



Dear MIFCO Customer:

We would like to thank and congratulate you on the purchase of the McEnglevan machine and accessories, and to share with you our confidence in the quality and reliability of our equipment.

The enclosed Operating Manual and Warranty Registration Card are important to both of us for two reasons:

1. Your Registration Card, with proper serial number, will be documented in our files and your written warranty will be forwarded to you upon the receipt of this card. Please complete and mail the return card now.
2. Proper instruction on the maintenance of your machine is very important. Please read your instruction manual completely for best results and maximum machine tool life.

Should you ever need service, it is available through the distributors, our factory representatives or directly from the factory. It is the obligation of our franchised distributor who sells you this equipment to conduct field service where possible. Please contact your local distributor first and they will assist you in resolving any problems you may encounter.

We take pride along with you in your purchase of this equipment. We will be happy to assist you in any way possible to receive optimum results in its operation and use.

Sincerely yours,

A handwritten signature in black ink that reads 'Matthew K. Walter'. The signature is written in a cursive, flowing style.

Matt Walter
CEO

DO NOT REMOVE THIS PAGE

In accordance with the National Electric Code, A.G.A., Canadian Standard Association, O.S.H.A., N.F.P.A., and the F.I.A. recommendations, this specification sheet must remain a part of this manual. Most of the components are U.L. and A.G.A. listed.

This manual contains the Electrical Wiring schematic applicable to this particular equipment. If there are any questions, contact your distributor or the factory. Only licensed electricians or qualified factory representatives should trouble shoot the electrical system of this equipment.

The electrical portion of this equipment is built in compliance with the National Electric Code in effect as of this date.

Purchased from _____ Date _____

City _____ State _____ Zip Code _____

Model Number _____ Serial Number _____

Electrical Service Specifications

_____ Volts _____ Phase _____ Hertz

Note: Schematic drawings showing different voltages, phase and hertz data are included in the manual. Use the above Electrical Service Specifications as your guide in selecting the correct schematic drawing.

ATTENTION: READ ME FIRST!!!

Watlow F4 Temperature Controller Programming the Control Instrument

First of all, the Watlow Control Instrument is pre-programmed here at the factory and has tuning parameters entered into it that have been arrived at by extensive testing. Everyone's needs are different and the control parameters chosen were decided on for a mixture of speed, to get the load up to temperature as fast as possible, and to minimize overshoot of the setpoint. You may decide to tune the instrument to suit your needs more closely. This is a relatively easy process, but it is strongly suggested that you read the accompanying book on your particular Watlow Controller **FIRST**.

To enter a setpoint into the controller, look at the lower display of the instrument. You will notice that the Setpoint 1 is the first parameter displayed. Use the right arrow to enter the setpoint. Use the up or down arrows to determine the setpoint and right arrow again, after the setpoint is entered. The unit should begin heating. This is all that is required.

Entering a Ramp / Soak Profile

(If you ordered Programmable Option #1 with your unit.)

The instrument is shipped from our factory with a sample profile that is named PROCESS 1. It can be viewed by going down the Main Page list in the lower display to the line that says Go to Profiles. Use the right arrow to go into the group. The display will read Create Profile, Edit Profile, Delete Profile. Choose Edit Profile and use the right arrow to step through the existing profile. PROCESS 1 is a simple 4 step profile for ramping the furnace up at 6:00 am to a setpoint of 1800°F. Step 1 has a ramp time of 1 second, the lowest setting, to immediately change the setpoint. Step 2 is a 1 hour soak period to hold the load at the setpoint for a period of 1 hour. Step 3 is a 1 second ramp back down to a setpoint of 50°F. Step 4 is the end segment. This tells the controller what to do at the end of the profile. In this case, we have programmed it to hold at the final setpoint. We employ the feature called guaranteed soak, which delays timing of steps until the process temperature is within a specified range of the setpoint.

There are other questions that have to be answered for each step when a profile is being created that tell it to perform certain functions, or to observe certain parameters. Refer to the sample profile page on the next page of this manual to see the standard settings for these steps in this furnace. It is also strongly suggested that you refer to the chapter on page 4.1, entitled Profile Programming, of the Watlow manual supplied with this operating manual for further details pertaining to creating profiles.

To run the profile, press the profile button in the lower left corner of the instrument. It will ask which profile you wish to run. Select the profile, right arrow out of the group, and the profile will start. You can confirm this by referring to the lower display. Line 3 reads out the current step, line 4 tells the time remaining for that step, and line 5 tells the actual time in 24 clock readout. To stop a profile, press the profile button again and tell the instrument to terminate the profile. Right arrow out of the group and the profile terminates. The Setpoint 1 reading will say OFF. Arrow down to the Setpoint 1 line and right arrow into it, enter a setpoint again and right arrow out of the group and a new setpoint will be entered.

Watlow Series 97 High Limit Instrument

The high limit instrument supplied with your furnace is set at the factory to its maximum range setting. This is done to protect the heating elements in the furnace chamber. Should you wish to lower the setpoint of the high limit instrument, please refer to the Watlow Series 97 manual supplied with this manual.

(For special order units with the following controller.)

OPERATION OF THE HONEYWELL UDC-2000

THIS IS INTENDED AS A QUICK REFERENCE GUIDE AND SHOULD NOT BE SUBSTITUTED FOR READING THE PRODUCT MANUAL. THE PURPOSE OF THIS SHEET IS TO GET YOUR FURNACE RUNNING AND SIMPLIFY OPERATION IN THE BEGINNING.

Your instrument has been calibrated and tuned at the factory prior to shipping. There should be no need for further adjustment in the field.

To begin with, the UDC-2000 is relatively simple to operate. To start the furnace, press the start button or flip the toggle switch. Then your instrument will power up and you will see the Process Temperature displayed and either an F° or C° beside it, depending on the configuration requested. To enter a setpoint, press the display button marked **DISP**. The letters **SP** will appear in the lower left corner and the process temperature will be replaced by the setpoint value.

To enter the setpoint press the **up or down** arrows, and the value will begin to change in one degree increments. This process can be speeded up by pressing the opposite arrow while holding the first one in. Press once and the setpoint will increase by 10ís; once again and it will increase by 100ís.

Once you have obtained your desired setpoint, that is all you have to do. To return to Process or Chamber Temperature Display, press **RESET** once and the process value will be displayed. If you do nothing, it will return to Process value in about 1 minute. This is all you have to do. The furnace will begin heating immediately.

INDUSTRIAL FURNACES WITH HIGH LIMIT

Once you have followed the steps above, you must also enter a setpoint value in the High Limit instrument. If the instrument display reads **LIMIT** you must first press **RESET** button. Then press the display button marked **DISP**, and once again, as with the control instrument, **SP** will appear in the lower left of the display, and what was your process value or chamber temperature will now become your setpoint value. Enter a setpoint approximately 10∞ higher than the setpoint in the control instrument. Once you have obtained a setpoint value the display will return to Process value in about 1 minute. If the high limit instrument is engaged, the main contactor will be released and the display will read **LIMIT**. It must be reset after the process temperature goes below the setpoint to restart the furnace.

