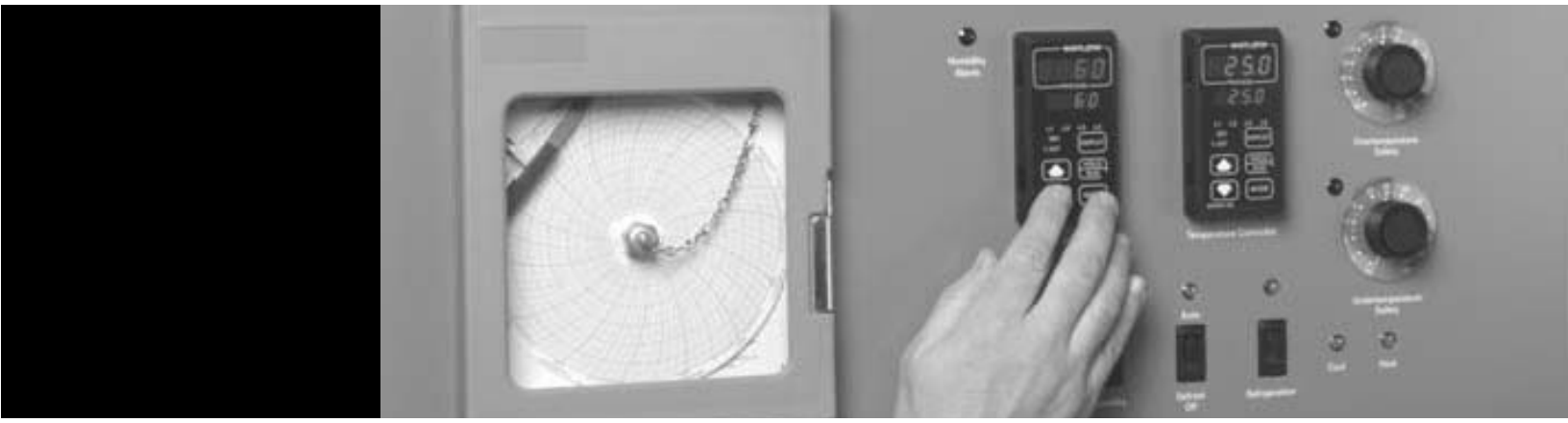
Model 3940 Series

Forma Environmental Chamber

Operating and Maintenance Manual 7053940 Rev. 0



Thermo SCIENTIFIC

Table 1. Models Covered in This Manual

Model	Capacity (cu. ft.)	Voltage
3911	11	208-220
3913	11	220-240
3940	29	208-220
3949	29	220-240

MANUAL NUMBER 7053940

REV	ECR/ECN	DATE	DESCRIPTION	By
0	24965/IN-4051	3/8/11	Release 10	ccs



Important Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

Caution All internal adjustments and maintenance must be performed by qualified service personnel. ▲

Material in this manual is for information purposes only. The contents and the product it describes are subject to change without notice. Thermo Fisher Scientific makes no representations or warranties with respect to this manual. In no event shall Thermo be held liable for any damages, direct or incidental, arising out of or related to the use of this manual.

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Important operating and/or maintenance instructions. Read the accompanying text carefully.



Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.



Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.



Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.



Marking of electrical and electronic equipment, which applies to electrical and electronic equipment falling under the Directive 2002/96/EC (WEEE) and the equipment that has been put on the market after 13 August 2005.

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the WEEE symbol. Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State European Country, and this product should be disposed of or recycled through them. Further information on Thermo's compliance with this directive, the recyclers in your country and information on Thermo products will be available at www.thermofisher.com.

- ✔ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- ✔ Always dissipate extreme cold or heat and wear protective clothing.
- ✔ Always follow good hygiene practices.
- ✔ Each individual is responsible for his or her own safety.

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1-877-213-8051	FAX
http://www.thermoscientific.com	Internet Worldwide Web Home Page
service.led.marietta@thermofisher.com	Service E-Mail Address

Our **Sales Support** staff can provide information on pricing and give you quotations. We can take your order and provide delivery information on major equipment items or make arrangements to have your local sales representative contact you. Our products are listed on the Internet and we can be contacted through our Internet home page.

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Whatever Thermo Scientific products you need or use, we will be happy to discuss your applications. If you are experiencing technical problems, working together, we will help you locate the problem and, chances are, correct it yourself...over the telephone without a service call.

When more extensive service is necessary, we will assist you with direct factory trained technicians or a qualified service organization for on-the-spot repair. If your service need is covered by the warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

Regardless of your needs, our professional telephone technicians are available to assist you Monday through Friday from 8:00 a.m. to 6:00 p.m. Eastern Time. Please contact us by telephone or fax. If you wish to write, our mailing address is:

Thermo Fisher Scientific
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Marietta, OH 45750

International customers, please contact your local Thermo Scientific distributor.

Warranty Notes

Information You Should Know Before Requesting Warranty Service

- **Locate the model and serial numbers.** A serial tag is located on the unit itself.
- For equipment service or maintenance, or with technical or special application inquiries, contact Technical Services at 1-800-438-4851 or 1-740-373-4763 (USA and Canada). Outside the USA, contact your local distributor.

Repairs NOT Covered Under Warranty

- **Calibration of control parameters.** Nominal calibrations are performed at the factory; typically ±1°C for temperature, ±1% for gases, and ±5% for humidity. Our service personnel can provide precise calibrations as a billable service at your location. Calibration after a warranty repair is covered under the warranty.
- **Damage resulting from use of improper quality water, chemicals or cleaning agents detrimental to equipment materials.**
- **Service calls for improper installation or operating instructions.** Corrections to any of the following are billable services:
  1) electrical service connection
  2) tubing connections
  3) gas regulators
  4) gas tanks
  5) unit leveling
  6) room ventilation
  7) adverse ambient temperature fluctuations
  8) any repair external to the unit
- **Damage resulting from accident, alteration, misuse, abuse, fire, flood, acts of God, or improper installation.**
- **Repairs to parts or systems resulting from unauthorized unit modifications.**
- **Any labor costs other than that specified during the parts and labor warranty period, which may include additional warranty on CO_2 sensors, blower motors, water jackets, etc.**

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Section 1 Installation and Set-Up

Locate the unit on a firm, level surface in an area of minimum ambient temperature fluctuation. A minimum of three (3) inches of clearance is required at the top and back of the incubator. This space is necessary to allow adequate airflow around the refrigeration system. At least eight (8) inches clearance above the cabinet is required for service access.

Preliminary Cleaning and Disinfecting

Disinfect all interior surfaces with a general-use laboratory disinfectant. Rinse thoroughly with sterile distilled water, then 70% ethanol. Dry with a sterile cloth as needed.

Disinfect the shelf channels and shelves, then rinse with distilled water before installing.

Caution Before using any cleaning or decontamination method except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment. ▲

Warning Accidental spills of hazardous materials on or inside this unit are the responsibility of the user. ▲

Installing the Shelves

The shelves may be installed at any level in the incubator. Install a shelf channel on each side. With the tabs pointing up, attach the channel by locating the rivet into a slotted hole, far end first. Pull the channel toward the front and slide the front rivet on the channel into the slotted hole and press down. Make sure that the channels are opposite each other so that the installed shelf will be level.

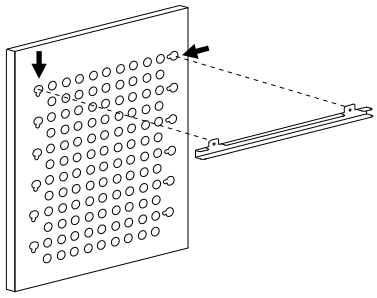


Figure 1-1. Install Shelf Channel

Leveling the Unit

Place a bubble-type level on a shelf inside the incubator. Adjust the feet as needed; counterclockwise to lengthen or clockwise to shorten. Level the unit front-to-back and left-to-right.

Connect Water Inlet for Humidity System

The humidity reservoir will require approximately three cups (0.710 liter) of water on the initial filling. For best operation of the incubator, sterilized distilled, demineralized or de-ionized water should be used in the humidity reservoir. Water purity should be in the resistance range of 50K to 1M Ohm/cm, or a conductivity range of 20.0 to 1.0 uS/cm. Refer to ASTM Standard D5391-93 or D4195-88 for measuring water purity.

Distillation systems, as well as some types of reverse osmosis water purity systems, can produce water in the quality range specified. Tap water is not recommended as it may contain chlorine, which can deteriorate the stainless steel. Tap water may also have a high mineral content, which would produce a build-up of scale in the reservoir. High purity or ultra pure water is not recommended as it is an extremely aggressive solvent and will deteriorate the stainless steel. High purity water has a resistance of above 1M to 18M Ohm. Even high purity water can contain bacteria and organic contaminants. Water should always be sterilized or treated with a decontaminant, safe for use with stainless steel as well as safe for the product, prior to being introduced into the humidity reservoir.

Caution Distilled or de-ionized water used in the humidity reservoir must be within a water quality resistance range of 50K to 1M Ohm/cm to protect and prolong the life of the stainless steel. Use of water outside the specified range will decrease the operating life of the unit and may void warranty. ▲

The water inlet is the 1/8” FPT connection located on the rear top center of the incubator. A 1/4” hose fitting is provided for a hose connection, if desired. Water inlet pressure must not exceed 40 PSI. A manual shut-off valve should be installed between the main water supply and the incubator.

Caution To prevent mineral buildup on humidity generator walls, it may be necessary to clean the humidity generator with a non-metallic abrasive pad and flush thoroughly every two to three months. Refer to Section 4, Cleaning the Humidity Steam Generator. ▲

Alternate Water Supply for Humidity System

If an in-house water supply of the required purity range (50K to 1M Ohm) is not available, an alternate water supply method can be used. A large vented carboy (5 gal. minimum) of water in the required purity range can be placed on top of the unit. Connect it to the 1/8" FPT water inlet fitting, located on the rear top center of the incubator.

Note The maximum water consumption of this incubator could be as high as 2 gallons per day. When using an alternate water supply method, it is recommended that the supply be checked periodically based on source volume. ▲

Connect Drain Line

The cabinet's 3/8" MPT drain line connection is located on the rear (lower left side) of the cabinet. A P-trap (Figure 1-2) is included with the unit and must be installed on the connection.

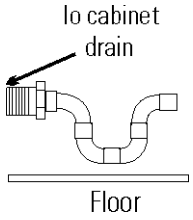


Figure 1-2. P-Trap

To install the drain connection:

1. Using Teflon pipe thread tape, tape the threads on the cabinet drain connection.

2. Using an open end adjustable wrench, install the P-trap onto the connection. Make sure the trap section is positioned down.

3. Push a piece of 3/8" ID tubing onto the trap and direct the tubing to a convenient drain. Install a hose clamp on the tubing, if desired. A condensate evaporator (P/N 1900031) or condensate pump (P/N 184062) may also be used.

4-20 Milliamp Output

The environmental chamber is equipped with 4-20mA output for the remote transmission of temperature, humidity and CO_2 data. A terminal strip is located on the back of the incubator for convenience. Refer to Figure 1-3 for terminal pin identification.

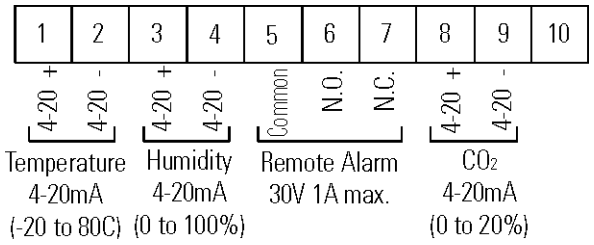


Figure 1-3. Terminal Pin Identification

Remote Alarm Contacts

Remote alarm connections are also included on the terminal strip (Figure 1-3) providing Normally Open (N.O.) and Normally Closed (N.C.) contacts. C is the Common terminal. The remote alarm will activate when either the incubator's temperature, humidity, or CO_2 go out of the set alarm limits.

Power Connection

See the serial tag on the side of the unit for electrical specifications, or refer to the electrical schematics at the end of this manual.

Caution Connect the incubator to a grounded, dedicated circuit. For Models 3911 and 3940, the power cord connector is the mains disconnect device. Models 3913 and 3949 have a fusable disconnect located on the back of the unit. Position the incubator so the unit can be easily disconnected. ▲

For Models 3911 and 3940, plug the provided 10 ft. power cord with the NEMA 14-20 plug into the grounded dedicated electrical circuit.

Start-Up

When the humidification system is operational, the incubator may be started. Preset the controls as follows:

Overtemp Safety Thermostat . . . . . Fully Clockwise
Undertemp Safety Thermostat . . . Fully Counterclockwise
Main Power Switch . . . . . .ON
Humidity Controller . . . . . .Desired Setpoint
Temperature Controller . . . . . .Desired Setpoint
Door Heater . . . . . .40% (factory set)

For best overall performance of the incubator, the refrigeration switch should be turned On for most applications. When running Low or No humidity at high temperatures, the refrigeration switch may be turned Off.

Caution The defrost switch must be turned on when the temperature setpoint is 10°C, or below. ▲

Set the Overtemp Safety Thermostat

Allow the chamber temperature and humidity to stabilize then set the overtemp safety thermostat as follows:

1. Turn the overtemp control knob slowly counterclockwise until the audible alarm sounds and the overtemp indicator lights.

2. Turn the overtemp control knob clockwise at least 2°. The alarm should be silenced and the overtemp indicator light should go out. The overtemp safety thermostat is now set a few degrees above the control temperature setpoint. When the chamber temperature rises to the overtemp control point, the alarm system will activate, power to the heaters will shut off, and the chamber temperature will be maintained at the overtemp control point.

When an overtemp condition occurs, the cause must be determined and corrected before normal operation under the main temperature controller can be resumed.

Note When the chamber temperature control setpoint is changed, the overtemp safety thermostat must be reset to accommodate the change. ▲

Note The overtemp control is not directly calibrated. The numbers on the dial are for reference only. ▲

Set the Undertemp Safety Thermostat

Allow the chamber temperature and humidity to stabilize, then set the undertemp safety thermostat as follows:

1. Turn the undertemp control knob slowly clockwise until the audible alarm sounds and the undertemp indicator lights.

2. Turn the undertemp control knob counterclockwise at least 2° on the scale. The alarm will silence and the undertemp indicator light go out.

The undertemp safety thermostat is now set a few degrees below the control temperature setpoint. When the chamber temperature drops to the undertemp control point, the alarm system activates, power to the compressor shuts off, and the chamber temperature is maintained at the undertemp control point.

When an undertemp condition occurs, the cause must be determined and corrected before normal operation under the main temperature controller can be resumed.

Set Undertemp Safety Thermostat (cont'd)

Note When the chamber temperature control setpoint is changed, the undertemp safety thermostat must be reset to accommodate the change. ▲

Note The undertemp control is not directly calibrated. The numbers on the dial are for reference only. ▲

Cobex Recorder (Optional)

The seven-day circular chart recorder is located on the front of the incubator cabinet and is protected by a glass door.

To prepare the recorder for operation, open the glass door and snap the connector onto the 9V battery (Figure 1-4). If the unit is operating, the green LED lights steady. If the unit is not turned on, the LED blinks.

If the battery is weak or not connected, the green LED will flash. If power is lost to the cabinet, the LED will also flash. When replacing the 9V battery, use only an alkaline style battery. Dispose of the old battery following established environmental practices.

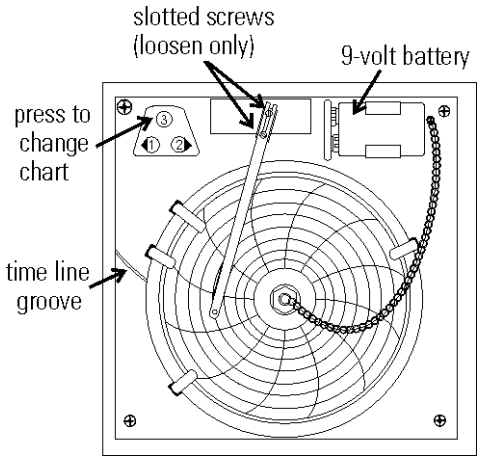


Figure 1-4. Install Battery In Recorder

Change the Chart Paper

1. Press the Change Chart button (#3) and hold it for 1 second until the pen begins to move to the left of the chart. See Figure 1-4.
2. Remove the existing chart by unscrewing the center knob securing it.
3. Install the new chart, positioning it so that the correct time line coincides with the time line groove on the chart plate.
4. Replace the center knob and screw it tightly against the chart.

