameter.
LED Output Indicator	Lights when the control is calling for heat.
LED SV Indicator	Lights when the setpoint value is displayed.

CONTROL Instrument (Cont.)

The Despatch CONTROL instrument is a dual functioning proportional or ON-OFF controller. Due to the physical characteristics of the oven, the CONTROL has been configured as an ON-OFF controller and set to its optimum operating values. Initially the CONTROL will allow the heater to operate at full power. However, as the actual oven temperature reaches the setpoint, the ON-OFF CONTROL will cycle the heater on and off, minimizing process temperature fluctuations.

HI-LIMIT Instrument

The oven is equipped with a HI-LIMIT instrument. The purpose of the HI-LIMIT instrument is to provide a protective measure for the product and/or the oven itself. If the setting on the HI-LIMIT is exceeded, the heating process will discontinue, thus protecting the product and/or the oven.

Set the HI-LIMIT instrument to a temperature 10°C - 14°C higher than the CONTROL instrument setpoint or a temperature that should not be exceeded in the process. If the setting on the HI-LIMIT instrument is exceeded the heater will shut down. The HI-LIMIT instrument must be manually reset by pushing the reset button on the HI-LIMIT instrument.

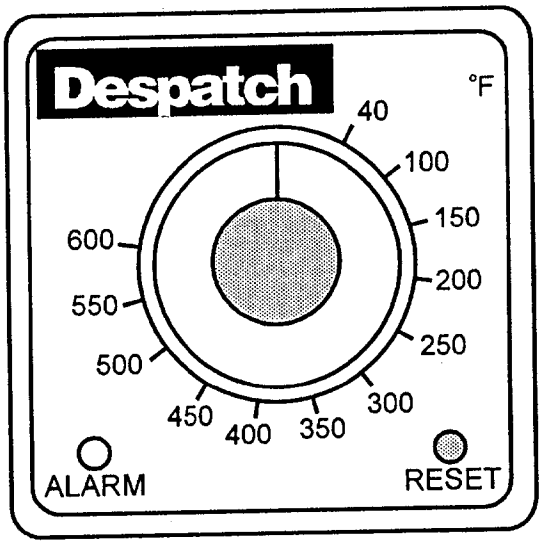


Figure 3 illustrates the HI-LIMIT instrument.

Product HI-LIMIT Instrument

If the product being processed has a critical high temperature limit, the HI-LIMIT instrument should be used as a product HI-LIMIT instrument. The HI-LIMIT instrument should be set to a temperature somewhat below the temperature at which the product could be damaged. Use the CONTROL instrument or a pyrometer to determine the product high limit setting.

Oven HI-LIMIT Instrument

If the product does not have a critical high temperature limit, the HI-LIMIT can be used as an oven HI-LIMIT instrument. An oven HI-LIMIT instrument protects oven equipment. Since the HI-LIMIT instrument does not show the temperature, it can be accurately set only after the oven is in operation. Until then, the HI-LIMIT should be set at the maximum position so all preliminary testing and adjusting can be done.

Oven Theory

This oven has an efficient gravity convected airflow to 204°C (400°F). A gravity convected oven relies on gravity to move air through the chamber. The process of moving air by relying on gravity is a slow responding process. Thus the overall chamber temperature takes a finite amount of time (roughly a few minutes) to soak in at the desired operating temperature. The time that it takes the unit to soak in at setpoint is related to such parameters as chamber area, load mass and exhaust rate. The unique Despatch design and CONTROL action compensates for this fact.

The oven uses an indicating microprocessor based digital control that displays the actual chamber temperature at the sensing point. Despatch strategically locates the CONTROL's temperature sensor to optimize the control action for the entire chamber for various load conditions. The CONTROL display will fluctuate a few degrees around the setpoint, but the overall chamber temperature will remain very stable. The underlying reason for this is that the display is showing temperature fluctuations at the temperature sensor location, not the overall chamber temperature. The strategic location of the sensor compensates for delays in gravity convection and enhances the performance and temperature control of the oven. The oven has been engineered to have an overall result of quality productivity while still maintaining an economical approach and ease of use.

INSTRUCTIONS

The INSTRUCTIONS section provides directions on unpacking, installation, operation and maintenance.

Unpacking and Inspection

Remove all packing materials and thoroughly inspect the oven for damage of any kind that could have occurred during shipment.

- See whether the carton and plastic cover sheet inside carton are still in good condition.
- Look at all outside surfaces and corners of the oven for scratches and dents.
- Check the oven controls and indicators for normal movement, bent shafts, cracks, chips or missing parts such as knobs and lenses.
- Check the door and latch for smooth operation.

If there is damage, and it could have happened during shipment follow these instructions.

1. Contact the shipper immediately and file a written damage claim.
2. Contact Despatch Industries to report your findings and to order replacement parts for those that were damaged or missing.
3. Send a copy of your filed damage claims to Despatch.
4. Next, check to make sure you have received all the required materials. Your shipment should include:

   - One (1) Despatch oven,
   - One (1) Instruction manual,
   - One (1) Warranty card,
   - Two (2) Shelves,
   - One (1) Package containing four rubber feet.

Unpacking and Inspection (Cont.)

5. If any of these items are missing from the packaged contents, contact Despatch Industries to have the appropriate materials forwarded to you.

6. Finally, to protect the warranty on your new oven, complete the warranty card and mail it to Despatch within 15 days after receipt of the equipment.

WARNING:
All grounding and safety equipment must be in compliance with applicable codes, ordinances and accepted safe practices.

Setup

1. Remove adhesive backing sheet from the rubber feet.

2. Attach rubber feet to the bottom corners of the oven.

3. Place oven on a bench top or an optional cabinet base.

The oven must have a minimum of two (2) inches clearance in the rear to provide proper ventilation. The oven may be placed next to another cabinet, or next to another oven, with three (3) inch clearance (the doors will still open).

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

4. Identify correct power source indicated on the specification plate.

5. Plug or hardwire oven directly to the electric supply.

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

HI-LIMIT Instrument Adjustment

Before putting the oven into production, adjust the oven HI-LIMIT instrument as follows.

1. Press the **POWER** switch to ON.
2. Set the CONTROL instrument at 14°C (25°F) above the desired operating temperature or the desired high limit temperature.
3. Push the black button to reset the HI-LIMIT instrument and operate the oven until the CONTROL instrument is regulating.
4. Allow the oven to soak at this temperature for 30 minutes.
5. Carefully adjust the HI-LIMIT instrument downward until it trips. The **HEATER ON** LED will come on.
6. Reset the CONTROL instrument at the desired operating temperature.

It will be necessary to reset the HI-LIMIT instrument whenever it has tripped. The HI-LIMIT instrument may be reset by first allowing the oven chamber to cool slightly (or by tuning the HI-LIMIT instrument thermostat up several degrees) and pushing the black reset button.

Operating

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, and 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 86 of 1990.

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

Loading the Oven

Despatch Industries 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 help the purchaser and operator in fulfilling that responsibility.

When loading the oven avoid spills of anything onto the heater elements or onto the floor of the oven. Do not place the load on the oven floor plate. This may cause the load to heat unevenly and the weight may cause shorting out of the heater elements. Use the shelves provided.

The two shelves are designed to be pulled out about half way without tipping. The support capacity of the shelves is listed in the Capacities Table in the Specifications section in this manual. Do not overload the shelves.

Distribute the workload evenly so that airflow is not restricted. Do not overfill your oven. The workload should not take up more than two-thirds of any dimension of the inside cavity.

Pre-Startup Checklist

✓ 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.

✓ Check line voltage. Voltage must correspond to nameplate requirements of motors and controls. Refer to the section on power connections in the INTRODUCTION of this manual.

✓ Fresh air and exhaust. 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. The proper ventilation clearances should be fulfilled at all times. Refer to the Set-up instructions in this manual.

✓ Ventilation There is an exhaust opening in the rear of the unit that is covered by a hat bracket. Do not remove the hat bracket as it protects the exhaust opening from being completely covered.

✓ Helpful hints

For drying ovens, open vent to prevent buildup of moisture.

For sample heating, close the vent when no ventilation is required.

Startup

For fastest oven heat-up time, close the fresh-air vent. After the desired temperature is reached, the vent may be adjusted as needed.

> WARNING:
> Do not use flammable solvent or flammable material in this oven. Do not process closed containers of any substance or liquid in this oven because they may explode under heat.

1. Start the oven.

   a. Press the **Power on** pushbutton.

   b. Set the vent opening. The vents may have to be adjusted to achieve maximum performance at various operating temperatures.

> NOTE:
> The setpoint can be viewed by pressing the SET key.

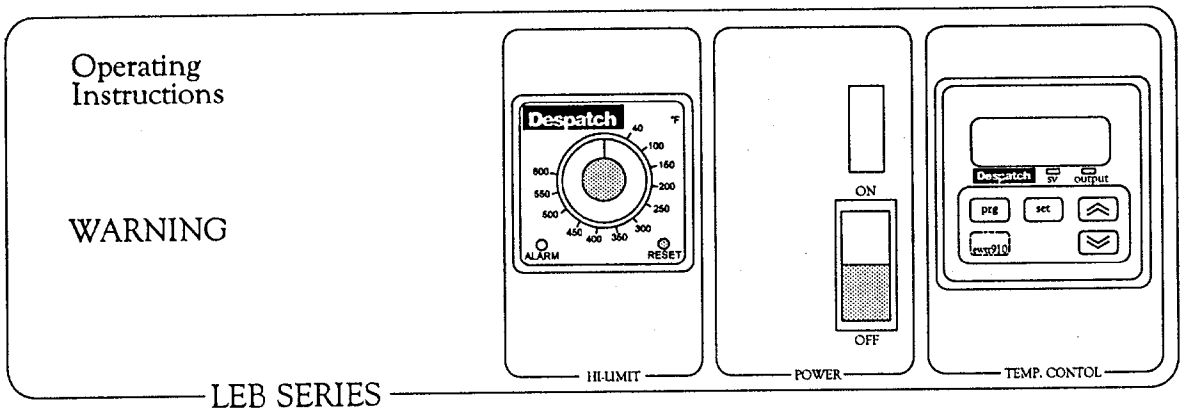


Figure 4 illustrates the control panel on the oven.

