

Model 3010 and 3020

Water Jacketed CO2 Incubators

Operating and Maintenance Manual 7013010 Rev. 6

Visit us online to register your warranty
www.thermoscientific.com/labwarranty

Thermo SCIENTIFIC

Models covered:		
Model	**Sensor***	**Voltage****
3010	T/C sensor	115 V
3020	IR sensor	115 V

**T/C is a thermal conductivity sensor, IR is an infra-red sensor.*

***All units are 50/60 Hz.*

MANUAL NUMBER 7013010

REV	ECR/ECN	DATE	DESCRIPTION	By
6	ECNM-002105	03/13/23	Updated assembly drawing in page 7-2.	TFI
5	ECNM-001514	06/04/21	Added EMC statements in preface page iv.	TFI
4	ECNM-000906	02/22/21	Replaced part number 400202 with 400218 in page 7-1, updated Assembly drawing in page 7-2 and Electrical drawing in pages 8-1 to 8-3.	TFI
3	ECNM-001141	09/29/2020	Added tubing inspection details to preventive maintenance section in page 4-14.	TFI
2	40087/IN-4743	7/27/16	Changed label on remote alarm artwork to note - pg 5-1	ccs
1	40639	5/3/16	Added risk assessment info	ccs
0	27988/IN-4478	4/7/14	Release 2 - Original	ccs



Important Read this operating 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. ▲

Warning 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.

Intended Use

The Thermo Scientific Water Jacketed CO_2 incubators are intended to provide an environment with controlled temperature and Carbon Dioxide (CO_2) as well as elevated humidity (RH) for the growth of cultivating cell and tissue cultures.

Non Intended Use

The incubators are not intended for use by the general public. The units are not intended for use within the patient environment or outdoors. These units are not designed to be used with liquid CO_2 or liquid N_2. These units should not be used with any flammable or toxic materials.

© 2023 Thermo Fisher Scientific. All rights reserved.



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.



Asphyxiation Hazard Warning. High concentrations of CO_2 can displace oxygen and cause asphyxiation!



Lifting Hazard Warning. The incubator weighs more than 200 lbs (91 kgs). Take adequate safety measures when moving this device.



WEEE Compliance: Thermo Fisher Scientific has contracted with companies for recycling/disposal in each EU Member State. For further information, send an email to weee.recycle@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.

EMC

This equipment has been tested and found to comply with the limits for a Class A digital device. Class A covers devices for usage in all establishments other than domestic and that are not directly connected to a low voltage power supply network, which supplies domestic environment.

Consideration for Korea.

EMC Registration is done on this equipment for business use only. It may cause interference when the product would be used in home.
사용자 안내문 이 기기는 업무용 환경에서 사용할 목적으로 적합성평가 를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있 습니다 .

Consideration for EU

This product is intended for use at locations where product is being supplied by separate power network, in most cases supplied from a high or medium voltage transformer, dedicated only for manufacturing plants or similar plants.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada Statement:

This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Do You Need Information or Assistance on Thermo Scientific Products?

If you do, please contact us 8:00 a.m. to 6:00 p.m. (Eastern Time) at:

1-740-373-4763	Direct
1-800-438-4851	Toll Free, U.S. and Canada
1-877-213-8051	FAX
http://www.thermofisher.com	Internet Worldwide Web Home Page
service.led.marietta@thermofisher.com	Tech Support Email Address
www.unitylabservices.com	Certified Service Web Page

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.

Our **Service Support** staff 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 Thermo Scientific products.

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 (Asheville) LLC
401 Millcreek Road, Box 649
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.**

Table of Contents

Section 1 Installation and Start-Up 1-1

Control Panel Operation 1-2
Control Panel Keys, Displays & Indicators 1-2
Unit Installation 1-3
Stack the Incubators 1-3
Preliminary Cleaning 1-5
Shelf Installation 1-6
Air Sample Filter Installation 1-6
Access Port Installation 1-6
Connect Unit to Electrical Power 1-7
Level the Unit 1-7
Fill the Humidity Pan 1-8
Fill the Water Jacket 1-8
Connect the CO_2 Gas Supply 1-9
Incubator Start-Up 1-10
Set the Operating Temperature Setpoint 1-10
Set the Overtemp Setpoint 1-11
Set the CO2 Setpoint 1-12

Section 2 Calibration 2-1

Calibrate Temperature 2-1
Calibrate Thermal Conductivity (T/C) CO_2 System 2-2
Calibrate Infra-Red (IR) CO_2 System 2-3

Section 3 Alarms 3-1

Section 4 Routine Maintenance 4-1
Clean the Incubator Interior 4-1
Reverse the Door Swing 4-4
Reverse the Hinges for Exterior Door 4-4
Clean the Humidity Pan 4-4
Clean the Cabinet Exterior 4-4
Replace Fuses 4-10
Replace the Access Port Filter 4-11
Replace the Air Sample Filter 4-11
Add or Replenish Rust Inhibitor 4-12
Drain Water Jacket 4-12

Section 5 Remote Alarms 5-1

Section 6 Specifications 6-1

Section 7 Parts List 7-1

Section 8 Electrical Schematics 8-1

Section 9 Warranty Information 9-1

Section 1 Installation and Start-Up

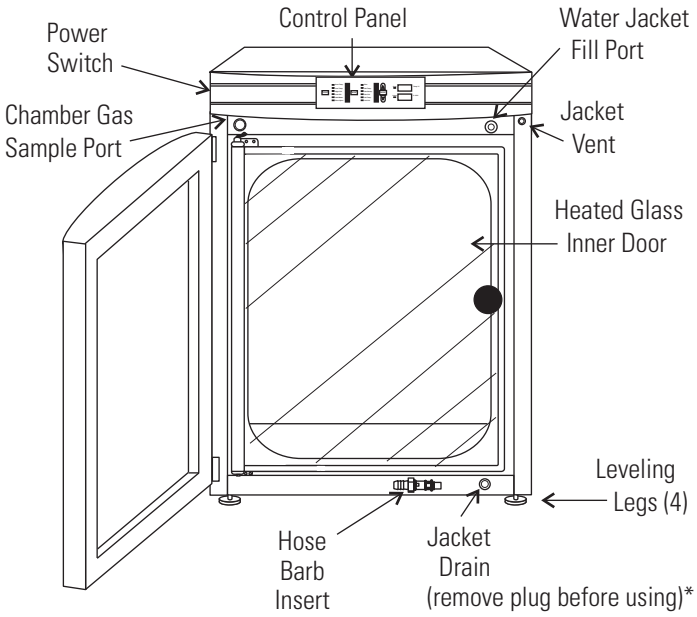


Figure 1-1. Water Jacket Incubator

- Outer Door - Reversible to opposite swing, see Section 4.
- Heated Inner Door - Keeps chamber interior dry. Reversible to opposite swing, see Section 4.
- Chamber Gas Sample Port - Used for sampling chamber CO_2 content, for calibration (Section 2).
- Main Power Switch
- Control Panel - Keypad, Displays and Indicators. (See Figure 1-2).
- Fill Port - Used for filling the water jacket.
- Water Jacket Vent - Allows air to escape from the water jacket during filling and normal expansion and contraction when the incubator heats or cools.
- Leveling Legs - Used to level the unit.
- Water Jacket Drain – Remove plug and use hose barb insert included. Plug when not in use.

Note The incubators are stackable. Information follows in this section. ▲

*When setting up the incubator, install the cover plate packed inside the incubator shipping carton.

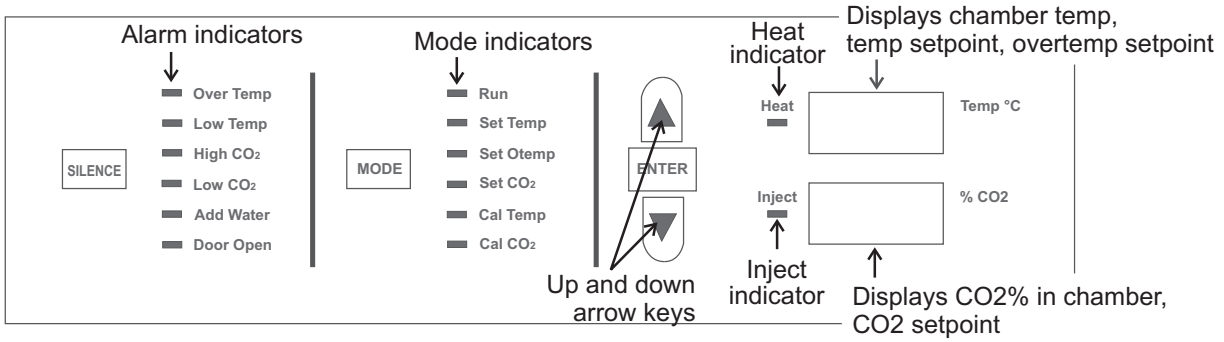


Figure 1-2. Control Panel

Control Panel Keys, Displays & Indicators

- SILENCE: Mutes the audible alarm. See Section 3 for ringback times.
- Alarm Indicators: Specific indicator flashes during an alarm condition.
- MODE: Switch used to select desired mode.
- Mode Indicators: Selected mode indicator lights.
- Up and Down Arrows: Increase or decrease parameter values, toggle selected mode choices.
- Enter: Saves the value being changed to memory.
- Heat Indicator: Lights when power is applied to the heaters.
- Inject Indicator: Lights when gas is being injected into the incubator.
- Temp °C Display: Displays chamber temperature, temperature setpoint or overtemperature setpoint.
- % CO2 Display: Displays percentage of CO_2 in the chamber or CO_2 setpoint.