Change the Pen

1. Using a small flat blade screwdriver, loosen the 2 screws holding the pen arm and remove the pen and arm as an assembly.
2. Unsnap the plastic hinge securing the pen. Remove and discard the old pen.
3. Install the new pen by snapping the hinge securely around the pen arm.
4. Re-install the pen assembly by sliding the pen arm under the screws, positioning the pen tip in the time line groove. Tighten the screws.
5. Push the Chart Change button and hold it for 1 second until the pen begins to move back onto the chart.

Note Make sure that the pen is marking on the chart. It may be necessary to gently lift the pen onto the chart paper. ▲

Honeywell Recorder (Optional)

The Honeywell, DR 4500 Recorder is a one to four-channel microprocessor-based, circular chart recorder.

The recorder is capable of recording both temperature and humidity and printing alphanumeric chart data on blank heat-sensitive chart. Refer to the Honeywell Configuration Record at the end of Section 4 and the supplemental Honeywell Recorder manual.

IR CO_2 Option

This section applies to units with the IR CO_2 option only.

Connect the CO_2 Source

For the most economical use, the liquid CO_2 supply tanks should be without siphon tubes, so that only CO_2 gas enters the incubator injection system. Two tanks may be joined together with a manifold to ensure a continuous CO_2 supply.

Install a two-stage pressure regulator, with indicating gauges, at the supply cylinder outlet. The high-pressure gauge should have an indicating range of 0 to 2000 psig to monitor tank pressure. The low-pressure gauge should have an indicating range of 0 to 30 psig to monitor input pressure to the incubator injection system. A suitable two-stage pressure regulator is available.

Connect the CO_2 Source (continued)

The CO_2 source must be regulated at a pressure level of 15, ±5 psig. Higher pressure levels may damage the CO_2 control system. The user should determine the most economical pressure level, between 10 and 20 psig appropriate for the desired CO_2 percentage in the chamber. Use only sufficient pressure to maintain recovery time after door openings.

To connect the CO_2 supply (Figure 1-5):

1. Connect the CO_2 tubing to the 1/4" hose fitting installed in the CO_2 inlet.
2. Check the tubing connection for leaks.

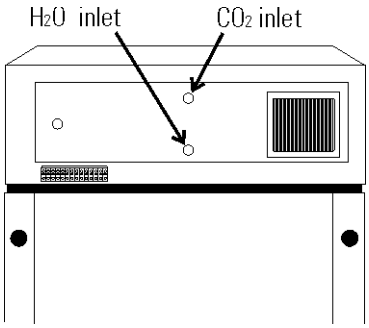


Figure 1-5. Inlet Connections

Set the CO_2 Content

The Watlow CO_2 controller's upper display shows the actual CO_2 content inside the chamber. The lower display shows the CO_2 setpoint.

Before setting the CO_2 content, allow the chamber temperature and humidity to stabilize. Do not open door during the stabilization period.

To set the CO_2 content (0% to 20%), press the Up or Down Arrow keys on the Watlow PM6 Controller.

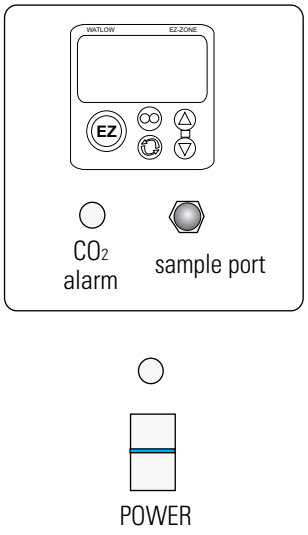


Figure 1-6. Watlow PM6 Control

CO_2 Control and Indicators

Sample Port

The sample port is used for checking CO_2 percentage in the incubator chamber by an independent test instrument (such as with a Fyrite, or similar CO_2 test instrument).

Caution To prevent CO_2 loss, the sample port must be capped when it is not in use. ▲

CO_2 Alarm

The CO_2 alarm is factory set to activate when the chamber CO_2 content deviates from configured alarm set points (see configuration record). When a CO_2 alarm occurs, the CO_2 Alarm indicator on the control panel lights and the audible alarm sounds.

The CO_2 alarm high and low setpoints are established through the Watlow PM6 CO_2 controller (A.LO, and A.HI). Refer to the Configuration Record included at the end of Section 4.

Section 2 Start-Up and Operation

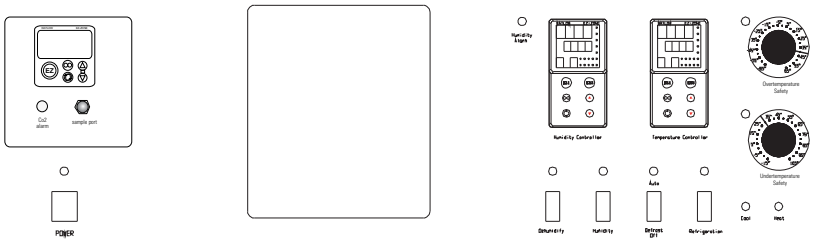


Figure 2-1. Control Panel Shown with Optional CO_2 Control

Control Panel

Main Power Switch and Indicator Light (Figure 2-2)

The main power switch controls power to the incubator. The main power indicator lights when the power switch is on and the unit is receiving power.

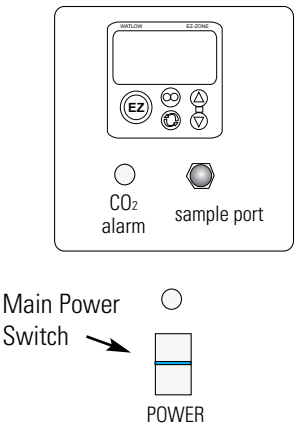


Figure 2-2. Main Power

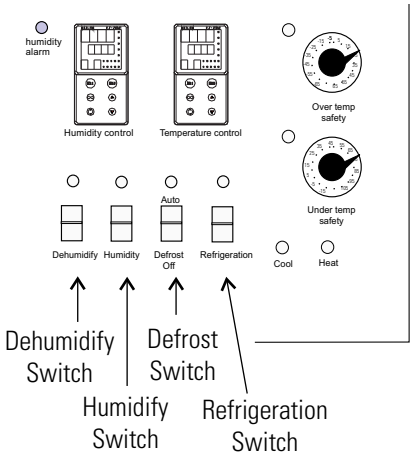


Figure 2-3. Switches

Refrigeration Switch and Indicator Light (Figure 2-3)

The refrigeration switch controls power to the refrigeration system. The refrigeration indicator lights when the refrigeration switch is on and the compressor is receiving power.

Control Panel (continued)

Defrost Switch and Indicator Light (Figure 2-3)

The defrost switch controls power to the defrost system. Setting the defrost switch to Auto will provide two 15-minute defrost cycles during a twenty-four hour period. The defrost indicator lights when the defrost switch is on and the incubator is in a defrost cycle.

Caution The defrost switch must be set to Auto when the temperature setpoint is 10°C, or below. ▲

Humidity Switch and Indicator (Figure 2-3)

The humidity switch controls the power to the humidification system circuit. The humidity indicator light will cycle as the controller toggles between humidify and dehumidify.

Dehumidify Switch and Indicator (Figure 2-3)

The dehumidify switch is used with the optional heatless dryer P/N 1900139 to provide dehumidification. The heatless dryer injects dry air into the incubator chamber as needed, to maintain humidity levels. When controlling humidity, the dehumidification switch should be in the ON position for most applications. The dehumidification light will cycle on and off as the humidity controller toggles between humidify and dehumidify.

Heat Indicator (Figure 2-4)

The Heat Indicator illuminates when the heater activates.

Cool Indicator (Figure 2-4)

The Cool Indicator illuminates when the refrigeration system activates.

Overtemp Safety Control, Indicator Light, and Audible Alarm (Figure 2-4)

The overtemp safety thermostat should be set slightly above the operating temperature of the incubator. In the event of an overtemp condition, the overtemp safety thermostat:

- Activates the audible alarm and the overtemp indicator light.
- Interrupts power to the heaters and maintain the incubator's cabinet temperature at the overtemp safety control point.

Note The overtemp control is not directly calibrated. The numbers on the dial are for reference only. ▲

If an overtemp condition occurs, the alarm can only be silenced by raising the overtemp safety thermostat setting. However, the cause of the problem must be determined and corrected before normal operation under the main temperature controller is resumed.

Control Panel (continued)

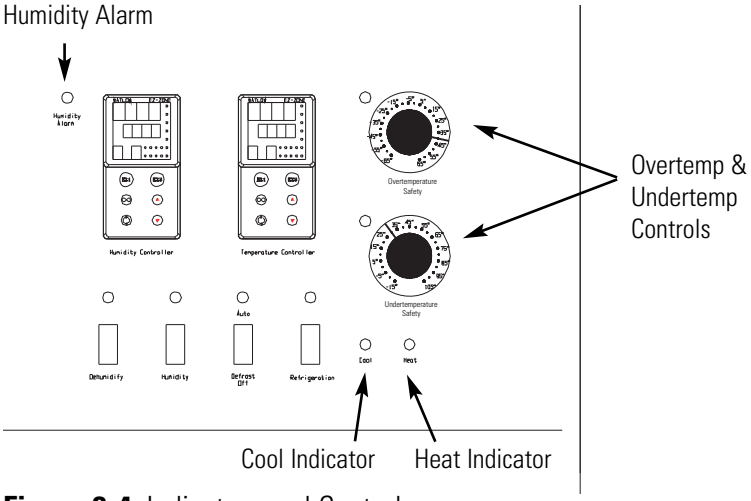


Figure 2-4. Indicators and Controls

Undertemp Safety Control, Indicator Light and Audible Alarm (Fig. 2-4)

The undertemp safety thermostat should be set slightly lower than the operating temperature of the incubator. In the event of an undertemp condition, the undertemp safety thermostat will:

- Activate the audible alarm and the undertemp indicator light.
- Interrupt power to the refrigeration system and maintain the incubator's cabinet temperature at the undertemp safety control point.

Note The undertemp control is not directly calibrated. The numbers on the dial are for reference only. ▲

If an undertemp condition occurs, the alarm can only be silenced by lowering the undertemp safety thermostat setting. However, the cause of the problem must be determined and corrected before normal operation under the main temperature controller is resumed.

Audible Humidity Alarm and Indicator Display (Figure 2-4)

The humidity alarm is a function of the humidity controller (Figure 2-4). When the cabinet humidity goes outside the set parameters of the controller, "4" indicator on the controller lights, the audible alarm sounds, and the humidity alarm indicator on the control panel lights.

The alarm can be silenced by pressing either EZ key.

Control Panel (continued)

Note The humidity controller's high and low limits are factory-set at 100% and 0%. Therefore, the system will go into the alarm state when the humidity exceeds these percentages by one percent. When operating the incubator near these high or low humidity levels, frequent alarms may occur. This will require that the controller's high or low limit be reset to three or four percent over the high limit or three or four percent under the low limit. Refer to the Watlow User's guide provided. Refer also to the factory configuration records located at the end of Section 4 of this manual. ▲

Set the Operating Temperature

The Watlow temperature controller's upper numerical display shows the actual temperature inside the incubator chamber. The lower display shows the temperature setpoint.

To raise or lower the setpoint, press the Up or Down Arrow. Temperatures are set in 0.1°C increments.

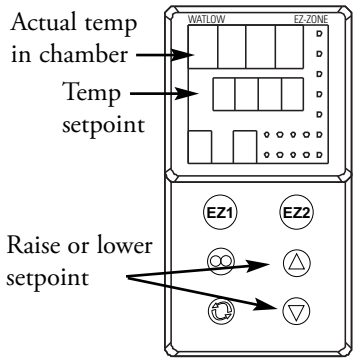


Figure 2-6. Changing Temp

Set the Operating Humidity

The Watlow humidity controller's upper numerical display shows the actual humidity inside the incubator. The lower display shows the humidity setpoint.

To raise the setpoint, press the Up or Down Arrows. Humidity is set in one percent increments.

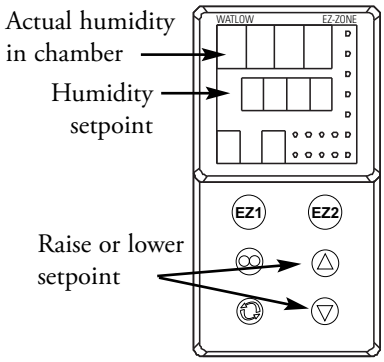


Figure 2-7. Changing Humidity

Air Exchange Ventilator Caps

Air exchange for the incubator is regulated through the manually adjustable intake and exhaust ventilator caps located on the top of the cabinet.

When viewed from the front of the incubator, the intake cap is on the left and the exhaust cap is on the right. The ventilator caps may be opened by turning counterclockwise, and closed by turning clockwise.

For optimum performance of the unit, the vent caps should be closed at all times.

Heatless Dryer (Optional)

The optional heatless dryer (P/N 1900139) provides dehumidification for the incubator chamber. The dehumidify switch must be turned On for the dryer to operate. The dryer is controlled with the humidity controller and should operate at 90 psi.

Section 3 Routine Maintenance

Warning De-energize all potential sources of energy to this unit and lockout/tagout their controls. (O.S.H.A. Regulation, Section 1910-147.) ▲

The continued cleanliness of the stainless steel used in this unit has a direct effect on the appearance and operation of the unit. Use the mildest cleaning procedure that will do the job effectively. Clean the outside of the incubator with soap and water or with any non-abrasive commercial spray cleaner. Clean the inside of the chamber with alcohol and/or soap and water. Disinfect the interior panels with a general use laboratory disinfectant, diluted according to the manufacturer's instructions. Rinse the surface thoroughly after each cleaning and wipe the surfaces dry. Always rub in the direction of the finish polish lines.

Caution Do not use chlorinated solvents on stainless steel as they can cause rusting and pitting. ▲

Caution Do not use volatile or aromatic solvents for cleaning inside the cabinet as their residue can contaminate the cabinet environment. ▲

The Thermopane glass door may be cleaned with commercial glass cleaner or with a solution of ammonia and water.

Maintaining the Humidity Generator

Depending on the quality of water used in the humidification system, it may be necessary to clean the humidity generator every 2 to 3 months. Refer to Section 4 for cleaning instructions.

PREVENTIVE MAINTENANCE
Environmental Chambers

Your equipment has been thoroughly tested and calibrated before shipment. Regular preventive maintenance is important to keep your unit functioning properly. The operator should perform routine cleaning and maintenance on a regular basis. For maximum performance and efficiency, it is recommended that the unit be checked and calibrated periodically by a qualified service technician.

The following is a condensed list of preventive maintenance requirements. See the specified section of the instruction manual for further details.

We have qualified service technicians, using NIST traceable instruments, available in many areas. For more information on Preventive Maintenance or Extended Warranties, please contact us at the number below.

Cleaning and calibration adjustment intervals are dependent upon use, environmental conditions and accuracy required.

Tips for all incubators:
- Do NOT use bleach or any disinfectant that has high chloros.
- Use sterile, distilled or demineralized water.
- Avoid spraying cleaner on the CO2 sensor.
- Do not use powdered gloves for tissue cultures.

Preventive Maintenance for Environmental Chambers

Refer to Manual Section	Action	Yearly	2 Years	5 Years	6 Years
--	Inspect door latch, hinges and door gasket seal	✓			
3	Check air exchange ventilator caps for adjustment; open or close as required	✓			
4	Perform a complete decontamination procedure. Wipe down interior, shelves, side panels with disinfectant. Rinse everything well with sterile distilled water.	Between Experiments *More frequent decontamination may be required, depending on use and environmental conditions.*			
5	Verify and document all calibrations, at the minimum.	✓			
5	* Inspect and clean the humidity generator, at the minimum.	✓			
--	Clean drip pan and drain lines	✓			
--	Clean refrigeration system condenser	✓			
--	Verify defrost cycle for below 10°C operation	✓			
--	Change filters (under normal conditions)	✓			
--	†Replace the filter elements on the dryer, if applicable.	✓			
--	†Rebuild the solenoid valves on the dryer, if applicable.		✓		
--	†Replace/repack the dessicant towers on the dyer, if applicable.			✓	
--	†Replace the check valve and o-rings on the dryer, if applicable.				✓

** Qualified service personnel only*

~ Regular monitoring routines of the various levels in your unit is encouraged.

† Refer to Puregas Dryer manual included in shipping box.

