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Model: 3911/3913

Reach-In Incubator
11 cu ft capacity

Manual No. 7013911 Rev-1

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.

Refer to the serial tag on the rear cover of this manual

NOTE:

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

MANUAL NO. 7999999

REV	ECN	DATE	DESCRIPTION
0	IN-2111	8/96	Product release (2) add Watlow 982 deg

Do You Need Information or Assistance on Forma Scientific Products?

If you do, please contact us 8:00 a.m. to 7:00 p.m. (Eastern Time) at:

1-740-373-4763	Direct
1-888-213-1790	Toll Free, U.S. and Canada
1-740-373-4189	FAX
http://www.forma.com	Internet Worldwide Web Home Page
fservice@forma.com	Service E-Mail Address

Forma's **Sales Support** 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.

The Forma **Product Service Support** can supply technical information about proper setup, operation or troubleshooting of your equipment. We can fill your needs for spare or replacement parts or provide you with on-site service. We can also provide you with a quotation on our Extended Warranty for your Forma products.

Whatever Forma 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 Forma warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

Regardless of your needs, Forma's professional telephone technicians are available to assist you Monday through Friday from 8:00 a.m. to 7:00 p.m. Eastern Time. Please contact us by telephone or fax. If you wish to write, our mailing address is:

Forma Scientific, Inc.
PO Box 649
Marietta, OH 45750

International customers please contact your local Forma Scientific distributor.

General Safety Notes used in this Manual

	Important operating and/or maintenance instructions. Read the accompanying text carefully. Ce symbole attire l'attention de l'utilisateur sur des instructions importantes de fonctionnement et/ou d'entretien. Il peut être utilisé seul ou avec d'autres symboles de sécurité. Lire attentivement le texte d'accompagnement. Wichtige Betriebs- und/oder Wartungshinweise. Lesen Sie den nachfolgenden Text sorgfältig. Importante instruccions de operacion y/o mantenimiento. Lea el texto acompanante cuidadosamente.
	Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol. Ce symbole attire l'attention de l'utilisateur sur des risques électriques potentiels. Seules des personnes qualifiées doivent appliquer les instructions et les procédures associées à ce symbole. Gefahr von Stromschlägen. Nur qualifizierte Personen sollten die Tätigkeiten ausführen, die mit diesem Symbol bezeichnet sind. Potencial de riesgos electricos. Solo personas das capacitadadas deben ejecutar los procedimientos asociadas con este simbulo.
	Equipment being maintained or serviced must be turned off and locked off to prevent possible injury. Risques potentiels liés à l'énergie. L'équipement en entretien ou en maintenance doit être éteint et mis sous clé pour éviter des blessures possibles. Geräte, an denen Wartungs- oder Servicearbeiten durchgeführt werden, müssen abgeschaltet und abgeschlossen werden, um Verletzungen zu vermeiden. El equipo recibiendo servicio o mantenimiento debe ser apagado y segurado para prevenir danos.

	Hot surface(s) present which may cause burns to unprotected skin or to materials which may be damaged by elevated temperatures Présence de surface(s) chaude(s) pouvant causer des brûlures sur la peau non protégée, ou sur des matières pouvant être endommagées par des températures élevées. Heiße Oberfläche(n) können ungeschützter Haut Verbrennungen zufügen oder Schäden an Materialien verursachen, die nicht hitzebeständig sind. Superficias calientes que pueden causar quemaduras a piel sin proteccion o a materiales que pueden estar danados por elevadas temperaturas.

√ 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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SECTION 1 - RECEIVING

1.1 Preliminary Inspection

This item was thoroughly inspected and carefully packed prior to shipment and all necessary precautions were taken to ensure safe arrival of the merchandise at its destination. Immediately upon receipt, before the unit is moved from the receiving area, carefully examine the shipment for loss or damage. Unpack the shipment and inspect both interior and exterior for any in-transit damage.

1.2 Visible Loss or Damage

If any loss or damage is discovered, note any discrepancies on the delivery receipt. Failure to adequately describe such evidence of loss or damage may result in the carrier refusing to honor a damage claim. Immediately call the delivering carrier and request that their representative perform an inspection. Do not discard any of the packing material and under no circumstances move the shipment from the receiving area.

1.3 Responsibility for Shipping Damage

For products shipped F.O.B. Marietta, Ohio, the responsibility of Forma Scientific, Inc. ends when the merchandise is loaded onto the carrier's vehicle.

On F.O.B. Destination shipments, Forma Scientific's and the carrier's responsibility ends when your Receiving Department personnel sign a free and clear delivery receipt.

Whenever possible, Forma Scientific, Inc. will assist in settling claims for loss or in-transit damage.

SECTION 2 - INSTALLATION AND START-UP

2.1 Location

Locate the unit on a firm, level surface in an area of minimum ambient temperature fluctuation. A minimum of 12 inches clearance is required at the top of the incubator and a minimum of 3 inches clearance is required at the rear of the incubator to facilitate adequate air flow around the refrigeration system.

2.2 Water (Humidity System) and Drain Connections

a. Connecting the Water Inlet for the Humidity System

Do not attempt to operate the humidity system without filling it with water. The humidification heater will overheat, and the overtemp safety thermostat will shut the humidification system down.

The humidity reservoir will require approximately one quart (.946 liter) of water on the initial filling. To ensure continuous satisfactory operation of the incubator, only distilled water should be used in the humidity system. Purity of the water used in the incubator humidifier reservoir must be within the 50K Ohm to 1 Meg Ohm range to protect, and prolong the life of the stainless steel unit.

IMPORTANT:

Use of tap water, or distilled water outside the specified range, will decrease the operating life of the unit and will void the warranty.

The water inlet is the 1/8" NPT connection located on the rear top left corner of the incubator. Water inlet pressure at the unit should be from 15 to 40 PSI. A manual shut-off valve should be installed between the main water supply and the incubator.

To prevent mineral buildup on heater coils and humidity generator walls, it may be necessary to clean the humidity generator and immersion heaters with a non-metallic abrasive pad and flush thoroughly every two or three months. Refer to Section 4.2, Cleaning the Humidity Generator and Immersion Heaters.

b. Connecting the 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 2-1) is included with the unit and must be installed on the connection. 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 that the trap 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.

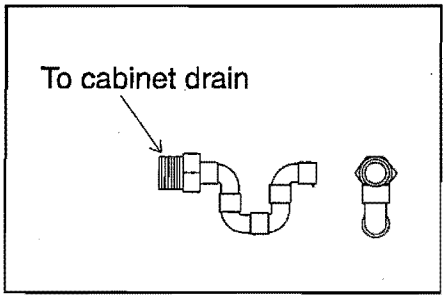
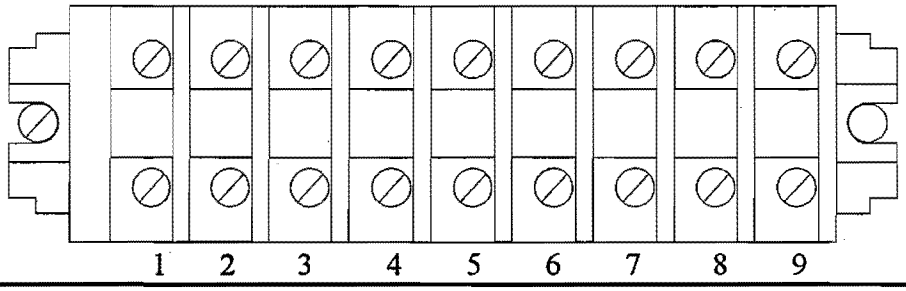


Figure 2-1
Cabinet drain p-trap

2.3 RS-232 Output Interface and Remote Alarm Connector

The Model 3911/3913 is equipped with an RS-232 Serial Communication Interface for the remote transmission of temperature and humidity data. Remote alarm connections are also included on the terminal strip.

Key



Pin #	Description	
1	temperature, Transmit Data	RS232 - Temperature
2	temperature, Receive Data	
3	temperature, Common	
4	humidity, Transmit Data	RS232 - Humidity
5	humidity, Receive Data	
6	humidity, Common	
7	temperature, Common	Remote Alarm Contacts
8	temperature N.O.	(Temperature and Humidity)
9	temperature N.C.	

Terminal Pin Descriptions, RS-232 (1-6) and Remote Alarm Connections (7-9)
Figure 2-2

IMPORTANT USER INFORMATION

Caution! Stored product should be protected by an activated alarm system capable of initiating a timely response 24 hours/day. Forma Alarms provide interconnect for centralized monitoring.

2.4 Power Connection

The electrical junction box is located on the rear top section of the incubator. With the junction box switch OFF, connect the incubator to an adequate power source. See the electrical data plate mounted on the unit for exact electrical specifications.

2.5 Start-Up Procedure

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 the refrigeration switch should be turned on for most applications. When running Low/No humidity, at high temperatures, the refrigeration switch may be turned off.

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

2.6 Setting 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 approximately two units on the scale. 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.

2.7 Setting 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 approximately two units on the scale. The alarm should be silenced and the undertemp indicator light should 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 will activate, power to the compressor will shut off, and the chamber temperature will be 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.

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

2.8 Preparing the (optional) Cobex Recorder

a. Installing the chart recorder battery

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 9-volt battery as shown in Figure 2-3. If the unit is operating, the green LED lights steady. If the unit is not turned on, the LED blinks.