Control Panel Operation

The Model 3010 water jacket incubator has six modes, which allow incubator setup. The modes are as follows:

- Run is the default mode for the incubator during normal operation.
- Set Temp is used to enter system temperature setpoints for incubator operation.
- Set Otemp is used to enter system overtemperature setpoints for incubator operation.
- Set CO2 is used to enter system CO_2 setpoints for incubator operation.
- Cal Temp is used to calibrate displayed chamber temperature (offset)
- Cal CO2 is used to calibrate displayed percentage of CO_2 in chamber (offset).

Unit Installation

1. Locate the unit on a firm, level surface capable of supporting the unit's operational weight of 365 lbs. (166 kg) plus the estimated total sample and user equipment weight.

2. Locate the incubator away from exterior doors and windows as changes in outdoor temperatures and contact with direct sunlight can affect the anti-condensation functions of the unit.

3. Position the door opening away from forced air heating and cooling ducts as these can carry dust, dirt and other contaminants into the incubator chamber, as well as negatively affect the door opening recovery time.

4. Allow enough clearance behind the unit for electrical and gas hook-up.

Warning This incubator weighs 265 lbs (120 kg) before filling the water jacket. If the unit has been in service, disconnect the power cord from both the unit and the power source, turn off all gas regulators and disconnect all tubing and any other connections from the rear of the electronics drawer before completely draining the water jacket.
Have sufficient personnel available to lift the unit into place using proper lifting techniques according to local EHS policies. Lift from both sides of the unit (left and right, not front and back) holding it from the bottom. Do not lift the incubator by the outer door as this could damage the hinges and/or the outer door may come loose. Note that the outer door can be removed to reduce weight and make it easier to lift the unit by its corners. Do not push or pull the incubator along the floor as this could damage the leveling feet. ▲

Stacking Incubators

Warning If the units have been in service, disconnect the power cord connector and drain the water jacket of the designated top unit before stacking. ▲

Note Stacking brackets (shown at left), washers, and bolts for stacking are included with each unit. ▲

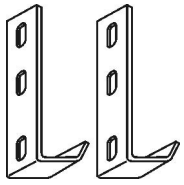


Figure 1-3. Stacking brackets

Stacking Incubators (continued)

1. Designate one incubator to be the top unit and the other as the bottom unit. Remove the base cover plate from the top unit using the finger holes in the base, or a slotted screwdriver (Figure 1-4).

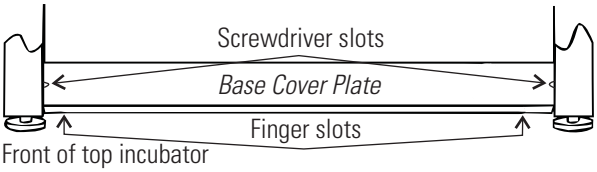


Figure 1-4. Remove Base Cover Plate

2. Note the two slots in the base of the incubator that accommodate the stacking bolts. Refer to Figure 1-5.

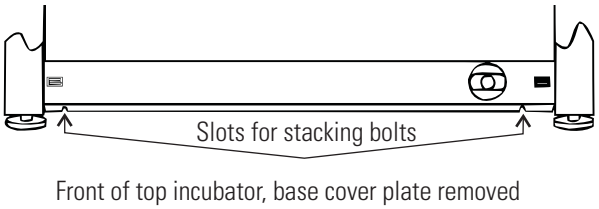


Figure 1-5. Stacking Bolt Slots

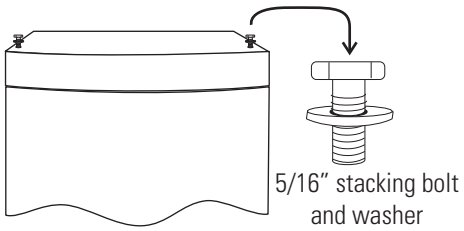
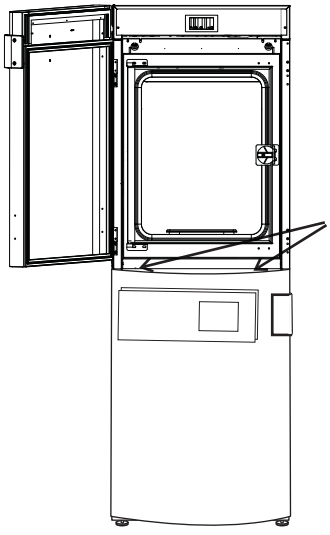


Figure 1-6. Bolt Holes

3. Remove the two plastic plugs from the bolt holes in the exterior top of the bottom unit. Install the 1/2" long 5/16-18 stacking bolts and washers into the bolt holes - do not tighten the bolts at this time. Refer to Figure 1-6.

4. Unscrew and remove the leveling feet from the top unit and lift it onto the bottom unit, off-setting the base of the top unit approximately 2-3 inches behind the stacking bolts and washers.





Warning This incubator weighs 265 lbs (120kg) before filling. Have sufficient personnel to lift it. ▲

5. Align the sides of the top unit with the bottom unit and slide the top unit forward until the slots in the base of the top unit align with the 5/16"-18 stacking bolts in the exterior top of the bottom unit. Refer to Figure 1-7.

Figure 1-7. Align Units

Stacking Incubators (continued)

6. Remove and save the two screws from the back of the control panel on the bottom unit as shown in Figure 1-8.

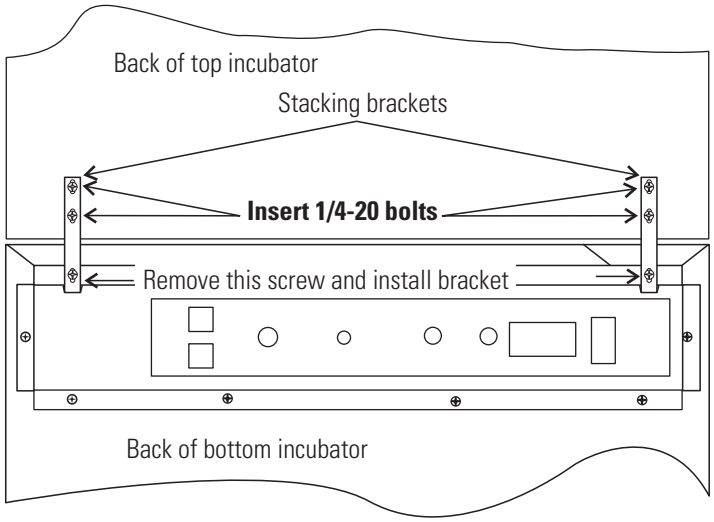


Figure 1-8. Remove and Save Screws

7. Insert the stacking brackets into the slots on the rear of the control panel of the bottom unit (Figure 1-5). Align the slots in the brackets with the mounting holes on the rear of the incubators. Secure the brackets with the screws saved above and the 1/4-20 bolts provided in the stacking kit. A 7/16" wrench or socket will be required for the bolts.
8. Secure the base of the top unit to the exterior top of the bottom unit by tightening the 5/16-18 stacking bolts using a 1/2" (13 mm) wrench or suitable tool.
9. Replace the base cover on the top unit.
10. The stacked units are ready to be placed into service.

Preliminary Cleaning

1. Remove the protective plastic coating on the shelf supports and air duct, if present.
2. Using a suitable laboratory disinfectant, clean all interior surfaces including shelves and shelf supports, door gaskets, blower wheel and CO_2 sensor. See Section 5.

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

Access Port Installation

Locate the opening in the top left corner of the interior chamber. Remove the tape from the opening on the outside of the unit. Locate the stopper with filter in the hardware bag. Install in the opening inside the chamber. See Figure 1-9.

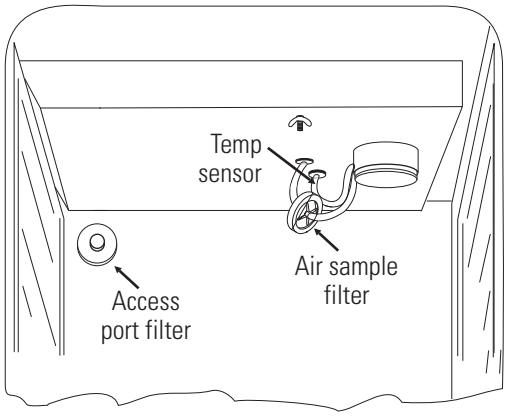


Figure 1-9. Filters

Air Sample Filter Installation

1. Remove the filter from the shipping bag.
2. Separate one section of the tubing from the filter. Install this section to the fitting on the blower plate.
3. After installing the top duct, connect the filter assembly to the tubing coming through the top duct.
4. Insert the free end of the air sample filter tubing into the larger hole in the back of the blower scroll. See Figure 1-9 for completed configuration.