If you have any questions, please feel free to call McEnglevan or Honeywellís toll free number found inside the front cover of the instrument operating manual.

(For special order units with the following controller.)

OPERATION OF THE HONEYWELL UDC-2000 HIGH LIMIT

THIS IS INTENDED AS A QUICK REFERENCE GUIDE AND SHOULD NOT BE SUBSTITUTED FOR READING THE PRODUCT MANUAL. THE PURPOSE OF THIS SHEET IS TO GET YOUR FURNACE RUNNING AND SIMPLIFY OPERATION IN THE BEGINNING.

INDUSTRIAL FURNACES WITH HIGH LIMIT

Once you have started your furnace and entered a setpoint in the control instrument, you must also enter a setpoint value in the High Limit instrument. If the instrument display reads **LIMIT** you must first press **RESET** button. Then press the display button marked **DISP**, and once again, as with the control instrument, **SP** will appear in the lower left of the display, and what was your process value or chamber temperature will now become your setpoint value. Enter a setpoint approximately 20° to 25° higher than the setpoint in the control instrument. Once you have obtained a setpoint value the display will return to Process value in about 1 minute. If the high limit instrument is engaged, the main contactor will be released and the display will read **LIMIT**. It must be reset after the process temperature goes below the setpoint to restart the furnace.

If you have any questions, please feel free to call McEnglevan or Honeywell's toll free number found inside the front cover of the instrument operating manual.

LTE-1824 Parts List
Electrical components:

003600 Fuseholder HKP - HH,
003624 2 Amp agc fuse
004048 Type J thermocouple wire 8í pc.
003908 Amber indicator light
004024 UDC 2000 controller
004026 UDC 2000 High limit
004509 Din-A-Mite SCR must be ordered voltage specific
003936 3 Pole contactor
003930 Magnetic motor starter
003951 Element heaters
003603 Fuse holder
003679 3" Copper buss bar
003695 17 3/4" Copper buss bar
003686 11 3/4" Copper buss bar
003682 2 3/4" Copper buss bar
004119 1/2" HP - 56C - 60 HZ motor
004192 Heating element 3000W - #525393
003408 1/2 x 3/8" Tank fitting MIP
004226 Dwyer air switch 26 -192281- 00 - 2619
004050 Thermocouple head assy
004045 15" Type J thermocouple
003662 Black start switch
003663 Red stop switch
003869 Box cooling fan
003868 Box intake filter

Door Assembly

1. 400815 Complete Door Assembly-1
2. 400034 Door Pivot Assembly-2
3. 400040 Door Hinge Assembly-1
4. 400050 Door Lock Assembly w/lugs-1

Work Chamber

1. 400130 WorkChamber-1
2. 400139A Front Flange-1
3. 400135 Front Seal Ring-1
4. 400020 1 Set Cloth Seal - 4pcs - 1
5. 002011 5/16"-18 Hex Nuts - 16

Heater Terminals

1. 003679 3" Copper Buss Bars - 4
2. 003686 11 3/4" Copper Buss Bars -1
3. 003682 2 3/4" Copper Buss Bars - 2
4. 003695 17 3/4" Copper Buss Bars -1

LTE-1824 (cont.)

Back Plug Assembly

1. 400680 Heater Plug -1
2. 004353 2400 Watt Heating Element - 6
3. 003408 1/2" Brass Compression Fittings -12
4. 002121 3/8" Std Flat Washers -10
5. 002015 3/8-16 Hex Nuts - 10

Grid Assembly

1. 400160 Work Grid Assembly - 1

Recirculating Fan and Motor Assembly

1. 400120 Recirculating Fan & Shaft - 1
2. 004226 Dwyer Air Pressure Switch - 1
3. 001210 3/8-16 x 2 1/4 Hexhead Capscrew - 4
4. 002121 3/8" Std flat Washer - 8
5. 400372 Cooling Fan Guard -1
6. 000652 1/4-20 RH Slotted Screws - 2
7. 400126 Cooling Fan -1
8. 002015 3/8-16 Std Hexnuts - 4
9. 002432 1" VAK Pillow Block Bearings - 2
10. 004269 2AK27-1" Bore Pulley -1
11. 004270 2AK41-5/8" Bore Pulley -1
12. 004285 Vee Belt 41,220 - 2
13. 400076 Vee Belt Guard -1
14. 002111 1/4" Flat Washer - 1
15. 003830 2"x 4" Junction Box - 1
16. 003832 2" x 4" Handy Box Cover -1
17. 004119 1/2 HP-1725 RPM 230-460,
3ph Ball Bearing TEFC 60hz, 56 C Flange Motor - 1
18. 400070 Motor Stand -1
19. 003760 3/8" Flex Conduit Conn # 7480V - 3
20. 001205 3/8-16 1" Hexhead Capscrews - 4
21. 002122 3/8" Lock Washer - 4

LTE-1830 Parts List
Electrical components:

003600 Fuseholder HKP - HH,
003624 2 Amp agc fuse
004048 Type J thermocouple wire 8í pc.
003908 Amber indicator light
004024 UDC 2000 controller
004026 UDC 2000 High limit
004509 Din-A-Mite SCR must be ordered voltage specific
003936 3 Pole contactor
003930 Magnetic motor starter
003951 Element heaters
003603 Fuse holder
003679 3" Copper buss bar
003695 17 3/4" Copper buss bar
003686 11 3/4" Copper buss bar
003682 2 3/4" Copper buss bar
004119 1/2" HP - 56C - 60 HZ motor
004192 Heating element 3000W - #525393
003408 1/2 x 3/8" Tank fitting MIP
004226 Dwyer air switch 26 -192281- 00 - 2619
004050 Thermocouple head assy
004045 15" Type J thermocouple
003662 Black start switch
003663 Red stop switch
003869 Box cooling fan
003868 Box intake filter

Door Assembly

1. 400815 Complete Door Assembly-1
2. 400034 Door Pivot Assembly-2
3. 400040 Door Hinge Assembly-1
4. 400050 Door Lock Assembly w/lugs-1

Work Chamber

1. 400830 WorkChamber-1
2. 400139A Front Flange-1
3. 400135 Front Seal Ring-1
4. 400020 1 Set Cloth Seal - 4pcs - 1
5. 002011 5/16"-18 Hex Nuts - 16

Heater Terminals

1. 003679 3" Copper Buss Bars - 4
2. 003686 11 3/4" Copper Buss Bars -1
3. 003682 2 3/4" Copper Buss Bars - 2
4. 003695 17 3/4" Copper Buss Bars -1

LTE-1830 (cont.)