Section 4 Service

Caution Service must be performed by qualified service personnel only! ▲

Warning De-energize all potential sources of energy to this unit and lockout/tagout their controls. ▲

Access Electrical Components

To gain access to the electrical components, remove the two screws located on the left side of the control panel with a Phillips screwdriver. The control panel is hinged and will swing open.

Over/Undertemp Probe and Thermostat

1. Remove the incubator top right side air dam by removing the screws holding it in place.
2. Remove the top three screws from the top of the right duct cover.
3. Lean the duct sheet out, and remove the Permagum seal from around the probe access hole.
4. Remove the 15” copper capillary overtemp probe by extracting two plastic clips that hold the probe in place.
5. Open the control panel by removing the four screws located on the top and bottom of the control panel.

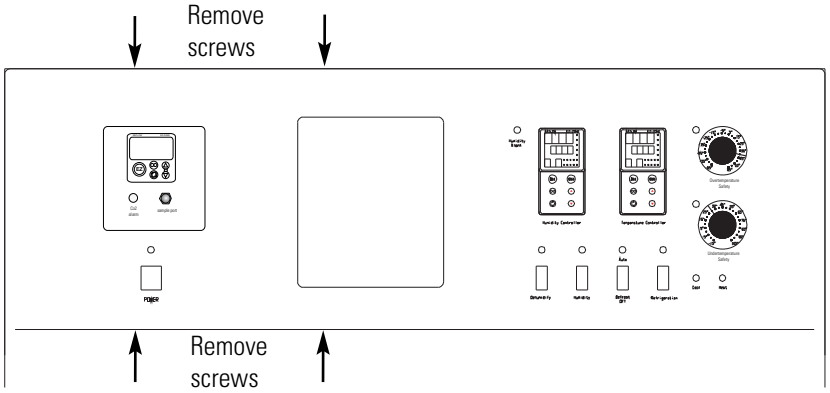


Figure 4-1. To Open Control Panel

Over/Undertemp Probe and Thermostat (cont.)

6. Pull the probe up through the access hole and into the control panel.
7. Follow the wires from the probe to the thermostat mounted on the control panel. Clip the plastic ties holding the overtemp cable to the existing wiring.
8. Pull the overtemp knob on the control panel off.
9. Remove the two screws that hold the overtemp assembly to the control panel.
10. Disconnect the two wires from the back of the thermostat assembly.
11. Pull the entire assembly from the panel, and remove the unit.
12. Replace the thermostat and probe.
13. Re-assemble in reverse order.

Note Reseal probe access hole with Permagum and tie-wrap overtemp cable to existing wires after replacing probe. ▲

Humidity/Temp Sensor

1. Follow Steps 1-6 from 'Over/Undertemp Probe and Thermostat' section to locate and remove the probe from the chamber.
2. Clip any plastic ties securing the probe wiring. Disconnect the probe.
3. Install the replacement probe in the chamber. When replacing the humidity sensor, be sure to mount the probe at the same angle as originally mounted.
4. Route the probe wire through the access hole into the control housing.
5. Connect the probe to the appropriate controller wiring.
6. Reseal the probe access hole with Permagum and tie-wrap the probe wire to existing wires.

Program Humidity/ Temp Controllers

The Watlow temperature and humidity controllers have been set at the factory to operate the incubator within the specifications listed in the Specifications section of this manual. Reference copies of the Watlow configuration records are included at the end of this section.

To prevent tampering, software lockouts are employed in the system. These lockouts must only be removed by persons skilled in configuring controller software.

Caution Re-programming either the temperature or humidity controllers alters the factory defaults and will seriously alter the performance of the incubator. This may also void the warranty. Do not re-configure the controllers without first consulting the Technical Services Department. ▲

Remove Software Lockout

1. Press the Advance and Infinity keys at the same time and hold them for about six seconds. The word "Fcty" (factory) will appear in the bottom display. If numbers in the bottom display begin to scroll up or down, the keys have not been pressed simultaneously. Try again.

2. Press the Up Arrow until "LoC" (lock) appears in the upper display. The word "Fcty" will remain in the lower display (Figure 4-2).

3. Press the Advance key to scroll through the menus as follows:

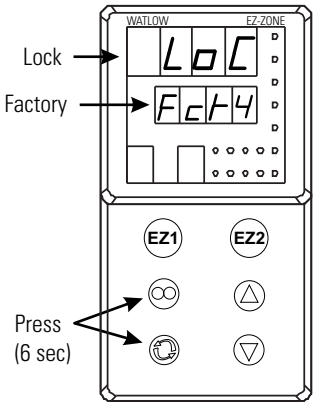


Figure 4-2. Displays

Lower display	Upper display	
LoC	1	Change to 3 w/ up and down arrow keys
rLoC	1	Change to 5 w/ up and down arrow keys
LoCL	1	Change to 5 w/ up and down arrow keys

Restore Software Lockout

To turn the software lockout back On:

1. Set Lock values back to previous setting. See 'Remove Software Lockout' above.

Controller Configuration

The Watlow PM Temperature and Humidity Controllers have been configured at the factory. Copies of the Watlow Configuration records are included at the end of this section.

Caution Do not re-configure the controller without first consulting the Technical Services department. ▲

Offset Calibration (Temp/Humidity)

It may be necessary to calibrate the temperature or humidity controllers to match an independent temperature or humidity sensor. To do so, follow the next few steps.

1. Perform the “Remove Software Lockout’ procedure in this section.
2. Suspend an independent, calibrated sensor(s) in the center of the interior chamber.
3. Allow approximately 30 minutes for the incubator to stabilize.
4. Press Up and Down Arrow keys simultaneously for 3 seconds. The word “OPEr” appears in the lower display.
5. Press Down Arrow until “Ai” appears in the upper display.
6. Press the Advance key until “i.CA” appears in the lower display. Press Up or Down Arrow key to either add or subtract an offset value. This value is the difference between the actual value shown on the controller, and the reference sensor value.
7. Press the Infinity key until the display reverts to normal operation.
8. Perform the ‘Restore Software Lockout’ procedure in this section.

Replace Optional Recorder and Probe(s)

1. Open the incubator door, and locate the probe mounting plate attached to the center of the right interior wall. Remove the mounting plate.
2. The recorder probe is attached to the lower end of the back of the mounting plate. Remove the probe by carefully sliding it out of the housing.
3. Remove the screws securing the right side air dam.
4. Remove the top three screws on both edges of the right duct sheet.
5. Lean the duct sheet out in order to remove the Permagum seal from around the probe access hole.
6. Remove the four screws located on the top and bottom of the control panel and open the control panel door. Remove any Permagum from around the access hole.
7. Pull the probe(s) carefully up through the hole.
8. Follow the probe cable(s) to the back of the recorder, and carefully clip any plastic ties holding the cable(s) to other wiring.
9. Remove the four screws securing the recorder and pull it carefully out from the front of the control panel.
10. Replace the recorder with the correct part.

Note When replacing the recorder and probe(s), retie the probe cable(s) to the existing wires. ▲

Calibrate the Recorder

Place an accurate thermometer(s) in the chamber next to the recorder's probe(s). After about three minutes, compare the thermometer with the chart recorder. For 2 pen operations, also compare the second thermometer.

Note For 2 pen operations, first select the pen to be calibrated. Hold down the #1 arrow for the red (#1) pen or the #2 arrow for the blue (#2) pen (Figure 4-3), until the light goes out. Adjust as necessary. ▲

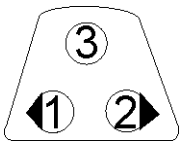


Figure 4-3. Arrows

If an adjustment is necessary, press either the #1 or #2 arrow to move pen left or right. The arrow must be held about five seconds before pen begins to move. Release the arrow when pen matches thermometer.

Set Door Heater Control

Warning High voltage is present behind control panel. Servicing must be performed only by qualified electrical service personnel. ▲

The infinite heater control is located in the left side of the incubator top compartment behind the control panel door. The control varies the amount of door heat from no heat (zero) to full heat (100) as indicated by the dial face. If the knob is turned past zero, a "click" indicates that all power to the door is shut off. If turned past 100, a similar "click" indicates that the heat is set at maximum.

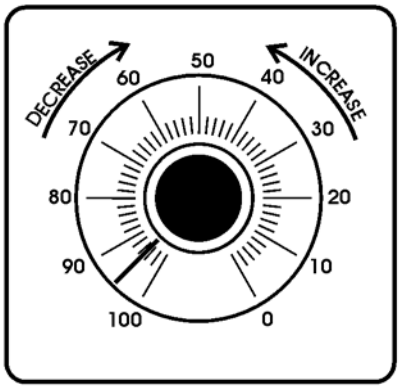


Figure 4-4. Door Heater Control

Initially, the units leave the factory with the dial set at 40. If desired, the amount of heat can later be reduced until moisture appears on the door, then the heat advanced. However, in fluctuating ambient conditions, it is recommended that a minimum of 40% door heat be used.

Clean/Adjust Steam Generator

Depending upon the quality of water used in the humidification system, it may be necessary to clean the humidity steam generator (P/N 1900190) every 2 to 3 months.

Materials Required:

6-foot stepladder
Flat and Phillips screwdrivers
11/32 Nutdriver or wrench
Laboratory disinfectant
9/16 Open end wrench
1/2 Open end wrench
Sponge & cleaning materials

Warning De-energize all potential sources of energy to this unit and lockout/tagout their controls. ▲

1. Remove all contents from the incubator, turn it off, and disconnect from power source.
2. Turn off the valve supplying the sterile distilled water.

Clean/Adjust Steam Generator (continued)

3. From the stepladder, remove the eight screws securing the top of the incubator cabinet.

4. When the steam generator has cooled, remove the four thumbscrews and wingnuts (Figure 4-5).

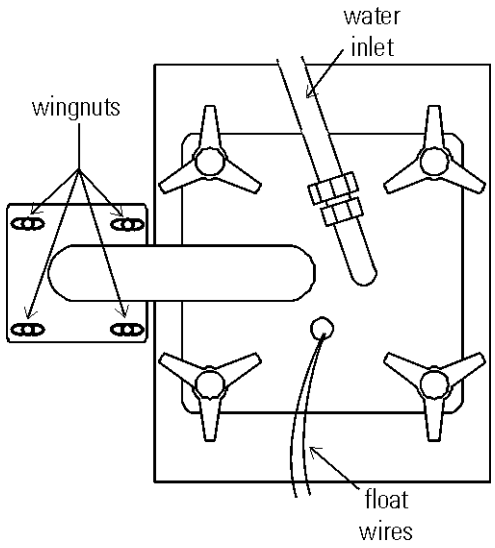


Figure 4-5. Access to Steam Generator

5. Disconnect water inlet from steam generator.

Warning The internal temperature of the steam generator is hot enough to boil water. Make certain sufficient time is allowed for the unit to completely cool before removing the top. ▲

6. Lift the top off the steam generator and set it aside.

7. Loosen the four nuts holding the front cover and remove it. Mark the top of heater location for future reference. Unsnap the two toggle clamps on the heater.

8. Remove the can through the top of the steam generator, taking care not to spill water out of the can. Empty the water. Clean the can with a good quality laboratory detergent and disinfectant. Do not use any type of chloride cleaner. A bristle brush may be needed for stubborn rust and scale. Also clean the inside of the steam tube using a test tube brush. Repeat cleaning with soap and water as necessary.

9. Re-assembly in reverse order. Replace the cabinet top and return incubator to service.

CO2 Controller Calibration

If it should become necessary to calibrate the CO_2 controller, perform the procedures on Pages 4-3 through 4-4.

Start from the standard operating display (setpoint in bottom display, actual CO_2 reading in the upper display).

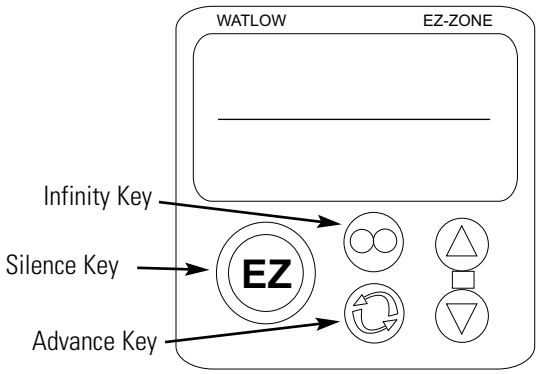


Figure 4-6. Key Locations

TEMPERATURE CONFIGURATION RECORD (WATLOW PM8)

MODELS:	**3911, 3913, 3920, 3940, & 3949**
JOB NUMBER:	
UNT SERIAL NUMBER:	
CONTROL TYPE:	**Temperature**
PREPARED BY:	**GLS** **DATE 7-Mar-2011**

Operations Page: (Press "UP" & "DN" keys for 3 sec.

Ai:	Ai 1		Ai 2					
	AC.Pu	---	AC.Pu	---				
	i.Er	*	i.Er	nSrc				
	i.CA	@	i.CA	@				
Lnr:	Lnr 1		Lnr 2					
	Su.A	*	Su.A	*				
	ofSt	@	ofSt	@				
	o.u	*	o.u	*				
Pu:	Pu 1		Pu 2					
	Su.A	*	Su.A	*				
	ofSt	@	ofSt	@				
	o.u	*	o.u	*				
dio:	dio 5		dio 6					
	do.5	off	do.6	off				
Mon:	Pu.A	*	h.Pr	*	C.SP	*		
	C.MA	**Auto**	C.Pr	*				
LooP:	r.En	**no**	Aut	**no**	h.Pb	**2.3**	td	**12**
	C.M	**AUto**	C.SP	*	c.Pb	**1.3**	db	**0.0**
	A.tSP	**90**	id.S	**23.9**	ti	**90**	o.SP	**0.0**
ALM:	ALM 1		ALM 2		ALM 3		ALM 4	
	A.Lo	**-20.0**	A.Lo	**32.0**	A.Lo	**32.0**	A.Lo	**32.0**
	A.hi	**34.0**	A.hi	**300.0**	A.hi	**300.0**	A.hi	**300.0**
P.StA:	P.Str	**1**	Ent1	**off**	JC	**0**		
	P.ACr	**nonE**	Ent2	**off**				

Setup Page: (Press "UP" & "DN" keys for 6 sec.

Ai:	Ai 1		i.Er	**off**	FiL	**2.0**
	Sen	**rO.IH**	dEC	**0.0**	i.Er	**off**
	rt.L	**3**	Ai 2		dEC	**0**
	FiL	**2.0**	Sen	**off**		
Lnr:	Lnr 1		Lnr 2		(All other perameters at default values)	
	fn	**off**	fn	**off**		
Pu:	Pu 1		Pu 2			
	fn	**off**	fn	**off**		
	FiL	**0.0**	FiL	**0.0**		
dio:	dio 5		dio 6			
	dir	otPt	dir	otPt		
	Fn	off	Fn	off		
LooP:	h.Ag	**Pid**	P.dL	0.0	L.SP	**-20.0**
	C.Ag	**Pid**	UFA	**USEr**	h.SP	**60.0**
	C.Cr	**off**	FAiL	**USEr**	SP.Lo	**-100.0**
	t.tUn	**no**	L.dE	**no**	SP.hi	**100.0**
	t.Agr	**Cr it**	rP	**oFF**		

TEMPERATURE CONFIGURATION RECORD (WATLOW PM8)

MODELS: **3911, 3913, 3920, 3940, & 3949**
JOB NUMBER:
UNT SERIAL NUMBER:
CONTROL TYPE: **Temperature**
PREPARED BY: **GLS** **DATE 7-Mar-2011**

otPt:

otPt 1		otPt 2		otPt 3			
Fn	**Cool**	Fn	**hEAt**	o.ty	**MA**	r.Lo	**-20.0**
o.tb	**30.0**	o.Ct	**Ftb**	fn	**rMt**	r.hi	**80.0**
o.Lo	**0**	o.tb	**5.0**	r.Sr	**Ai**	o.CA	**@**
o.hi	**100**	o.Lo	**0**	Fi	**1**	otPt 4	
		o.hi	**100**	S.Lo	**4.00**	Fn	ALM
				S.hi	**20.00**	Fi	**1**

ALM:

ALM 1		ALM 1		ALM 1		ALM 4	
A.ty	**Pr.AL**	A.Sd	**both**	A.dL	**0**	A.ty	**oFF**
Sr.A	**Ai**	A.LA	**nLAt**	ALM 2			
iS.A	**1**	A.bL	**oFF**	A.ty	**oFF**		
A.hy	**0.3**	A.Si	**off**	ALM 3			
A.Lg	**AL c**	A.dSP	**off**	A.ty	**oFF**		

FUn:

Fun 1		Fun 2	
Lev	**high**	Lev	**high**
Fn	**nonE**	Fn	**nonE**
Fi	**0**	Fi	**0**

gLbL:

C-F	**C**	gSE	**oFF**	C.Led	**both**	d.ti	**0**
AC.LF	**60**	Si.A	**5**	ZonE	**off**	Usr.S	**nonE**
r.tyP	**ti**	Si.b	**6**	ChAn	**off**	Usr.r	**nonE**
P.tyP	**StPt**	Pot i	**0**	d.PrS	**1**		

CoM

Ad.S	**1**	MAP	**1**	nU.S	**yES**

rtC

hoUr	**@**	Min	**@**	doW	**@**

Factory Page: (Press "Infinity" & "Advance" kry for 6 sec.)