Shelf Installation

1. Install the side ducts with the tabs facing into the center of the chamber with their slots up. There are no right side or left side ducts, simply rotate one of them to fit the opposite side. Tilt the side ducts as they are placed in the chamber so the tops fit into the top air duct, then guide them into the vertical position. Figure 1-10 shows the duct as it would be oriented for the right side of the chamber.

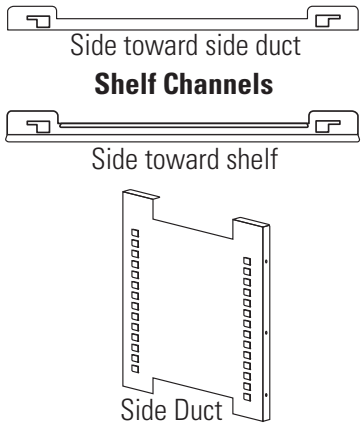


Figure 1-10. Channels

Shelf Installation (continued)

2. Referring to Figure 1-10, note that there is no difference between left and right side shelf channels.

3. Install the shelf channels by placing the channel's rear slot over the appropriate rear tab on the side duct. Pull the shelf channel forward and engage the channel's front slot into the side duct's appropriate forward tab. Refer to Figure 1-11.

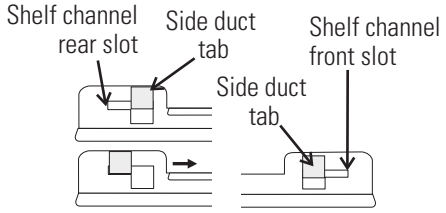


Figure 1-11. Channel Tabs

4. Figure 1-12 shows one of the channels installed on the right side duct.

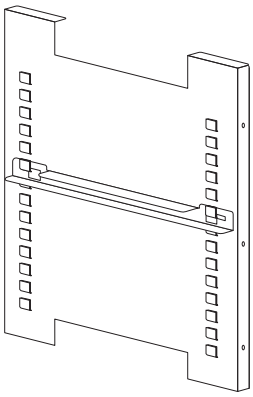


Figure 1-12. Channel Installed

Level the Unit

Check the unit for being level by placing a bubble-style level on one of the shelves. Turn the hex nut on the leveler counterclockwise to lengthen the leg, or clockwise to shorten it. Level the unit front-to-back and left-to-right.

Connect Unit to Electrical Power

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

Warning Connect the incubator to a grounded dedicated circuit only. The power cord connector is the mains disconnect device for the incubator. Position the unit so that it can be easily disconnected. ▲

Plug the provided power cord into the power inlet connector (Figure 1-13) and into the grounded dedicated circuit.

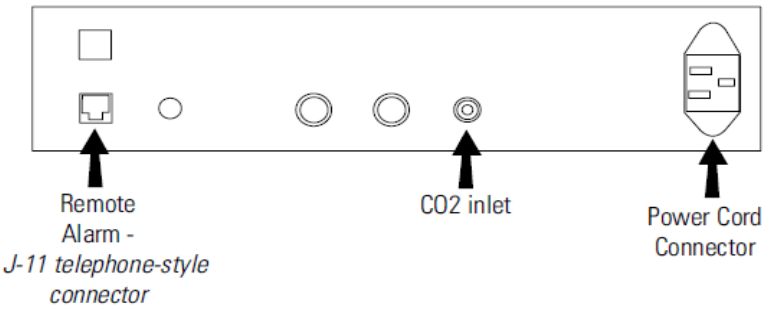


Figure 1-13. Rear Panel, Showing All Options

Fill the Water Jacket

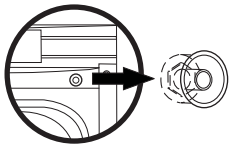
Turn the power switch on. ADD WATER will appear in the message center. Press the Silence key to silence the alarm.

Note The fill port has a plug that must be removed before filling and replaced after filling is complete. ▲

Caution Chlorine is detrimental to stainless steel. Using chlorinated tap water or additives that contain chlorine, will void the water-jacket warranty! ▲

Fill the water jacket with 11.7 gallons (43.5 liters) of pure water. Silicone tubing and a funnel are shipped in the accessory bag with the unit.

For ease of connecting/disconnecting, use the silicone tubing provided to connect directly to the fill port. See Figure 1-1 and this detail. Do not install vinyl tubing directly onto the fill port as it may be difficult to remove. A 3/8" to 3/8" hose connector has been provided to attach lengths of vinyl tubing to the silicone fill port tubing, to reach the distilled water source.



Detail 1. Fill Port

When the jacket is full, the audible alarm sounds a continuous tone for 10 seconds and the alarm condition clears. Refer to Section 4, Table of Alarms.

Note Model 3010 Water Jacket Incubator is shipped from the factory with a rust inhibitor added to the water inside the unit. The rust inhibitor must be replenished every 2 years. See Section 5 to drain the water jacket and for the correct proportion of rust inhibitor to the water. ▲

Fill the Humidity Pan

For best operation of the incubator, sterilized distilled, demineralized or de-ionized water should be used in the humidity pan. Water purity should be in the resistance range of 50 K to 1 M 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 pan. 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 1 M to 18 M Ohm.

Fill the Humidity Pan (continued)

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 pan.

Caution Distilled or de-ionized water used in the humidity reservoir must be within a water quality resistance range of 50 K to 1 M 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 void warranty. ▲

Fill the humidity pan to within 1/2 inch of the top with sterile, distilled water. Place the pan directly on the incubator floor to ensure optimum humidity and temperature response.

For applications requiring higher humidity conditions, the pan should be placed against the left side wall of the incubator. The ductwork has been designed for this purpose. Also, the CO_2 sample port may be capped to assist in achieving greater RH. In some ambients, this may cause condensation to form in the chamber.

Check the level and change the water frequently to avoid contamination. Do not allow the water level to fluctuate significantly. “Dry-outs” will have an adverse effect on the humidity level, as well as CO_2 calibration.

Connect the CO_2 Gas Supply

Warning High concentrations of CO_2 gas can cause asphyxiation! OSHA Standards specify that employee exposure to carbon dioxide in any eight-hour shift of a 40-hour work week shall not exceed the eight-hour time weighted average of 5000 PPM (0.5% CO_2). The short term exposure limit for 15 minutes or less is 30,000 PPM (3% CO_2). Carbon dioxide monitors are recommended for confined areas where concentrations of carbon dioxide gas can accumulate. ▲

The CO_2 gas supply being connected should be industrial grade 99.5% pure and should not contain siphon tubes. Install a two-stage pressure regulator at the cylinder outlet. The high pressure gauge at the tank should have 0-2000 psig range and the low pressure gauge, at the incubator inlet, should have a 0-30 psig range. Input pressure to the incubator must be maintained at 15 psig (103.4 kPa), ±5 psig.

The incubator has a serrated fitting on the back of the cabinet to connect the gas supply. Refer to Figure 1-13. The fitting is labeled CO2 Inlet. Make sure that the connection is secured with a clamp. Check fitting for leaks.

Connect the CO2 Gas Supply (continued)

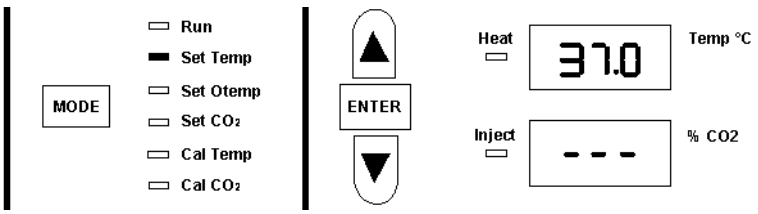
Warning This incubator is designed to be operated with CO_2 gas only. Connecting a flammable or toxic gas can result in a hazardous condition. Gases other than CO_2 should not be connected to this equipment.
CO_2 gas cylinders have UN1013 labeled on the cylinder and are equipped with a CGA 320 outlet valve. Check the gas cylinder for the proper identification labels. The CO_2 gas supply being connected to the incubator should be industrial grade, 99.5% pure. Do not use CO_2 gas cylinders equipped with siphon tubes. A siphon tube is used to extract liquid CO_2 from the cylinder, which can damage the pressure regulator. Consult with your gas supplier to ensure that the CO_2 cylinder does not contain a siphon tube. Gas cylinders should also be secured to a wall or other stationary object to prevent them from tipping.
A two-stage CO_2 pressure regulator is required to be installed on the outlet valve of the gas cylinder. Input pressure to the incubator must be maintained at 15 psig (103.4 kPa), ±5 psig, for proper performance of the CO_2 control system. (A single stage CO_2 pressure regulator will not maintain 15 psig.
If higher purity CO_2 is desired inside the incubator (greater than 99.5% pure), the pressure regulator should be constructed with a stainless steel diaphragm along with specifying the purity of the CO_2 from the gas supplier. Follow the manufacturer's instructions to ensure proper and safe installation of the pressure regulator on the gas cylinder. Consult your facility safety officer to ensure that the equipment is installed in accordance with the codes and regulations that are applicable in your area. ▲

Incubator Start-Up

Now that the incubator has been properly installed, connected to power, filled with water, humidity pan filled, and connected to gas supply, system setpoints can be entered. The temperature, over temperature, and CO_2. setpoints can now be entered.