Back Plug Assembly

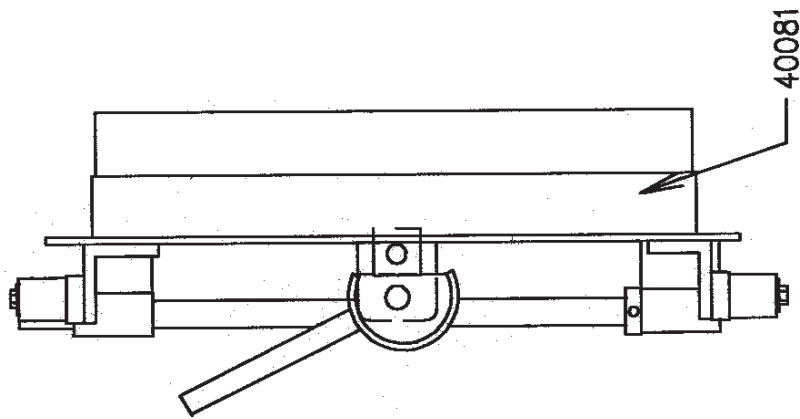
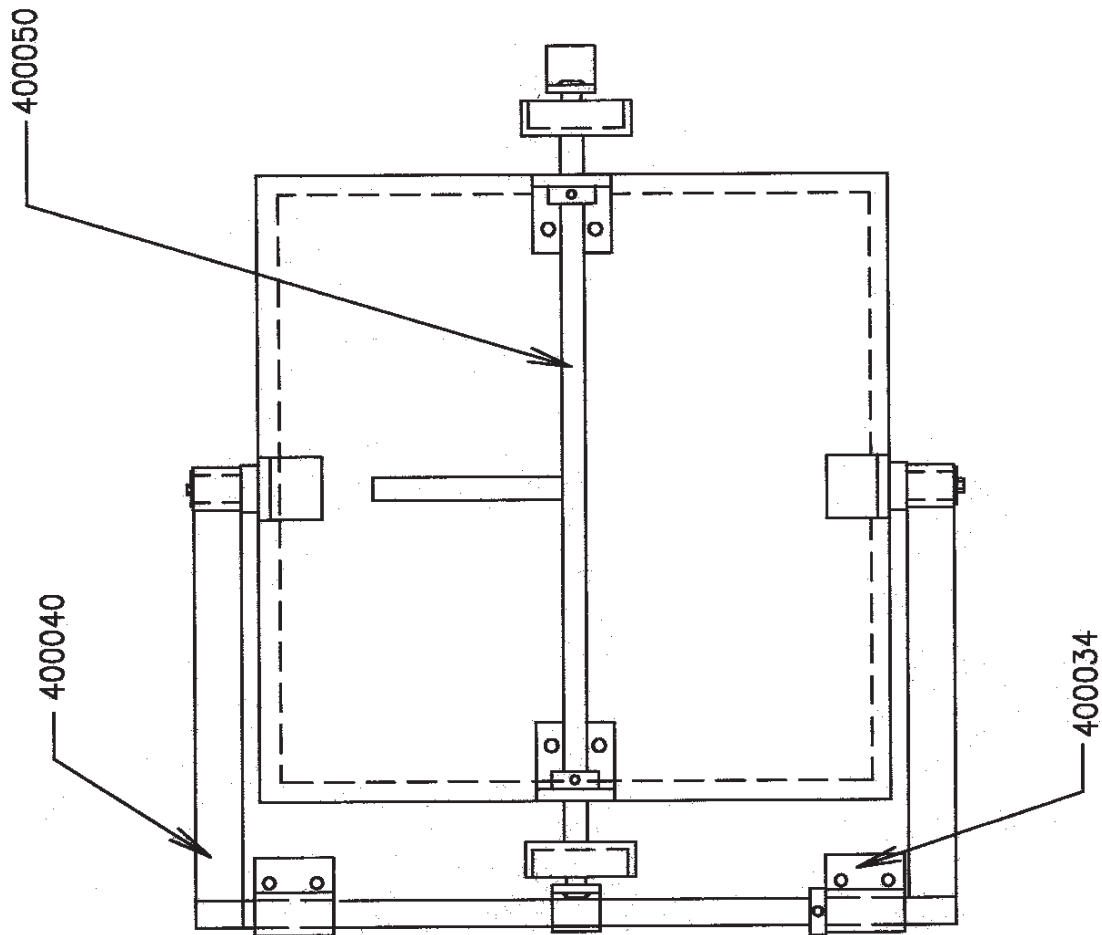
1. 400680 Heater Plug -1
2. 004192 3000 Watt Heating Element - 6
3. 003408 1/2" Brass Compression Fittings -12
4. 002121 3/8" Std Flat Washers -10
5. 002015 3/8-16 Hex Nuts - 10

Grid Assembly

1. 400360 Work Grid Assembly - 1

Recirculating Fan and Motor Assembly

1. 400120 Recirculating Fan & Shaft - 1
2. 004226 Dwyer Air Pressure Switch - 1
3. 001210 3/8-16 x 2 1/4 Hexhead Capscrew - 4
4. 002121 3/8" Std flat Washer - 8
5. 400372 Cooling Fan Guard -1
6. 000652 1/4-20 RH Slotted Screws - 2
7. 400126 Cooling Fan -1
8. 002015 3/8-16 Std Hexnuts - 4
9. 002432 1" VAK Pillow Block Bearings - 2
10. 004269 2AK27-1" Bore Pulley -1
11. 004270 2AK41-5/8" Bore Pulley -1
12. 004285 Vee Belt 41,220 - 2
13. 400076 Vee Belt Guard -1
14. 002111 1/4" Flat Washer - 1
15. 003830 2"x 4" Junction Box - 1
16. 003832 2" x 4" Handy Box Cover -1
17. 004119 1/2 HP-1725 RPM 230-460,
3ph Ball Bearing TEFC 60hz, 56 C Flange Motor - 1
18. 400070 Motor Stand -1
19. 003760 3/8" Flex Conduit Conn # 7480V - 3
20. 001205 3/8-16 1" Hexhead Capscrews - 4
21. 002122 3/8" Lock Washer - 4