2. Enter the setpoint on the CONTROL instrument.

   a. Press and hold the set key. The SV light indicates that the value displayed is the setpoint value.

   b. Use the ▲ key or the ▼ key to enter the setpoint to the desired operating temperature.

   c. Release the set key.

> NOTE:
> Optimum performance for specific operating conditions may require calibration. See the Calibration section in this manual.

3. Set the HI-LIMIT instrument to a temperature slightly higher than the setpoint, or to a temperature that should not be exceeded in the process. If the HI-LIMIT instrument is exceeded the heater will shut down. The HI-LIMIT instrument must be manually reset by pushing the black button on the HI-LIMIT instrument.

Startup (Cont.)

4. Check that the CONTROL output LED is on. The white light will also come on, indicating a heat condition. When the oven temperature reaches setpoint, the white light will cycle on and off as controlled by the CONTROL instrument.

5. After the heating cycle is complete, turn the POWER rocker switch to the OFF position.

NOTE:
In the event of an open thermocouple circuit, EEE will be displayed by the CONTROL. If EEE is displayed, verify the presence of a good thermocouple.

Maintenance

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

Checklist

✓ Keep equipment clean. Gradual dirt accumulation retards air flow. A dirty oven can result in unsatisfactory operation such as unbalanced temperature 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 work results. Keep all equipment accessible. Do not permit other materials to be stored or piled against it.

✓ Protect controls against excessive heat. This is particularly true of controls, motors or other equipment containing electronic components. Temperatures greater than 51.5°C (125°F) should be avoided.

✓ Establish maintenance & checkup schedules. Do this promptly and follow the schedules faithfully. Careful operation and maintenance will be more than paid for in continuous, safe and economical operation.

✓ Maintain equipment in good repair. Make repairs immediately. Delays may be costly in added expense for labor and materials and in prolonged shut down.

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

✓ 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.

Tests

Tests should be performed carefully and regularly. The safety of personnel as well as the condition of equipment may depend upon the proper operation of any one of the functions of the Protocol™. Test the Protocol™ every 40 hours. Check that the heater LED is cycling on and off, indicating that the heater is working. In the manual mode, enter the HI-LIMIT to the same value as the setpoint. Run manual mode.

When the oven temperature reaches setpoint, the Hi-limit should shut down the system. The HI-LIMIT must be manually reset by pushing the **Reset** key.

Replacement

Parts

To order or return parts, contact the Service Products Division at Despatch. The Service Products Division features our Response Center for customer service. When returning parts, the Despatch representative will provide you with an MRA (Material Return Authorization) number. The MRA number must be attached to the returned part for identification. When you are ordering parts, be sure to give the model number, serial number and the part number. This will expedite the process of obtaining a replacement part.

When you have a service need, just contact the **Response Center** at **1-800-473-7373**: FAX 612-781-5353.

WARNING:
Disconnect the main power switch or power cord before attempting any repair or adjustment.

CONTROL Instrument

(Tools needed: one quarter (¼) inch socket set screwdriver)

1. Disconnect power.
2. Remove screws with ¼ inch socket from the face of the control panel and slide it forward.
3. Remove wires from the old control instrument, noting which numbered wires connect to which terminals.

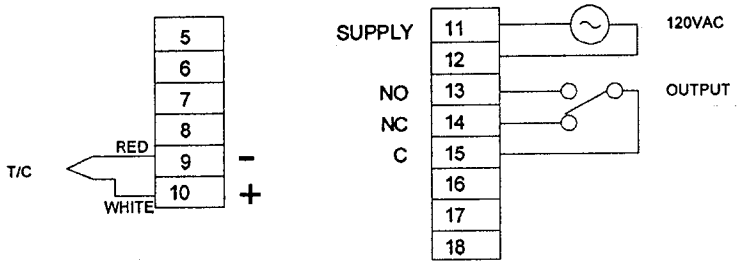


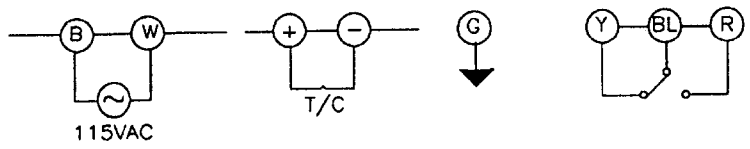
Figure 5 illustrates the connections to the CONTROL instrument.

4. Disconnect the CONTROL mounting bracket.
5. Remove old CONTROL instrument from control panel.
6. Install new CONTROL instrument into the control panel.
7. Secure CONTROL mounting bracket.
8. Reattach wires to the new CONTROL instrument. Make sure that the wires are connected correctly.
9. Replace control panel.

HI-LIMIT Instrument

(Tools needed: one quarter (¼) inch socket set screwdriver)

1. Disconnect power.
2. Remove screws with ¼ inch socket from the face of the control panel and slide it forward.
3. Remove wires from the old HI-LIMIT instrument, noting which numbered wires connect to which terminals.



WHITE → LINE
BLACK → LINE
GREEN – GROUND
RED – NO
YELLOW – NC
BLUE – C

T/C RED WIRE —
WHITE WIRE +

Figure 6 illustrates the connections to the HI-LIMIT instrument.

4. Remove mounting screws holding the HI-LIMIT instrument to the control panel.
5. Remove old HI-LIMIT instrument from control panel.
6. Install new HI-LIMIT instrument into the control panel.
7. Replace mounting screws.
8. Reattach wires to the new HI-LIMIT instrument. Make sure that the wires are connected correctly.
9. Replace control panel.

Heater Unit

(Tools needed: Crescent wrench, screwdriver, one quarter (¼) inch socket set)

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

APPENDIX

Special Instructions

The oven has been tested and preset at the factory for normal operating conditions. In most applications, it will not be necessary to alter the oven's settings. This section contains additional information and reference material to access the Parameter Programming mode. This section also covers calibration for the CONTROL and for the HI-LIMIT.

The CONTROL instrument was carefully programmed at the factory using the Parameter Programming mode. The parameters which may be accessed include temperature setting, display functions and thermocouple selection.

The Calibration section covers the procedure necessary to recalibrate the CONTROL. Recalibration may be necessary if the CONTROL does not comply with known standards or to align the CONTROL for a specific operating condition. The Calibration section also covers the procedure for aligning the HI-LIMIT thermostat when HI-LIMIT recalibration is necessary.

Parameter Programming Mode

WARNING:
Make sure you understand what you are changing before doing so. Changing the program parameters will alter the functions of the CONTROL.

The instrument and control parameters are set through the Parameter Programming mode. In most applications, it is not necessary to alter the oven settings. The following instructions describe how to access, view and, if desired, change the parameters.

Once the Parameter Programming mode is accessed, the output LED will start blinking on and off. If a particular setting is not allowed, the display will flash. The CONTROL will not allow the display to be altered improperly.

The CONTROL will automatically exit the Parameter Programming mode if no keys are pressed for about 20 seconds. During programming, the output LED should be blinking

1. Press the prg key, set key and the ewtr910 key simultaneously.

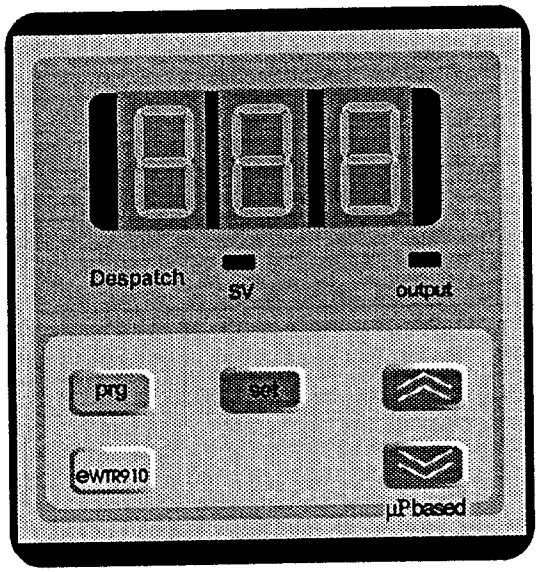


Figure 7 illustrates the control instrument.

2. Check that the LED is flashing, indicating that the control is in the program mode.

3. Press the ▲ key until the desired parameter is displayed. See Program Mode Outline.

4. Press and hold the set key to view the parameter setting.

Parameter Programming Mode (Cont.)

5. While holding the set key, use the ▲ key and the ▼ key to change the parameter setting to the desired setting.

6. Press the prg key, set key and ewtr910 key simultaneously to exit the Parameter Programming mode. The CONTROL will revert back to its normal mode.

Table 6 Parameter Program Mode Outline

Code	Name	Settings
d1*	Differential Set	-1
LS1	Lower Set 1 (degrees)	50°C
HS1	Higher Set 1 (degrees)	204°C
od	Output Delay	0
drb	Dynamic Restart Band	0
dSi	Dynamic Set Increment	0
dSt	Dynamic Set Time	1
CAL	Calibration	0
Ft	Function Type	on
PSE	Probe Selection	FE
HC1	Heat/Cool Output	H
rP1	Relay Protection 1	ro
LF1	LED Function 1	di
rou	Readout (degrees)	°C
dro	Display Readout	P
hdd	Half-Digit Display	n
tAb	Table of Parameters	not adjustable

* If d1 is not displayed the Function Type must be first set to on.