Set the Operating Temperature Setpoint

The temperature setpoint range is 10° to 55°C, settable to within 0.1°C. The lowest temperature the incubator can control is +5°C above the ambient temperature at the incubator's location. This incubator is shipped from the factory with a temperature setpoint of 10°C. At this setting, all heaters and alarms are turned off.



Set the Operating Temp Setpoint (continued)

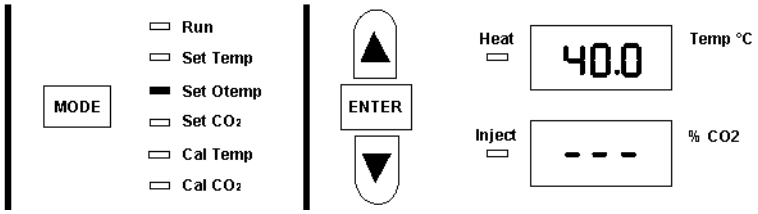
To change the temperature setpoint:

1. Press the Mode key until the Set Temp indicator lights (see illustration above).
2. Press the up/down arrow until the desired temperature setpoint is displayed.
3. Press Enter to save the setpoint.
4. Press the Mode key until the Run Indicator lights to go to Run mode.

Set the Overtemp Setpoint

Caution The overtemp circuit is designed as a safety to protect the incubator only. It is not intended to protect or limit the maximum temperature of the cell cultures or customer's equipment inside the incubator if an overtemp condition occurs. ▲

The factory setting for the Overtemperature setpoint is 40°C. It can be set over a range of temp setpoint +0.5°C to 60°C. If the temperature setpoint is moved above the Overtemp setpoint, the Overtemp will automatically update to 1.0°C + the temp setpoint. It is recommended that the Overtemp setpoint be 1°C over the temp setpoint.

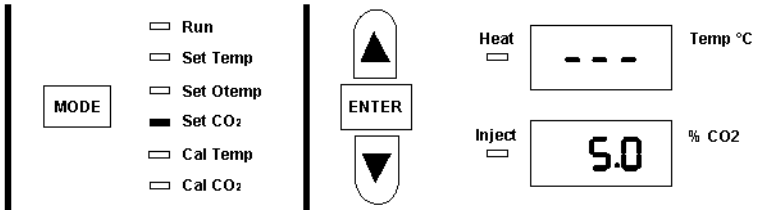


To set the Overtemp setpoint:

1. Press the Mode key until the Set Otemp indicator lights (see illustration above).
2. Press the up/down arrow until the desired Overtemp setpoint is displayed.
3. Press Enter to save the setpoint.
4. Press the Mode key until the Run Indicator lights to go to Run mode.

Set the CO_2 Setpoint

All T/C CO_2 cells are precalibrated at the factory at 37°C, high humidity, and 10% CO_2, settable to within 0.1% CO_2. Therefore, if a temperature setpoint of 37°C has been entered, the humidity pan filled and the CO_2 control is to run between 0-10% with a T/C CO_2 sensor, the CO_2 setpoint may be entered immediately. Otherwise, it is important to allow the unit 12 hours to stabilize at the temperature setpoint before entering the CO_2 setpoint.



The CO_2 setpoint range is 0.0% to 20.0%. The incubator is shipped from the factory with a CO_2 setpoint of 0.0%. At this setting, all CO_2 control and alarms are turned off.

To change the CO_2 setpoint:

1. Press Mode key until Set CO_2 indicator lights (see illustration above).
2. Press the up/down arrow until the desired CO_2 setpoint is displayed.
3. Press Enter to save the setpoint.
4. Press the Mode key until the Run indicator lights to go to Run mode.

Section 2 Calibration

After the unit has stabilized, the air temperature and CO_2 display reading can be calibrated to reference instruments.

Calibration frequency is dependent on use, ambient conditions, and accuracy required. Good laboratory practice would require at least an annual calibration check. On new installations, all parameters should be checked after the stabilization period.

Prior to calibration, the user should be aware of the following system functions. While the unit is in Cal Temp Mode, temperature control is stopped so that chamber temperature remains stable. When the unit is in Cal CO2 Mode, CO_2 control is stopped so that CO_2 levels remain stable. If no keys are pressed for approximately five minutes while in either of these two modes, the system resets to Run Mode so control can be reactivated.

Caution Before making an adjustment or calibration to the unit, it is imperative that all reference instruments be properly calibrated. ▲

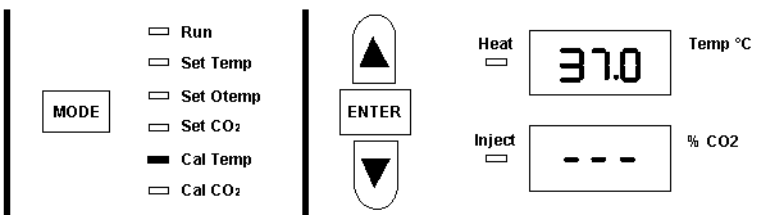
Calibrate Temperature

Place the calibrated instrument in the center of the chamber. The instrument should be in the airflow, not against the shelf. Before calibration, allow the cabinet temperature to stabilize.

Temperature Stabilization Periods

Start-Up - Allow 12 hours for the temperature in the cabinet to stabilize before proceeding.

Operating Unit - Allow at least two hours after the display reaches setpoint for the temperature to stabilize before proceeding.



Calibrate Temp (continued)

1. Press the Mode key until the Cal Temp indicator lights.
2. Press the up/down arrow to match the display to a calibrated instrument.
3. Press Enter to store the calibration into memory.
4. Press the Mode key to return to Run mode.

Calibrate Thermal Conductivity CO2 Sys.

The 3010 model has a thermal conductivity (T/C) CO_2 sensor. Thermal conductivity of the incubator atmosphere is not only effected by the quantity of CO_2 present, but also by the air temperature and the water vapor present in the incubator atmosphere. In monitoring the effects of CO_2, air temperature and absolute humidity must be held constant so any change in thermal conductivity is caused only by a change in CO_2 concentration.

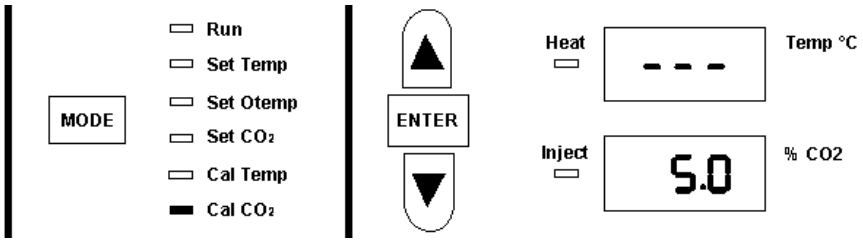
Changing temperature or changing from elevated humidity levels to room ambient humidity levels would necessitate a recalibration of the CO_2 control.

T/C CO2 Sensor Stabilization Periods

Some T/C CO_2 sensors go through an aging period, especially on new installations. Calibration should be checked on a weekly basis and adjusted as necessary. When stabilization occurs, checks may become less frequent.

Start-up - The CO_2 sensor has been calibrated at the factory for 37°. Allow temperature, humidity, and CO_2 levels in the chamber to stabilize at least 12 hours before checking the CO_2 concentration with an independent instrument.

Presently operating - Make sure the chamber doors are closed. Allow at least 2 hours after the temperature and CO_2 displays reach their setpoints for chamber atmosphere stabilization.



Calibrate T/C CO2 System (continued)

1. Make sure stabilization periods outlined above are followed.
2. Sample the chamber atmosphere through the sample port with an independent instrument. Sample the atmosphere at least 3 times to ensure the accuracy of the instrument.
3. Press the Mode key until the Cal CO2 indicator lights.
4. Press the up/down arrow to change the display to match the independent instrument.
5. Press Enter to store calibration.
6. Press the Mode key to return to Run Mode.

Calibrate Infra-Red CO2 System

Model 3020 has an infra-red CO_2 sensor. Infra-Red CO_2 sensors are not effected by chamber atmosphere temperature or humidity. However, the light detector in the sensor is effected by wide temperature changes. Therefore, changing temperature setpoints could necessitate a recalibration of the CO_2. Chamber temperature should be allowed to stabilize before checking CO_2 concentrations with an independent instrument, especially on start-up.

All models equipped with an IR CO_2 sensor have an automatic calibration that occurs every 24 hours, and lasts for 5 to 6 minutes. During automatic calibration, the CO_2 display is blanked out and HEPA filtered room air is pumped through the CO_2 sensor. A new CO_2 calibration value is stored in memory for use as the 0.0% CO_2 reference point. The keypad/ control panel is locked during calibration, with the message center reading CO2 AUTO CAL.

Startup - Allow the temperature and the CO_2 of the cabinet to stabilize at least 12 hours before proceeding.

Operating Unit - Allow CO_2 to stabilize at least 2 hours at setpoint before proceeding.

Calibrate Infra-Red CO2 System (cont.)