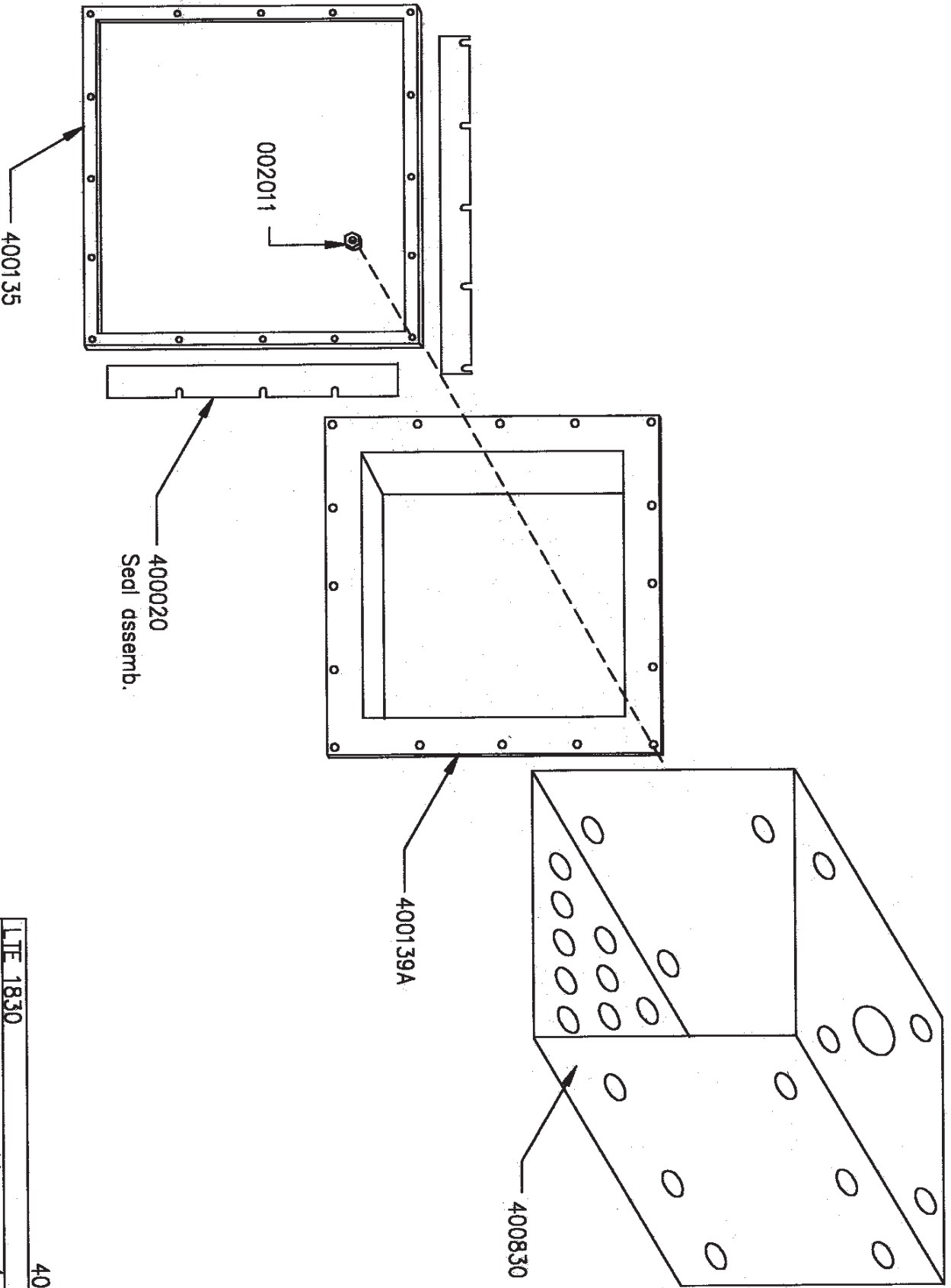
Redrawn 8/16/1999 400815

LT 1830

Door and hinge assembly 1 Per Unit

M I F C O

10/70



400135

002011

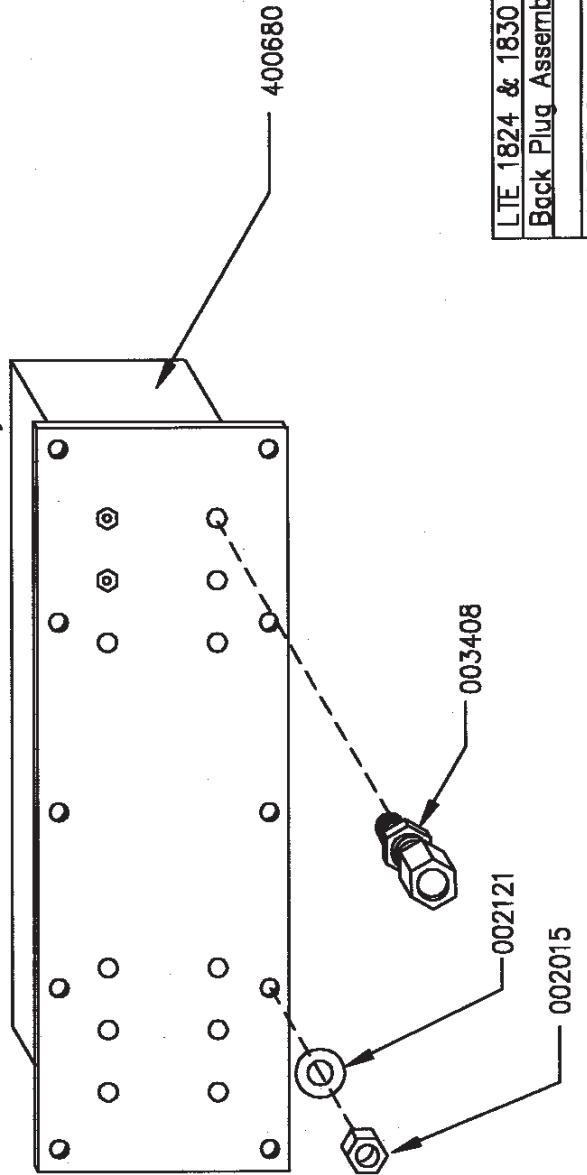
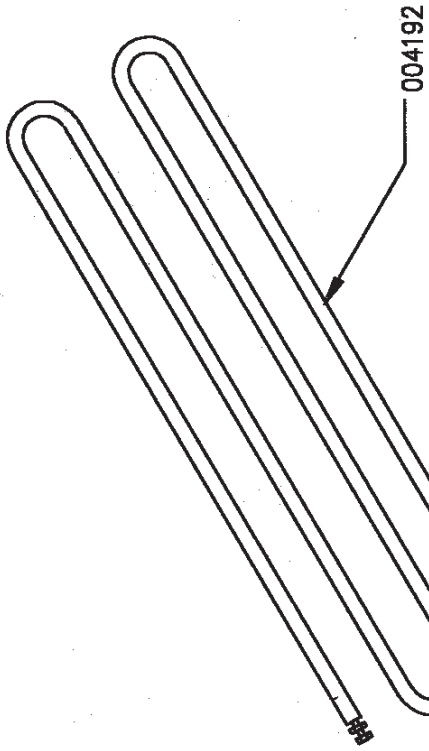
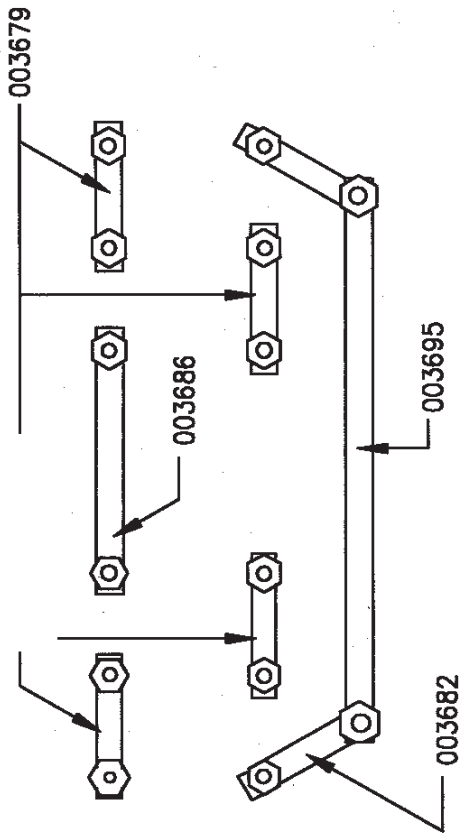
400020
Seal assembl.