Parameter Programming Mode (Cont.)

d1 Differential Set - Used in ON/OFF mode only. Must be set to -1 for heating

LS1 Lower Set 1 - This is the lower setpoint limit below which the user cannot change the setpoint.

HS1 Higher Set 1 - The maximum setpoint limit for the chamber. The user cannot set the setpoint above the maximum setpoint.

od Output Delay - This provides a delay selection for the outputs in applications where noise may cause brief erroneous signals from the sensor to the controller.

drb Dynamic Restart Band - This is a soft start function. When temperature falls below or rises above this restart band, another soft cycle is initiated. The value of this parameter represents half of the total band.

dSi Dynamic Set Increment - Expressed in degrees of the setpoint. This parameter represents the dynamic increase of the setpoint. See Dynamic Restart Band. A setting of 0 disables this function.

dSt Dynamic Set Time - Time value between two successive dynamic setpoint increases.

CAL Calibration - The number of degrees the control will offset the display from the sensor input. This parameter is used to align the oven's actual chamber temperature with the display appearing on the control. The ± sign determines whether the adjustment is made upward or downward. See Calibration at the end of this addendum.

Ft Function Type - Control mode selection.
on = ON/OFF control,
Pi = PID control
This oven operates only with the ON/Off control setting.

PSE Probe Selection - Input type. FE = J T/C, Cr = K T/C, rh = S T/C

HC1 Heat/Cool Output - Heating = H, Cooling = C. Set to Heating (H) for heating applications.

Parameter Programming Mode (Cont.)

rP1 Relay Protection 1 - Determines the status of the relay in the event of a sensor error.
ro = relay open (factory setting)
rc = relay closed
Use the ro setting for heating applications.

LF1 LED Function 1 - Determines whether the light is on or off when the relay is energized.
di = direct, light is ON when output relay is energized
in = reverse, light is OFF when the output relay is energized

rou Readout (degrees)
C = degrees celsius
F = degrees fahrenheit

dro Display Readout
P = Process value
S = Setpoint value

hdd Half-Digit Display - The right most digit can be set to read-out in 0 or 5 only automatically rounding to the nearest value.

tAb Table of Parameters - Factory setting, cannot be changed.

Calibration

Temperature CONTROL

The CONTROL instrument has been tested and calibrated at the factory. Under normal operating conditions, recalibration should not be necessary. However, if the instrument does not comply with known standards, OR if the user would like to recalibrate the CONTROL for a specific operating condition, then recalibration is easily accomplished.

Calibration Instructions

(Equipment needed: Temperature Measuring Device with a Compatible Temperature Sensor)

1. Verify that the CAL (Calibration) programmed in the CONTROL is 0. Refer to Instructions on viewing the parameter in the OPERATING mode in the Appendix of this manual

2. Locate the temperature sensor of the temperature measuring device at the center of the chamber.

3. Operate the oven until it reaches the desired operating temperature and the CONTROL is regulating. The user may wish to have a loaded chamber with a standard amount of product to simulate a specific operating condition. It will take several minutes for the unit to stabilize at the controlled temperature. Allow at least 30 minutes of operation at the stabilized temperature before proceeding.

4. Subtract the average controlled temperature (number appearing on the CONTROL display) from the actual oven temperature (number appearing on the temperature measuring device display). The CONTROL and the device must be in the same scale (°C or °F).

Actual Oven Temperature - Controlled Temperature = calculated value

5. Enter the calculated value from Step 4 as the new CAL (Calibration) value in the instruments.

HI-LIMIT Instrument

The HI-LIMIT equipped on the ovens is a non-indicating HI-LIMIT (a device that does not display sensor temperature). The HI-LIMIT has been tested and calibrated at the factory and recalibration should not be necessary. However, since the HI-LIMIT is a non-indicating device, the HI-LIMIT may need to be recalibrated against known standards so that the temperature dial indication on the HI-LIMIT matches the HI-LIMIT thermocouple input.

Calibration Instructions

(Tools Needed: 1/16 inch Allen wrench)

1. Set CONTROL instrument at 14°C (25°F) above the desired operating temperature.

2. Push black button to reset the HI-LIMIT instrument and operate oven until the CONTROL instrument is regulating. Allow the oven to soak for 30 minutes.

3. Carefully adjust the HI-LIMIT instrument downward until it trips (HEATER ON LED goes off).

4. Carefully loosen the set screw on the black knob on the HI-LIMIT with a 1/16 inch Allen wrench.

5. Carefully align the HI-LIMIT dial with the CONTROL temperature display.

6. Carefully tighten the set screw.

7. Reset CONTROL instrument at the desired operating temperature. The two instruments are now set in their correct positions.

It will be necessary to reset the HI-LIMIT instrument whenever it has tripped. The HI-LIMIT instrument may be reset by first allowing the oven chamber to cool slightly (or turning the HI-LIMIT instrument thermostat up several degrees) and pushing the black reset button.

Troubleshooting

Equipment which operates for long periods of time may develop problems. Below are possible problems and suggested solutions. If you have a problem not listed and do not know what to do, contact Despatch Industries at our toll free Help Line 800-473-7373.

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 plugset.
	Burned out heater	Replace heater (see warranty statement).
	CONTROL instrument malfunction	Replace controller.
	Loose wire connections	Disconnect power and check connections behind control panel.
Slow heat up	Improperly loaded workload	Reduce load or redistribute load in chamber.
	Low line voltage	Supply sufficient power and proper connections. Check for circuit overload.
	1 or 2 heating elements burned out	Replace burned out element (see warranty statement, back page).
	240 volt oven is connected to a 208V line	Raise line voltage to a 240 volt line.
Frequent heater element out	Harmful fumes generated by load	Increase vent opening or discontinue process.
	Spillage or splattering of material on heater elements	Disconnect power and clean oven chamber and elements.
	Overheating oven	Check the HI-LIMIT instrument.
Erratic temp.	CONTROL instrument malfunction	Replace CONTROL.

Troubleshooting (Cont.)

Difficulty	Probable Cause	Suggested Remedy
Inaccurate temp.	CONTROL instrument miscalibration	Recalibrate CONTROL instrument.
	CONTROL instrument misconfiguration	Check configuration and operating mode parameters.
	CONTROL instrument offset	Check CONTROL instrument offset adjustment.
	High limit setting	High limit should be 10-25+ °C higher than setpoint.
Excess surface or door temp.	Door seal deterioration	Replace door seal.
Improper airflow	Improperly loaded	Reduce load or redistribute load.
Oven will not control at setpoint	HI-LIMIT instrument set too low	Set the HI-LIMIT higher.
	CONTROL instrument malfunction	Replace CONTROL instrument.
	Vent(s) closed	Open exhaust air vent. Unit will not control at minimum operating temperature with vent(s) closed.
Heater does not shutdown until temp. reaches the HI-LIMIT setting	CONTROL instrument malfunction	Replace CONTROL instrument.
	Relay malfunction	Replace relay.

Accessories

The oven has options that can easily be field installed.

Table 7 Accessories

Option	Functional Description
Recorder kit	The round chart recorder follows the temperature changes and records them for permanent record.
240 Volt conversion kit	Converts 120 volt oven for 240 volt operation. Available on LEB 1-21, LEB 1-28, LEB 1-47 and LEB 1-76. 240 V conversion must be factory installed to conform to UL listing requirements.
Process timer kit	Shuts down the heater at the end of the heating cycle. Available in 6 or 12 hour ranges.
Running time meter kit	Logs the overall processing time. The digital meter charts up to 99,999.9 hours of process time and cannot be reset.
Signal timer kit	One hour timer signals the end of the cycle with a bell.
Extra shelves	
Base cabinets	
Stacking kit	

The above items can all be field installed. For further information on these items or other available options, please contact your Despatch representative.

Warranty

For years Despatch has delivered an exceptional product backed by a strong sense of responsibility and drive for long term customer satisfaction. These business principles enable us to offer the exclusive and comprehensive "Classic™ Four Plus One Service Warranty Program".

Despatch Classic™ Service Warranty Program

The basis of this outstanding, exclusive service program is a four-year replacement warranty covering defects in workmanship or material on all Despatch manufactured components and assemblies. Add to this a comprehensive 1 year parts warranty on the entire unit and you have one of the strongest warranties in the industry.

Immediate Service Response

The key to the Classic™ Service Program is response. A toll free Help-Line connects you to our Customer Service response center giving you immediate access to specialized assistance. Our customer service Product Service Technicians have over 200 years experience and access to detail design and manufacturing documentation specific to your Despatch unit. This exacting level of service is a benefit only Despatch can provide and means that you can expect speedy, accurate and the most cost effective response.

Field Service Network

A growing network of Service Professionals are available to support your Despatch equipment. From routine calibration and preventive maintenance to emergency breakdown response, our service network is positioned to reach 90 percent of our installed base within four hours. This is service you can depend on.

Best Service Protection in the Industry!