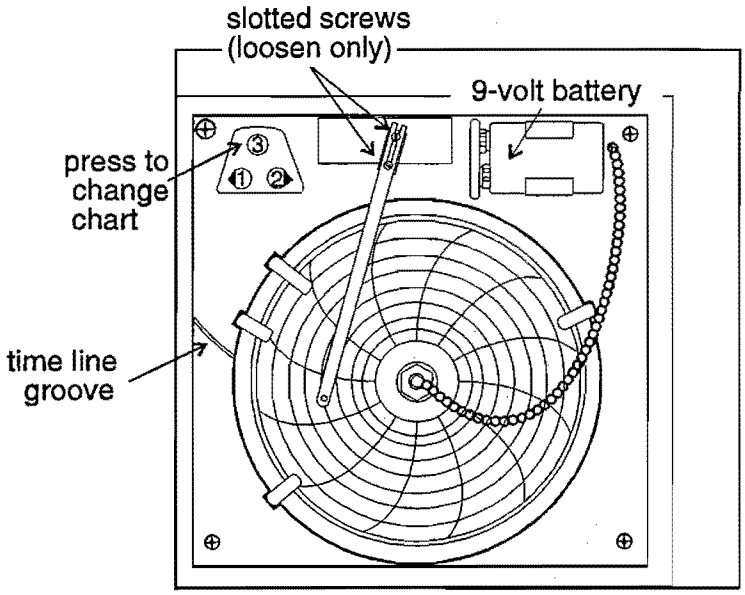


Figure 2-3

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 9-volt battery, use only an alkaline style battery.

b. Changing 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 2-3.

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.

c. Changing 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.

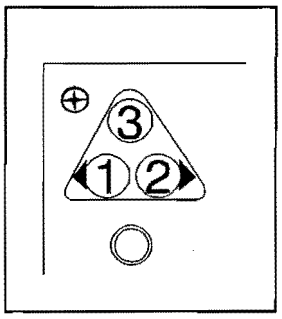


Figure 2-4

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.

d. Calibrating the chart recorder

1. 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 you wish to calibrate. Hold down the #1 arrow for the red (#1) pen or the #2 arrow for the blue (#2) pen, until the light goes out. Then adjust as necessary.

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

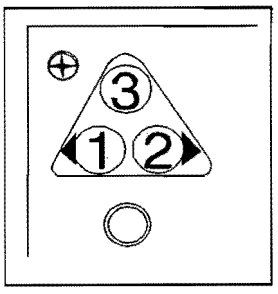


Figure 2-5

2.9 Controller Configuration

The controllers have been pre-configured at the factory. Reference copies of the Configuration records are included on the following pages.

The controller should not be re-configured without first consulting Forma Scientific, Inc., Service Department at 1-800-848-3080.

Temperature Configuration

3940 (WATLOW 982) CONFIGURATION RECORD

Customer: _____

Job Number: _____

Unit Serial Number: _____

Control Type: Temperature

Prepared By: _____

Completed By: _____

Switch Configuration:

Main Boards

SW1	ON
SW2	ON

(This switch should remain in the **OFF** position until factory testing has been completed.)

Output 2 Option Board

SW1	NA
SW2	NA

Output 3 Option Board

SW1	NA
SW2	NA

Output 4 Option Board

SW1	NA
SW2	NA

Input 1 Board

SW1	OFF
SW2	OFF
SW3	ON

Input 2 Board

SW1	NA
SW2	NA
SW3	NA

Software Configuration:

Operations Menus

SYS:	Ei1S	NA	Ent4	NA	A3LO	NA	A4Hi	NA
	Ei2S	NA	A2LO	NA	A3Hi	NA	Aut	OFF
	Ent3	OFF	A2Hi	NA	A4LO	NA		
PID:	Pb1	2.0	dE1	NA	It2	NA	dB	0.0
	rE1	0.50	Ct1	5	rA2	0.25		
	It1	NA	Pb2	1.0	dE2	NA		
	rA1	0.19	rE2	0.25	Ct2	30		

PROG: See Programming Sheets if required.

Setup Menus

InPt:	In1	Rt.d	CAL1		rL2	NA	CAL2	NA
	dEC1	0.0	rtd1	din	rH2	NA	Hunt	NA
	rL1	-100.0	Ftr1	2	LrnL	NA		
	rHi	100.0	In2	NA	LrnH	NA		
OtPt:	Ot1	Ht	AL2	NA	LAt3	nLA	SIL4	NA
	PrC1	NA	LAt2	NA	SIL3	ON	Aout	NA
	HyS1	0.1	SIL2	NA	Ot4	NA	PrC3	NA
	Ot2	CL	Ot3	AL3	AL4	NA	ArL	NA
	PrC2	NA	AL3	Pr1	HyS4	NA	ArH	NA
	HyS2	0.1	HyS3	0.1	LAt4	NA	ACAL	NA
gLbL:	C_F	C	Anun	ON	PtyP	ti	PStr	StPt
	Err	nLA	LoP	-100	gSd	0	LOC	2 *
	Ei1	NO	HiP	100	POut	Cont		
	Ei2	NA	AtSP	90	IdSP	NA		

* LOC should be set at 0 until factory testing and calibration is complete.

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

COM:	bAUd	9600	dAtA	7o	PrOt	FULL	Addr	0
	IntF	NA						

Humidity Configuration

3940 (WATLOW 982) CONFIGURATION RECORD

Customer:
Job Number:
Unit Serial Number:
Control Type: Humidity
Prepared By:
Completed By:

Switch Configuration:

Main Boards

SW1	ON
SW2	ON

(This switch should remain in the **OFF** position until factory testing has been completed.)

Output 2 Option Board

SW1	NA
SW2	NA

Output 3 Option Board

SW1	NA
SW2	NA

Output 4 Option Board

SW1	NA
SW2	NA

Input 1 Board

SW1	ON
SW2	ON
SW3	ON

Input 2 Board

SW1	NA
SW2	NA
SW3	NA

Software Configuration:

Operations Menus

SYS:	Ei1S	NA	Ent4	NA	A3LO	0	A4Hi	NA
	Ei2S	NA	A2LO	NA	A3Hi	100	Aut	OFF
	Ent3	NA	A2Hi	NA	A4LO	***		

*** These values are customer setable to there alarm points.

PID:	Pb1	8	dE1	NA	It2	NA	dB	0
	rE1	0.05	Ct1	5.0	rA2	0.00		
	It1	NA	Pb2	2	dE2	NA		
	rA1	0.35	rE2	0.00	Ct2	30		

PROG: See Programming Sheets if required.

Setup Menus

InPt:	In1	0-5	CAL1		rL2	NA	CAL2	NA
	dEC1	0.0	rtd1	NA	rH2	NA	Hunt	NA
	rL1	0	Ftr1	2	LrnL	NA		
	rHi	100	In2	NA	LrnH	NA		

OtPt:	Ot1	Ht	AL2	NA	LAt3	nLA	SIL4	NA
	PrC1	NA	LAt2	NA	SIL3	OFF	Aout	NA
	HyS1	1	SIL2	NA	Ot4	NA	PrC3	NA
	Ot2	CL	Ot3	AL3	AL4	NA	ArL	NA
	PrC2	NA	AL3	Pr1	HyS4	NA	ArH	NA
	HyS2	1	HyS3	1	LAt4	NA	ACAL	NA

gLbL:	C_F	NA	Anun	ON	PtyP	ti	PStr	StPt
	Err	nLA	LoP	-100	gSd	0	LOC	2 *
	Ei1	NO	HiP	100	POut	Cont		
	Ei2	NA	AtSP	90	IdSP	NA		

* LOC should be set at 0 until factory testing and calibration is complete.

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

COM:	bAUd	9600	dAtA	7o	PrOt	FULL	Addr	0
	IntF	NA						

Section 3 - Start Up and Operation

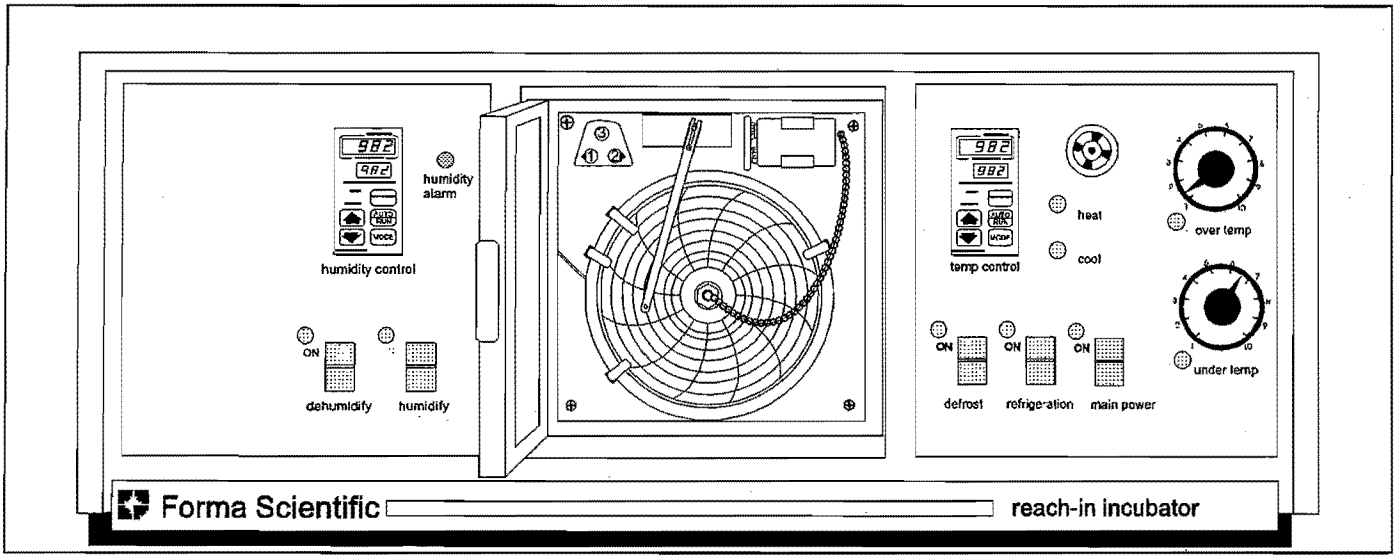


Figure 3-1
Model 3911/3913 Control panel shown with optional CoBex recorder

3.1 The 3911 Control Panel

Main Power Switch and Indicator Light (Figure 3-2)

(A) 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.

Refrigeration Switch and Indicator Light (Figure 3-2)

(B) 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.