LOC:

LoC.o	**2**	PaS.E	**oFF**	SLoC	**1 $**
LoC.P	3	rLoC	**1 $**		

CUSt:

CUSt: 1		CUSt: 2		CUSt: 3		CUSt: 4 thru 20	
PAr	**AC.Pu**	PAr	**AC.SP**	PAr	**PAC.r**	PAr	**nonE**

* Displays current controller value. (Display only)
$ LOC should be set at 5 until factory testing and calibration is complete.
@ This is a calibration factor and will vary from unit to unit.

HUMIDITY CONFIGURATION RECORD (WATLOW PM8)

MODELS: **3911, 3913, 3940, & 3949**
JOB NUMBER:
UNT SERIAL NUMBER:
CONTROL TYPE: **Humidity**
PREPARED BY: **GLS** **DATE 7-Mar-2011**

Operations Page: (Press "UP" & "DN" keys for 3 sec.)

Ai:	Ain	*	i.Er	*	i.CA	@		
Lnr:	Su.A	*	ofST	@	o.u	*		
Pu:	Su.A	*	ofST	@	o.u	*		
dio:	dio 5		dio 6					
	Ei.S	iACT	dO.S	off				
Mon:	Pu.A	*	h.Pr	*	C.SP	*		
	C.MA	**Auto**	C.Pr	*				
LooP:	C.M	**AUto**	C.SP	*	c.Pb	**3.8**	db	**0.0**
	A.tSP	**100**	id.S	**75.0**	ti	**51**	o.SP	**24.0**
	Aut	**no**	h.Pb	**6.0**	td	**8**		
ALM:	ALM 1		ALM 2		ALM 3		ALM 4	
	A.Lo	**0.0**	A.Lo	**32.0**	A.Lo	**32.0**	A.Lo	**32.0**
	A.hi	**100.0**	A.hi	**300.0**	A.hi	**300.0**	A.hi	**300.0**
P.StA:	P.Str	**1**	Ent1	**off**	JC	**0**		
	P.ACr	**nonE**	Ent2	**off**				

Setup Page: (Press "UP" & "DN" keys for 6 sec.)

Ai:	Sen	**voLt**	S.hi	**5.00**	P.EE	**oFF**	dEC	**0**
	Unit	**RH**	r.Lo	**0.0**	FiL	**2.0**		
	S.Lo	**0.00**	r.hi	**100.0**	i.Er	**oFF**		
Lnr:	fn	**off**	(All other perameters at default values)					
Pu:	fn	**off**	FiL	**0.0**				
dio:	dio 5		dio 6					
	dir	in	dir	otPt				
	Lev	high	Fn	off				
	Fn	nonE						
	Fi	**0**						
LooP:	h.Ag	**Pid**	P.dL	0	L.SP	**0.0**		
	C.Ag	**Pid**	UFA	**USEr**	h.SP	**100.0**		
	C.Cr	**off**	FAiL	**USEr**	SP.Lo	**-100.0**		
	t.tUn	**no**	L.dE	**no**	SP.hi	**100.0**		
	t.Agr	**Cr it**	rP	**oFF**				
otPt:	otPt 1		otPt 2		otPt 3		r.Lo	**0.0**
	Fn	**Cool**	Fn	**hEAt**	o.ty	**MA**	r.hi	**100.0**
	o.tb	**10.0**	o.Ct	**vtb**	fn	**rMt**	o.CA	@
	o.Lo	**0**	o.Lo	**0**	r.Sr	**Ai**		
	o.hi	**100**	o.hi	**100**	Fi	**1**	otPt 4	
					S.Lo	**4.00**	Fn	ALM
					S.hi	**20.00**	Fi	**1**
ALM:	ALM 1		ALM 1		ALM 2			
	A.ty	**Pr.AL**	A.LA	**nLAt**	A.ty	**oFF**		
	Sr.A	**Ai**	A.bL	**oFF**	ALM 3			
	A.hy	**0.3**	A.Si	**on**	A.ty	**oFF**		
	A.Lg	**AL c**	A.dSP	**on**	ALM 4			
	A.Sd	**both**	A.dL	**0**	A.ty	**oFF**		

HUMIDITY CONFIGURATION RECORD (WATLOW PM8)

MODELS: **3911, 3913, 3940, & 3949**

JOB NUMBER:

UNT SERIAL NUMBER:

CONTROL TYPE: **Humidity**

PREPARED BY: **GLS** **DATE 7-Mar-2011**

FUn:	Fun 1		Fun 2					
	Lev	**high**	Lev	**high**				
	Fn	**SiL**	Fn	**SiL**				
	Fi	**1**	Fi	**1**				
gLbL:	C-F	**C**	gSE	**oFF**	C.Led	**off**	d.ti	**0**
	AC.LF	**60**	Si.A	**5**	ZonE	**off**	Usr.S	**nonE**
	r.tyP	**ti**	Si.b	**6**	ChAn	**off**	Usr.r	**nonE**
	P.tyP	**StPt**	Pot i	**0**	d.PrS	**1**		
CoM	Ad.S	**1**	MAP	**1**	nU.S	**yES**		
rtC	hoUr	**@**	Min	**@**	doW	**@**		

Factory Page: (Press "Infinity" & "Advance" kry for 6 sec.)

LOC:	LoC.o	**2**	PaS.E	**oFF**	SLoC	**1 $**		
	LoC.P	3	rLoC	**1 $**				
CUSt:	CUSt: 1		CUSt: 2		CUSt: 3		CUSt: 4 thru 20	
	PAr	**AC.Pu**	PAr	**AC.SP**	PAr	**PAC.r**	PAr	**nonE**

* Displays current controller value. (Display only)
$ LOC should be set at 5 until factory testing and calibration is complete.
@ This is a calibration factor and will vary from unit to unit.

CO2 CONFIGURATION RECORD (WATLOW PM6)

MODELS: 3920, 3940, & 3949 (KITS 1900226 & 1900227)
JOB NUMBER:
UNT SERIAL NUMBER:
CONTROL TYPE: CO2
PREPARED BY: GLS **DATE** 7-Mar-2011

Program Page
See Programming Sheets if required.*

Operations Page: (Press "UP" & "DN" keys for 3 sec.)

Mon:	C.MA	*	h.Pr	*	C.SP	*	Pu.A	*
LOOP:	C.M	**AUto**	C.SP	*	ti	**80**	o.SP	**0.0**
	A.tSP	**90**	id.S	**5.0**	td	**0**		
	Aut	**no**	h.Pb	**1.0**	db	**0.0**		
ALM:	ALM 1		ALM 2		ALM 3		ALM 4	
	A.Lo	**-1.0**	A.Lo	**32.0**	A.Lo	**32.0**	A.Lo	**32.0**
	A.hi	**21.0**	A.hi	**300.0**	A.hi	**300.0**	A.hi	**300.0**
Ai:	Ain	*	i.Er	*	i.CA	@		

Setup Page: (Press "UP" & "DN" keys for 6 sec.)

Ai:	Sen	**MA**	S.hi	**20.00**	P.EE	**oFF**	dEC	**0.0**
	Unit	**Pro**	r.Lo	**0.0**	FiL	**2.0**		
	S.Lo	**4.00**	r.hi	**20.0**	i.Er	**oFF**		
LooP:	h.Ag	**Pid**	UFA	**USEr**	L.SP	**0.0**		
	C.Ag	**oFF**	FAiL	**oFF**	h.SP	**20.0**		
	t.tUn	**no**	L.dE	**no**	SP.Lo	**-100.0**		
	t.Agr	**Cr it**	rP	**oFF**	SP.hi	**100.0**		
otPt:	otPt 1		otPt 2		otPt 3		S.hi	**20.00**
	Fn	**hEAt**	Fn	**ALM**	o.ty	**MA**	r.Lo	**0.0**
	o.tb	**10.0**	Fi	**1**	fn	**rMt**	r.hi	**20.0**
	o.Lo	**0**			r.Sr	**Ai**	o.CA	**0.0**
	o.hi	**100**			Fi	**1**		
					S.Lo	**4.00**		
ALM:	ALM 1		ALM 1		ALM 2			
	A.ty	**Pr.AL**	A.LA	**nLAt**	A.ty	**oFF**		
	Sr.A	**Ai**	A.bL	**oFF**	ALM 3			
	A.hy	**0.3**	A.Si	**on**	A.ty	**oFF**		
	A.Lg	**AL o**	A.dSP	**on**	ALM 4			
	A.Sd	**both**	A.dL	**0**	A.ty	**oFF**		
FUn:	Lev	**high**	Fn	**SiL**	Fi	**1**		
gLbL:	C-F	**C**	Zone	**oFF**	d.ti	**0**		
	AC.LF	**60**	ChAn	**oFF**	Usr.S	**nonE**		
	C.Led	**oFF**	d.PrS	**1**	Usr.r	**nonE**		
CoM	Ad.S	**1**	MAP	**1**	nU.S	**yES**		

Factory Page: (Press "Infinity" & "Advance" kry for 6 sec.)

LOC:	LoC.o	**2**	PaS.E	**oFF**	rLoC	**1 $**	SLoC	**1 $**
CUSt:	CUSt: 1		CUSt: 2		CUSt: 3 thru 20			
	PAr	**AC.Pu**	PAr	**AC.SP**	PAr	**nonE**		

* Displays current controller value. (Display only)
$ LOC should be set at 5 until factory testing and calibration is complete.
@ This is a calibration factor and will vary from unit to unit.

CO2 CONFIGURATION RECORD (WATLOW PM6)

MODELS: **3911 & 3913 (KIT 1900227)**

JOB NUMBER:

UNT SERIAL NUMBER:

CONTROL TYPE: **CO2**

PREPARED BY: **GLS** **DATE 7-Mar-2011**

Program Page
See Programming Sheets if required.*

Operations Page: (Press "UP" & "DN" keys for 3 sec.)

Mon:	C.MA	*	h.Pr	*	C.SP	*	Pu.A	*
LOOP:	C.M	**AUto**	C.SP	*	ti	**310**	o.SP	**0.0**
	A.tSP	**90**	id.S	**5.0**	td	**10**		
	Aut	**no**	h.Pb	**1.5**	db	**0.0**		
ALM:	ALM 1		ALM 2		ALM 3		ALM 4	
	A.Lo	**-1.0**	A.Lo	**32.0**	A.Lo	**32.0**	A.Lo	**32.0**
	A.hi	**21.0**	A.hi	**300.0**	A.hi	**300.0**	A.hi	**300.0**
Ai:	Ain	*	i.Er	*	i.CA	**@**		

Setup Page: (Press "UP" & "DN" keys for 6 sec.)

Ai:	Sen	**MA**	S.hi	**20.00**	P.EE	**oFF**	dEC	**0.0**
	Unit	**Pro**	r.Lo	**0.0**	FiL	**2.0**		
	S.Lo	**4.00**	r.hi	**20.0**	i.Er	**oFF**		
LooP:	h.Ag	**Pid**	UFA	**USEr**	L.SP	**0.0**		
	C.Ag	**oFF**	FAiL	**oFF**	h.SP	**20.0**		
	t.tUn	**no**	L.dE	**no**	SP.Lo	**-100.0**		
	t.Agr	**Cr it**	rP	**oFF**	SP.hi	**100.0**		
otPt:	otPt 1		otPt 2		otPt 3		S.hi	**20.00**
	Fn	**hEAt**	Fn	**ALM**	o.ty	**MA**	r.Lo	**0.0**
	o.tb	**10.0**	Fi	**1**	fn	**rMt**	r.hi	**20.0**
	o.Lo	**0**			r.Sr	**Ai**	o.CA	**0.0**
	o.hi	**100**			Fi	**1**		
					S.Lo	**4.00**		
ALM:	ALM 1		ALM 1		ALM 2			
	A.ty	**Pr.AL**	A.LA	**nLAt**	A.ty	**oFF**		
	Sr.A	**Ai**	A.bL	**oFF**	ALM 3			
	A.hy	**0.3**	A.Si	**on**	A.ty	**oFF**		
	A.Lg	**AL o**	A.dSP	**on**	ALM 4			
	A.Sd	**both**	A.dL	**0**	A.ty	**oFF**		
FUn:	Lev	**high**	Fn	**SiL**	Fi	**1**		
gLbL:	C-F	**C**	Zone	**oFF**	d.ti	**0**		
	AC.LF	**60**	ChAn	**oFF**	Usr.S	**nonE**		
	C.Led	**oFF**	d.PrS	**1**	Usr.r	**nonE**		
CoM	Ad.S	**1**	MAP	**1**	nU.S	**yES**		

Factory Page: (Press "Infinity" & "Advance" kry for 6 sec.)

LOC:	LoC.o	**2**	PaS.E	**oFF**	rLoC	**1 $**	SLoC	**1 $**
CUSt:	CUSt: 1		CUSt: 2		CUSt: 3 thru 20			
	PAr	**AC.Pu**	PAr	**AC.SP**	PAr	**nonE**		

* Displays current controller value. (Display only)

$ LOC should be set at 5 until factory testing and calibration is complete.

@ This is a calibration factor and will vary from unit to unit.

HONEYWELL TRULINE CONFIGURATION RECORD

SHT 1 OF 4

CUSTOMER: _____
JOB NUMBER: _____
UNIT SERIAL #: _____
CONTROL TYPE: _____
PREPARED BY: _____ ***DATE:*** / /
COMPLETED BY: _____ ***DATE:*** / /

GROUP PROMPT	*FUNCTION PROMPT*	*VALUE OR SELECTION*
TUNING1	PROP BD or GAIN	
	RATE MIN	
	RSET MIN or RESET RPM or MAN RSET	
	CYCSEC	
	PROP BD2 or GAIN2	
	RATE2MIN	
	RSET2MIN or RSET2RPM	
	CYC2SEC	
TUNING2	PROP BD or GAIN	
	RATE MIN	
	RSET MIN or RSET PRM or	
	MAN RSET	
	CYCSEC	
	PROP BD2 or GAIN2	
	RATE2MIN	
	RSET2MIN or RSET2RPM	
	CYC2SEC	
SP RAMP1	SP RAMP	
	TIME MIN	
	FINAL SP	
	SP RATE	
	EU/HR UP	
	EU/HR DN	
	SP PROG	
SP RAMP2	SP RAMP	
	TIME MIN	
	FINAL SP	
	SP RATE	
	EU/HR UP	
	EU/HR DN	
	SP PROG	

GROUP PROMPT	*FUNCTION PROMPT*	*VALUE OR SELECTION*
CHART	CHRTSPD	7 DAY
	HOUR/REV	
	TIME DIV	21
	MINOR DIV	FOUR
	CONTINUE	NO
	CHART NAME	
	HEADER	YES
	REMSW	NONE
	WAKEMIN	
	WAKE HR	
	WAKE DAY	
	WAKE MON	
TIME	MINUTES	(CURRENT)
	HOURS	(CURRENT)
	DAY	(CURRENT)
	MONTH	(CURRENT)
	YEAR	(CURRENT)
	DAY	(CURRENT)
PEN1	PEN1	ENABLE
	PEN1IN	INPUT 1
	CHART1HI	80
	CHART1LO	-20
	PEN1ON	
	PEN1OFF	
	MAJORDIV	10
	MINORDIV	10
	RNG1TAG	TEMP
PEN2	PEN2	ENABLE
	PEN2IN	INPUT 2
	CHART2HI	100
	CHART2LO	0
	PEN2ON	
	PEN2OFF	
	MAJORDIV	10
	MINORDIV	10
	RING2TAG	% RH
PEN3	PEN3	DISABLE
	PEN3IN	
	CHART3HI	
	CHART3LO	
	PEN3ON	
	PEN3OFF	
	MAJORDIV	
	MINORDIV	
	RING 3 TAG	