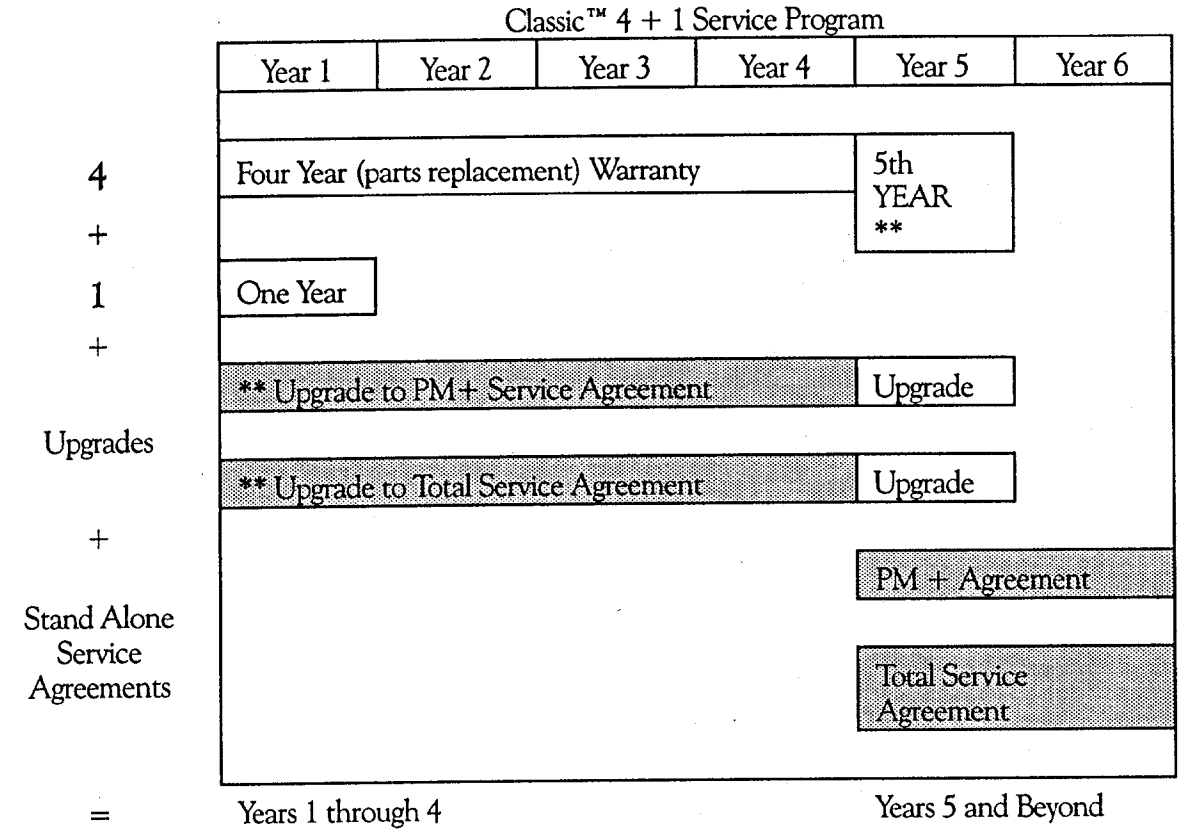


Figure 8 illustrates the Classic ™4 Plus 1 Service Program

** Receive 5th year parts replacement warranty free with purchase of PM+ or Total Service Agreement within the first two years.

Classic™ Series Warranty

Parts and Material

Despatch warrants all parts and assemblies manufactured by Despatch for the Classic™ Series oven to be free from defects in material and workmanship for a period of four (4) years from the date of shipment or start-up, by Authorized Despatch Service Representative, whichever is later.

Despatch further warrants all parts and assemblies to be free from defects in material and workmanship for a period of one (1) year from date of shipment or start-up, by Authorized Despatch Service Representative, whichever is later.

Despatch will repair or replace, at our option, f.o.b. Despatch's factory, parts covered by this warranty. Despatch is not responsible for parts defects resulting from misuse, abuse, acts of nature or utility performance not to Despatch specification including electrical, environmental and fresh air/exhaust provisions.

Labor and Expenses

Despatch Classic™ Series warranty cover parts replacement or repair. Labor and other expenses related to the removal and replacement of such parts are the owners responsibility as is any necessary reprogramming, calibration and certification.

Exclusions/Limitations of Liability

The foregoing warranty shall be deemed valid and binding upon Seller if and only if Purchaser loads, operates and maintains the equipment supplied hereunder in accordance with the instruction manual provided upon delivery of the equipment. Seller does not guarantee the process of manufacture by Purchaser or the quality of product to be produced by subject equipment. This warranty does not cover expenses to diagnose, repair or replace components or associated failures.

Exclusions/Limitations of Liability (Cont.)

Parts failures caused by improper operation, abuse, misuse, acts of nature, and nonconforming utilities and environments are not covered by this warranty.

Despatch shall not in any event be liable for indirect, special, consequential or liquidated damages or penalties, including loss of revenue, profits or business opportunities resulting from interruption of product production. Despatch shall further be held blameless for any damages or expenses resulting from delays in our attempts to diagnose and repair the equipment, unavailability of spare parts or inaccessibility of the equipment. Specifically excluded from this warranty is responsibility for internal and external corrosion damage to the equipment.

Emergency Service

In an emergency situation, Customer agrees to:

1. Immediately shut off fuel or energy supply (gas and electricity).
2. Call 911 for emergency assistance if needed.
3. Call Despatch Service Help-Line at 800-473-7373.

Non-Compliance

Despatch reserves the right to suspend and withhold service as provided under this Warranty in the event of non-compliance by the Customer to any terms and conditions of this Warranty. Further, Despatch is held harmless for any loss of production, incurred expenses, or other inconveniences due to suspension of service under this non-compliance provision.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES WHATSOEVER, AND SPECIFICALLY THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

SEE ATTACHED DESCRIPTION OF DESPATCH CUSTOMER SERVICE PROCEDURES AND RELATED CUSTOMER RESPONSIBILITIES WHICH ARE INTEGRAL TO THIS WARRANTY.

THE FOREGOING WARRANTY IS NOT TRANSFERRABLE IN SITUATIONS WHERE EQUIPMENT OWNERSHIP IS TRANSFERRED TO ANOTHER PARTY.

Despatch Customer Service

Procedures and Customer Responsibilities

To provide the most effective service to our customers under this warranty, all requests for repairs are to be initiated by the Customer by telephone to the Despatch Service Help Line, 800-473-7373. The Standard Period of Maintenance (SPM) is defined as 8 a.m. to 5 p.m. local time, excluding weekends and Despatch Holidays. Calls placed within the SPM will be handled as follows.

Help Line calls connect the customer with the Despatch Response Center. The Response Center will record all pertinent information, including SERIAL and MODEL NUMBER of the unit(s), the urgency and nature of the problem, and the name and phone number of the caller or other contact. This information will be passed to the first available service support technician who will research the units serial file so as to be familiar with customer unit when he calls the customer back. Despatch service technicians will make every effort to call back within four (4) working hours, or less, from receipt of the initial call. Despatch will advise the Customer on suggested steps and/or tests to either resolve the problem or help to confirm the diagnosis of the problem.

Customer Agrees to cooperate in performing such tests and attempting to resolve the problem as quickly as possible. Customer also agrees to replace minor parts such as fuses, latches, etc. as instructed by Despatch Service Technicians. This approach has Despatch and the Customer cooperating to effect the most expedient and cost effective repair and minimize down time. If in Despatch's sole judgement, the equipment cannot be repaired in this manner, an on-site visit by a Despatch authorized service representative may be scheduled to repair the equipment. Customer agrees that, when requested and authorized, such charges will be paid by the Customer within 30 days from receipt of invoice.

Attachment A - Sustained Service Support

At Despatch long term customer satisfaction means more than responding quickly and effectively to our customers' service requirements. It means offering comprehensive customer support well beyond the scope of our initial contractual commitment. + Despatch's Service Products Division offers a Total Service Agreement package or a Preventive Maintenance Plus agreement (PM+). These service products are unique in the industry and offer the following benefits to our customer:

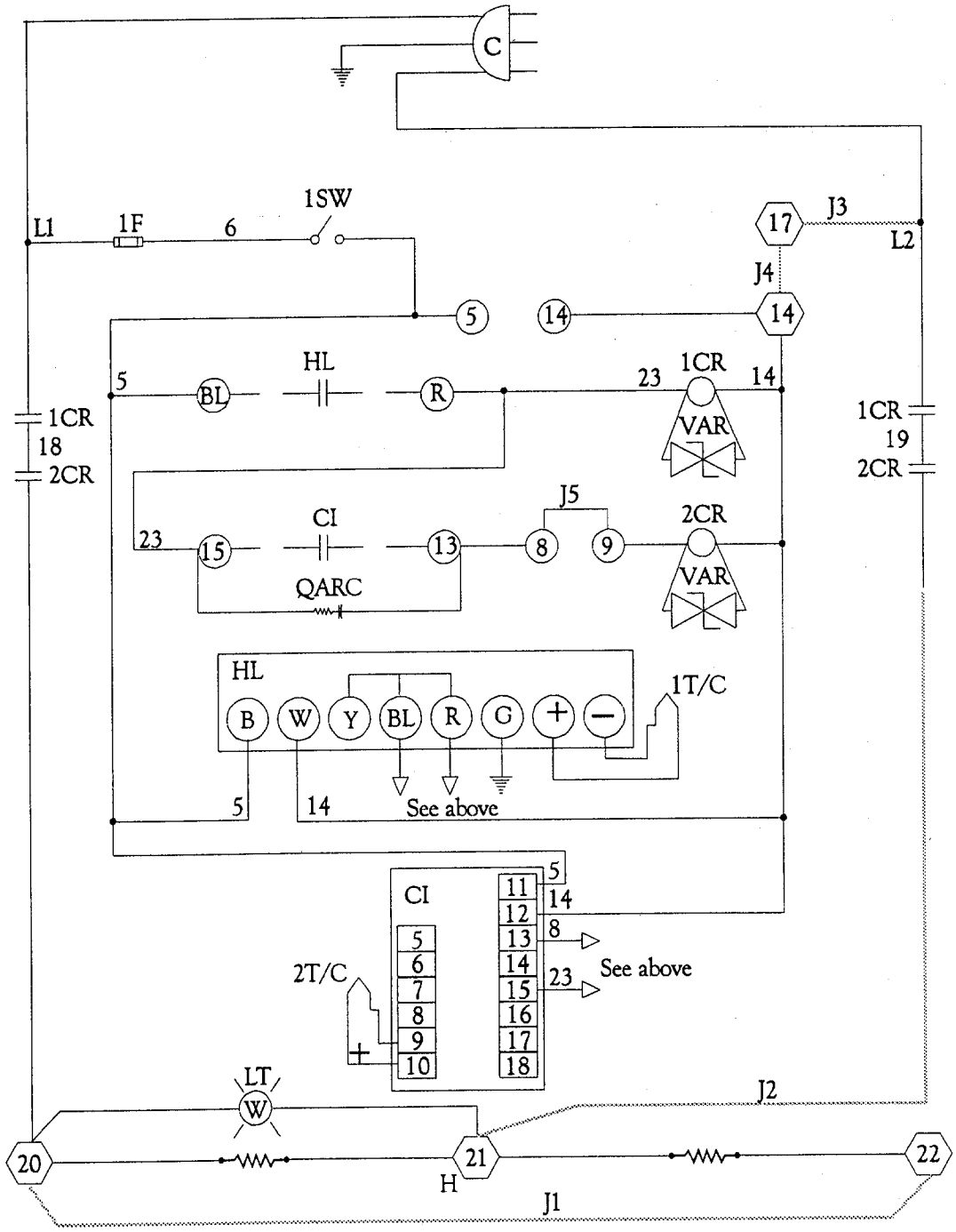
- Priority response for minimum production interruption.
- Preventive maintenance for longer product life.
- Discount on parts and services where applicable.
- Single payment for reduced billing expense.
- Elimination of need for a separate purchase order for each service requested.