400139A

400830

LTE 1830	400830
Work chamber assembly	1 Per unit
M I F C O	10/1970

Heater Terminals 460 V.

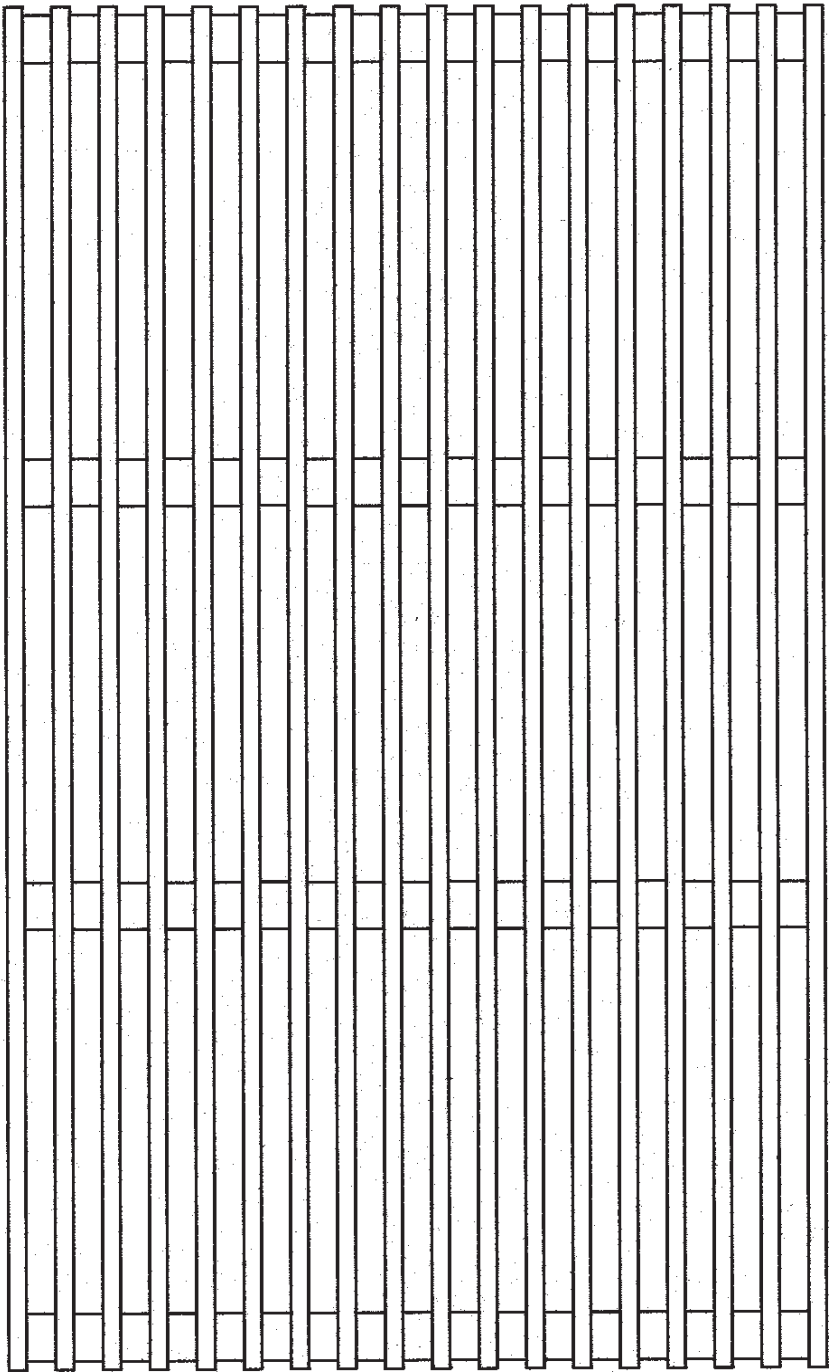


400680

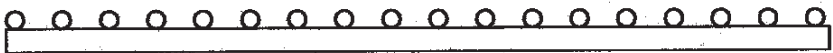
LTE 1824 & 1830