HONEYWELL TRULINE CONFIGURATION RECORD

SHT 2 OF 4

GROUP PROMPT	*FUNCTION PROMPT*	*VALUE OR SELECTION*
PEN4	PEN4	DISABLE
	PEN4IN	
	CHART4HI	
	CHART4LO	
	PEN4ON	
	PEN4OFF	
	MAJORDIV	
	MINORDIV	
	RNG4TAG	
INPUT1	DECIMAL	XXX.X
	UNITS	DEG C
	ENGUNITS	
	IN1TYPE	100 PT
	XMITTER	
	IN1HI	482.2
	IN1LO	-184.4
	CUTOFF	
	INPTCOMP	
	FILTER1	2
	BURNOUT	UP
INPUT2	DECIMAL	XXXX
	UNITS	EU
	ENGUNITS	RH
	IN2TYPE	0-5 V
	XMITTER	LINEAR
	IN2HI	100
	IN2LO	0
	CUTOFF2	
	INPTCOMP	
	FILTER2	2
	BURNOUT	UP
INPUT3	DECIMAL	
	UNITS	
	ENGUNITS	
	IN3TYPE	
	XMITTER	
	IN3HI	
	IN3LO	
	CUTOFF3	
	INPTCOMP	
	FILTER3	
	BURNOUT	

GROUP PROMPT	*FUNCTION PROMPT*	*VALUE OR SELECTION*
INPUT4	DECIMAL	
	UNITS	
	ENGUNITS	
	IN4TYPE	
	XMITTER	
	IN4HI	
	IN4LO	
	CUTOFF4	
	INPTCOMP	
	FILTER4	
	BURNOUT	
TOTAL1	(Value)	
	RESETTOT	
	TOTAL1	
	TOTALEU	
	RATE	
	SCALER	
	RSETABLE	
TOTAL2	(Value)	
	RSETTOT	
	TOTAL2	
	TOTALEU	
	RATE	
	SCALER	
	RSETABLE	
CONTROL1	PID SETS	
	SW VALUE	
	SP SOURC	
	RATIO	
	BIAS	
	SP TRACK	
	POWER UP	
	SP HILIM	
	SP LOLIM	
	ACTION	
	OUT HILIM	
	OUT LOLIM	
	DROPOFF	
	DEADBAND	
	OUT HYST	
	FAILSAFE	
	REM SW	
	MAN KEY	
	PBorGAIN	
	MINorRPM	
	CONT1ALG	
	OUT1ALG	
	4-20 RNG	
	SHEDMODE	
	SHED SP	

HONEYWELL TRULINE CONFIGURATION RECORD

GROUP PROMPT	*FUNCTION PROMPT*	*VALUE OR SELECTION*
CONTROL2	PID SETS	
	SW VALUE	
	SP SOURC	
	RATIO	
	BIAS	
	SP TRACK	
	POWER UP	
	SP HILIM	
	SP LOLIM	
	ACTION	
	OUT HILIM	
	OUT LOLIM	
	DROPOFF	
	DEADBAND	
	OUT HYST	
	FAILSAFE	
	REM SW	
	MAN KEY	
	PBorGAIN	
	MINorRPM	
	CONT1ALG	
	OUT1ALG	
	4-20 RNG	
	SHEDMODE	
	SHED SP	
OPTIONS	INPUT 1	ENABLE
	INPUT2	ENABLE
	INPUT3	DISABLE
	INPUT4	DISABLE
	CONTROL1	DISABLE
	CONTROL2	DISABLE
	REJFREQ	60 HZ
	HF REJ	ENABLE
	AUX OUT	DISABLE
	4mA VAL	
	20mA VAL	
	RELHUMID	NO
	ATMPRES	
	DEVIATION	NONE
	DEVSETPT	
	SCROLL	NONE
	INP ALG	
	COEFF	
	PV HIGH	
	PV LOW	
	RATIO A	
	BIAS A	
	RATIO B	
	BIAS B	
	RATIO C	
	BIAS C	
	GRANDTOT	
	ComSTATE	DISABLE
	ComADDR	
	SHEDTIME	
	UNITS	

GROUP PROMPT	*FUNCTION PROMPT*	*VALUE OR SELECTION*
ALARMS	A1S1 VAL	
	A1S2 VAL	
	A1S1 TYPE	NONE
	A1S2 TYPE	NONE
	A1S1 HL	
	A1S1 EV	
	A1S2 HL	
	A1S2 EV	
	AL1 HYST	0.1
	A2S1 VAL	
	A2S2 VAL	
	A2S1 TYPE	NONE
	A2S2 TYPE	NONE
	A2S1 HL	
	A2S1 EV	
	A2S2 HL	
	A2S2 EV	
	AL2 HYST	
	A3S1 VAL	
	A3S2 VAL	
	A3S1 TYPE	
	A3S2 TYPE	
	A3S1 HL	
	A3S1 EV	
	A3S2 HL	
	A3S2 EV	
	AL3 HYST	
	A4S1 VAL	
	A4S2 VAL	
	A4S1 TYPE	
	A4S2 TYPE	
	A4S1 HL	
	A4S1 EV	
	A4S2 HL	
	A4S2 EV	
	AL4 HYST	
	A5S1 VAL	
	A5S2 VAL	
	A5S1 TYPE	
	A5S2 TYPE	
	A5S1 HL	
	A5S1 EV	
	A5S2 HL	
	A5S2 EV	
	AL5 HYST	
	A6S1 VAL	
	A6S2 VAL	
	A6S1 TYPE	
	A6S2 TYPE	
	A6S1 HL	
	A6S1 EV	
	A6S2 HL	
	A6S2 EV	
	AL6 HYST	

HONEYWELL TRULINE CONFIGURATION RECORD

SHT 4 OF 4

GROUP PROMPT	***FUNCTION PROMPT***	***VALUE OR SELECTION***
EVNT MSG	EVENT 1	NONE
	MESSAGE 1	
	POSITION 1	
	EVENT 2	NONE
	MESSAGE 2	
	POSITION 2	
	EVENT 3	NONE
	MESSAGE 3	
	POSITION 3	
	EVENT 4	NONE
	MESSAGE 4	
	POSITION 4	
	EVENT 5	NONE
	MESSAGE 5	
	POSITION 5	
	EVENT 6	NONE
	MESSAGE 6	
	POSITION 6	
LOCKOUT	PASSWORD	
	LOCKOUT	MAX
	CHANGE	
ADJUST	TRACE LN	
	GRID LN	
	PEN TYPE	

GROUP PROMPT	***FUNCTION PROMPT***	***VALUE OR SELECTION***

JUMPERS TO BE FITTED
CONTROL OUTPUT 1 & 2 __________
ALARMS 1 & 2 ____________________
ALARMS 3 & 4 ____________________
ALARMS 5 & 6 ____________________

INPUT JUMPERS TO BE FITTED		
	W1/MA	W3
INPUT 1	W1	RTD
INPUT 2	MA	T/C
INPUT 3		
INPUT 4		

Section 5 Specifications

Temperature

Control . . . . . .±0.1°C @ +37°C (98.6°F)
Range . . . . . .0°C (32°F) to +60°C (140°F)
Sensor . . . . . .RTD
Controller . . . . . .Digital electronic proportional
Setpoint . . . . . .Digital
Display . . . . . .Digital LED
Readability . . . . . .0.1°C
Setability . . . . . .0.1°C
Uniformity . . . ±0.3°C at 25°C to 37°C with six shelves installed*

Shelves

Standard . . . . . .3911/3913 - 3, 3940/3949 - 6
Maximum . . . . . .3911/3913 - 11, 3940/3949 - 19
Dimensions . . . 30.62”W x 25.81”F-B, (77.78 cm x 65.56 cm)
Construction . . . . . .Solid stainless steel reinforced
Surface Area . . . . . .5.4 sq. ft. (.51 sq. m) per shelf
Max. Per Chamber . . . . . .104.3 sq. ft. (9.69 sq. m)
Clearance . . . . .Adjustable on 3” (7.62 cm) centers
Loading . . .35 lbs. (16 kg) (slide in and out), 50 lbs. (23 kg) (stationary)

Construction

Volume . . . . . .3940, 3949 - 29 cu. ft. (821 liters)
3911, 3913 - 11 cu. ft. (312 liters)
Interior . . . . . .304 2B stainless steel
Exterior . . . . . .Cold rolled steel
Insulation . . . . . .2” (5.1cm) Foamed urethane
Outer Door Gasket . .Four sided vinyl compression
Finish . . Powder coated. Salt spray tests exceed 1000 hrs. per ASTM Standard B117-85

* Better than ±0.5°C uniformity at all other temperature parameters.

Weight
- Net - 3911/3913 . . . . . .300 lbs. (136 kg)
- Net - 3940/3949 . . . . . .800 lbs. (363 kg)

Shipping
- Motor - 3911/3913 . . . . . .375 lbs. (170 kg)
- Motor - 3940/3949 . . . . . .850 lbs. (386 kg)

Temperature Alarm
- Sensor . . . . . .Thermostat
- Controller . . . . . .Thermostat
- Setpoint . . . . . .Analog reference dial
- Alarm . . . . . .Audible/visual

Humidity
- Control . . . . . .±5% RH
- Range . . . . . .Above ambient to 95%
- Sensor . . . . . .Thin film polymer
- Controller . . . . . .Electronic, direct set in % RH
- Setpoint . . . . . .Digital
- Display . . . . . .Digital LED
- Readability 1%
- Setability 1%
- Steam Generator . . Initial fill approx. 1 quart (.95 liters)

Fittings
- Fill Port . . . . . .1/8” FPT
- Drain Port . . . . . .3/8” (1.9 cm) FPT

Unit Heat Load
- 6000 BTUH (1750W)

Refrigeration
- Compressor . . . . . .1/4 Horsepower, air-cooled
- Refrigerants . . . . . .Non-CFC

Electrical

3911, 3940 . . . . .208-220V, 1 PH, 60Hz, 3P, 4W, 15.0 FLA

3913, 3949 . .220-240V, 1 PH, 50/60Hz, 2P, 3W, 15.0 FLA

Line Cord

Model 3911/3940 . . . . . .10' NEMA 14-20P

Model 3913/3949 . . none (lockable disconnect provided)

Dimensions

Model 3911/3913

Exterior . . . . . .38.00"W x 51.5"H x 32.00"F-B (96.52 cm x 130.80 cm x 81.28 cm)

Interior . . . . . .31.00"W x 24.00"H x 27.00"F-B (78.74 cm x 60.90 cm x 68.58 cm)

Model 3940/3949

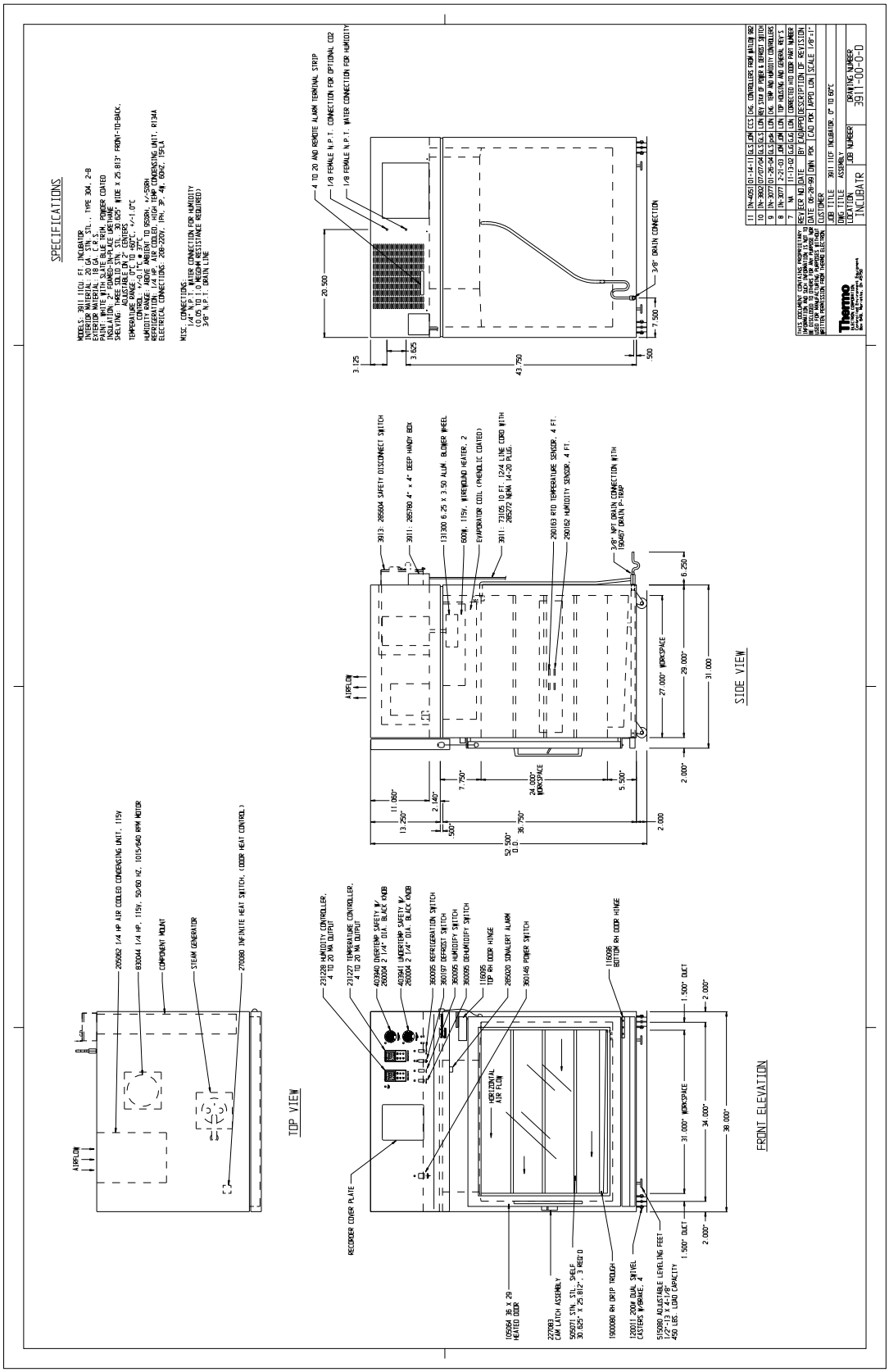
Exterior . . . . . .38.00"W x 88.5"H x 32.00"F-B (96.52 cm x 224.79 cm x 81.28 cm)