Because these extra service options are aimed at extending our new equipment productivity, we will also extend the Despatch four year manufactured parts warranty for another 12 months. This bonus warranty is automatically yours when you purchase a service agreement from Despatch within the first 12 months after shipment of the equipment.

Drawings

LEB1-21 120V

Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007453	1	250 Volt 6 Amp fuse
C	031233	1	Power Cord
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	007818	1	1200 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

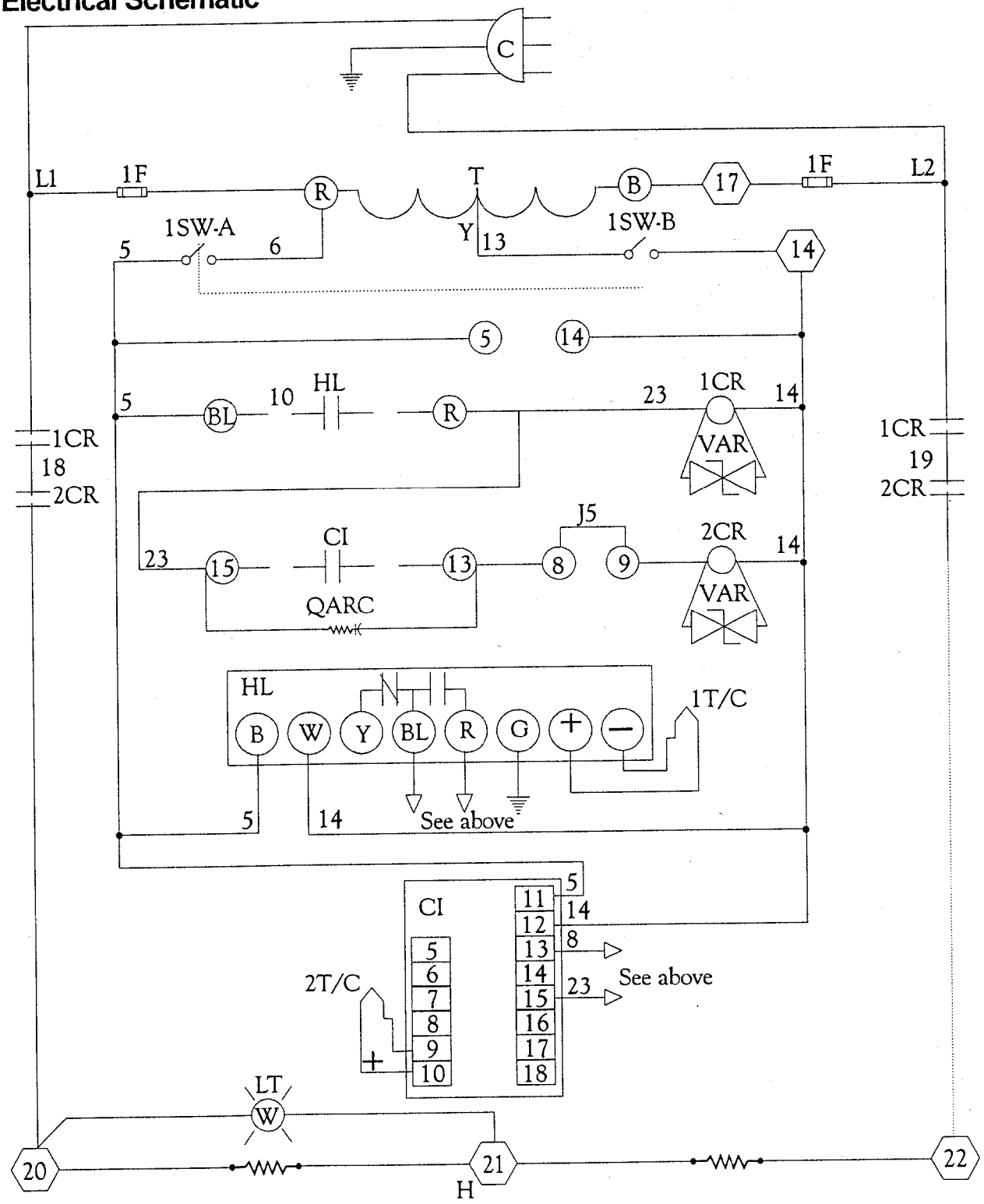

Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB1-21 240V

Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007453	2	250 Volt 6 Amp fuse
C	105115	1	Power Cord
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	007818	1	1200 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
T	012479	1	50VA Transformer
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

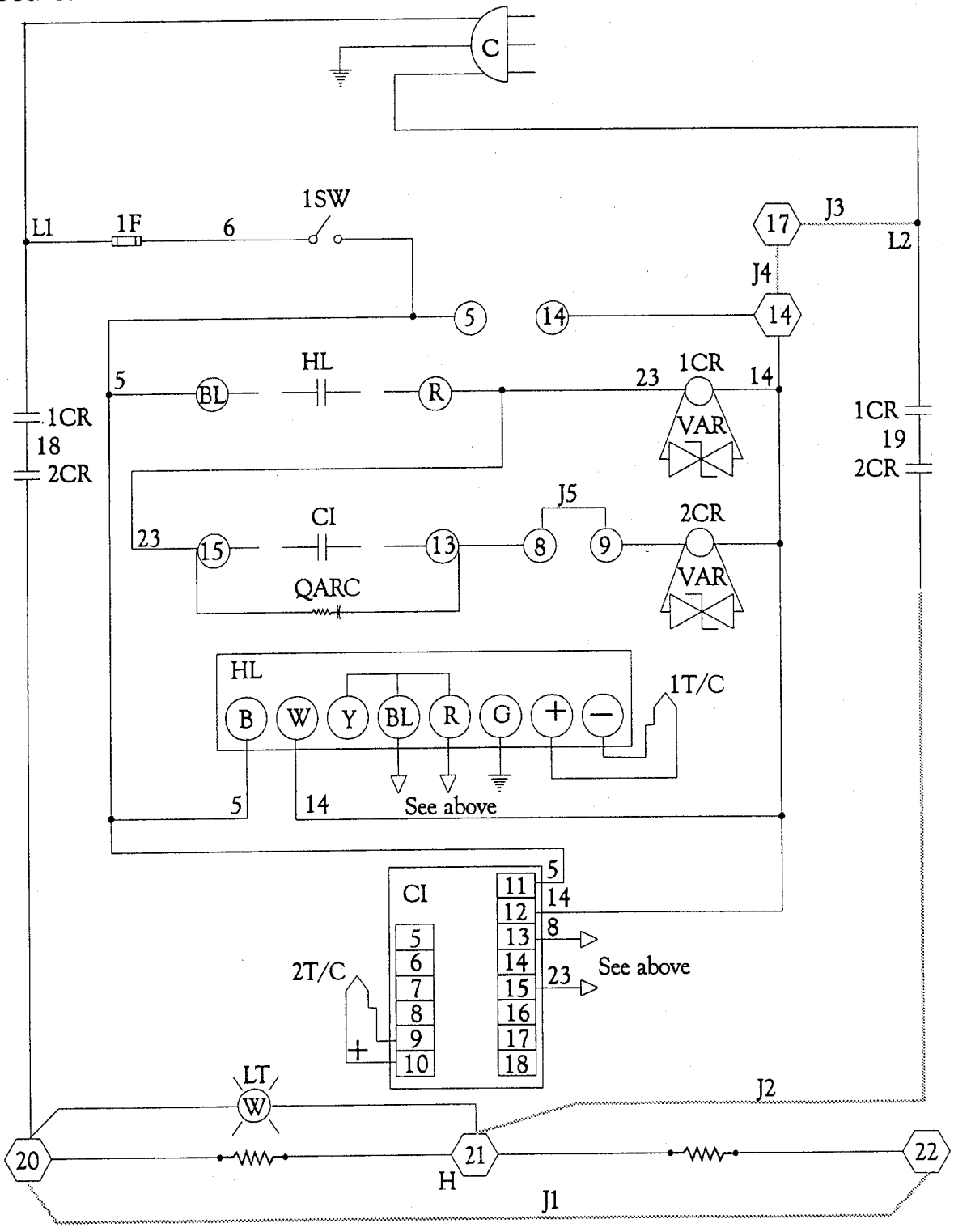

Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB1-28 120V

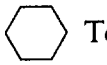
Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007453	1	250 Volt 6 Amp fuse
C	031233	1	Power Cord
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	007818	1	1200 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