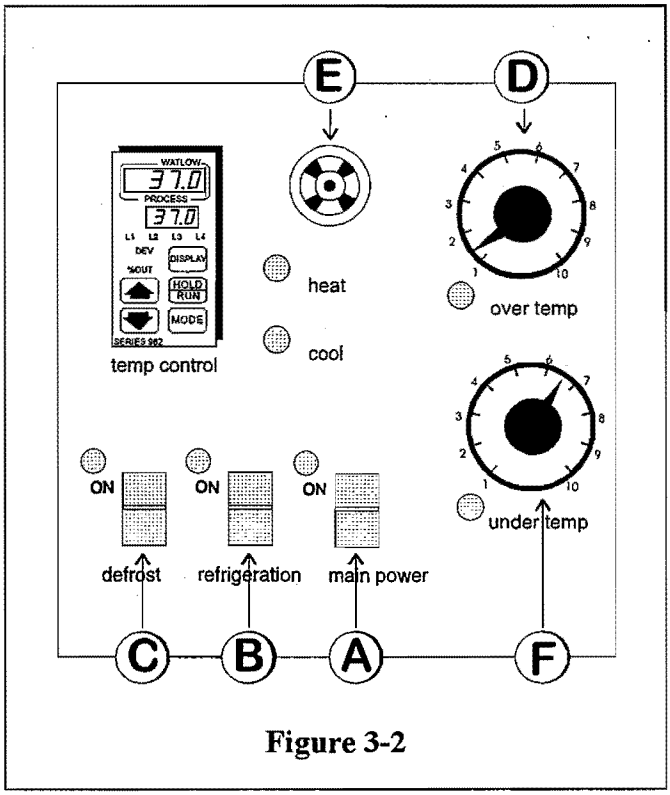


Figure 3-2

Defrost Switch and Indicator Light (Figure 3-2)

(C) The defrost switch controls power to the defrost system. The defrost timer is factory set to 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.

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

Overtemp Safety Control, Indicator Light, and Audible Alarm (Figure 3-2)

(D) 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 will:

- Activate the audible alarm and the overtemp indicator light.
- Interrupt 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 (0 to 10) on the dial are *for reference only* and do not correspond to any specific temperature.

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.

Undertemp Safety Control, Indicator Light and Audible Alarm (Figure 3-2)

(E)(F) 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: As with the overtemp safety control, the undertemp control is not directly calibrated. The numbers (0 to 10) on the dial are *for reference only* and do not correspond to any specific temperature.

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 r esumed.

Humidify Switch and Indicator (Figure 3-3)

(G) The humidify switch controls the power to the humidification system circuit. The heaters operate *only* if there is a sufficient amount of water in the humidification system. The humidity indicator lights when the humidify switch is on.

Dehumidify Switch and Indicator (Figure 3-3)

(H) When the dehumidify switch is on, power to the humidification system heaters are interrupted, and the refrigeration system turns on to provide control for drying. The dehumidify indicator lights when the dehumidify switch is on. When a defrost cycle occurs, the dehumidify light may cycle on and off to reflect the action of the humidity controller. The dehumidify switch should be on when:

- The incubator is being operated without refrigeration
- A lower level of RH (above ambient) is desired.

Humidity removed from the cabinet is processed through the evaporator in the refrigeration system.

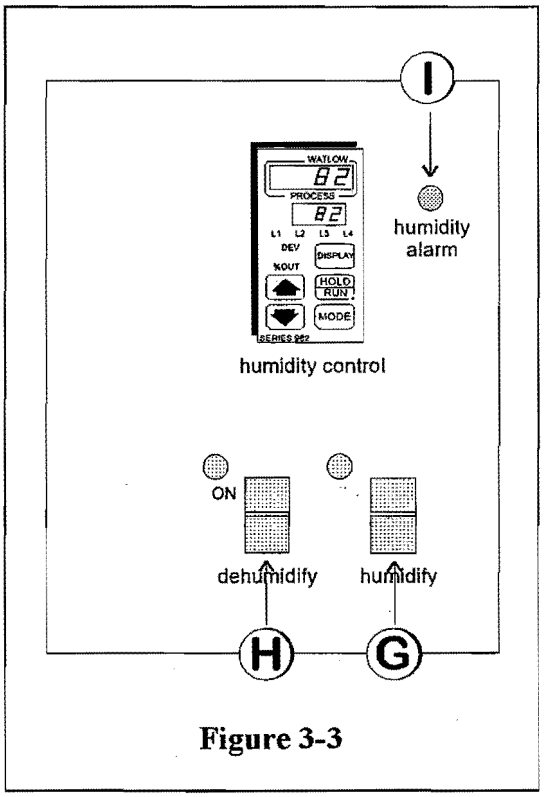


Figure 3-3

Audible Humidity Alarm and Indicator Display (Figure 3-3)

(I) The humidity alarm is a function of the humidity controller Figure 3-4. When the cabinet humidity goes outside the set parameters of the controller, L3 indicator on the controller lights, the audible alarm sounds, and the humidity alarm indicator (Figure 3-3, Item I) on the control panel lights.

(J) Pressing the Hold/Run key (Figure 3-4, Item J) on the controller silences the audible alarm and extinguishes the humidity alarm indicator. The L3 indicator on the controller, however, remains lit until the cabinet humidity returns to the system setpoint.

Note: The humidity controller's high and low limits are set by the factory at 90% and 30%. Therefore, the system will go into the alarm state when the humidity exceeds these percentages by one percent (91% and 29% respectively). 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 2 of this manual.

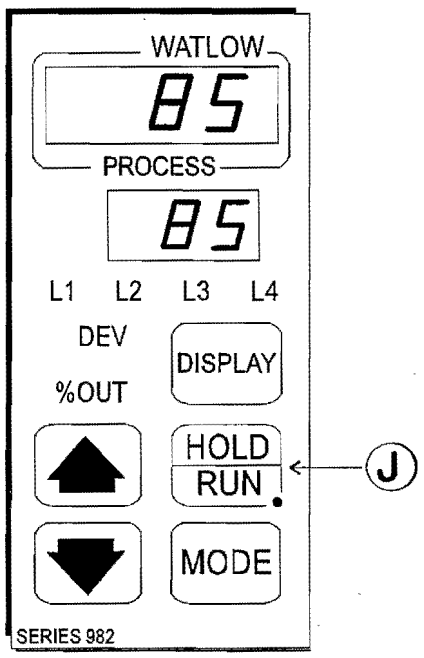


Figure 3-4

3.2 Setting the Incubator's Operating Temperature (Figure 3-5)

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

(M) To raise or lower the setpoint, press the up or down arrow. Temperatures are set in .1°C increments.

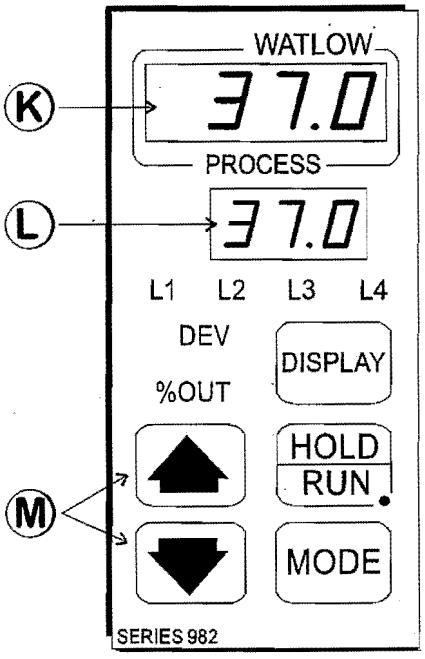


Figure 3-5

3.3 Setting the Incubator's Operating Humidity (Figure 3-6)

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

(P) To raise the setpoint, press the up or down arrows. Humidity is set in one percent increments.

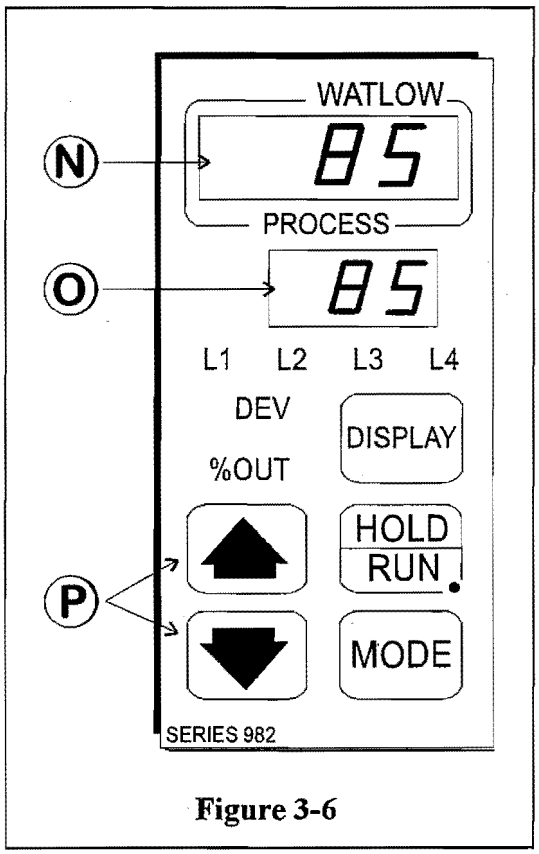


Figure 3-6

3.4 Programming the controllers.

The Watlow temperature and humidity controllers have been set at the factory to operate the incubator within the specifications listed in Section 6 of this manual. Reference copies of the Watlow configuration records are included at the end of Section 2 of this manual.

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

Making program changes to either the temperature or humidity controllers will seriously alter the performance of the incubator and therefore must be made only by qualified persons. The controllers should not be re-configured without first consulting Forma Scientific, Inc., Service Department, at 1-800-848-3080.

a. Removing the mechanical lockout

Make sure the unit is turned off.

Wearing a grounding wrist strap or maintaining constant contact with the metal cabinet, press in the four locking tabs on the frame of the Temperature controller. There are two tabs on either side as shown in the front and side views in Figure 3-7. When all tabs are unlocked, pull the controller module out of its frame.

Looking at the top of the module, locate the red DIP switch indicated in Figure 3-8. With a fingernail or small screwdriver, turn off SW #2 by moving the white toggle down or towards the front of the module.

Very carefully, replace the module into its frame and press firmly on the top and bottom of the bezel until all four locking tabs "click" into place.