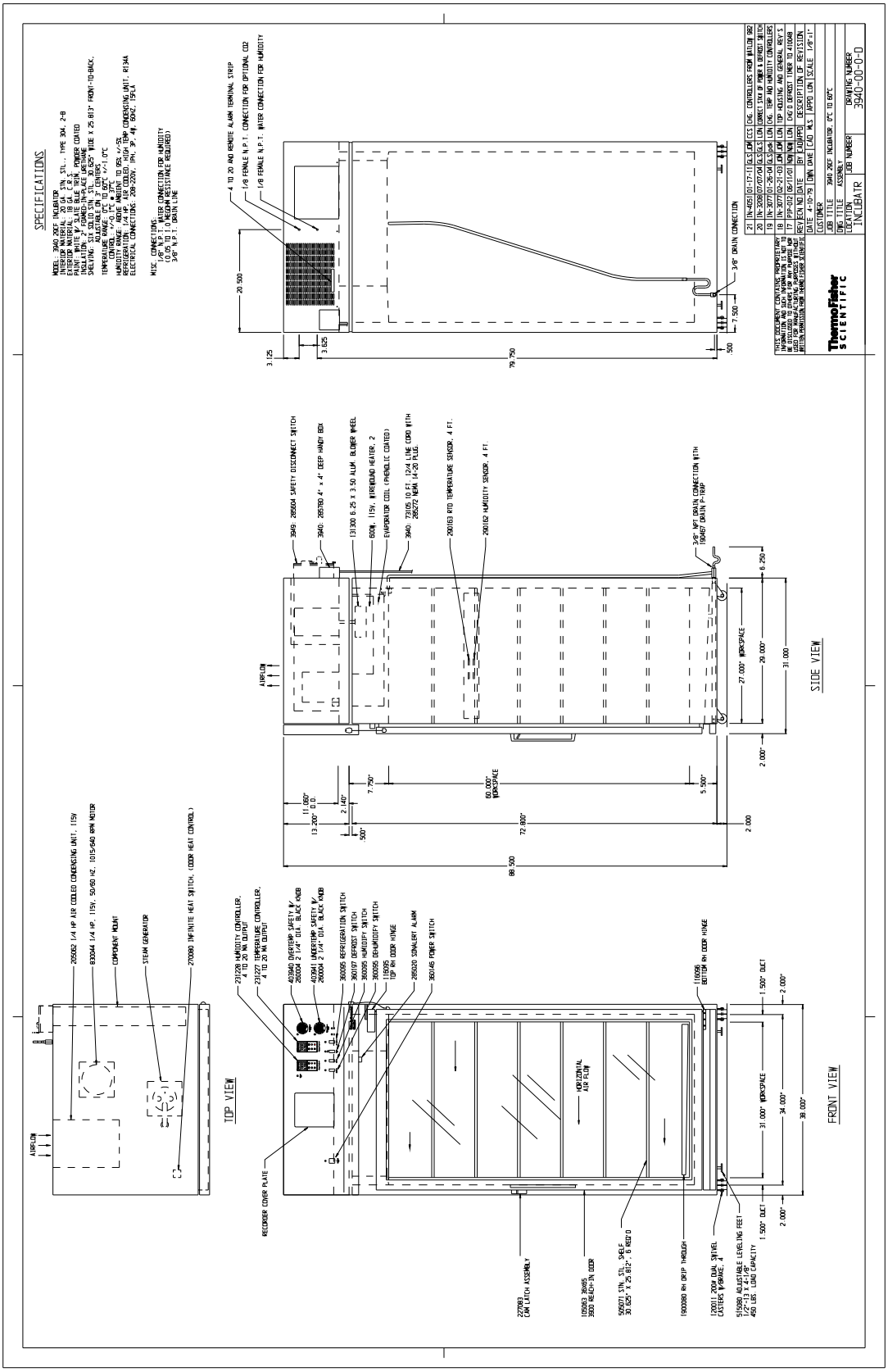
Interior . . . . . .31.00"W x 60.00"H x 27.00"F-B (78.74 cm x 152.40 cm x 68.58 cm)

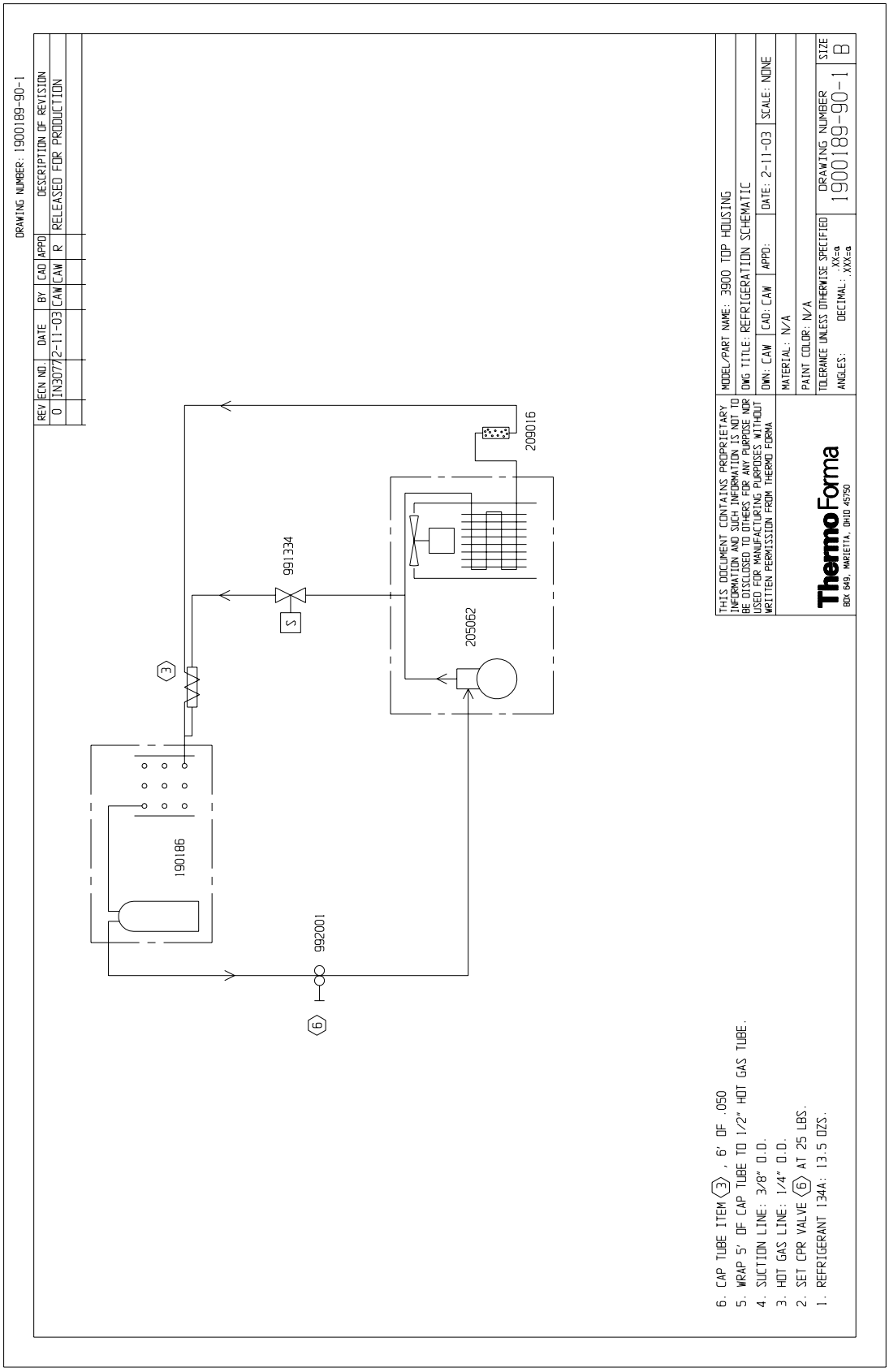
Continuing research and improvements may result in specification changes at any time. Performance plus or minus the least significant digit unless otherwise specified.

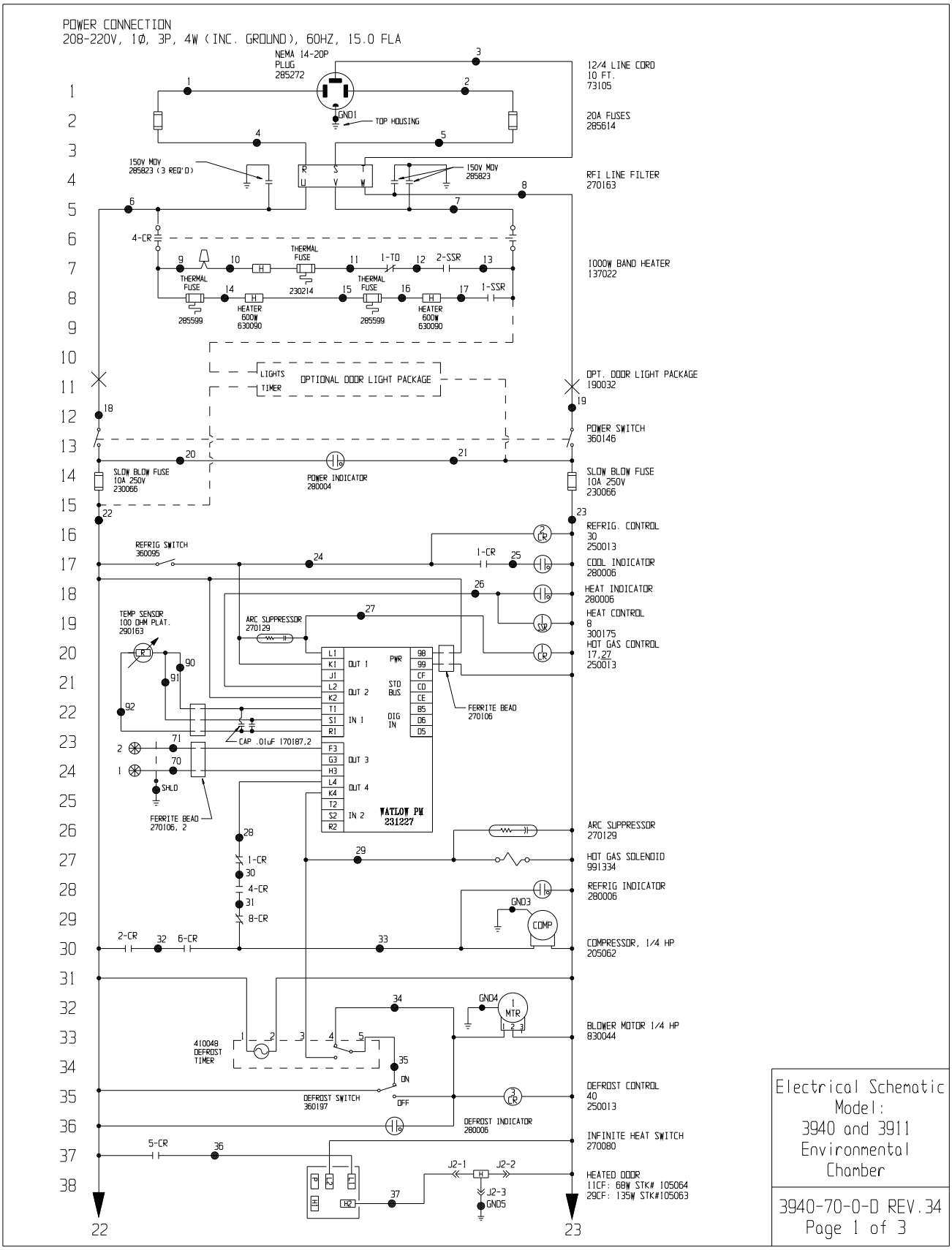
Section 6 Spare Parts

Part No.	Description	Qty
290163	RTD Temperature Sensor	1
230066	Fuse, Ceramic 10A 350V	2
400051	Power Supply	1
290162	RH Sensor	1
231227	Watlow PM8 Temperature Controller	1
231228	Watlow PM8 Humidity Controller	1
231226	Watlow PM6 Optional CO2 Controller	1
270129	Arc Filter for Watlow PM Controller	1
285614	20A Fuse	2
137022	Heater (steam)	1
403940	Over Temp Thermostat	1
403941	Under Temp Thermostat	1
410048	Defrost Timer	1
630090	Heater (wirewound)	1
205062	Condensing Unit, 1/4 HP 115V R-134A	1
991334	Solenoid, 120V .101" Port (Refrig.)	1
230214	Thermal Fuse, 250V 17A	1
830044	Blower Motor, 1/4 HP, 115V	1
110092	SS Humidity tank	1
300175	SS Relay	2


SPECIFICATIONS
MODELS: 3911 11CU. FT. INCUBATOR
INTERIOR MATERIAL: 18 GA. STN. STL., TYPE 304, 2-B
EXTERIOR MATERIAL: 18 GA. S.
PAINT: WHITE WITH SLATE BLUE TRIM, POWDER COATED
INSULATION: 2" FOAMED-IN-PLACE POLYURETHANE
SHELVING: THREE SOLID STN. STL. 30.625" WIDE X 25.813" FRONT-TO-BACK, ADJUSTABLE ON 2" CENTERS
TEMPERATURE RANGE: 5°C TO 60°C +/-1.0°C
CONTROL: +/-0.1°C @ 37°C
HUMIDITY RANGE: ABOVE AMBIENT TO 95%RH, +/-5%RH
REFRIGERATION: 1/4 HP, AIR COOLED CONDENSING UNIT, R134A
ELECTRICAL CONNECTIONS: 208-220V, 1PH, 3P, 4W, 60HZ, 15FLA
MISC. CONNECTIONS
1/4" O.D. WATER CONNECTION FOR HUMIDITY (0.25 TO 1.0 MEGOHM RESISTANCE REQUIRED)
3/8" N.P.T. DRAIN LINE
4 TO 20 AND REMOTE ALARM TERMINAL STRIP
1/8 FEMALE N.P.T. CONNECTION FOR OPTIONAL CO2
1/8 FEMALE N.P.T. WATER CONNECTION FOR HUMIDITY
3/4" DRAIN CONNECTION
20.500
3.125
3.625
43.750
7.500
.500
TOP VIEW
AIRFLOW
205062 1/4 HP AIR COOLED CONDENSING UNIT, 115V
830044 1/4 HP, 115V, 50/60 HZ, 1015/940 RPM MOTOR
COMPRESSOR MOUNT
STEAM GENERATOR
270080 INFINITE HEAT SWITCH, (DOOR HEAT CONTROL)
SIDE VIEW
AIRFLOW
3913: 285804 SAFETY DISCONNECT SWITCH
3911: 285780 4" x 4" DEEP HANDY BOX
131300 6.25 X 3.50 ALUM. BLOWER WHEEL
600A, 115V, W/HEATING HEATER, 2
EVAPORATOR COIL (PHENOLIC COATED)
3911: 731105 10 FT. 12/4 LINE CORD WITH 285824 NEMA 14-30 PLUG
290163 RTD TEMPERATURE SENSOR, 4 FT.
290162 HUMIDITY SENSOR, 4 FT.
3/8" NPT DRAIN CONNECTION WITH 190467 DRAIN P-TRAP
6.250
27.000" WORKSPACE
29.000"
31.000
24.000" WORKSPACE
11.080"
13.250"
2.140"
7.750"
5.500"
2.000
.500
52.500" O.D.
36.750"
FRONT ELEVATION
RECORDER COVER PLATE
231228 HUMIDITY CONTROLLER, 4 TO 20 MA OUTPUT
231227 TEMPERATURE CONTROLLER, 4 TO 20 MA OUTPUT
403940 OVERTEMP SAFETY W/ 285804 2 1/4" DIA. BLACK KNOB
403941 UNDERTEMP SAFETY W/ 285804 2 1/4" DIA. BLACK KNOB
360265 REFRIGERATION SWITCH
360197 DEFROST SWITCH
360265 HUMIDIFY SWITCH
360265 DEHUMIDIFY SWITCH
116095 TOP RH DOOR HINGE
285920 SIGNALERT ALARM
360146 POWER SWITCH
116096 BOTTOM RH DOOR HINGE
HORIZONTAL AIR FLOW
1.500" DUCT
2.000"
31.000" WORKSPACE
34.000"
36.000"
2.000"
105804 36 X 29 HEATED DOOR
227083 CAM LATCH ASSEMBLY
505277 STN. STL. SHELF 30.625" X 25.812", 3 REQ'D
1900080 RH DRIP TROUGH
120011 2004 DUAL SWIVEL CASTERS W/BRAKE, 4
515080 ADJUSTABLE LEVELING FEET 1/2"-13 X 4-1/8" 450 LBS. LOAD CAPACITY
1.500" DUCT
2.000"
11 1N-4051 01-14-11 GLS DM CCS ENG. CONTROLLERS FROM MINOLTA SRC
10 1N-3902 07-07-04 GLS GLS LDN Key Stm EP TEMPS & DEFROST SWITCH
9 1N-3777 01-26-04 GLS pbs LDN ENG. TEMP AND HUMIDITY CONTROLLERS
8 1N-3777 2-21-03 LDM LDN LDN TOP HOUSING AND GENERAL KEYS
7 NA 11-13-02 GLG LG LDN CORRECTED MID DOOR PART NUMBER
REV# DESCRIPTION OF REVISION BY (INITIAL) DATE
DATE 06-28-99 DWN PDK CHKD PDK APPD LDN SCALE 1/6"=1"
DWG TITLE ASSEMBLY
CUSTOMER
JOB TITLE 3911 11FT INCUBATOR, 0° TO 60°C
LOCATION INCUBATR
JOB NUMBER
DRAWING NUMBER 3911-00-0-D
Thermo
Thermo Electron Corporation
Forma Scientific
Marietta, Ohio 45750
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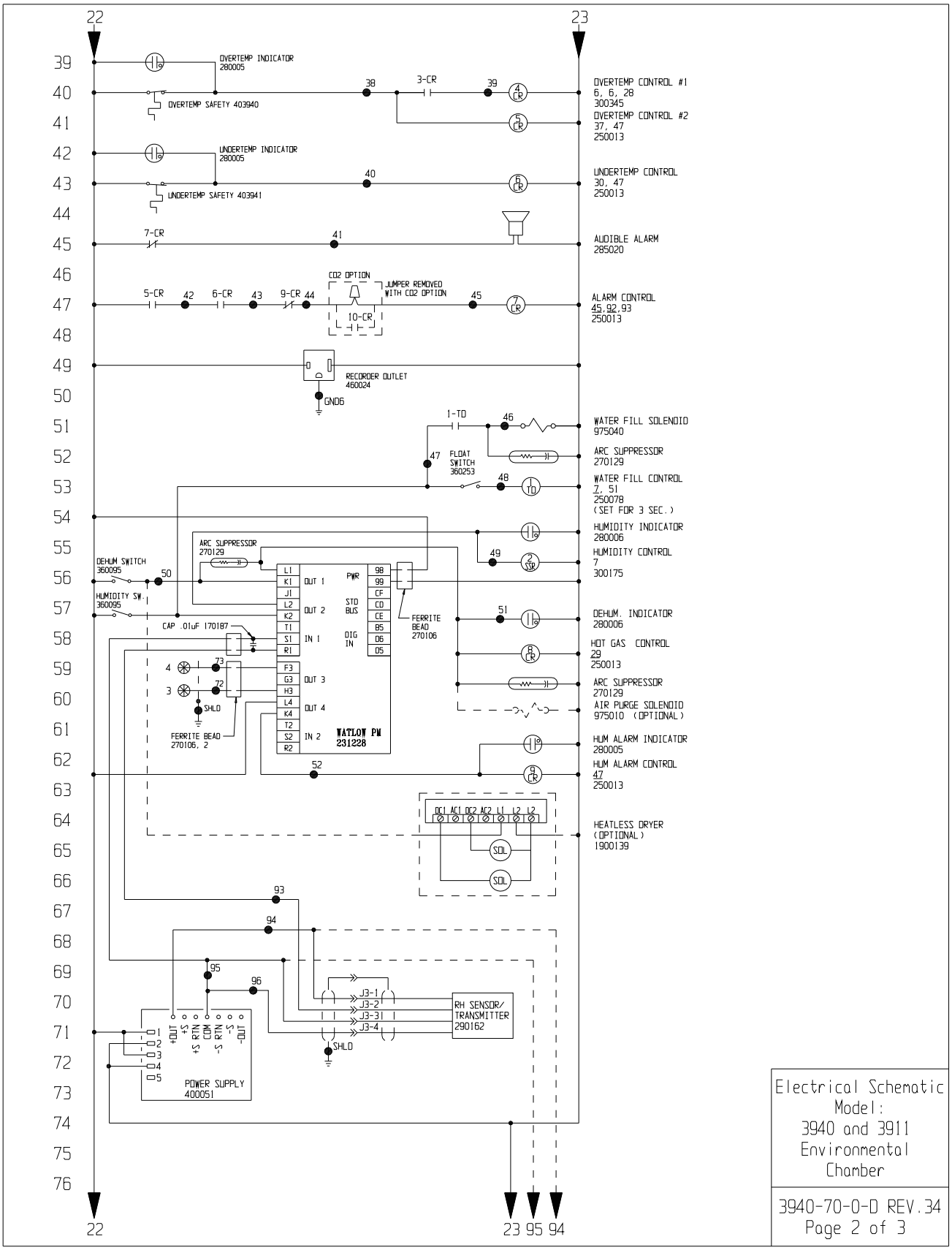