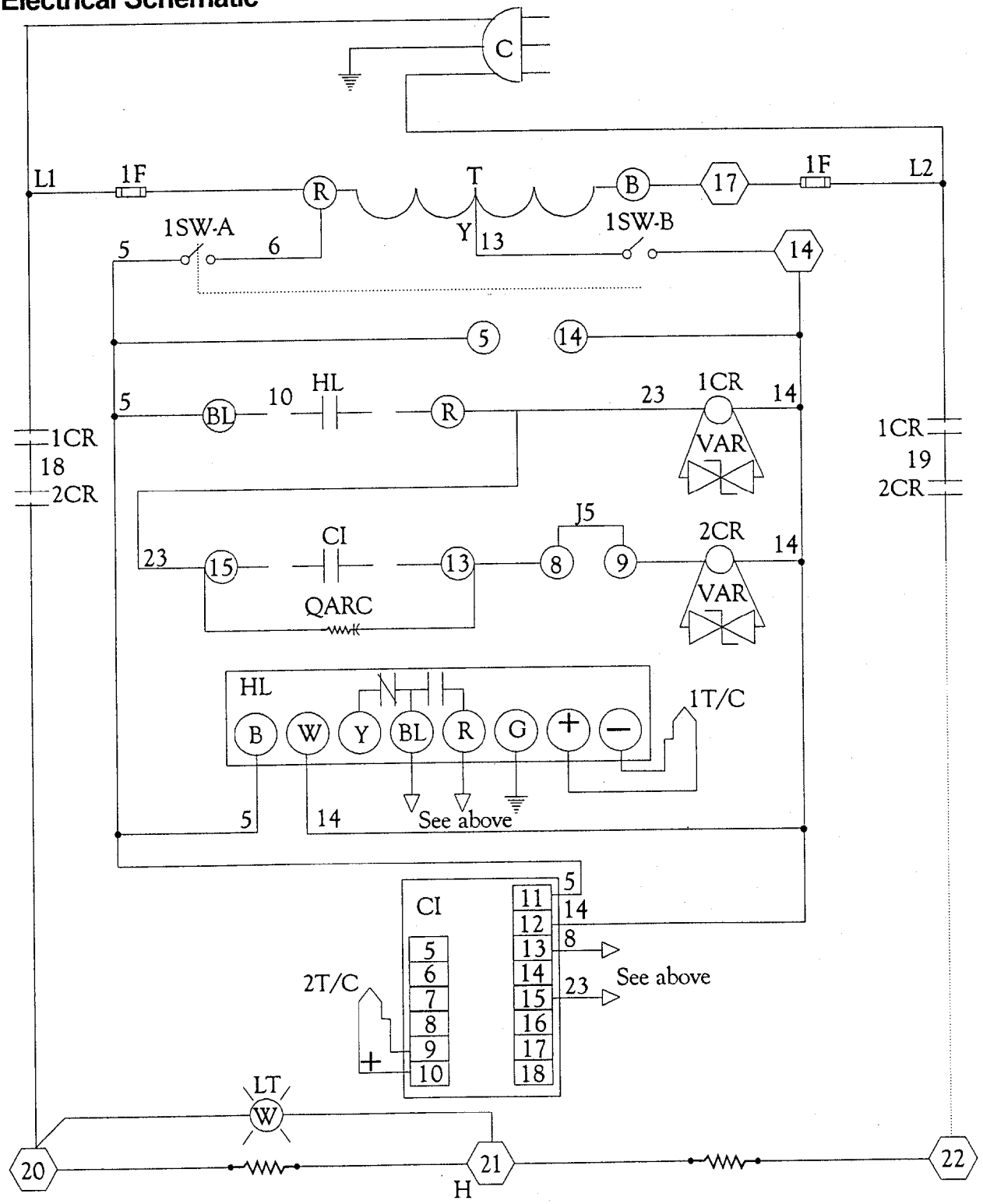

Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB1-28 240V

Electrical Schematic



Parts List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007453	2	250 Volt 6 Amp fuse
C	105115	1	Power Cord
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	007818	1	1200 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
T	012479	1	50VA Transformer
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

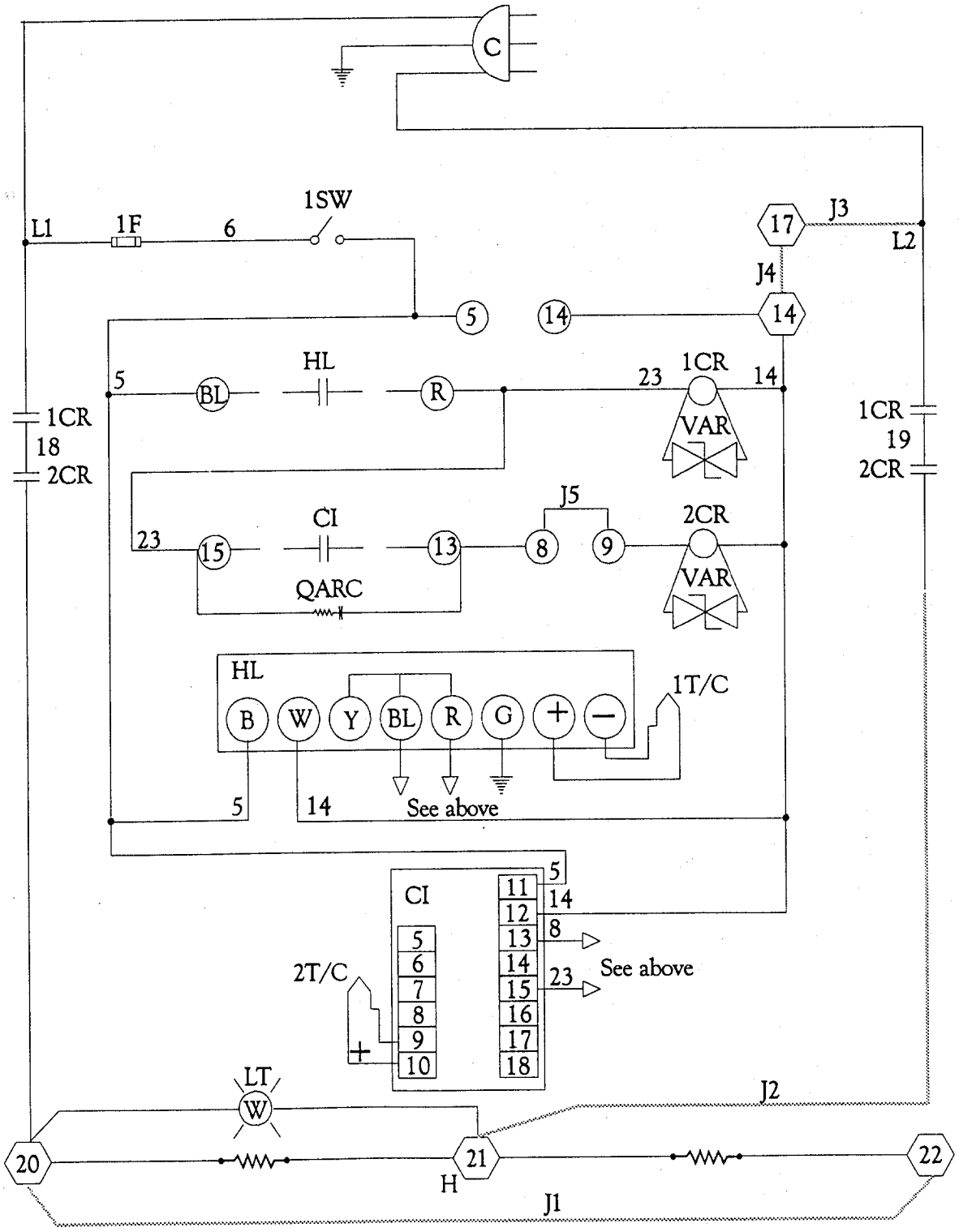

Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB1-47 120V

Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007453	1	250 Volt 6 Amp fuse
C	074496	1	Power Cord
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	054353	1	1600 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