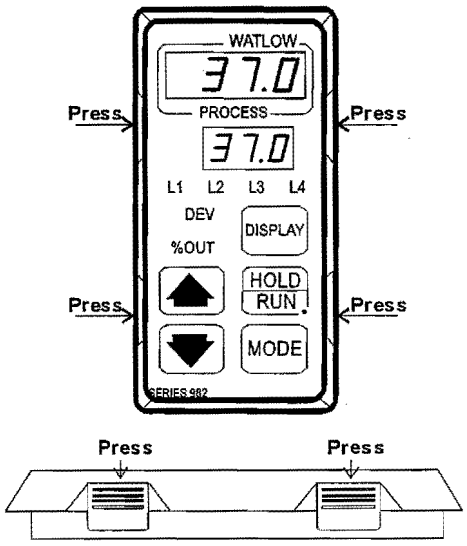


Figure 3-7

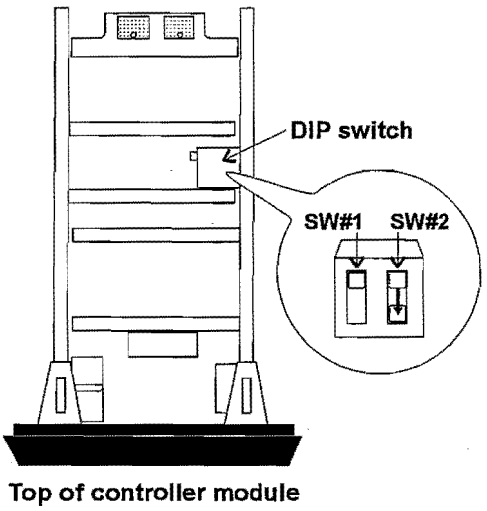


Figure 3-8

b. Removing the Software Lockout

Press the up arrow and down arrow keys at the same time and hold them for about three seconds. The words "inpt" (input) and "set" will appear in the top and bottom displays. (Figure 3-9) If numbers in the bottom display begin to scroll up or down, the keys have not been pressed simultaneously. Try again.

Press the up arrow until "gLbL" (global) appears in the upper display. The word "set" will remain in the lower display. (Refer to Figure 3-10)

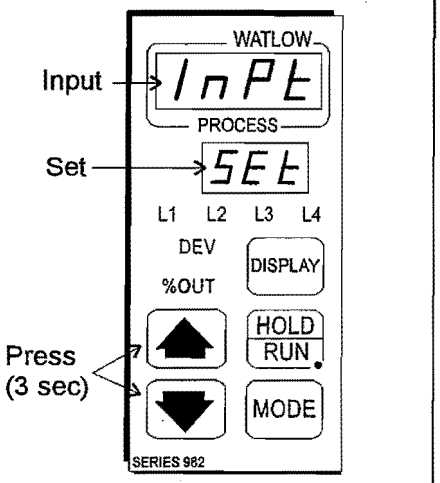


Figure 3-9

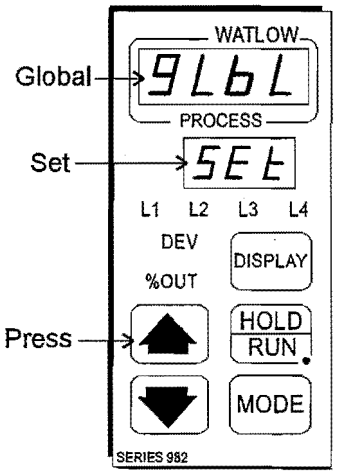


Figure 3-10

Press the Mode key to scroll through the menus until the upper and lower displays show "2 Loc" (Figure 3-11) Press the down arrow key until the 2 becomes 0 (zero) as shown in Figure 3-12.

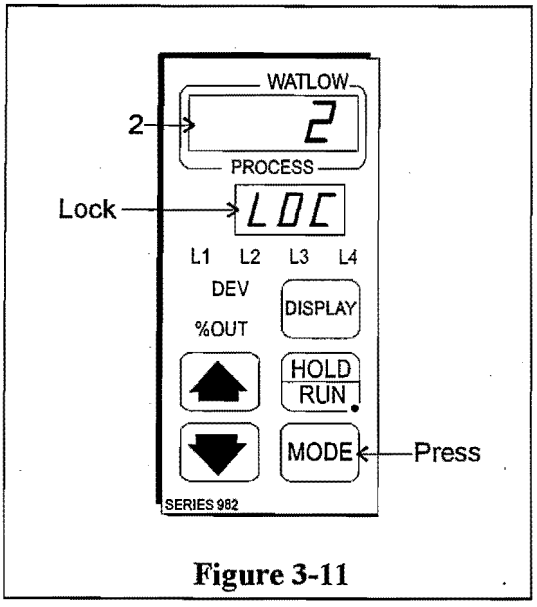


Figure 3-11

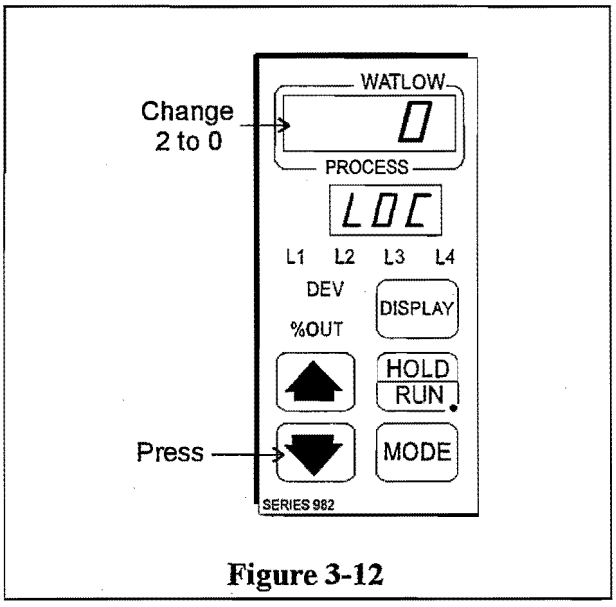


Figure 3-12

Press the Display key to return to showing the setpoint and actual temperatures. ***All safeguards are now removed and the controller may be programmed.*** Refer to the Watlow publications included with this operating manual.

Reprogramming the temperature or humidity controllers will change the factory default settings and may seriously alter the performance of the incubator and void the warranty. Contact the Forma Scientific, Inc., Service Department, at 1-800-848-3080.

SECTION 4 - ROUTINE MAINTENANCE

4.1 Cleaning the Incubator

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 Forma products 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.

a. Maintaining the Humidity Steam Generator

Depending upon the quality of water used in the humidification system, it may be necessary to clean the humidity generator and immersion heaters, every 2 to 3 months. Refer to Section 5.6 for cleaning instructions.

Section 5 - Service

CAUTION

Contains Parts and Assemblies Susceptible to Damage by Electrostatic Discharge (ESD)

Servicing must be performed by qualified service personnel only!

5.1 Accessing the Electrical Components

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

To gain access to the electrical components, open the control panel and grasp the left side of the control panel housing. Pull it gently, but firmly, up and out.

5.2 Replacing the Overtemp/Undertemp Probe and Thermostat

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

- Remove the incubator ceiling by remove the screws holding it in place.
- Remove the top three screws from the top of the right duct cover.
- Lean the duct sheet out, and remove the Permagum seal from around the probe access hole.

- Remove the 15" copper capillary overtemp probe by extracting the two plastic clips that hold the probe in place.
- Open the control panel.
- Pull the overtemp probe up through the access hole and into the control panel.
- 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.
- Pull the overtemp knob on the control panel off.
- Remove the two screws that hold the overtemp assembly to the control panel.
- Disconnect the two wires from the back of the thermostat assembly.
- Pull the entire assembly out of the panel, and remove the unit.
- Replace the thermostat and probe.

Note: Reseal the probe access hole with Permagum, and retie the overtemp cable to the existing wires after replacing the probe.

5.3 Replacing the Humidity/Temperature Sensor

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

- Locate the probe mounting plate in the center of the right side of the incubator interior.
- Open the mounting plate by removing the screws that hold it in place.
- Locate the humidity sensor mounted on the inside of the panel in a black housing. Note the angle of the probe.

- Grasp and unplug the probe from the probe cable.
- When replacing the humidity sensor, be sure to mount the probe at the same angle as it was originally mounted.

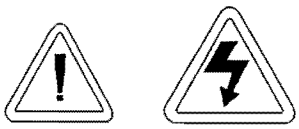
5.4 Replacing the Optional Recorder and Probe(s)

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

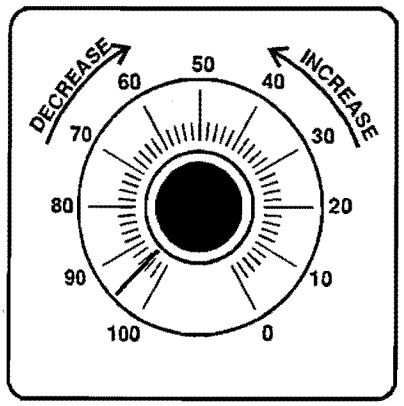
- Open the incubator door, and locate the probe mounting plate attached to the center of the right interior wall. Remove the mounting plate.
- The recorder probe is attached to the lower end of the back of the mounting plate. Remove the probe by carefully sliding it out of the housing.
- Remove the screws securing the ceiling of the incubator and remove the ceiling.
- Remove the top three screws on both edges of the right duct sheet.
- Lean the duct sheet out in order to remove the Permagum seal from around the probe access hole.
- Open the control panel door, and remove any Permagum from around the access hole.
- Pull the probe(s) carefully up through the hole.
- Follow the probe cable(s) to the back of the recorder, and carefully clip any plastic ties holding the cable(s) to other wiring.
- Remove the three screws securing the recorder and pull it carefully out from the front of the control panel.
- Replace the recorder with the correct Forma part.

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

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

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.