Back Plug Assembly 1 Per Unit

M I F C O 10/1970

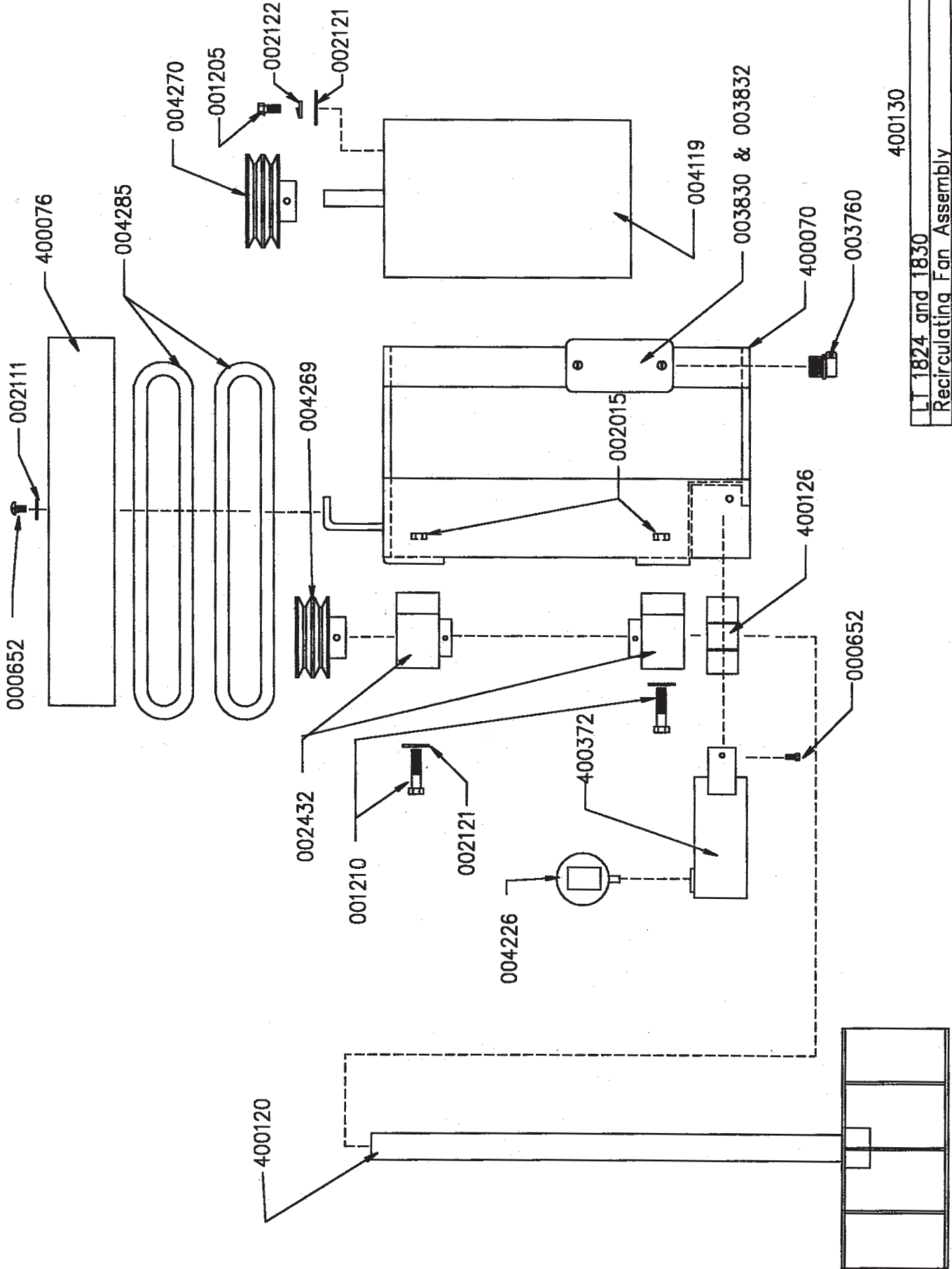


400360



400360

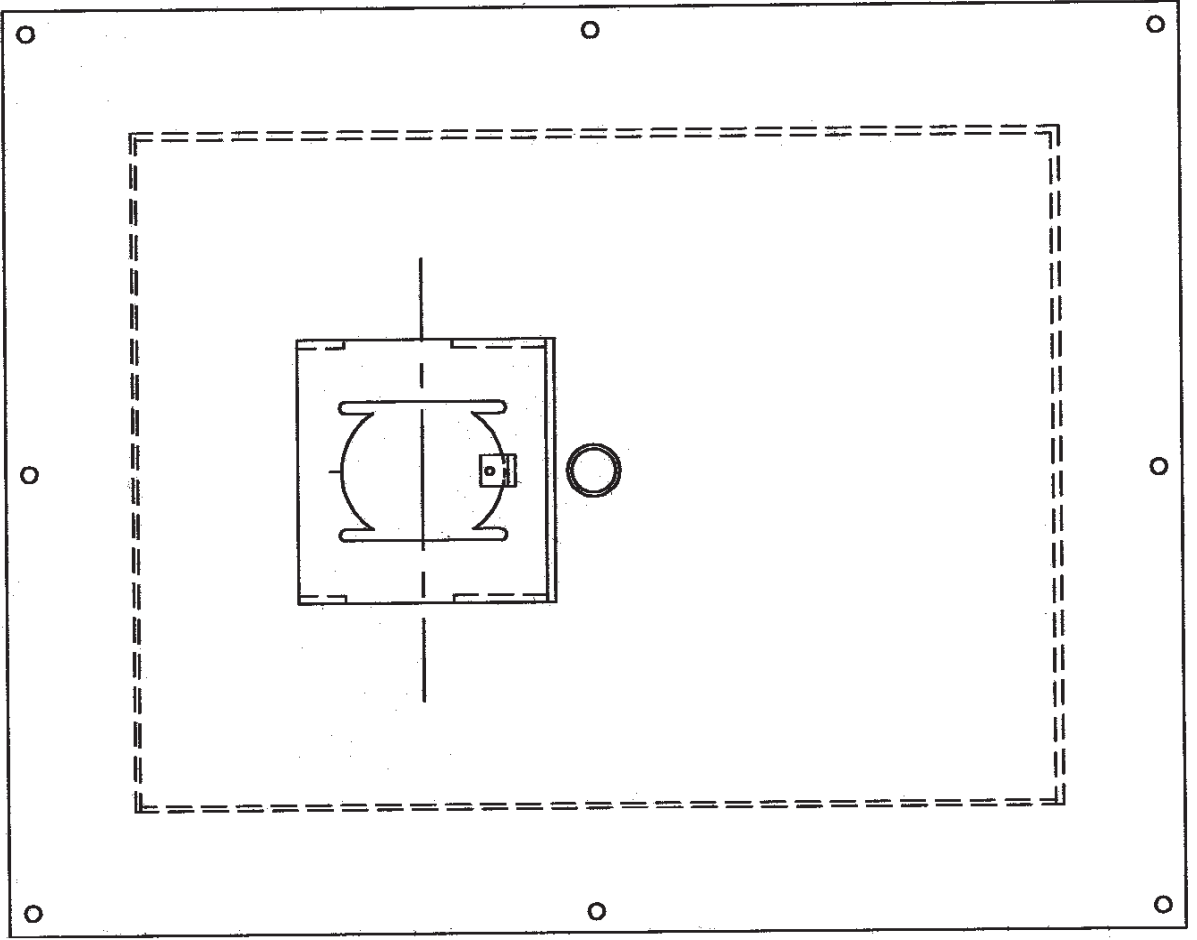
LT 1830	
Work chamber grid	1 Per Unit
M I F C O	9/8/1999