To ensure accurate calibration, the unit will not allow CO_2 to be spanned below 3%. If the cabinet does not contain at least 3% CO_2, increase the setpoint and allow the unit to stabilize before completing this procedure.

1. Measure the CO_2 concentration in the chamber through the gas sample port with a Fyrite or other independent instrument. Several readings should be taken to ensure accuracy.

2. Press the Mode key until the CAL indicator lights.

3. Press the right arrow until IR CAL XX.X% appears in the message center.

4. Press the up/down arrow to adjust the display to match the independent instrument reading.

5. Press Enter to store calibration.

6. After Enter is pressed, the unit will go into a calibration cycle that lasts 5 to 6 minutes. Control panel is locked during this calibration cycle.

7. Press the Mode key to return to Run Mode.

Section 3 Alarms

The incubator alarm system is shown in the table below. When an alarm is active, the LED next to the alarm condition flashes. Pressing Silence causes all active alarms to be silenced for the ringback period. However, the visual alarm continues until the incubator returns to a normal condition.
The alarms are momentary alarms only. When an alarm condition occurs and then returns to normal, the incubator automatically clears the alarm condition.

Temperature alarms are disabled when the temp setpoint is 10.0°C. CO_2 alarms are disabled when the CO_2 setpoint is 0.0%. The Low Temp alarm delay is set to 9 hours automatically on system power-up. This allows the user to avoid nuisance alarms when the system is first turned on. If the temp comes within the alarm limits prior to the 9 hour delay, the alarms will be enabled.

Table 3-1. Alarms

Alarm	Description	Delay	Ring-back	Trips Remote Alarm Contacts
Over Temp	Temperature is greater than Over Temperature setpoint	0 min.	15 min.	Yes
Low Temp	Temperature is at least 1°C lower than the temperature setpoint	15 min.	15 min.	Yes
High CO2	CO2 is at least 1% higher than the CO2 setpoint	15 min.	15 min.	Yes
Low CO2	CO2 is at least 1% lower than the CO2 setpoint	15 min.	15 min.	Yes
Add Water	Water is low in jacket	0 min.	15 min.	No
Door Open	Inner glass door is open	15 min.	15 min.	No
*Temp Display Flashes (Run Mode)	Temperature sensor failure	0 min.	15 min.	No
*CO2 Display Flashes (Run Mode)	CO2 sensor failure	0 min.	15 min.	No

** The microprocessor in the incubator continually scans the sensors to ensure they are operating properly. Should an error be detected, the affected display flashes and the alarm sounds. If such an alarm occurs, contact your local distributor or the Technical Services department.*

All alarm delays and ringback times are ±30 seconds.

Section 4 Routine Maintenance

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

Clean the Incubator Interior

Warning If the units have been in service, disconnect the power cord connector before cleaning. ▲

Use an appropriate disinfectant. All articles and surfaces must be thoroughly cleaned, rinsed and rough-dried.

Warning Alcohol, even a 70% solution, is volatile and flammable. Use it only in a well ventilated area that is free from open flame. If any component is cleaned with alcohol, do not expose the component to open flame or other possible hazard. Allow the alcohol to fully dry before turning power on. ▲

Warning Do not spray the T/C sensor with flammable solutions. The internal temperature of the CO_2 sensor is approximately 150°C when the unit is in operation. Allow sufficient time for the sensor to cool before cleaning. ▲

Caution Do not use strong alkaline or caustic agents. Stainless steel is corrosion resistant, not corrosion proof. Do not use solutions of sodium hypochlorite (bleach), as they may also cause pitting and rusting. ▲

1. Turn the incubator off and disconnect the plug from the power source.

2. Remove the shelves, access port filter and side duct sheets. Remove the temperature sensors and the air sample filter tubing from the back of the blower scroll. Refer to Figure 4-1.

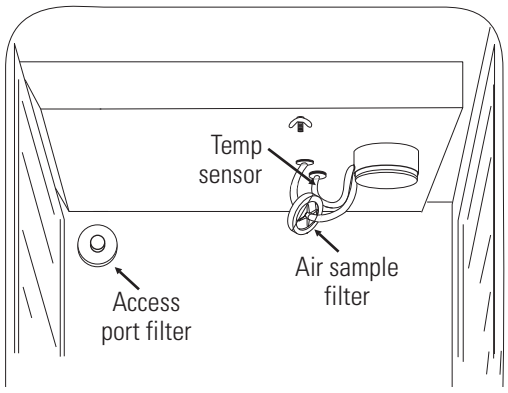


Figure 4-1. Filters and Sensor

Clean the Incubator Interior (continued)

3. Remove the filter from the air sample filter tubing.

4. Remove the wingnuts securing the top duct to the interior. Carefully slide the top duct down and off the temperature sensor, air sample filter tubing.

5. Wash the shelves, ducts, wingnuts and stopper with disinfectant and rinse with sterile water.
   Option: Autoclave shelves, ducts and wingnuts.

6. Remove the blower scroll by first pushing the black lever clip closest to you toward the scroll. Then turn the scroll to the right to disengage it from the blower scroll plate. Some manipulation may be required as the alignment holes are keyhole-shaped.

7. Remove the remaining wingnut, then pull down on the blower wheel. If a new wheel and scroll are going to be used, discard the old ones. If the old ones are being reused, wash all parts with disinfectant and rinse with sterile water.

8. Remove the blower scroll plate by first pushing the black lever clip toward the chamber ceiling. Then turn the plate to the left to disengage it from the alignment keyholes. Clean as above, or autoclave.

9. Wash the cabinet interior with disinfectant starting at the top and working down. Wash the inner door both inside and out. The cabinet and door must be rinsed with sterile water until the disinfectant has been removed. After the cabinet has been rinsed, spray with 70% alcohol.

10. Reinstall the blower scroll plate by aligning it with the larger end of the keyholes and turning it to the left to lock it on. Pull the black lever clip downward from the ceiling.

11. Install the blower wheel onto the motor shaft, aligning the d-shaped flat sides of each. See Figure 4-2. Secure the blower wheel with the wingnut. Make sure the wheel turns freely.

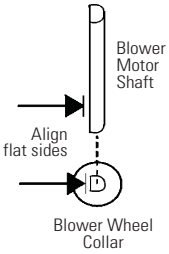


Figure 4-2.

12. Locate the blower scroll over the blower wheel into the larger end of the keyholes on the scroll plate. Turn the scroll to the right to lock it into the keyholes. Pull the black lever clip closest to you toward the front of the unit.

Clean the Incubator Interior (continued)

13. Install the top duct by feeding the temperature sensors, air sample tubing through the appropriate holes in the duct as it is raised to the top of the chamber. Be careful not to pull the grommets through the duct (Figure 4-3).

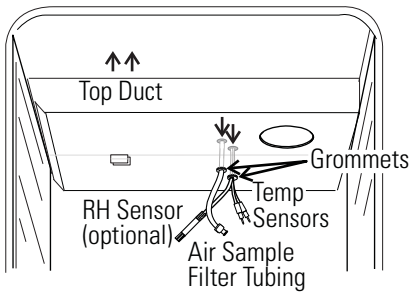


Figure 4-3. Install Top Duct

14. Locate the mounting studs and blower scroll into the appropriate holes in the top duct and install the wingnuts to secure the duct.

15. Install the air sample filter onto the top duct tubing.

16. Carefully pull the temperature sensor and air sample filter tubing down until they can be inserted approximately 1 inch into the appropriate holes in the back of the blower scroll. See Figure 4-4.

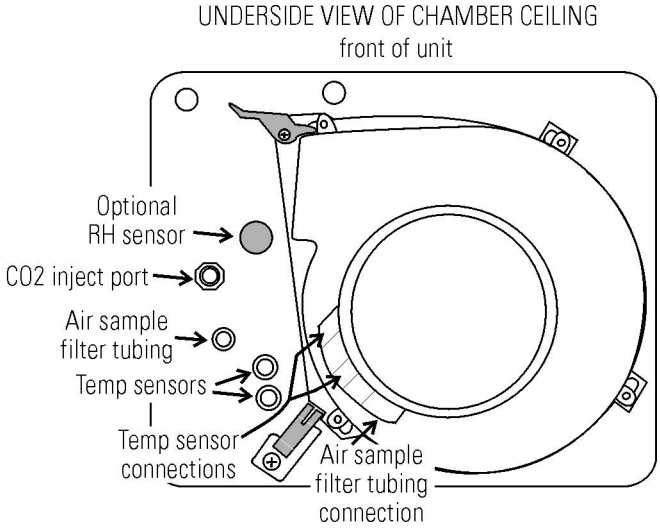


Figure 4-4. Sensor and Filter into Blower Scroll

17. Install the left and right ducts, and the access port stopper with filter, spraying each with 70% alcohol (do not saturate).

18. Install the shelves and spray with 70% alcohol.

19. Plug the incubator in and turn the power switch on. Allow the unit to run empty for 24 hours before returning to service.

Clean the Cabinet Exterior

Clean the incubator exterior with a damp sponge or soft, well-wrung cloth and mild detergent dissolved in water. Dry with a soft cloth.