SPECIFICATIONS
MODEL: 3940 2CF INCUBATOR
INTERIOR MATERIAL: 20 GA. STN. STL., TYPE 304, 2-B
EXTERIOR MATERIAL: 18 GA. STN. STL.
PAINT: WHITE W/ SLATE BLUE TRIM, POWDER COATED
SHELVING: SIX SOLID STN. STL. 30.625" WIDE X 25.813" FRONT-TO-BACK.
ADJUSTABLE ON 3" CENTERS
TEMPERATURE RANGE: AMBIENT +5°C TO +60°C
CONTROL: +/-0.1°C @ 37°C
HUMIDITY RANGE: 35% RH TO 95% RH
REFRIGERANT: R404A AIR COOLED HIGH TEMP CONDENSING UNIT, R134A
ELECTRICAL CONNECTIONS: 208-220V, 1PH, 3P, 4W, 60HZ, 15PLA
MISC. CONNECTIONS
1/4" O.D. WATER CONNECTION FOR HUMIDITY
(0.06 TO 1.0 MEGOHM RESISTANCE REQUIRED)
3/8" N.P.T. DRAIN LINE
4 TO 20 MA REMOTE ALARM TERMINAL STRIP
1/8 FEMALE N.P.T. CONNECTION FOR OPTIONAL CO2
1/8 FEMALE N.P.T. WATER CONNECTION FOR HUMIDITY
3/8" DRAIN CONNECTION
20.500
3.125
3.625
79.750
.500
7.500
ThermoFisher SCIENTIFIC
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DRAWING NUMBER
3940-00-0-D
2 TM-4051 10-17-11 ALS CAP CSS ENG. CONTROLLERS FROM ANTLIA INST
1 TM-3599 05-04-11 ALS CAP CSS ENG. CONTROLLERS FROM ANTLIA INST
TM-3077 02-21-03 LAM LAM LUN TOP HOUSING AND GENERAL REV'S
TP PIP-012 06-11-01 NAN NAN LUN CHG'D DEFROST TIMER TO 410048
REV EFF'N NO DATE BY EJA/JPPG DESCRIPTION OF REVISION
DATE 4-10-79 DRN. DWG LEAD MLS APPD LUN SCALE 1/4"=1"
CUSTOMER
JOB TITLE 3940 2CF INCUBATOR, 0°C TO 60°C
DETAIL TITLE ASSEMBLY
LOCATION INCUBATR
DSR NUMBER
SIDE VIEW
TOP VIEW
FRONT VIEW
AIRFLOW
3949: 265604 SAFETY DISCONNECT SWITCH
3940: 265780 4" x 4" DEEP HANDY BOX
131300 0.25 X 3.50 ALUM. BLOWER WHEEL
6006, 115V, WIREBOUND HEATER, 2
EVAPORATOR COIL (PHENOLIC COATED)
3940: 73105 10 FT. 12/4 LINE CORD WITH 265272 NEMA 14-20 PLUG
200163 RTD TEMPERATURE SENSOR, 4 FT.
200162 HUMIDITY SENSOR, 4 FT.
3/8" NPT DRAIN CONNECTION WITH 190407 DRAIN P-TRAP
6.250
27.000" WORKSPACE
29.000"
31.000
2.000"
11.000" O.D.
13.200" O.D.
2.140"
7.750"
.500"
60.000" WORKSPACE
72.800"
5.500"
2.000
88.500
205002 1/4 HP AIR COOLED CONDENSING UNIT, 115V
820044 1/4 HP, 115V, 50/60 HZ, 1015/640 RPM MOTOR
COMPRESSOR MOUNT
STEAM GENERATOR
270080 INFINITE HEAT SWITCH, (DOOR HEAT CONTROL)
231208 HUMIDITY CONTROLLER, 4 TO 20 MA OUTPUT
231277 TEMPERATURE CONTROLLER, 4 TO 20 MA OUTPUT
460060 CIRCUIT BREAKER, 5 AMP W/ BLACK KNOB
460064 CIRCUIT BREAKER, 7.5 AMP W/ BLACK KNOB
460061 CIRCUIT BREAKER, 2.5 AMP W/ BLACK KNOB
360095 REFRIGERATION SWITCH
360197 DEFROST SWITCH
360095 HUMIDIFY SWITCH
360095 DEHUMIDIFY SWITCH
115095 TOP RH DOOR HINGE
265020 SIGNALERT ALARM
360145 POWER SWITCH
115096 BOTTOM RH DOOR HINGE
1.500" DUCT
2.000"
31.000" WORKSPACE
24.000"
30.000"
1.500" DUCT
2.000"
RECORDER COVER PLATE
HORIZONTAL AIR FLOW
227063 CAM LATCH ASSEMBLY
105063 39495 3900 REACH-IN DOOR
506071 STN. STL. SHELF 30.625" X 25.812" - 6 REQ'D
1900080 RH DRIP THROUGH
120011 2004 DIA. SWIVEL CASTERS W/BRAKE, 4
515080 ADJUSTABLE LEVELING FEET 2.250" DIA. X 4.00" 450 LBS. LOAD CAPACITY


DRAWING NUMBER: 1900189-90-1
REV ECN NO. DATE BY CAD APPD DESCRIPTION OF REVISION
0 IN3077 2-11-03 CAW CAW R RELEASED FOR PRODUCTION
190186
991334
205062
209016
992001
3
6
S
6. CAP TUBE ITEM 3 , 6' OF .050
5. WRAP 5' OF CAP TUBE TO 1/2" HOT GAS TUBE.
4. SUCTION LINE: 3/8" O.D.
3. HOT GAS LINE: 1/4" O.D.
2. SET CPR VALVE 6 AT 25 LBS.
1. REFRIGERANT 134A: 13.5 OZS.
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MODEL/PART NAME: 3900 TOP HOUSING
DWG TITLE: REFRIGERATION SCHEMATIC
DWN: CAW CAD: CAW APPD: DATE: 2-11-03 SCALE: NONE
MATERIAL: N/A
PAINT COLOR: N/A
TOLERANCE UNLESS OTHERWISE SPECIFIED
ANGLES: DECIMAL: .XX±.a .XXX±.a
DRAWING NUMBER 1900189-90-1 SIZE B
ThermoForma
BOX 649, MARIETTA, OHIO 45750



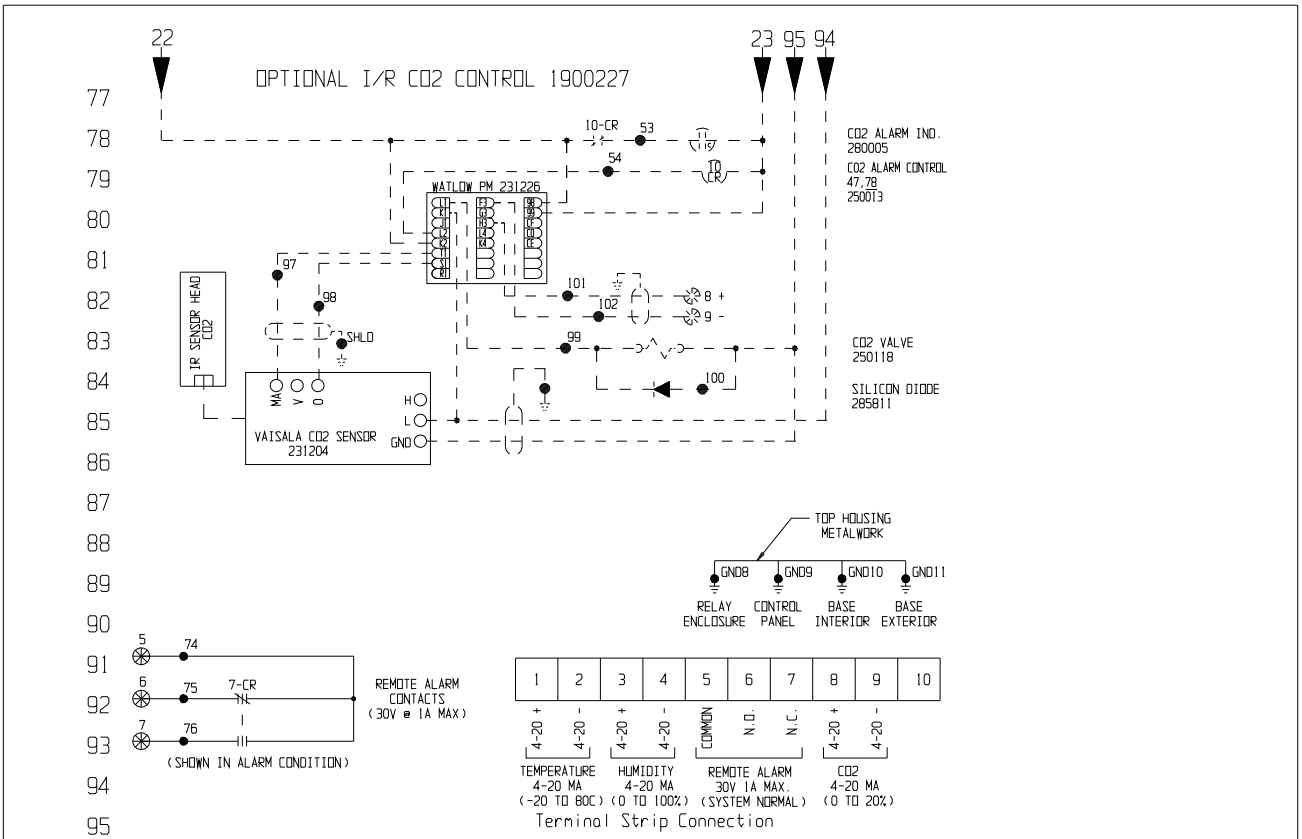
Electrical Schematic
Model:
3940 and 3911
Environmental
Chamber

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Page 1 of 3



Electrical Schematic
Model:
3940 and 3911
Environmental
Chamber

3940-70-0-D REV.34
Page 2 of 3



WIRE REFERENCE CHART

NO.	AWG	COLOR	NO.	AWG	COLOR	NO.	AWG	COLOR	NO.	AWG	COLOR
1	12	BLK	31	20	PUR	70	22	RED	---	---	---
2	12	RED	32	16	BRN	71	22	BLK	---	---	---
3	12	WHT	33	16	BLU	72	22	RED	90	22	WHT
4	12	BLK	34	16	YEL	73	22	BLK	91	22	RED
5	12	RED	35	16	BRN	74	22	RED	92	22	BLK
6	12	BLK	36	20	RED	75	22	BLK	93	22	RED
7	12	RED	37	20	BLK	76	22	WHT	94	22	GRN
8	12	WHT	38	20	RED	77	N/A	N/A	95	22	BLK
9	16	BLK	39	20	RED	78	N/A	N/A	96	22	WHT
10	16	ORG	40	20	BLU	79	N/A	N/A	97	22	RED
11	16	BLU	41	20	YEL	---	---	---	98	22	BLK
12	16	ORG	42	20	PUR	---	---	---	99	22	RED
13	16	RED	43	20	PUR	---	---	---	100	22	WHT
14	16	BLK	44	20	PUR	---	---	---	101	22	BLK
15	16	BLK	45	20	PUR	---	---	---	102	22	WHT
16	16	BLK	46	20	BLU	---	---	---	---	---	---
17	16	PUR	47	20	ORG	---	---	---	GND1	12	GRN
18	14	BLK	48	20	PUR	---	---	---	GND2	16	GRN
19	14	WHT	49	20	BLU	---	---	---	GND3	16	GRN
20	14	BLK	50	20	BRN	---	---	---	GND4	16	GRN
21	14	WHT	51	20	RED	---	---	---	GND5	20	GRN
22	16	BLK	52	20	YEL	---	---	---	GND6	16	GRN
23	16	WHT	53	20	YEL	---	---	---	GND7	16	GRN
24	20	BLU	54	20	RED	---	---	---	GND8	14	GRN
25	20	BLU	---	---	---	---	---	---	GND9	BRAID	N/A
26	20	RED	---	---	---	---	---	---	GND10	16	GRN
27	20	YEL	---	---	---	---	---	---	GND11	16	GRN
28	20	PUR	---	---	---	---	---	---	---	---	---
29	20	ORG	---	---	---	---	---	---	---	---	---
30	20	ORG	---	---	---	---	---	---	---	---	---

REV	ECN NO.	DATE	BY	CAD	APPD	DESCRIPTION OF REVISION
34	IN-4051	02/21/11	GLS	GLS	CCS	REVISE ARC SUPPRESSOR LOCATIONS
33	IN-4051	12/29/10	GLS	GLS	MSB	REV. CONTROLS FROM 982 & SD, ADD OLP OPT.
32	IN-3830	12/29/07	GLS	GLS	LDN	REWIRE ALARM RELAYS
31	IN-3229	12/21/04	GLS	GLS	LDN	REMOVE 270129 FROM TERM 15 &16 OF TEMP & RH
30	IN-3227	12/14/04	GLS	GLS	LDN	REVISED STEAM GENERATOR WIRING