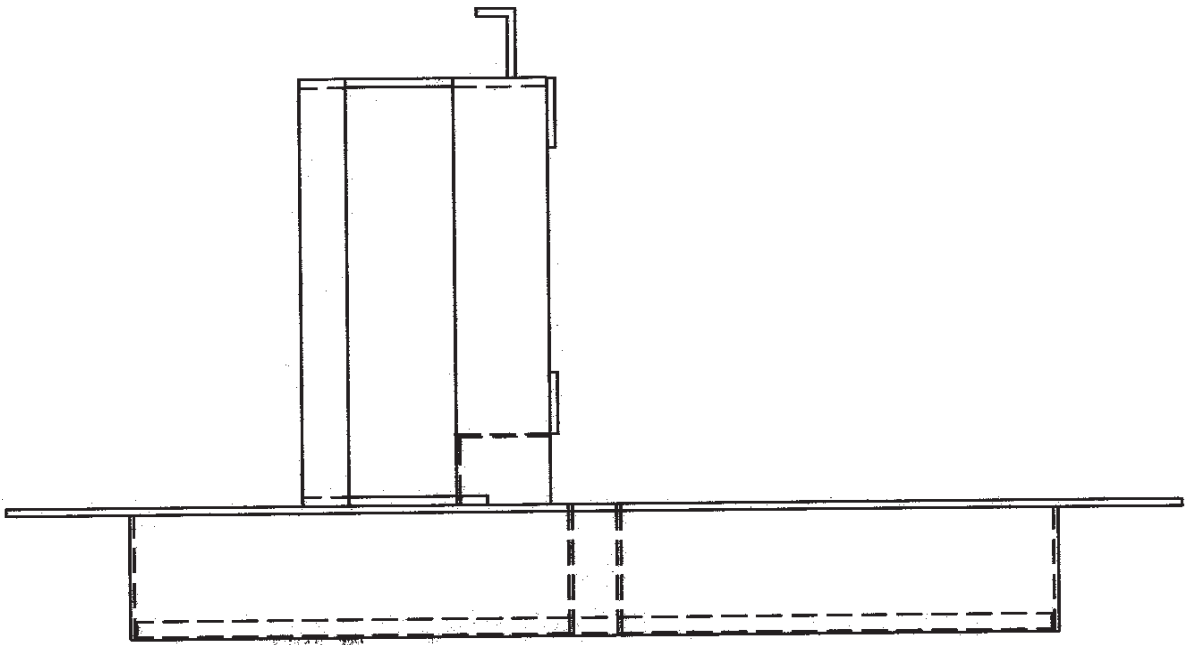
400130

LT 1824 and 1830
Recirculating Fan Assembly

M I F C O
9/10/1999



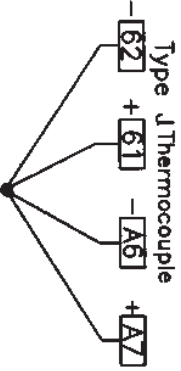
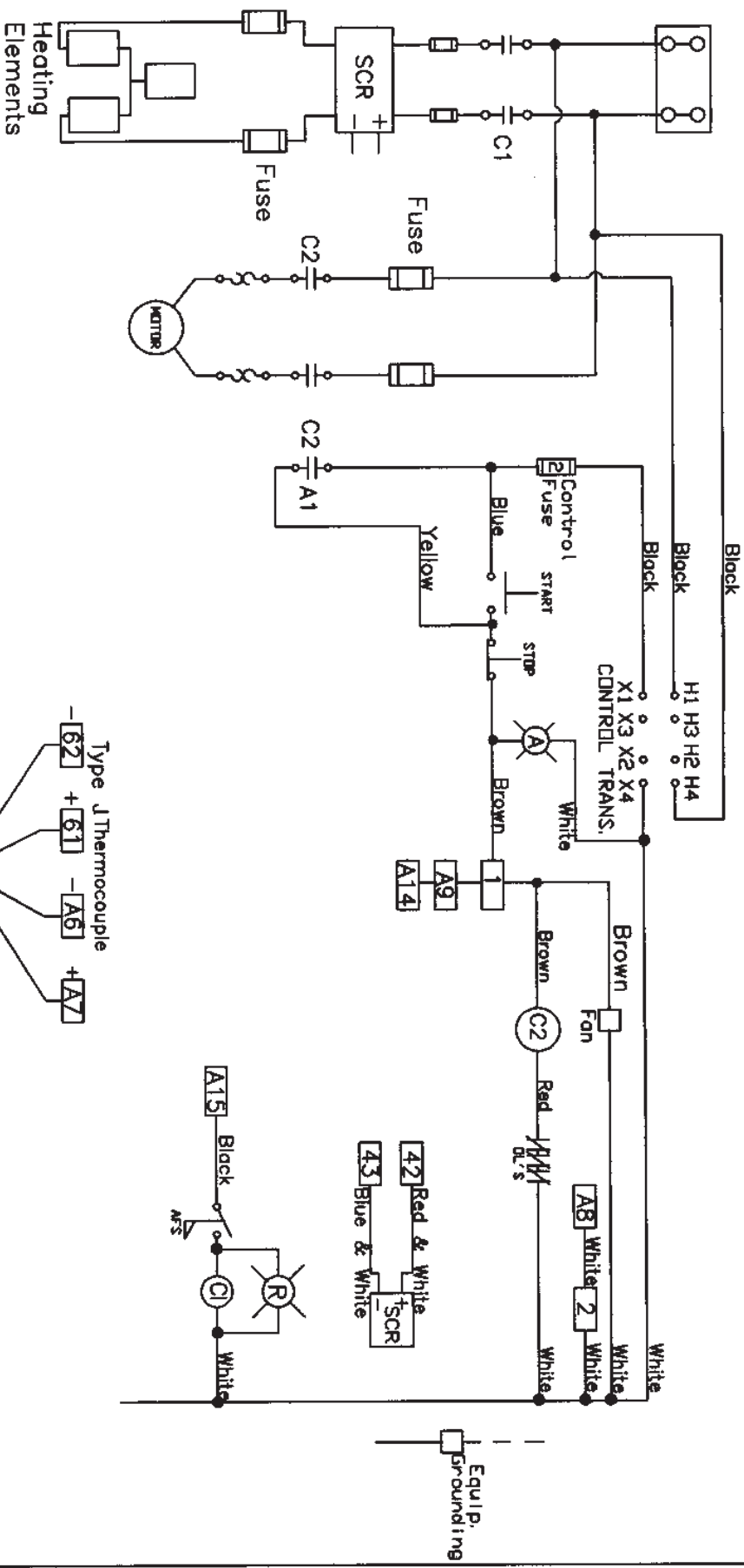
Furnace Front



Redrawn 8/10/1999 400060
 LT 1830
 Top plug assembly 1 Per Unit
 M I F C O 10/70

Power Supply
240 V
1 Ph / 60 Hz

LT 1824-LT 1830 Walwo F4 Controller and Series 97 High Limit



- Control Inst. Terminals
- High Limit Cont. Term.
- Contactor Coils
- Inst. Cabinet Cooling Fan
- Afs Air Flow Switch