Clean the Humidity Pan

Clean the humidity pan with soap and water and a general-use laboratory disinfectant. Rinse with sterile water and spray with 70% alcohol. The humidity pan may be autoclaved.

Reverse the Door Swing

For side-by-side operation or changing lab layouts, the inner and outer doors are field-reversible. The procedure is written from the prospective of changing the door swing from a left-hand to a right-hand swing. All screw holes are pre-drilled for reversing the door. The tools required are a Phillips and a flatblade screwdriver.

Warning If the units have been in service, disconnect the power cord connector before reversing the door swing. ▲

Reverse the Hinges for Exterior Door

Refer to Figure 4-7 A. The following instructions refer to the letters within the circles.

1. Open the outer door and remove it by lifting it off the hinge pins. Lay this door down on its face on a padded surface to prevent scratches.
2. Remove the two outer door hinges identified by the “A” in the Figure 4-7 A.
3. Remove the four nylon screws in locations “B”, which will be the new locations for the inner door hinges.
4. With the Phillips screwdriver, remove and save the four nylon screws from the outer door hinge mounting holes, noted as locations “C” on the right side of the door frame.
5. Remove the electrical connector on the top of the inner door hinge by carefully prying up the black strain relief.

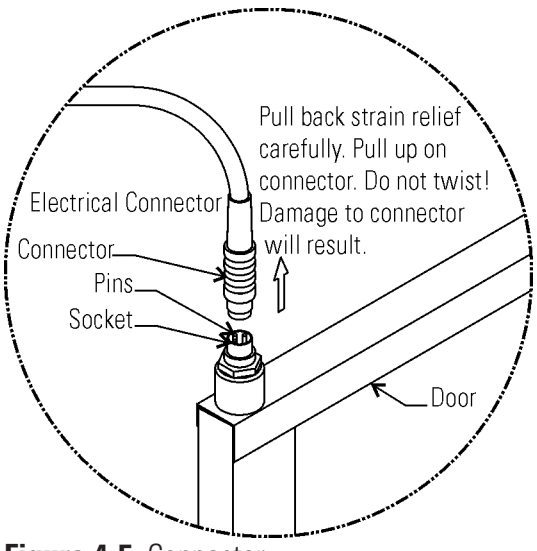
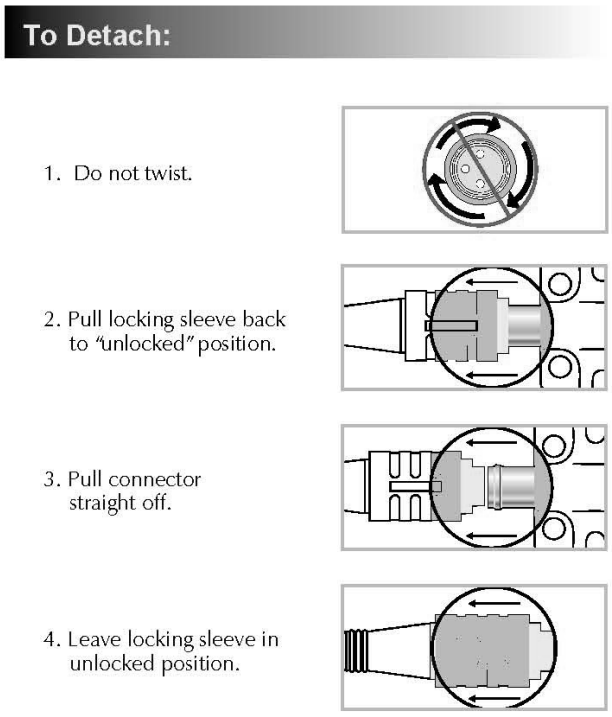


Figure 4-5. Connector

Reverse the Hinges for Exterior Door (continued)

6. Refer to item “D” in Figure 4-7 A. The heater wiring connector is of yellow rubber which should be visible when the strain relief is moved upward as shown. Refer to connector manufacturer’s instructions below.



7. Grasp the upper portion of the yellow connector and pull it up and out of the hinge socket.

8. Remove the inner door upper hinge, shown as “E”. This hinge will be inverted and become the lower inner door hinge when the hardware is reassembled. When removing the door, set it aside on a flat surface, taking care not to damage the electrical sockets on the top and bottom of the door frame. At this time, remove the 5/8” black plastic bushing from the hinge. This bushing will be inserted in the top hinge when the door is installed on the right side of the cabinet.

Caution Electrical connectors are mounted on the frame along the hinge side of the inner glass door at both the top and bottom of the door. Be careful not to damage the connectors by resting the weight of the door on them. Place the inner glass door on a flat surface where it cannot be damaged before moving on to the next step. ▲

9. Remove the lower inner door hinge, “F”. Note that this hinge will be inverted and become the upper inner door hinge when the hardware is reassembled. Also, remove the 1” long white plastic bushing from the center of the hinge and insert it into the hinge removed in the step above.

Reverse the Hinges for Exterior Door (continued)

10. The shoulder of the bushing must be on top as shown in Figure 4-7. Install the black plastic bushing into the hinge just removed and which will be the top hinge when the door is reversed. Refer also to Figure 4-5.

11. Remove the two nylon screws at location “G”.

12. Remove the door strike plate at location “H” and install the two nylon screws just removed into the vacant holes.

13. Remove the two outer Phillips screws on the frame beneath the control panel, identified as “I” in the illustration. Remove only the two outer screws and pull the electronics tray out about one-inch.

14. Verify that the nylon screws have been installed in the vacant door strike holes, identified as “J” (Figure 4-7B).

15. Move the door heater cable to the slot on the right side of the tray as shown in location “K”.

16. Push any excess cable into the tray area, making sure the wire will not be damaged when the tray is pushed back in and secured.

17. Install the lower inner door hinge, identified as location “L” in the drawing. (This was the top inner door hinge removed in Step 8 and should have the white plastic bushing installed.) Do not completely tighten the screws.

18. Insert the inner door into the lower hinge with the latch to the left. Align the door to the chamber opening and place the upper hinge in position as identified as “M”.

19. Insert the screws into the hinge but do not completely tighten them.

20. Match the pins on the yellow connector with the socket on the door. Press the connector completely into the socket and slide the strain relief down until no yellow is visible on the plug as shown in “N” of Figure 4-6.

    Manufacturer instructions follow.

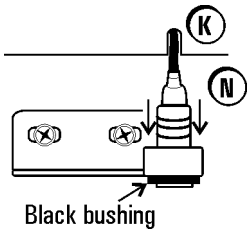
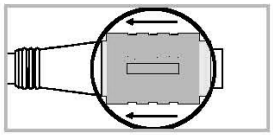


Figure 4-6. Bushing

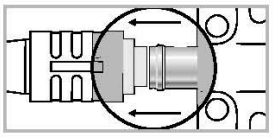
Reverse the Hinges for Exterior Door (continued)

To Attach:

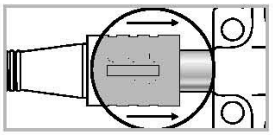
1. Be sure black locking sleeve is pulled back.



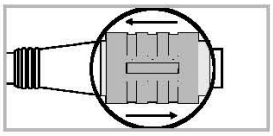
2. Line up pins and push connector onto plug. You will feel a "snap." Do not twist.



3. Push locking sleeve forward on connector until it is flush with the front of the connector.



4. If sleeve is difficult to slide on a new connector, "exercise" it a few times. Do not use tools.



21. Push the power cable completely into the slot in the electronics tray. Press the tray into position and secure it with the screws at the "S" locations.

22. Align the silver power buss visible through the glass along the hinge side of the door with the gasket along the right side of the chamber opening.

23. When both hinges are in place with the hinge screws still loosened, push up on the bottom hinge. This will shift both hinges and the door upward. Tighten the hinge screws.

24. Attach the strike plate at location "O", aligning it so the knob secures the door against the gasket.

25. Attach the outer door hinges at the "P" locations.

26. Install the nylon screws at the "R" locations.

27. Install the nylon screws in the "Q" locations.

28. Assemble the outer door to the incubator and return the unit to service.

Reverse the Hinges for Exterior Door (continued)