ATTENTION
OBSERVE PRECAUTIONS
ELECTROSTATIC
SENSITIVE DEVICES

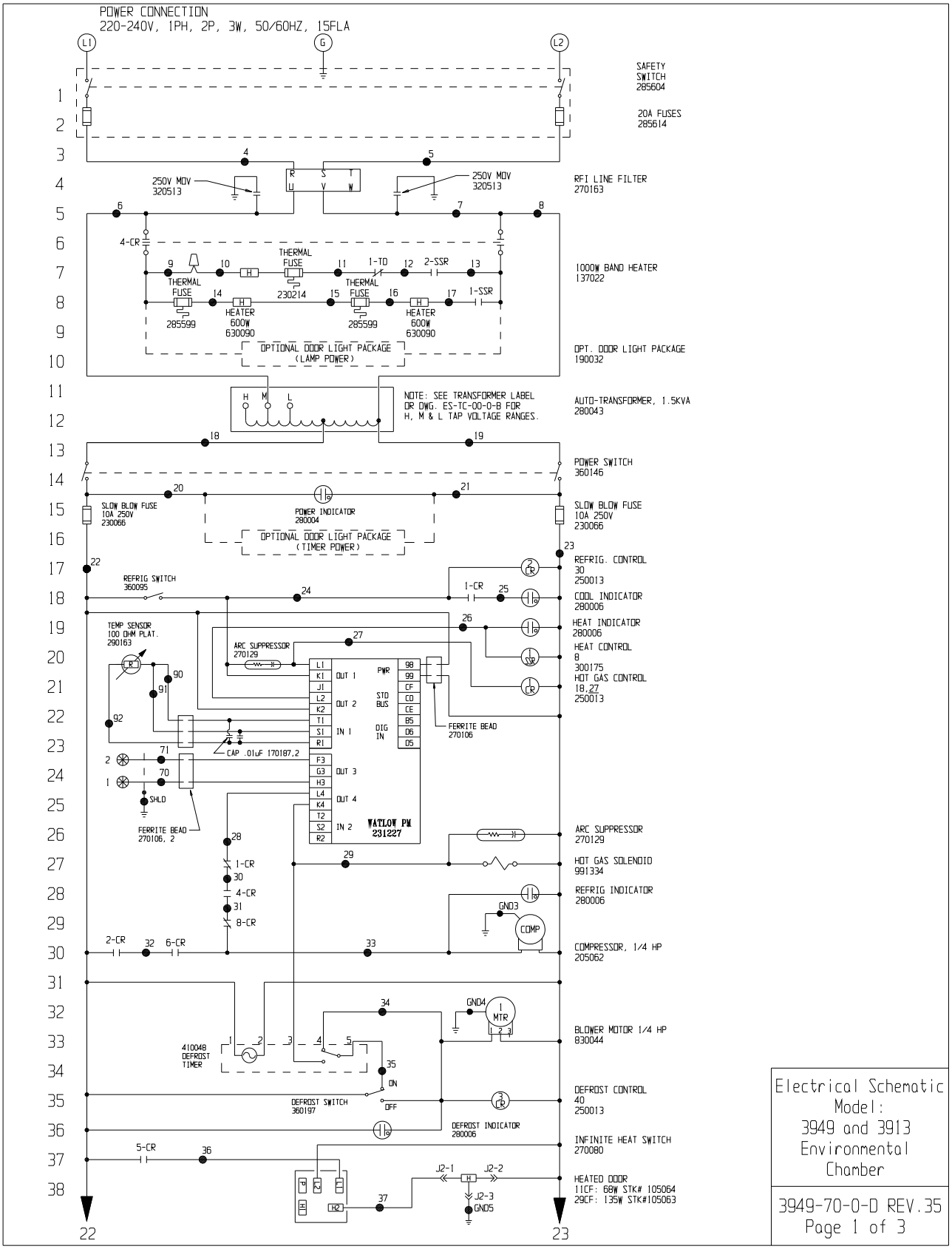
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MODEL/PART NAME: 3911, 3940 REACH-IN INCUBATOR
DWG TITLE: ELECTRICAL SCHEMATIC
DWN: ED | CAD: JD | APPD: LDN | DATE: 05/18/92 | SCALE: NONE
MATERIAL:
PAINT COLOR:
TOLERANCE UNLESS OTHERWISE SPECIFIED
ANGLES: DECIMAL: .XX=± .XXX=±
DRAWING NUMBER 3940-70-0
SIZE D

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BOX 649, MARIETTA, OHIO 45750

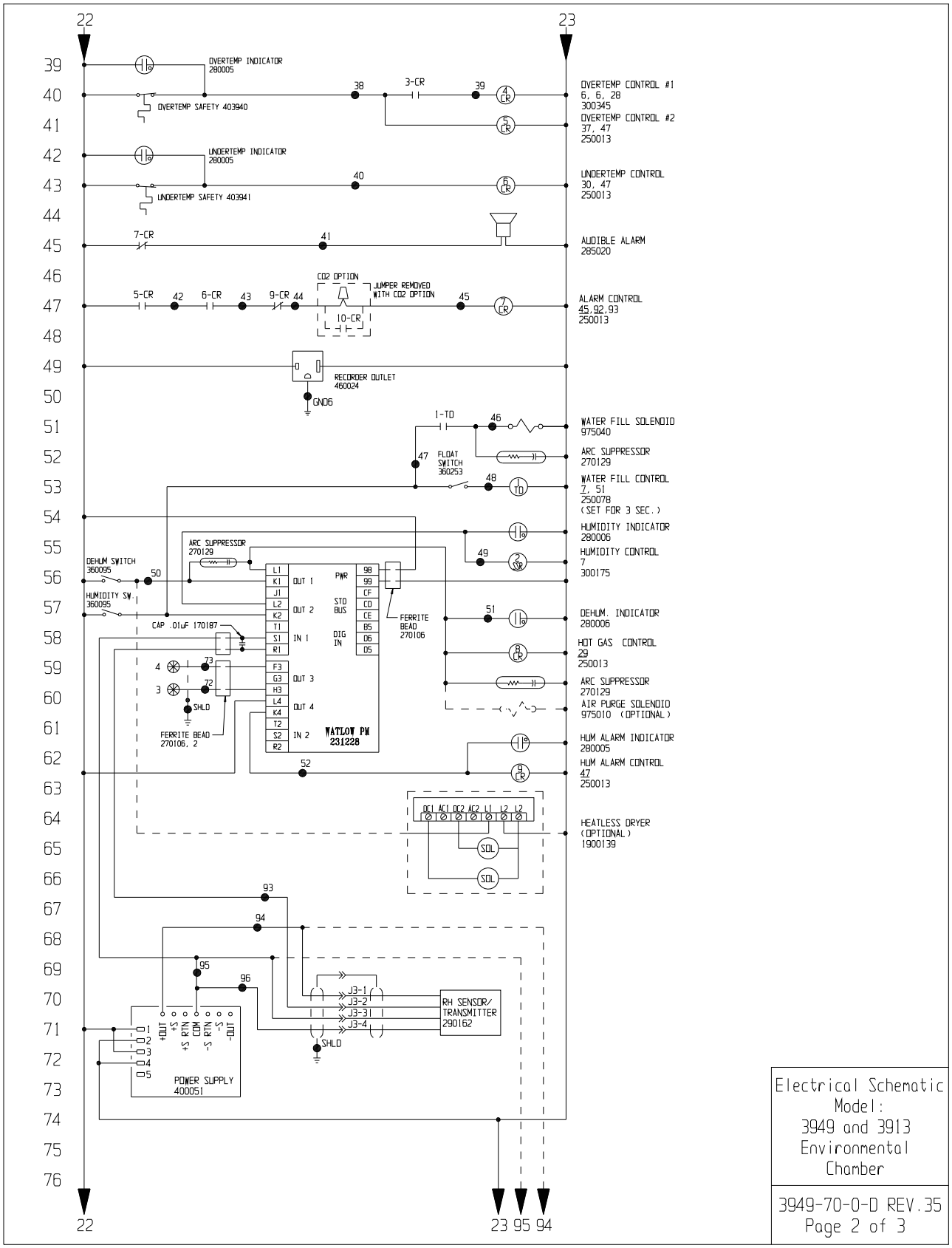
Electrical Schematic
Model:
3940 and 3911
Environmental
Chamber

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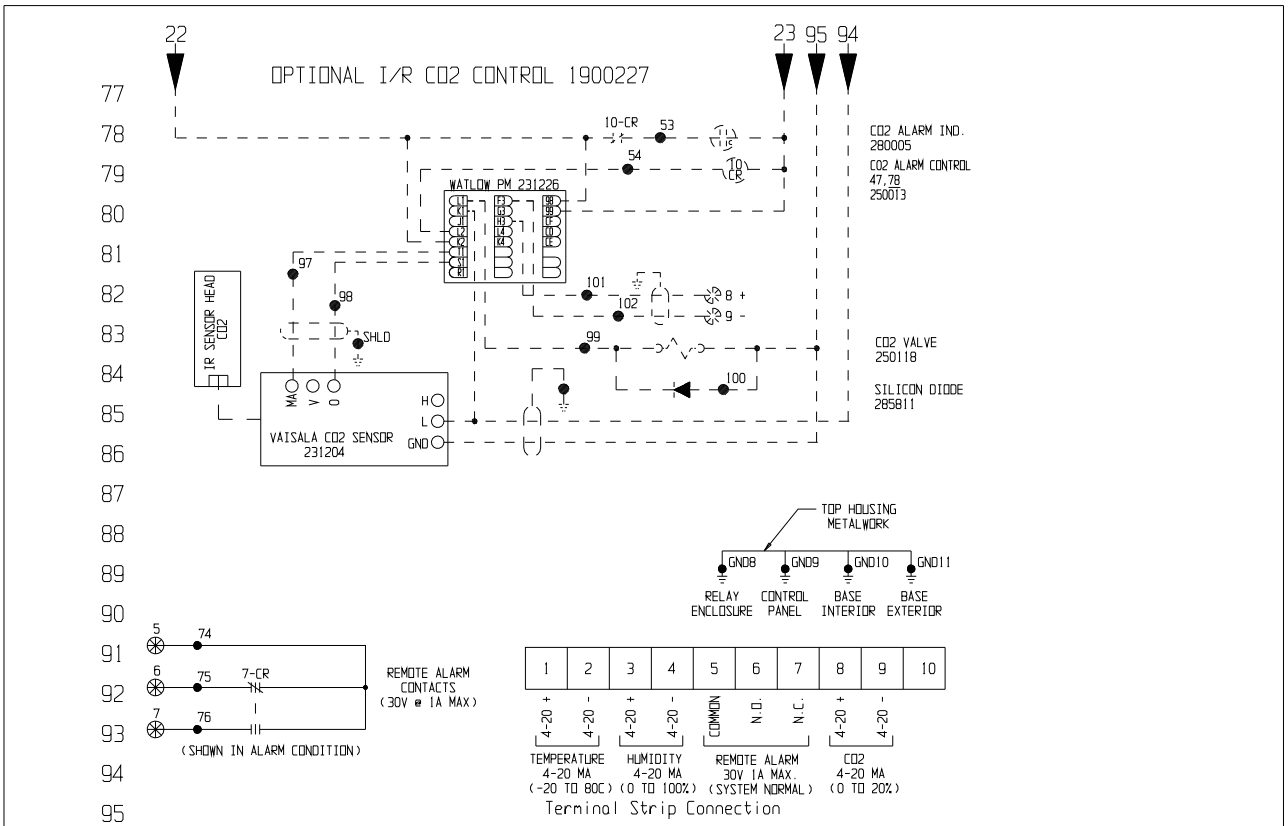
Electrical Schematic
Model:
3949 and 3913
Environmental
Chamber

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Page 1 of 3



Electrical Schematic
Model:
3949 and 3913
Environmental
Chamber

3949-70-0-D REV.35
Page 2 of 3



WIRE REFERENCE CHART

NO.	AWG	COLOR	NO.	AWG	COLOR	NO.	AWG	COLOR	NO.	AWG	COLOR
1	NA	NA	31	20	PUR	70	22	RED	---	---	---
2	NA	NA	32	16	BRN	71	22	BLK	---	---	---
3	NA	NA	33	16	BLU	72	22	RED	90	22	WHT
4	12	BLK	34	16	YEL	73	22	BLK	91	22	RED
5	12	RED	35	16	BRN	74	22	RED	92	22	BLK
6	12	BLK	36	20	RED	75	22	BLK	93	22	RED
7	12	RED	37	20	BLK	76	22	WHT	94	22	GRN
8	12	WHT	38	20	RED	77	N/A	N/A	95	22	BLK
9	16	BLK	39	20	RED	78	N/A	N/A	96	22	WHT
10	16	ORG	40	20	BLU	79	N/A	N/A	97	22	RED
11	16	BLU	41	20	YEL	---	---	---	98	22	BLK
12	16	ORG	42	20	PUR	---	---	---	99	22	RED
13	16	RED	43	20	PUR	---	---	---	100	22	WHT
14	16	BLK	44	20	PUR	---	---	---	101	22	BLK
15	16	BLK	45	20	PUR	---	---	---	102	22	WHT
16	16	BLK	46	20	BLU	---	---	---	---	---	---
17	16	PUR	47	20	ORG	---	---	---	GND1	12	GRN
18	14	BLK	48	20	PUR	---	---	---	GND2	16	GRN
19	14	WHT	49	20	BLU	---	---	---	GND3	16	GRN
20	14	BLK	50	20	BRN	---	---	---	GND4	16	GRN
21	14	WHT	51	20	RED	---	---	---	GND5	20	GRN
22	16	BLK	52	20	YEL	---	---	---	GND6	16	GRN
23	16	WHT	53	20	YEL	---	---	---	GND7	16	GRN
24	20	BLU	54	20	RED	---	---	---	GND8	14	GRN
25	20	BLU	---	---	---	---	---	---	GND9	BRAID	N/A
26	20	RED	---	---	---	---	---	---	GND10	16	GRN
27	20	YEL	---	---	---	---	---	---	GND11	16	GRN
28	20	PUR	---	---	---	---	---	---	---	---	---
29	20	ORG	---	---	---	---	---	---	---	---	---
30	20	ORG	---	---	---	---	---	---	---	---	---

REV	ECN NO.	DATE	BY	CAD	APPD	DESCRIPTION OF REVISION
35	IN-4051	02/21/11	GLS	GLS	CCS	REVISE ARC SUPPRESSOR LOCATIONS
34	IN-4051	12/29/10	GLS	GLS	MSB	REV. CONTROLS FROM 982 & SD, ADD DLP OPT.
33	IN-3830	12/29/07	GLS	GLS	LDN	REWIRE ALARM RELAYS
32	IN-3303	05-24-06	GLS	KDG	LDN	CHANGED 285823 150V MOV TO 320513 250V MOV
31	IN-3229	12/21/04	GLS	GLS	AAL	REMOVED 270129 FROM TERM 15 & 16 TEMP & RH

Electrical Schematic
Model:
3949 and 3913
Environmental
Chamber

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ELECTROSTATIC
SENSITIVE DEVICES

ThermoFisher SCIENTIFIC
BOX 649, MARIETTA, OHIO 45750

MODEL/PART NAME: 3913, 3949 REACH-IN INCUBATOR
DWG TITLE: ELECTRICAL SCHEMATIC
DWN: ED | CAD: JD | APPD: LDN | DATE: 05/18/92 | SCALE: NONE
MATERIAL:
PAINT COLOR:
TOLERANCE UNLESS OTHERWISE SPECIFIED
ANGLES: DECIMAL: .XX=± .XXX=±
DRAWING NUMBER: 3949-70-0
SIZE: D

3949-70-0-D REV.35
Page 3 of 3

THERMO FISHER SCIENTIFIC STANDARD PRODUCT WARRANTY

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period.

During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor included. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters and gaskets are excluded from this warranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo Fisher Scientific postage paid and replacement parts are shipped FOB destination.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

Your local Thermo Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation and preventive maintenance.

If equipment service is required, please call your Technical Services Department at 1-800-438-4851 (USA and Canada) or 1-740-373-4763. We're ready to answer your questions on equipment warranty, operation, maintenance, service and special application. Outside the USA, contact your local distributor for warranty information.

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THERMO FISHER SCIENTIFIC INTERNATIONAL DEALER WARRANTY

The Warranty Period starts two months from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period. Dealers who stock our equipment are allowed an additional six months for delivery and installation, provided the warranty card is completed and returned to the Technical Services Department.

During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor excluded. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters, reagents, tubing, and gaskets are excluded from this warranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo postage paid and replacement parts are shipped FOB destination.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

Your local Thermo Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation and preventive maintenance.

Contact your localdistributor for warranty information. We’re ready to answer your questions on equipment warranty, operation, maintenance, service and special application.

Rev. 4 2/09

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401 Millcreek Road
Marietta, Ohio 45750
United States

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