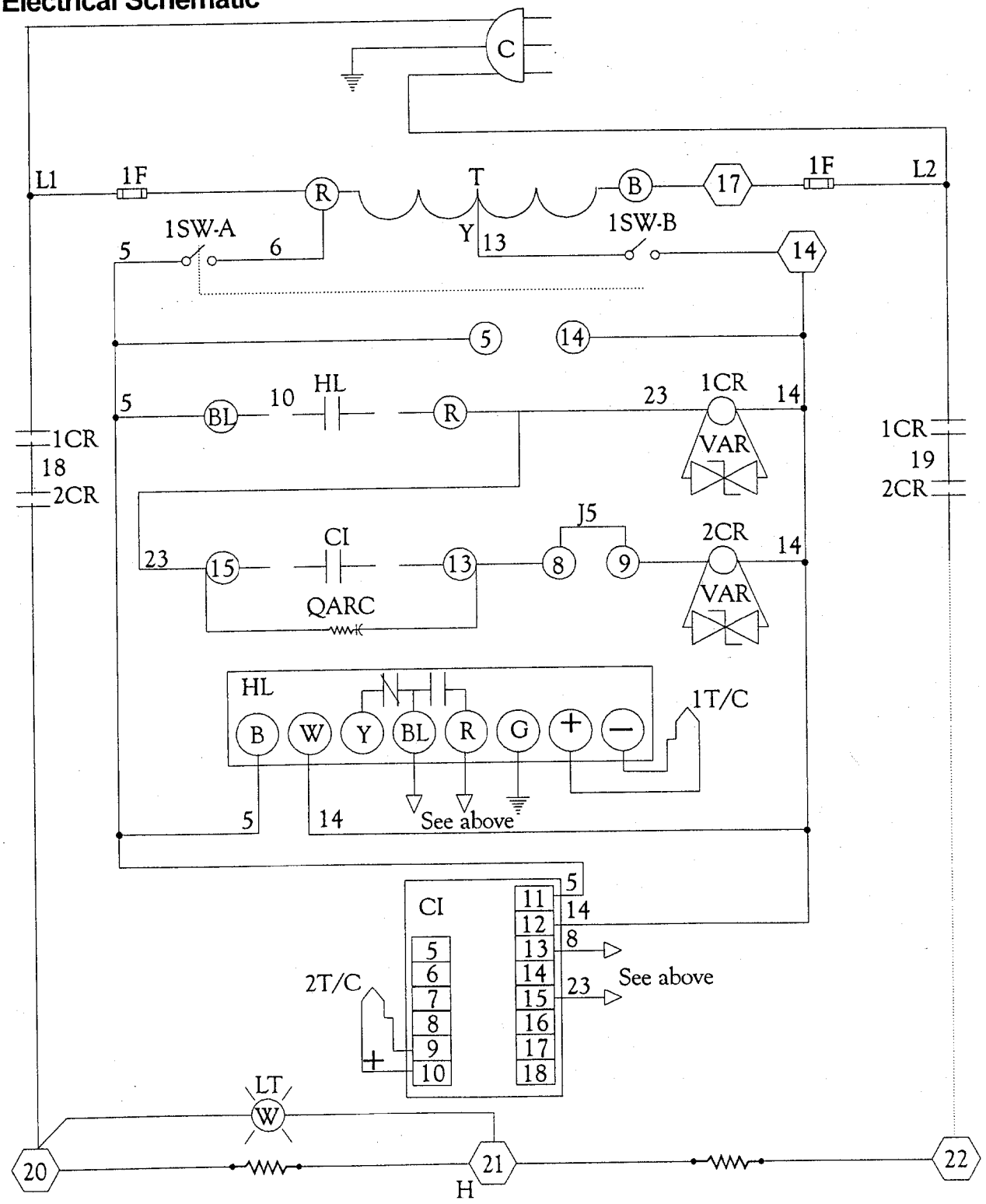

Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB1-47 240V

Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007453	2	250 Volt 6 Amp fuse
C	105115	1	Power Cord
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	054353	1	1600 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
T	012479	1	50VA Transformer
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

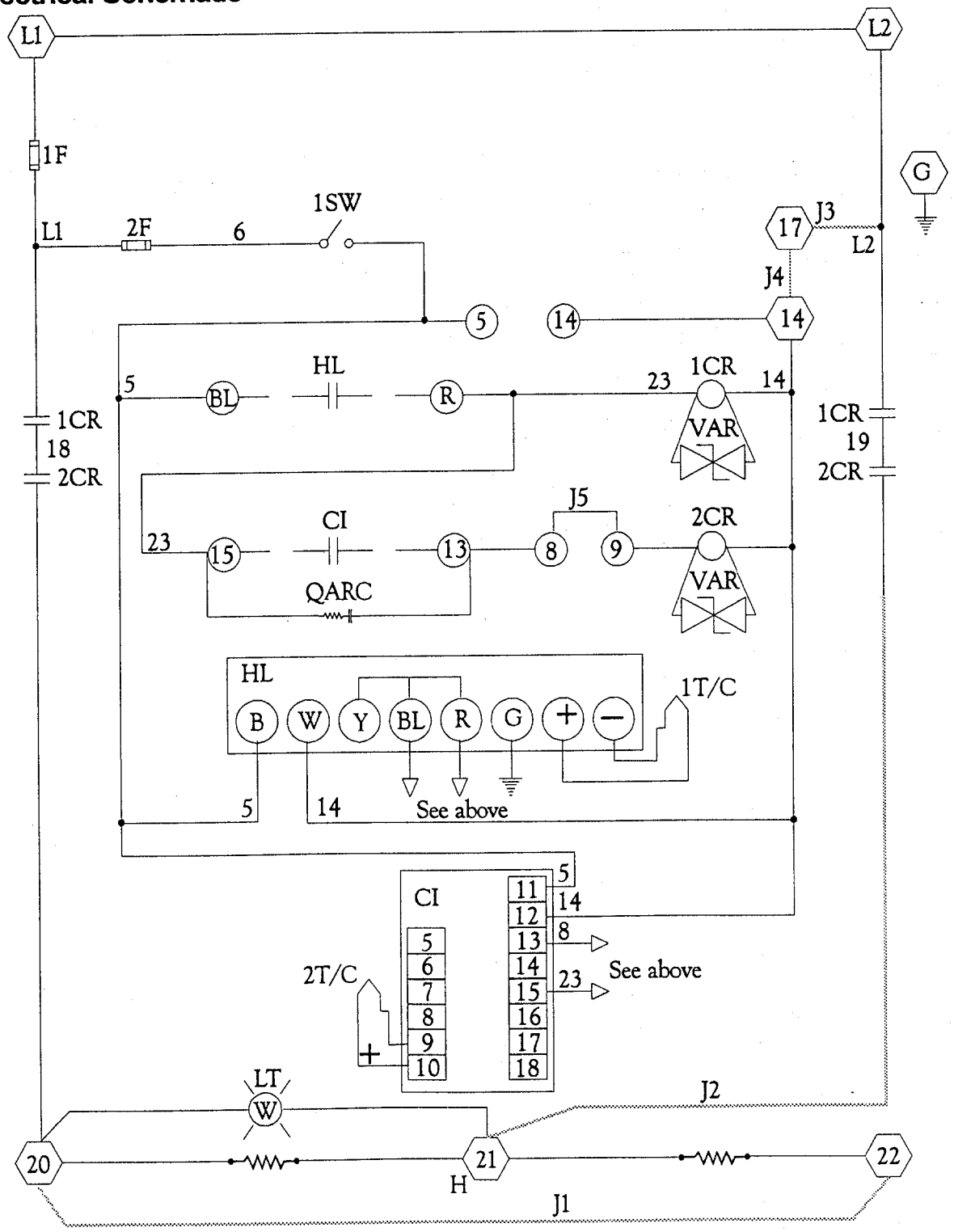

Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB1-76 120V

Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007415	1	250 Volt 25 Amp fuse
2F	007453	1	250 Volt 6 Amp Fuse
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	007818	1	1200 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

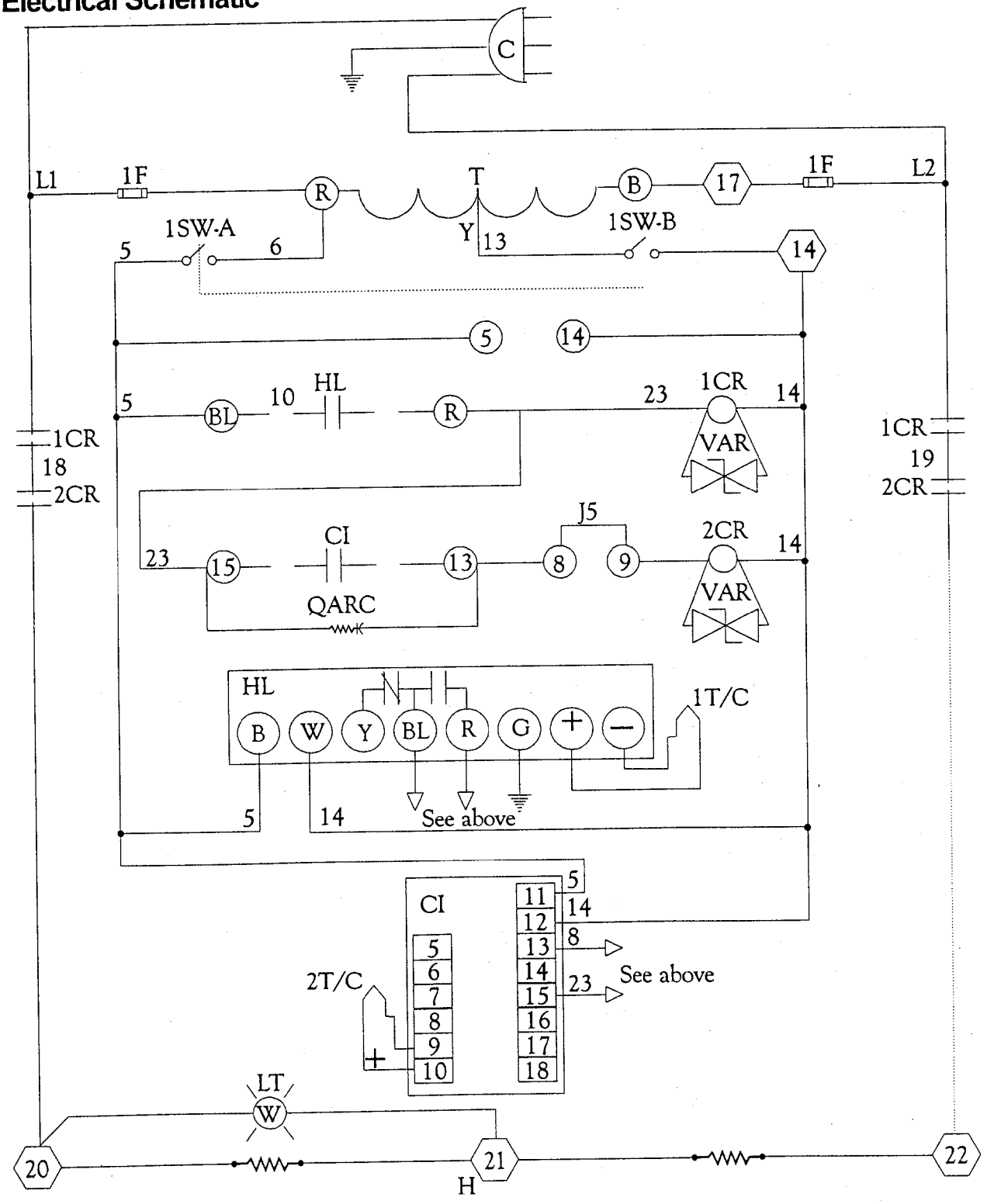

Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB1-76 240V

Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007453	2	250 Volt 6 Amp fuse
C	105115	1	Power Cord
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	007819	1	2400 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
T	012479	1	50VA Transformer
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