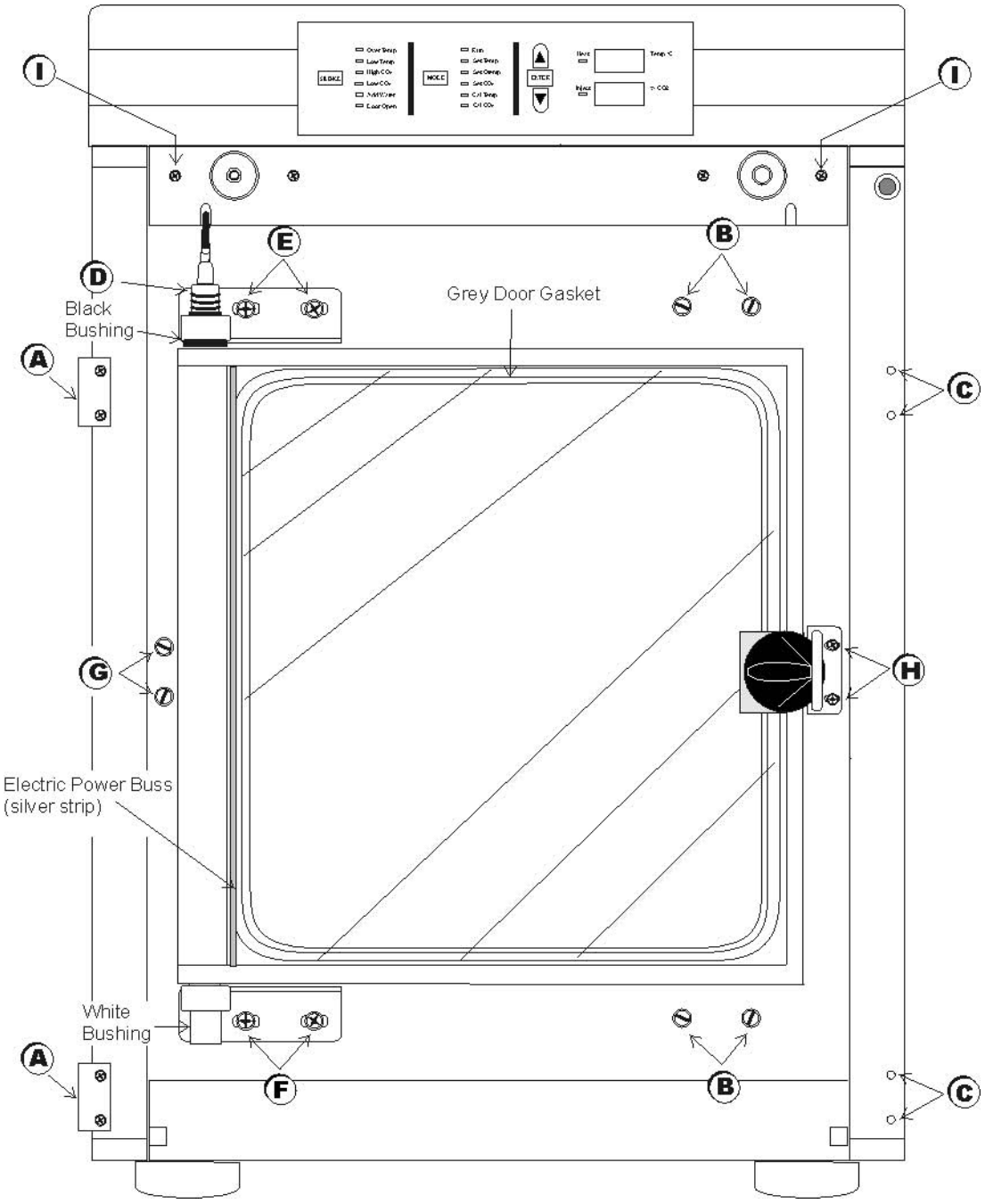


Figure 4-7A. Left Hinge Door

Reverse the Hinges for Exterior Door (continued)

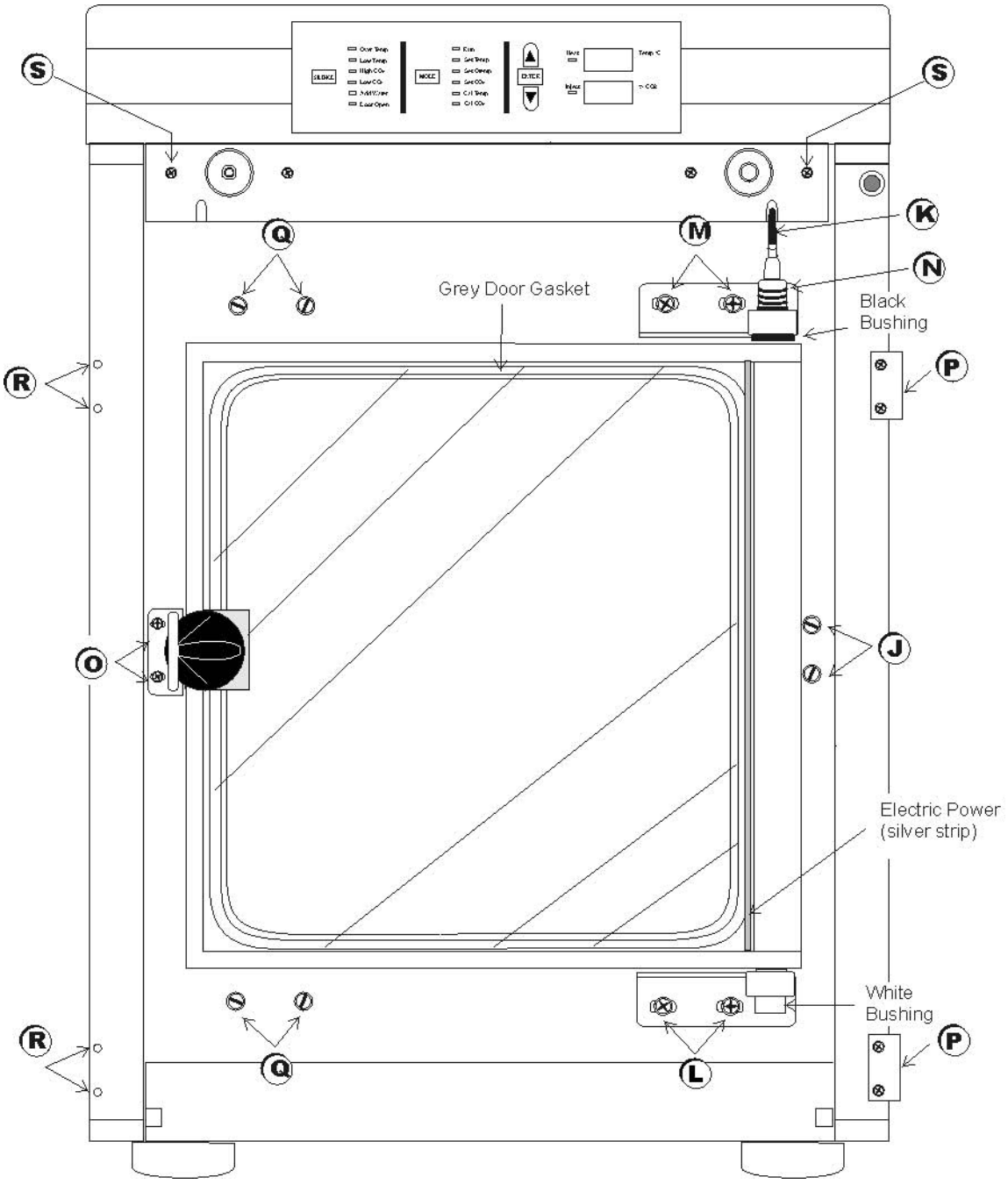


Figure 4-7B. Right Hinge Door

Replace Fuses

Warning The electronics drawer contains hazardous voltages. Replacing the fuses should be done by qualified personnel only. ▲

Two fuses in the incubator can be replaced. To replace a fuse:

1. Turn off the incubator's power switch and unplug the power cord from the wall outlet.
2. Open the exterior cabinet door.
3. Remove two screws as shown. See item "S" in Figure 4-7B.
4. Carefully slide out electronics drawer.

There are two fuses on the main microboard labeled 'F1 24 VAC Door Heater' and 'F4 24 VAC Collar Heater'. Refer to Figure 4-8 for the location of the main microboard. Remove the fuse and replace it with a new one of the same specification. See Table 4-1.

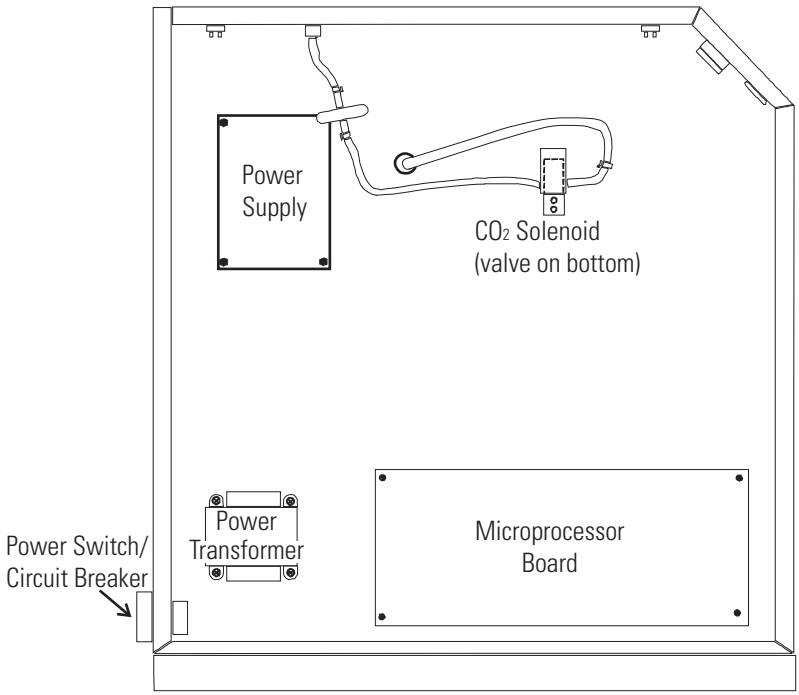


Figure 4-8. Electronics Drawer

Table 4-1. Replacement Fuses

Fuse #	Manufacturer P/N	Amperage Rating	Rupture Speed	IEC Letter Code
F1	BUSS GMC-3.5 A	3.5 Amp	Time-Lag	T
F4	BUSS GMC-2.5 A	2.5 Amp	Time-Lag	T

Replace Fuses (continued)

1. When the fuse has been replaced, slide the electronics drawer back in, being very careful to place the door heater cable back into the provided slot so that the drawer does not pinch the cable.
2. Replace the two screws removed earlier.
3. Close the exterior door.
4. Plug the power cord back into the dedicated, grounded circuit.
5. Turn on power switch. If the unit operates properly, it may now be returned to service.