HEAT TREAT - ED0110

LT 1824--LT 1830

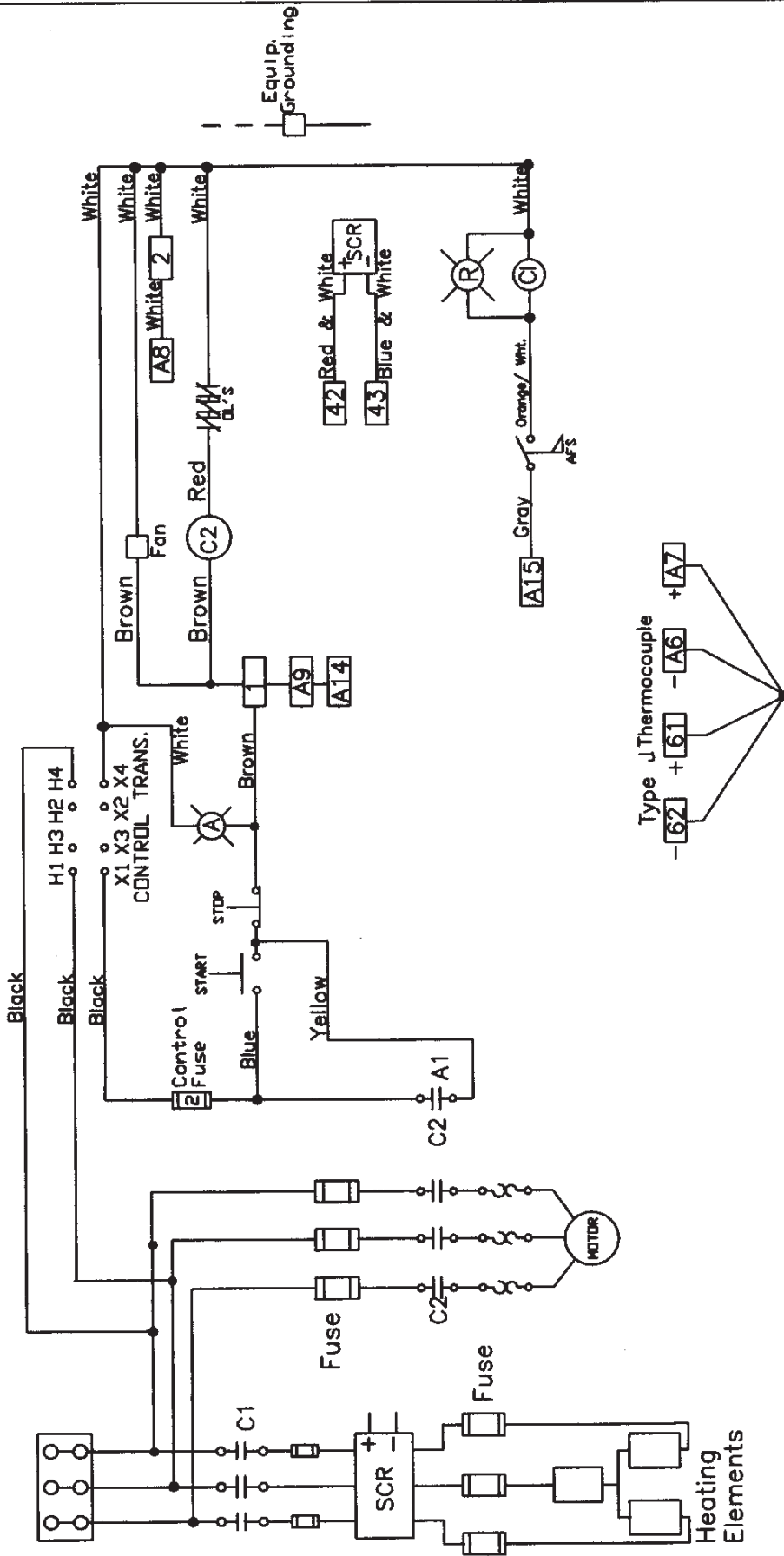
M I F C O

3/11/02

LT 1824-LT 1830

Watlow F4 Controller and Series 97 High Limit

Power Supply
230V / 460V
3 Ph / 60 Hz



- Control Inst. Terminals
- High Limit Cont. Term.
- Contactor Coils
- Inst. Cabinet Cooling Fan
- Afs Air Flow Switch

HEAT TREAT - ED0102

LT 1824--LT 1830

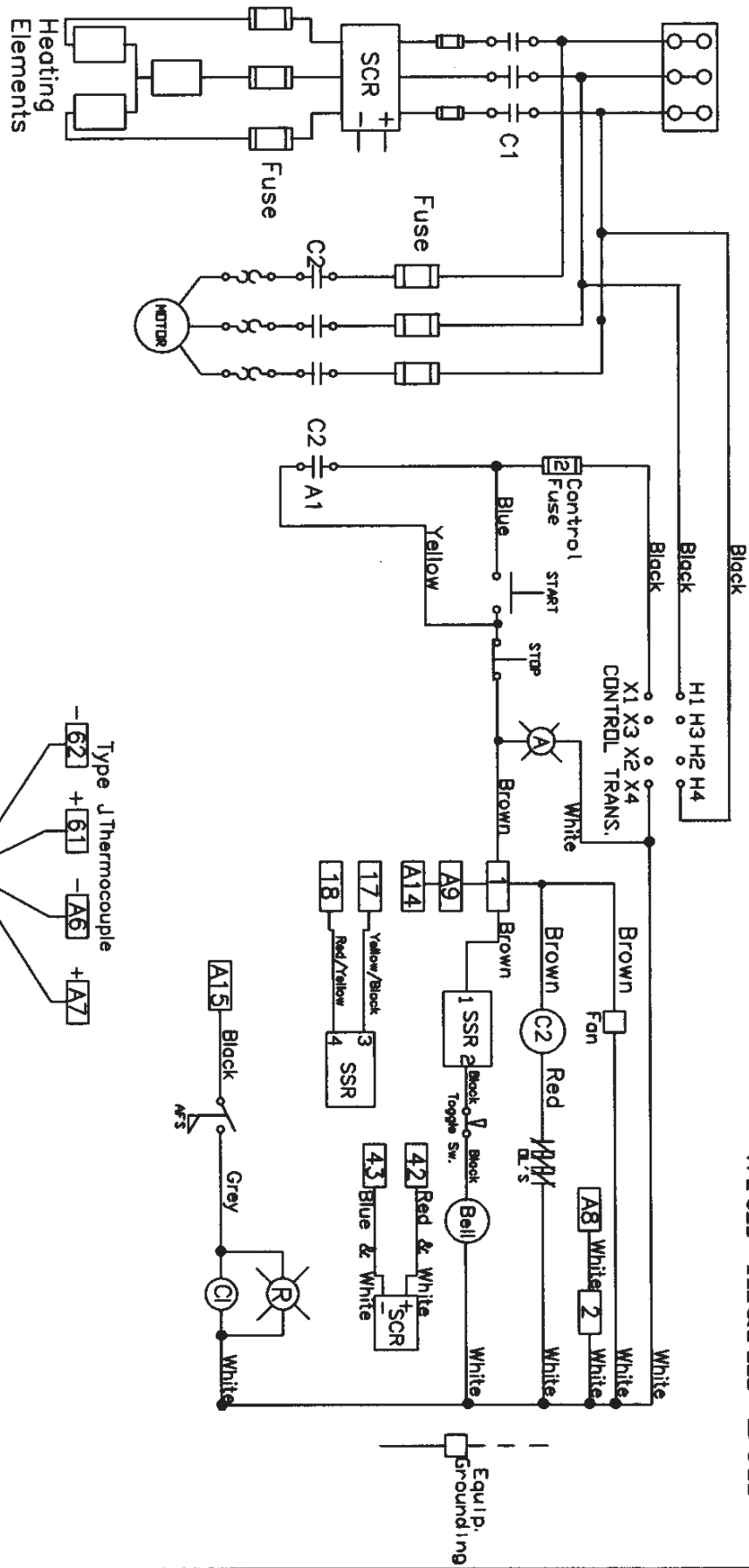
M I F C O

3/11/02

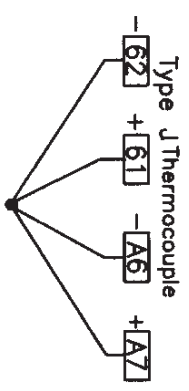
Power Supply
 230V / 460V
 3 Ph / 60 Hz

LT 1824-LT 1830

Watlow F4 Controller and Series 97 High Limit with Alarm Bell



- Control Inst. Terminals
- High Limit Cont. Term.
- Contactor Coils
- Inst. Cabinet Cooling Fan
- Afs Air Flow Switch



HEAT TREAT - ED-0118

LT 1824--LT 1830

M I F C O

2/25/03