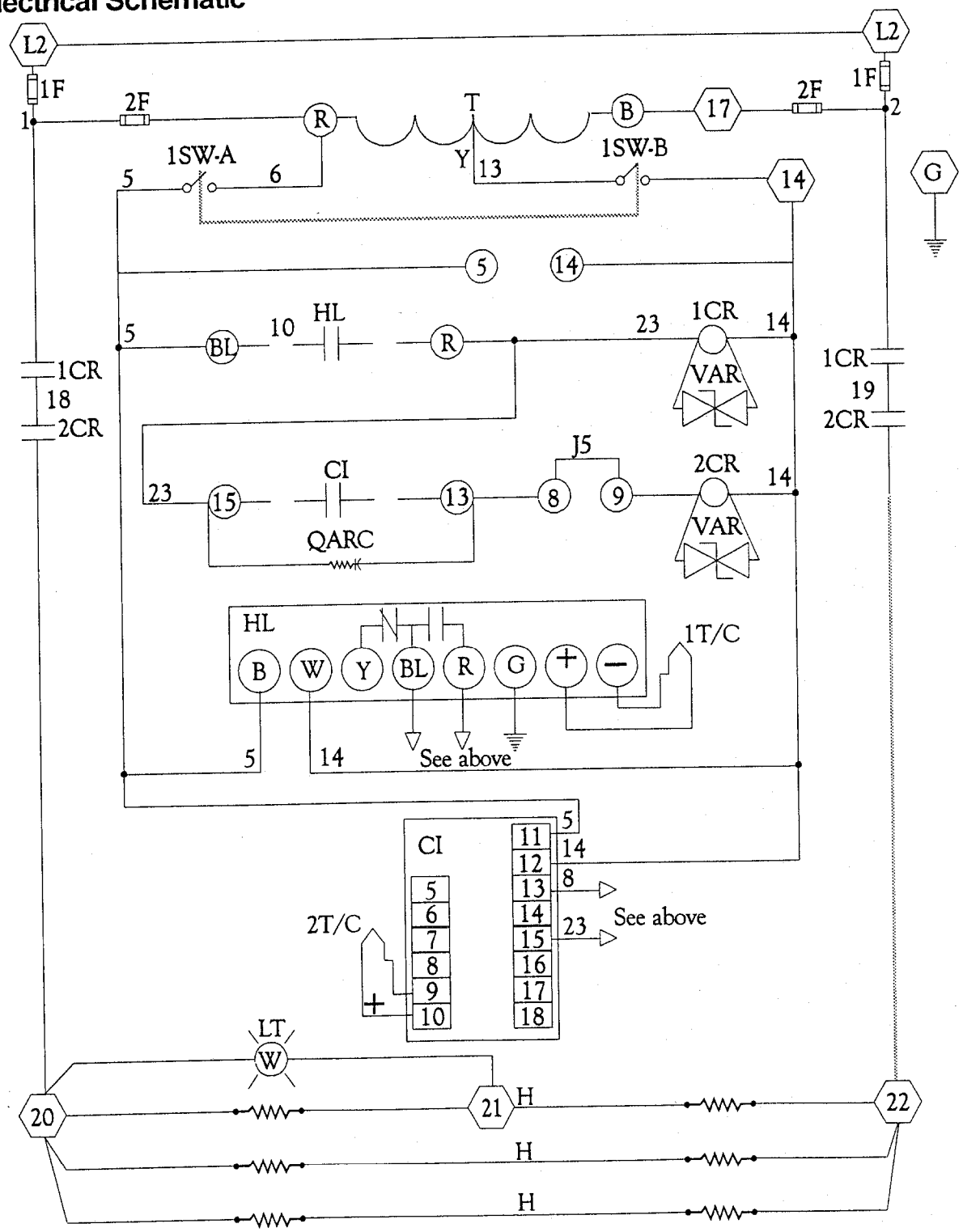

Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB2-20 240V

Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007613	2	250 Volt 20 Amp Fuse
2F	007453	2	250 Volt 6 Amp fuse
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	007818	3	1200 Watt Heater
T	012479	1	50VA Transformer
1,2T/C	111322	2	T/C ENL/LDB -4 72 Inches Long Test
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend

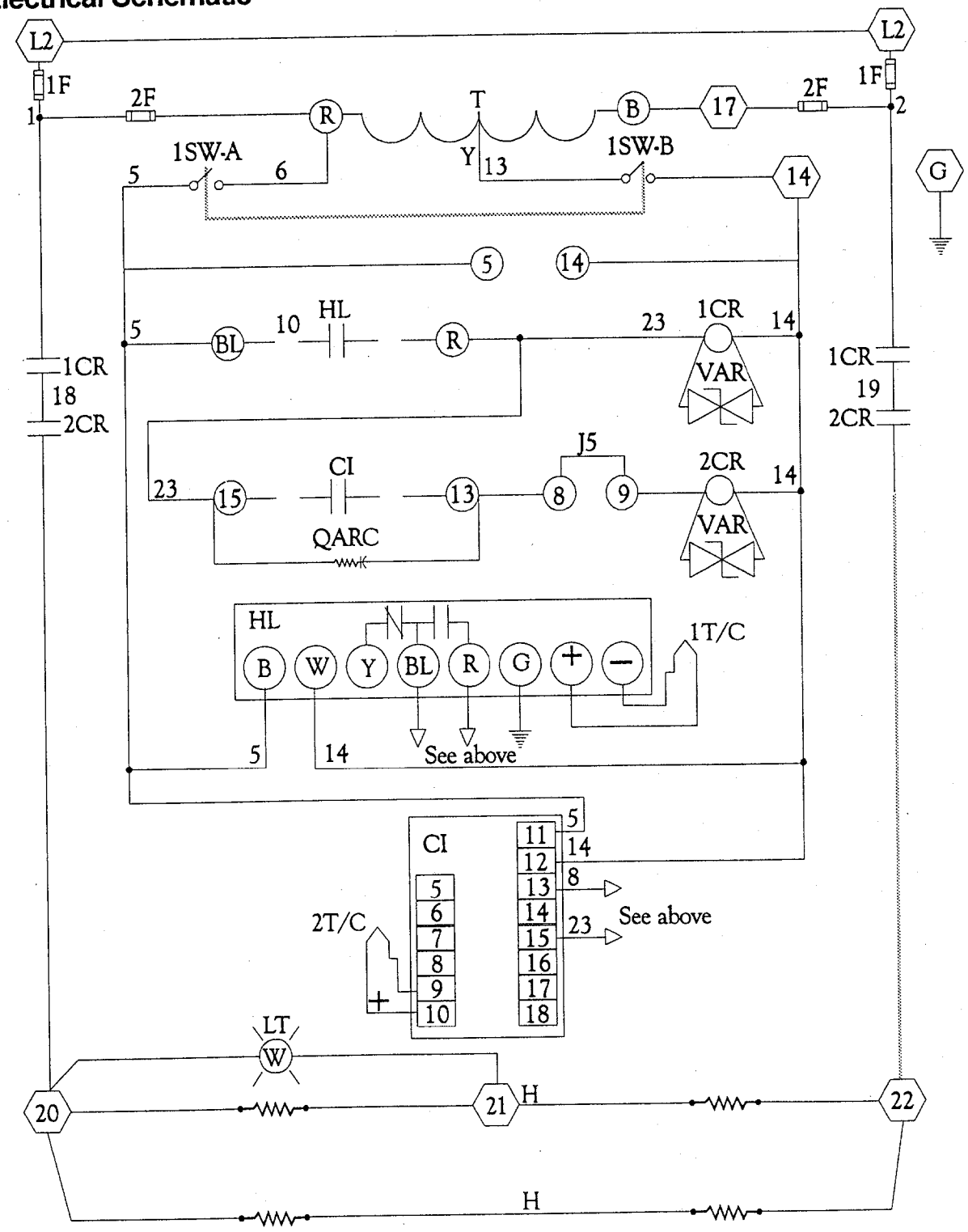
⬡ Terminal Strip Number

◯ Plug Terminal Number

J1 - 5 Yellow Jumpers

LEB2-30 240V

Electrical Schematic



Material List

Item	Part #	Qty	Description
CL	098849	1	Despatch Control
HL	086420	1	Despatch Hi-limit
1F	007615	2	250 Volt 25 Amp Fuse
2F	007453	2	250 Volt 6 Amp Fuse
SW	074116	1	Switch Gray DPST
LT	019150	1	White Pilot Light
1CR	080187	1	20 Amp Relay
2CR	073739	1	100-A09ND3 Contactor
H	007819	2	2400 Watt Heater
1,2T/C	111322	2	T/C ENL/LDB - 4 72 Inch Long Test
T	012479	1	50VA Transformer
QARC	046784	1	104M06QC100 Quencharc
VAR	014643	2	V130LA10A Varistor

Connection Legend


Terminal Strip Number


Plug Terminal Number

J1 - 5 Yellow Jumpers