5.6 Cleaning and Adjusting the Humidity Steam Generator, P/N 505087

Materials Required: 6-foot stepladder
Clamp-on style Ammeter
Siphon, sponge, and cleaning materials
Flat and Phillips screwdrivers
Laboratory disinfectant

- Remove all contents from the incubator, shut it off, and disconnect the power.
- Turn off the valve supplying the sterile distilled water.
- From the stepladder, remove the eight Phillips screws securing the top of the incubator cabinet.
- When the steam generator has cooled, remove the four thumbscrews.

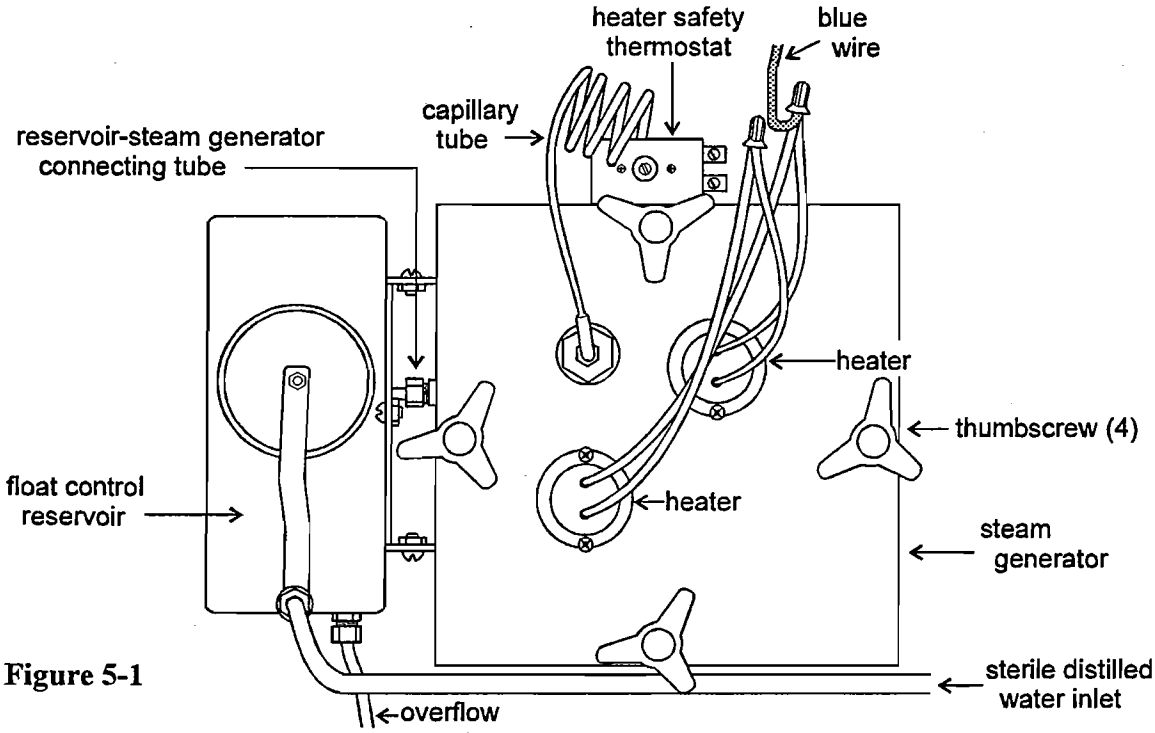


Figure 5-1

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

- Lift the top off of the steam generator and lay it to the side taking care to not crimp the copper capillary tube.

- Siphon all of the water out of the steam generator and clean it 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 standpipe using a test tube brush. Siphon and sponge the wash water out of the boiler. Repeat cleaning with soap and water as necessary.

- Carefully pry off the brass top of the float control reservoir. Clean and disinfect it and the connecting tube between the reservoir and the steam generator being careful to not damage the float assembly.

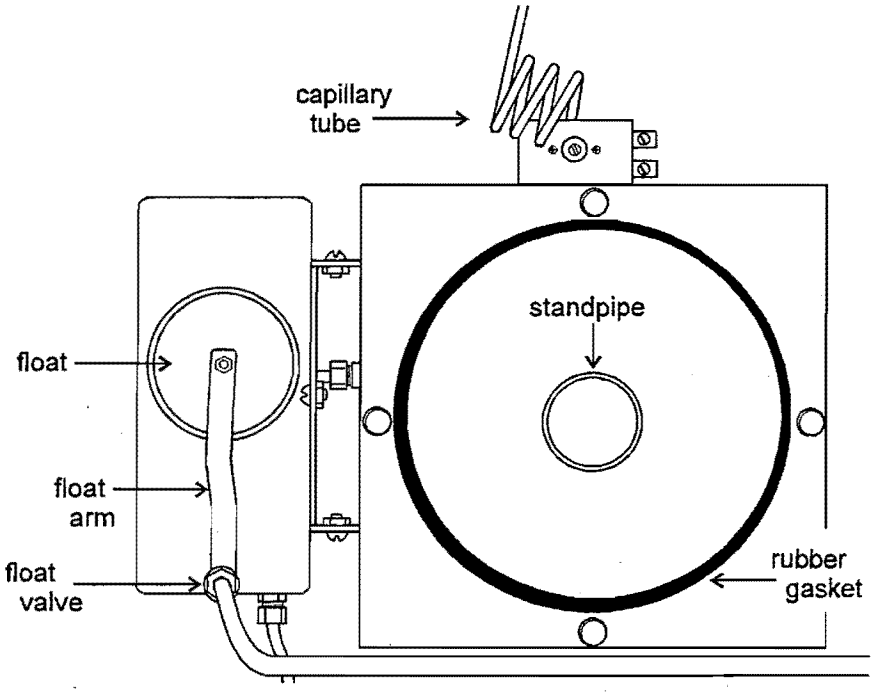


Figure 5-2

- Also clean the two heater elements and the part of the copper capillary tube attached to them.

- When all surfaces are clean, rinse with sterile distilled water until all soap and disinfectant are removed.

- Open the distilled water valve and allow the reservoir to fill. Measure the water level. Limits are three inches, plus or minus one-quarter of an inch. The water level is raised and lowered by carefully bending the float arm. When set, replace the cover.

- Replace the top of the steam generator and alternately tighten the four thumbscrews to evenly compress the rubber gasket.

a. Checking the Steam Generator Safety Thermostat Calibration

- Turn the slotted rheostat shaft of the temperature control on the back of the steam generator fully clockwise.

- Remove all tools and cleaning materials from the top of the incubator. Reconnect power to the unit and turn it on.

- Set the RH level to 100% and open the incubator door. This will cause the heaters in the steam generator to be continuously energized.

The next step requires working in the top section of the incubator where high voltages are present. This should only be done by qualified persons.

- Using a clamp-on ammeter, establish that current is flowing in the blue wire going to the heater connectors. Refer to Figure 5-1.

- Proper current is about 3.6 amps. If the current is not flowing and the humidity indicator is on, rotate the small slotted screw in the shaft of the safety thermostat counterclockwise, using a jeweler's screwdriver, until the current flows to the heaters.

- Allow the steam generator to operate for about 30 minutes continuously. If the heaters cycle off due to the safety thermostat, rotate the small slotted screw further counterclockwise to maintain the heater's operation.

- After 30 minutes, turn the small slotted screw clockwise *very slowly* until the heaters shut off.

- Turn the slotted screwdriver 1-1/2 turns counterclockwise. The thermostat is now properly adjusted.

- Replace the cabinet top and return the incubator to service.

SECTION 6 - SPECIFICATIONS

DATE: / / **BY:**

FORMA SCIENTIFIC SPECIFICATION SHEET

JOB DESCRIPTION: 3911 11CF Wide Range Reach-In Incubator, Humidification

NUMBER REQUIRED:

CUSTOMER ORDER # **QUOTE:** **INVOICE:**

CUSTOMER:

SHIP TO:

DRAWING NO: Per other side

INTERIOR SIZE: 31.000" wide x 24.000" high x 27.000" front to back

INTERIOR MATERIAL: 20 gauge, type 304 stainless steel, 2-B finish

SHELVING: Three solid 30.625" wide x 25.813" front to back, reinforced stainless steel, adjustable on 2" centers

EXTERIOR SIZE: 38.000" wide x 51.500 high x 31.000" front to back

EXTERIOR MATERIAL: 18 gauge cold rolled steel

FRAME MATERIAL: Integral

PAINT: Antique White with Slate Blue trim, powder coated exterior only

INSULATION: 2" thick foamed-in-place urethane

HEATERS: Two 600W, 120V wirewound

REFRIGERATION: 1/4HP, 115V, air cooled, hi-temp condensing unit, R134A

TEMPERATURE RANGE: 0C to 60C, +/-0.3 @ +25C to +37C

HUMIDITY RANGE: Above ambient to 95% +/-5%

CONTROLLER TYPE: Watlow 982 Dual LED PID microprocessor, temperature & humidity

ELECTRICAL: 208-220V, 1PH, 3W, 60HZ, 14FLA

WEIGHT: 300# **SHIPPING WEIGHT:** 375#

APPROVAL DRAWINGS: Sent; / / **Received;** / /

ORDER RECEIVED: / / **DELIVERY PROMISED:** / /

MISC. INFORMATION:

DRAWING NUMBERS:

3911-00-0-D	Rev #2	Assembly
3911-06-0-D	Rev #0	Final Assembly - Shell Stock
3911-07-0-D	Rev #0	Foam Assembly
3911-08-0-D	Rev #0	Misc. Sub-Assembly
3911-16-0-D	Rev #0	Interior Chamber Weld Assembly
3911-17-0-D	Rev #0	Left & Right Side Sub-Assembly
3911-18-0-D	Rev #0	Misc. Sub-Assembly
3911-19-0-D	Rev #1	Misc. Sub-Assembly
3911-20-0-D	Rev #0	Exterior Sub-Assembly
3911-21-0-D	Rev #0	Misc. Sub-Assembly
3911-22-0-D	Rev #0	Exterior Bottom & left Side Sub-Assembly
3911-23-0-D	Rev #0	Top & Bottom Sill Spot Plate Sub-Assembly
3911-24-0-D	Rev #1	Misc. Sub-Assembly
3911-31-0-D	Rev #1	Interior Layouts
3911-32-0-D	Rev #2	Misc. Interior Layouts
3911-33-0-D	Rev #0	Interior Ceiling Drip Pan Layouts
3911-34-0-D	Rev #0	Misc. Interior Layouts
3911-35-0-D	Rev #0	Misc. Interior Layouts
3911-36-0-D	Rev #1	Misc. Interior Layouts
3911-37-0-D	Rev #1	Interior Duct Sheets
3911-38-0-D	Rev #1	Exterior Side Layouts
3911-39-0-D	Rev #1	Exterior Back and Misc. Layouts
3911-40-0-D	Rev #0	Top & Bottom Sill Details
3911-41-0-D	Rev #2	Exterior Bottom and Misc. Layouts
3911-42-0-D	Rev #3	Drip Pan and Interior Layouts
3911-43-0-D	Rev #0	Door Extrusion & Trim Layouts
3911-70-0-D	Rev #5	Electrical Schematic
3911-90-0-D	Rev #0	Refrigeration Schematic R134A, Phenolic Coated Coil

SECTION 7 - SPARE PARTS LIST

Part No.	Description	Qty
290163	Sensor, RH/Temp Control	1
230066*	Fuse, Ceramic 10A 350V	1
290162	RH/Temp Control Signal Conditioner	1
400051	Power Supply	1
231186	Controller, Watlow 982 Auto Tune	2
320277	Triac, 25A	2
285615*	Fuse, Fusetron 25A	2
620430*	Humidifier Heater	1
270010	Thermostat, B-10 0-220F	1
131300	Blower Wheel	1
275030	Defrost Timer	1
630090	Heater	1
205062	Condensing Unit, 1/4 HP 115V R-134A	1
991334	Solenoid, 120V .101" Port	1
285599	Thermal Fuse, 250V 17A	1
830044	Blower Motor, 1/4 HP, 115V	1

*Immediate Stock

SECTION 8 - SCHEMATICS

SECTION 9 - WARRANTY INFORMATION AND SUPPLEMENTS

FORMA STANDARD PRODUCT WARRANTY

Dear Purchaser:

Good performance is what you expect when you buy products from Forma Scientific, Inc. We, too, are concerned about performance. That's why we offer the following One Year Protective Warranty:

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

During the one year warranty period, component parts proven to be defective in materials or workmanship will be repaired or replaced at our expense, labor included. Installation and calibration is not covered by this warranty agreement. The Forma Scientific, Inc. Service Department must be contacted for warranty determination and direction prior to any work being done.

Expendable items such as glass, filters, pilot lights, light bulbs, and door gaskets are excluded from this warranty coverage. Naturally, our warranty does not cover damage caused by accident, misuse, fire, flood, or acts of God.

Replacement or repair of component parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original one year warranty period. The Forma Service Department must give prior approval for the return of any components or equipment.

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

A word on installation and operation. We know you expect a proper installation. Your local Forma 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.

And about equipment service? Let's face it. Even the best products need service. If this occurs, please call your Forma Service Office at 1-800-848-3080 in the USA or 1-614-373-4763. We're ready to answer your questions on equipment warranty, operation, maintenance service and special applications.

We encourage you to keep this warranty explanation. You may never need it, but it's nice to know the protection is there.

Sincerely,

FORMA SCIENTIFIC, INC.

ISO 9001 REGISTERED

CONDITIONS AND TERMS OF SALE

SPECIFICATIONS AND MATERIAL CHANGES: Forma Scientific, Inc. reserves the right to offer our latest and improved models at time of shipment.

SHIPMENTS: All shipments are FOB Marietta, Ohio, freight prepaid and add. Unless Specific shipment instructions are provided, shipment will be made by the least expensive method.

PRICES: All prices are firm for the delivery period specified based on receipt of a purchase order within 30 days. Purchase Orders received after this time are subject to review and price adjustment. If, after acceptance of a Purchase Order the required delivery date is modified by the purchaser, Forma reserves the right to adjust the price to recover additional expenses incurred, due to increased labor or material cost (including mark-up), inventory expenses, and such like. In addition, Forma Scientific, Inc. will be entitled to invoice and receive payment for 90% of the value of labor and material expended.

TAXES: The prices quoted do not include any state, local or federal taxes.

PAYMENT: All payments are net 30 days from date of shipment. Order acceptance is subject to approval of our Credit Department.

CANCELLATION: Orders shall not be subject to cancellation unless cancellation charges are paid by the purchaser. Custom, non-catalog and modified units are not subject to cancellation under any condition.

DAMAGES OR SHORTAGES: Claims for shortages in shipment must be made within 5 working days of receipt of material. If the outer crate or carton is damaged in any way, purchaser should not sign the bill of lading until the carrier notes such damage on the bill of lading. Without this notation, carriers usually refuse purchaser damage claims. Unauthorized return of goods will be refused at Forma's dock. Authorized returned goods will be allowed at a 20% restocking charge plus whatever expenses are necessary to return material to first class, saleable condition. Custom fabricated or modified equipment is not subject to return under any condition.

DELIVERY: Delivery dates are approximate and based on production at time of quotation. Forma shall not be liable for damages to the purchaser for any default or delay in delivery for any reason. Every effort shall be made to meet the delivery quoted, but failure to meet the estimated delivery will not be considered cause for cancellation and/or claims which may arise from such delay.

LIMITATION OF LIABILITY: In no event, whether as a result of breach of contract, warranty or tort (including negligence and strict liability), shall Forma Scientific, Inc. be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of the equipment or any associated equipment, down-time costs, cost of substitute equipment, costs of labor, costs due to delays or claims of Purchaser's own customers for such damages. Purchaser agrees to indemnify Forma Scientific, Inc. and hold Forma Scientific, Inc. harmless from any and all liability, claims, demands, actions, suits, expenses or costs, including reasonable attorney's fees relating to such consequential or incidental damages.

The responsibility of Forma Scientific, Inc. for damages due to injuries, or death of employees of the Purchaser, or ultimate user of the equipment being serviced, caused by the equipment, shall be limited to that portion of such damages as might be attributed to the negligence or strict liability of Forma Scientific, Inc. The Purchaser and ultimate user agree to indemnify Forma Scientific, Inc. and hold Forma Scientific, Inc. harmless from any further damages, indemnity or contribution. All warranties, limitations of liability and indemnities provided herein will survive the termination of this agreement.

Forma Scientific's liability for any claim of any kind (including negligence and strict liability) for any loss or damage arising out of, or resulting from, this agreement or from the performance or breach thereof, or from the Services, Products or Parts furnished hereunder shall in no case exceed the price of the same giving rise to the claim.

INSTALLATION: Installation of all equipment shall be by, and at the expense of, the purchaser unless quoted herein. When installation is quoted, it is understood that elevator service will be made available to Forma Scientific, Inc. at no charge to move the equipment to specific locations. If elevator service is not available or if access to the specified location is not adequate, Forma Scientific, Inc. reserves the right to bill the purchaser for the additional cost of work required.

ACCEPTANCE: Orders, terms and specifications are subject to approval of Forma Scientific, Inc., Home Office. No variation shall be binding unless in writing signed by a Forma executive officer.

FORMA INTERNATIONAL DEALER WARRANTY

Dear Forma Representative:

Good performance is what you expect when you buy Forma Scientific products. We, too, are concerned about performance. That is why we offer the following One Year Protective Warranty:

The Warranty Period starts two months from the date your equipment is shipped from our factory. This allows for ample shipping time so that the warranty will go into effect at approximately the same time your equipment is delivered. This same protection extends to any subsequent owner during the warranty period. We have provided a means of delaying initiation of the warranty period for those dealers who stock our equipment. The warranty will go into effect upon the installation date when the warranty card has been completed and returned to the attention of the Forma Scientific Service Manager. This delayed warranty beginning is valid for a maximum of six months from the date of shipment from Forma. If no warranty card has been received by Forma within six months, the warranty period will begin two months from the date of shipment from our factory.

During the one year warranty period all component parts proven to be defective in materials or workmanship will be replaced at our expense, excepting labor. Installation and calibration are not covered by this warranty agreement.

Expendable items such as glass, filters, pilot lights, light bulbs, and door gaskets are excluded from this warranty coverage. Naturally, our warranty does not cover damage caused by accident, misuse, fire, flood, or acts of God.

Replacement or repair of component parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original one year warranty period. The Forma Service Department must give prior approval for the return of any components or equipment.

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

A word on installation and operation. We know that your customer expects a proper installation. The Forma International Sales Office is ready to help with information regarding site preparation before your equipment arrives. Our printed instruction manuals carefully detail equipment installation, operation, and preventive maintenance.

If you require immediate information regarding equipment service for your customer, please contact the Forma Service Manager at telephone: 614/373-4763, telex: 29-8205 or cable: FORMAEX. We are ready to answer your questions on equipment operation, maintenance, service and special applications.

The warranty stated above is in lieu of all other warranties, expressed or implied, of merchantibility, or fitness for particular use.

Sincerely,
Forma Scientific, Inc.

ISO 9001 REGISTERED

CONDITIONS AND TERMS OF SALE

SPECIFICATIONS AND MATERIAL CHANGES: Forma Scientific reserves the right to offer our latest and improved models at time of shipment.

SHIPMENTS: All shipments are FOB Marietta, Ohio, freight prepaid and add. Unless specific shipment instructions are provided, shipment will be made by the least expensive method.

PRICES: All prices are firm for the delivery period specified based on receipt of a purchase order within 30 days. Purchase Orders received after this time are subject to review and price adjustment. If, after acceptance of a Purchase Order the required delivery date is modified by the customer, Forma reserves the right to adjust the price to recover additional expenses incurred, due to increase in labor or material cost (including mark-up), inventory expenses, and such like. In addition, Forma Scientific will be entitled to invoice and receive payment for 90% of the value of labor and material expended.

TAXES: The prices quoted do not include any state, local or federal taxes.

PAYMENT: All payments are net 30 days from date of shipment. Order acceptance is subject to approval of our Credit Department.

CANCELLATION: Orders shall not be subject to cancellation unless cancellation charges are paid by the purchaser. Custom, non-catalog and modified units are not subject to cancellation under any condition.

DAMAGES OR SHORTAGES: Claims for shortages in shipment must be made within 5 working days of receipt of material. If the outer crate or carton is damaged in any way, customer should not sign the bill of lading until the carrier notes such damage on the bill of lading. Without this notation, carriers usually refuse customer damage claims. Unauthorized returns of goods will be refused at Forma's dock. Authorized returned goods will be allowed at a 20% restocking charge plus whatever expenses are necessary to return material to first class, saleable condition. Custom fabricated or modified equipment is not subject to return under any condition.

DELIVERY: Delivery dates are approximate and based on production at time of quotation. Forma shall not be liable for damages to the buyer for any default or delay in delivery for any reason. Every effort shall be made to meet the delivery quoted, but failure to meet the estimated delivery will not be considered cause for cancellation and/or claims which may arise from such delay.

LIMITATION OF LIABILITY: In no event, whether as a result of breach of contract, warranty or tort (including negligence and strict liability), shall Forma Scientific be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of the equipment or any associated equipment, down-time costs, cost of substitute equipment, costs of labor, costs due to delays or claims of Customer's own customers for such damages. Customer agrees to indemnify Forma Scientific and hold Forma Scientific harmless from any and all liability, claims, demands, actions, suits, expenses or costs, including reasonable attorney's fees relating to such consequential or incidental damages.

The responsibility of Forma Scientific for damages due to injuries, or the death of employees of the Customer, or ultimate user of the equipment being serviced, caused by the equipment, shall be limited to that portion of such damages as might be attributable to the negligence of strict liability of Forma Scientific. The Customer and ultimate user agree to indemnify Forma Scientific and hold Forma Scientific harmless from any further damages, indemnity or contribution. All warranties, limitations of liability and indemnities provided herein will survive the termination of this agreement.

Forma Scientific's liability for any claim of any kind (including negligence and strict liability) for any loss or damage arising out of, or resulting from, this agreement or from the performance or breach thereof, or from the Services, Products or Parts furnished hereunder shall in no case exceed the price of the same giving rise to the claim.

INSTALLATION: Installation of all equipment shall be by, and at the expense of, the purchaser unless quoted herein. When installation is quoted it is understood that elevator service will be made available to Forma Scientific at no charge to move the equipment to specified locations. If elevator service is not available or if access to the specified location is not adequate, Forma Scientific reserves the right to bill the purchaser for the additional cost of work required.

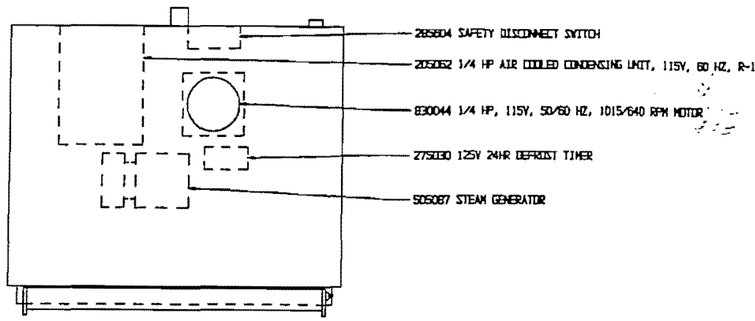
ACCEPTANCE: Orders, terms and specifications are subject to approval of Forma Scientific, Home Office. No variation shall be binding unless in writing signed by a Forma executive officer.

SPECIFICATIONS

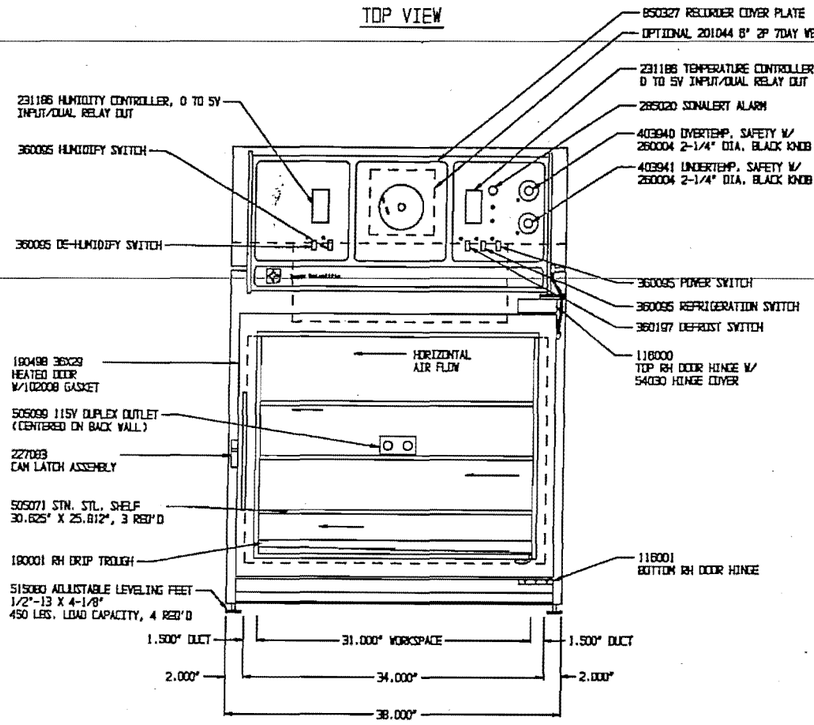
MODEL: 3911 11CF INCUBATOR, 115V DUPLEX OUTLET
INTERIOR MATERIAL: 20 GA. STN. STL., TYPE 304, 2-B
EXTERIOR MATERIAL: 18 GA. C.R.S.
PAINT: ANTIQUE WHITE WITH SLATE BLUE TRIM, POWDER COATED
INSULATION: 2" FOAMED-IN-PLACE URETHANE
SHELVING: THREE SOLID STN. STL. 30.625" WIDE X 25.813" FRONT-TO-BACK, ADJUSTABLE ON 2" CENTERS
TEMPERATURE RANGE: 0°C TO +60°C, +/-0.3°C UNIFORMITY @ +25°C TO +37°C
HUMIDITY RANGE: ABOVE AMBIENT TO 85%RH, +/-5%RH
REFRIGERATION: 1/4 HP, AIR COOLED, HIGH TEMP CONDENSING UNIT, R134A
ELECTRICAL CONNECTIONS: 208-220V, 1PH, 3W, 60HZ, 14FLA

MISCELLANEOUS INFORMATION:

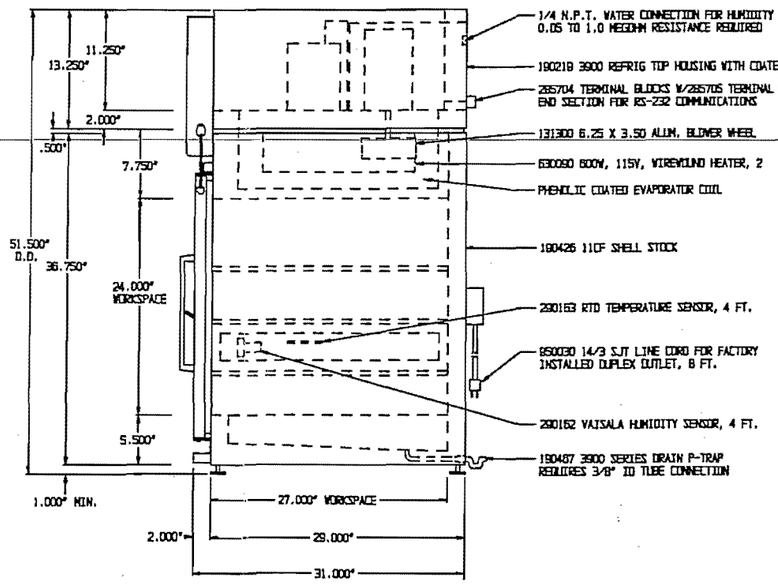
1. ADDED 505099 115V DUPLEX OUTLET TO CENTER REAR WALL



TOP VIEW



FRONT ELEVATION



RIGHT SIDE ELEVATION

CUSTOMER APPROVAL/REFERENCE
APPROVED BY
APPROVING FIRM
DATE OF APPROVAL

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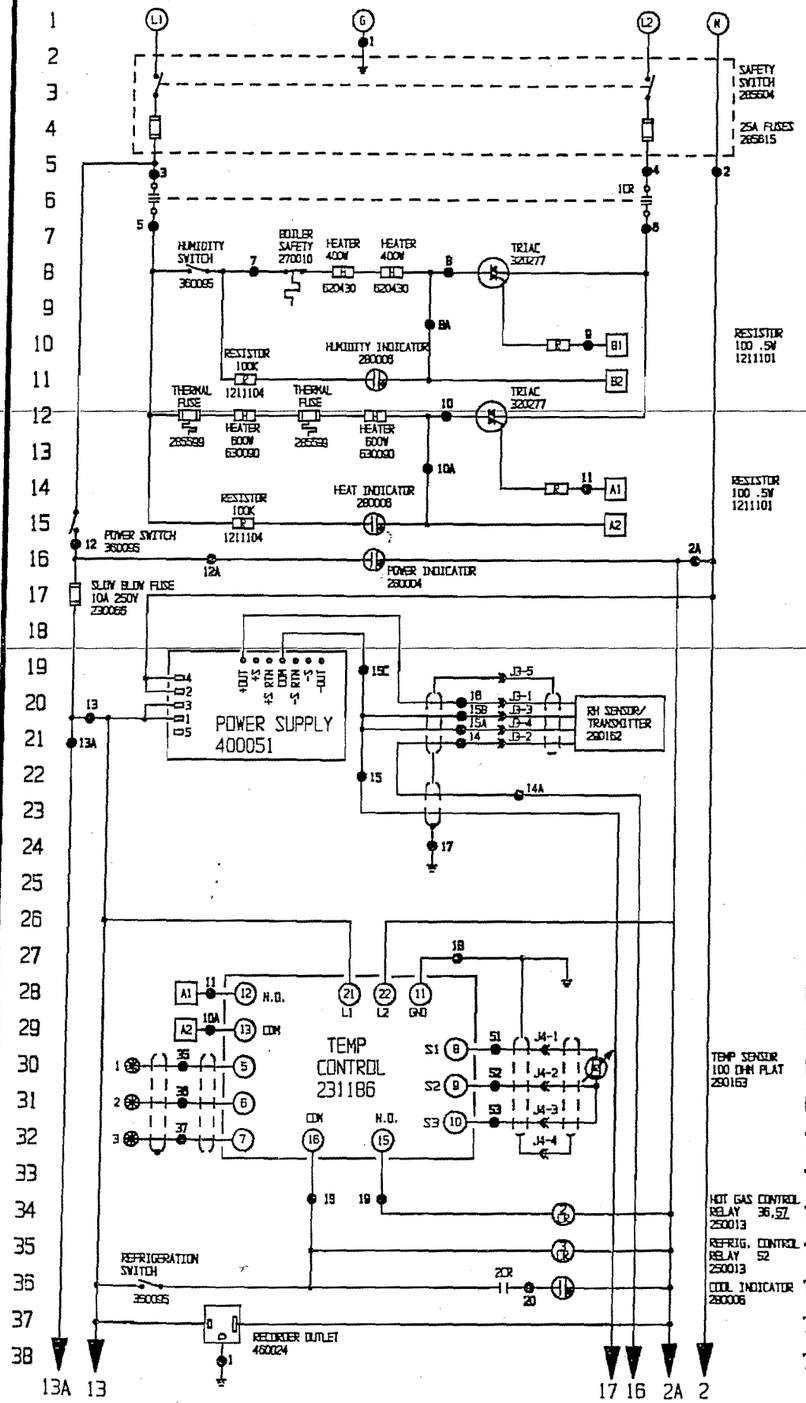
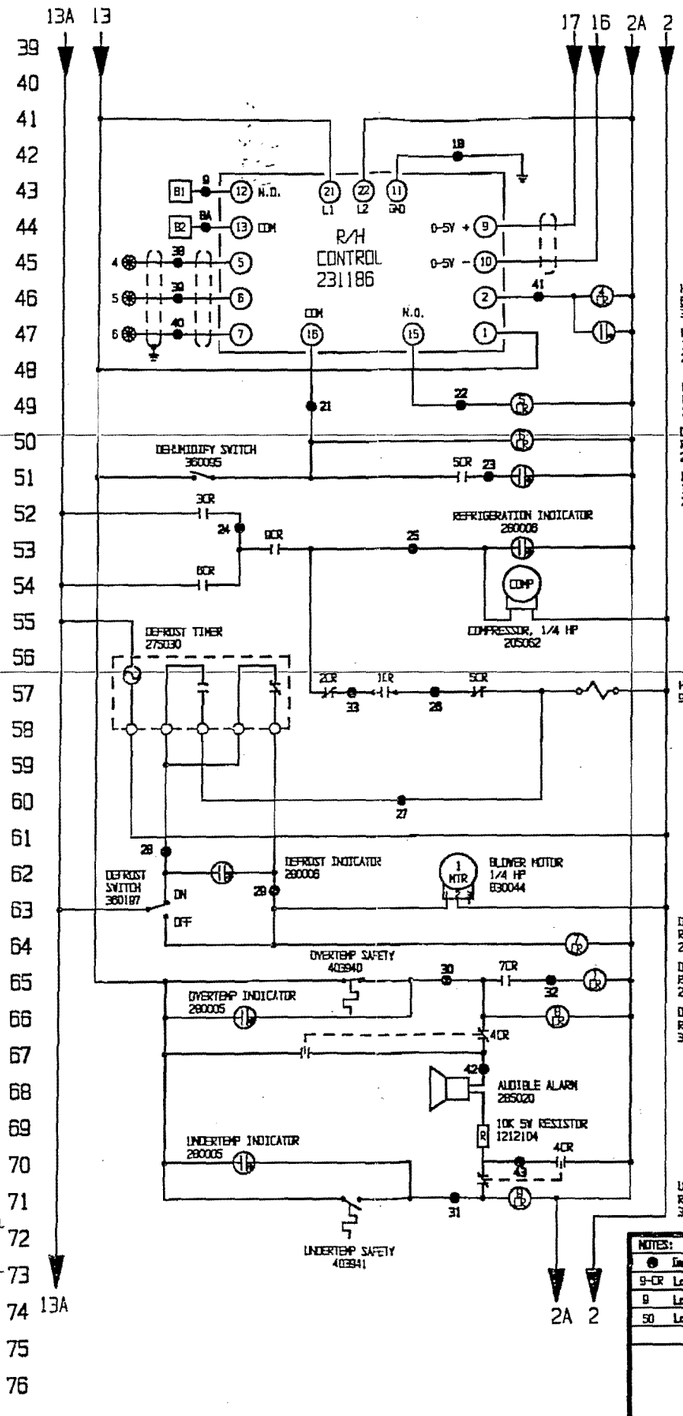
CUSTOM PRODUCTS

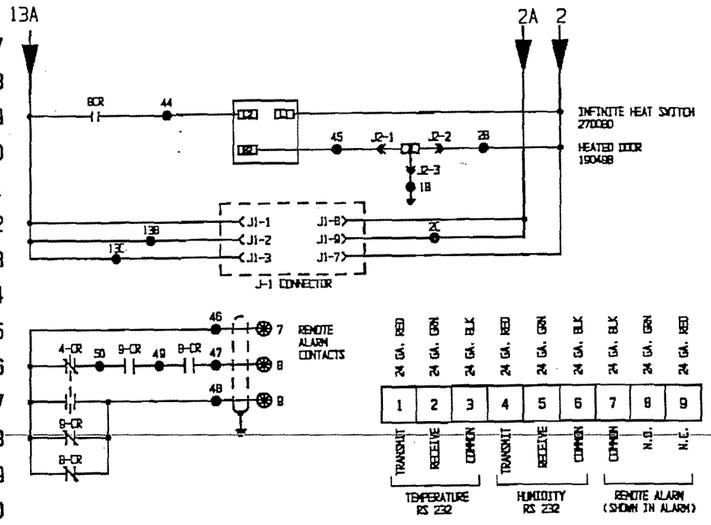
REV	ECR NO.	DATE	BY	CAD	APPD	DESCRIPTION OF REVISION

DATE 10-01-97	DWN TLC	CAD TLC	APPD	SCALE 1/8" = 1"
CUSTOMER	FISHER SCIENTIFIC/CANADA			
JOB TITLE	3911 11CF INCUBATOR, 115V DUPLEX OUTLET			
DWG TITLE	ASSEMBLY			
LOCATION INCUBATR	JOB NUMBER 27691	DRAWING NUMBER IN-27691-00-0-0		

POWER CONNECTION
208-220V, 1PH, 3W, 60HZ, 14FLA







Terminal Strip Connection

WIRE CHART

WIRE NO.	GAUGE	COLOR	WIRE NO.	GAUGE	COLOR
1	12	GRN/YEL	21	20	RED
1A	N/A	N/A	22	20	ORANGE
1B	16	GRN/YEL	23	20	YELLOW
2	14	WHITE	24	16	BLUE
2A	20	WHITE	25	18	BLACK
2B	18	WHITE	26	16	BLUE
2C	20	WHITE	27	18	BLACK
3	12	BLACK	28	18	RED
4	12	RED	29	16	YELLOW
5	16	BROWN	30	20	BLUE
6	16	RED	31	20	ORANGE
7	16	ORANGE	32	20	PURPLE
8	16	BLUE	33	16	BLUE
8A	20	BLUE	34	N/A	N/A
9	20	RED	35	22	RED
10	16	PURPLE	36	22	GREEN
10A	20	PURPLE	37	22	BLACK
11	20	BLUE	38	22	RED
12	16	YELLOW	39	22	GREEN
12A	20	YELLOW	40	22	BLACK
13	20	BROWN	41	20	YELLOW
13A	16	BROWN	42	20	YELLOW
13B	20	BROWN	43	20	RED
13C	20	BROWN	44	18	RED
14	22	RED	45	18	BLACK
14A	22	RED	48	24	BLACK
15	22	BLACK	47	22	GREEN
15A	22	BLACK	48	22	RED
15B	22	WHITE	49	22	WHITE
15C	22	BLACK	50	22	WHITE
16	22	GREEN	51	22	BLACK
17	22	SHIELD	52	22	WHITE
18	20	RED	53	22	RED
19	20	ORANGE			
20	20	PURPLE			

NOTES:

⊕ Denotes Terminal Strip Connection	Parts List Reference Number
9-CR Last Relay Number	○ Assembly
9 Last Terminal Number	○ Panel
50 Last Wire Number	○ Refrigeration
	□ Wiring

CUSTOMER APPROVAL/REFERENCE
APPROVED BY
APPROVING FIRM
DATE OF APPROVAL

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CUSTOM PRODUCTS
SPECIALIZED ENVIRONMENTAL SYSTEMS BY FORMA SCIENTIFIC

REV	ECN NO.	DATE	BY	CAD/APPD	DESCRIPTION OF REVISION
5		10/08/97	MDM/DON	///	REV'D PER STANDARD 3940 UPDATE
4		11/19/96	CSA	CSA/AAL	REV'D PER STANDARD 3940 UPDATE
3		1/03/96	CSA	CSA	AAL REVISED SOLENOID WIRING
2		11/17/94	CSA	CSA	AAL PHENOLIC COATED T-STATS
1	IN-1718	3/23/94	DRG	DRG	AAL CHANGED COND. UNIT TO 134-A

DATE 10/14/93 | DWN DRG | CAD DRG | APPD AAL | SCALE NONE
CUSTOMER FISHER SCIENTIFIC
JOB TITLE 3911 11CF INCUBATOR, 0°C TO 60°C
DWG TITLE ELECTRICAL SCHEMATIC
LOCATION INCUBATR | JOB NUMBER | DRAWING NUMBER 3911-70-0-D

POWER REQUIREMENTS: 208-220V, 1PH, 3W, 60Hz, 14FLA