There is one fuse in the incubator that is not replaceable. This fuse is intended for catastrophic failure only and is located on the power supply circuit board in the electronics drawer. See Figure 4-8. If this fuse is blown, the power supply must be replaced. Contact the factory for more information.

Replace the Air Sample Filter

The air sample filter should be replaced as needed; every 6 months is recommended. On the inside of the chamber, inserted into the back of the blower scroll, is the air sample filter and its connecting tubing. Disengage the tubing from the back of the scroll, then remove the filter from the tubing and discard. Install the new filter. Connect it securely to the air sample filter tubing, then insert the tubing into the back of the blower scroll.

Replace the Access Port Filter

The access port filter should be replaced as needed; every 6 months is recommended. The filter is connected to the stopper in the upper left corner of the inside chamber back wall. Remove the filter from the connecting tubing and discard. Install the new filter.

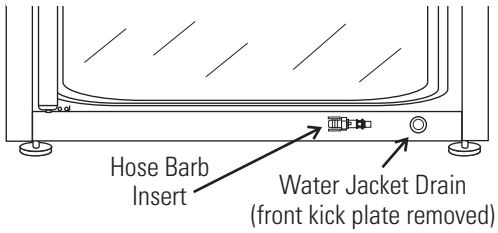
Drain Water Jacket

1. Turn the unit off. Remove the plug from the power source.
2. Remove the front cover plate below the door. There are small flatblade screwdriver pry slots on each end of the plate to help remove it. See Figure 4-9.



Figure 4-9. Front Cover Plate Below the Door

3. Remove the drain plug. Retain for use after draining is complete.
4. Connect the hose barb insert to the drain on lower front of the water jacket and to the drain hose.



**Remove the drain plug before inserting hose barb insert. Fitting will not seal correctly if plug is not removed.*

Figure 4-10. Water Jacket Drain and Hose Barb Insert

5. After water jacket has finished draining, remove the hose barb insert and secure on the front of the unit. See Figure 4-10 and 4-11.



Figure 4-11. Insert

6. Install the plug into the drain on the incubator
7. Install cover plate.
8. To fill the water jacket, see Section 1. Be sure to add the rust inhibitor to the water when filling. For the proportions of rust inhibitor to water and the part number, refer to following information.

Add or Replenish Rust Inhibitor

Model 3010 incubators are shipped from the factory with a rust inhibitor added to the water in the jacket. This inhibitor must be replenished every 2 years. Mix 1 bag/bottle of the rust inhibitor with a gallon of distilled, demineralized or de-ionized water. Drain a gallon of water from the jacket and replace it with the rust inhibitor mixture.

Rust Inhibitor (0.5 lb.) bag	1900100
Rust Inhibitor (800 ml) bottle (use in units with a cooling coil)	1900101

PREVENTIVE MAINTENANCE

Model 3010 Series Water Jacket Incubators

Your equipment has been thoroughly tested 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 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 operating 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 listed 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 chlorine content.
- Use sterile, distilled or demineralized water.
- Avoid spraying cleaner on the CO_2 sensor.
- Do not use powdered gloves for tissue cultures.

401 Millcreek Road, Box 649 • Marietta, Ohio 45750 USA • 740-373-4763
USA and Canada 800-438-4851 • Telefax: 740-373-4189 • http://www.marietta.led.service@thermofisher.com

Model 3010 Incubators _____ Preventive Maintenance

Refer to Manual Section	Action	Daily	Weekly	Monthly	6 Months	Yearly	2 years
--	Check CO_2 tank levels.	✓					
--	Inspect door latch, hinges and door gasket seal.					✓	
1	Check water level in the humidity pan, ½" from top		✓				
2	Verify and document CO_2 and temperature calibration, as applicable					✓	
4	Perform a complete decontamination procedure. Wipe down interior, shelves and side ducts with disinfectant. Change or clean blower wheel and scroll. Clean top duct. Clean humidity pan. Rinse everything well with sterile distilled water.	Between experiments *More frequent decontamination may be required, depending on use and environmental conditions*					
1	Change HEPA and gas filters, if applicable (*or as needed)*				✓		
4	Replenish rust inhibitor in water jacket.						✓
--	Tubing Maintenance and Inspection: Inspect all tubing and connections & Replace any tubing that shows signs of degradation or damage.				✓		

Section 5 Remote Alarms

CAUTION

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

A set of relay contacts are provided to monitor alarms through an RJ-11 telephone style connector on the back of the cabinet. Refer to Figure 1-13 for the location of the alarm connector.

The remote alarm provides a NO (normally open) output, a NC (normally closed) output and COM (common). Refer to Figure 5-1.

The contacts will trip on a power outage, temperature alarm or CO2 alarm. See Table 3-1.

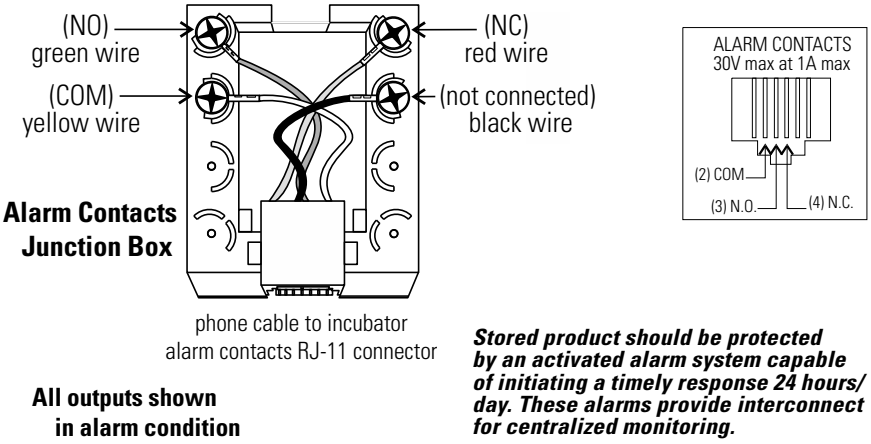


Figure 5-1. Remote Alarm Outputs

Section 6 Specifications

**Specifications are based on nominal voltages of 115 V in ambients of 22°C to 25°C.*

Temperature

Control . . . . . .±0.1°C
Range . . . . .+5°C above ambient to +55°C (131°F)
Uniformity . . . . . .±0.3°C @ +37°C
Low Temp Tracking Alarm . . .Fixed at 1.0°C below setpoint

Over Temperature Protection

Sensor . . . . . .Precision thermistor
Setability . . . . . .0.1°C

CO_2

CO_2 Control . . . . . .Better than ±0.1%
CO_2 Range 0-21%
Inlet Pressure . . . . .15 PSIG (1.034 bars), ±5 PSIG
CO_2 Sensor . . . . . .T/C (3010)
CO_2 Sensor . . . . . .IR (3020)
Readability 0.1%
Setability 0.1%
Low CO_2 Tracking Alarm . . Fixed at 1.0% below setpoint
High CO_2 Tracking Alarm . . . Fixed at 1.0% above setpoint

Humidity

RH . . . . . .Ambient to 95% @ +37°C (98.6°F)
Humidity Pan . . . . . .0.8 gal. (3 liters) standard

Fittings

Fill Port . . . . . .3/8” barbed
Drain Port . . . . . .3/8” barbed, quick connect
Access Port . . . 1-1/4” (3.18 cm) removable neoprene plug
CO_2 Inlet . . . . . .1/4” hose barbed

Unit Heat Load

115 V . . . . . .344 BTUH (100 Watt)

Shelves

Dimensions . . . . . .18.5” x 18.5” (47.0 cm x 47.0 cm)

Construction . . . . . .Stainless steel, perforated

Surface area . . . . . .2.4 sq. ft. (0.22 sq. m)

Max. per chamber . . . . . .38.4 sq. ft. (3.6 sq. m) per shelf

Loading . . . 35 lbs (16 kg) slide in and out, 50 lbs (23 kg) stationary

Standard 3

Maximum 16

Construction

Water Jacket Volume . . . . . .11.7 gal. (44.2 liters)

Interior Volume . . . . . .6.5 cu. ft. (184.1 liters)

Interior . . . . . .Stainless steel

Exterior . . . . . .18 gauge, cold rolled steel, powder coated

Outer Door Gasket . . . . . .Four-sided, molded magnetic vinyl

Inner Door Gasket . . . Removable, cleanable, feather-edged, silicone

Electrical

115V . . . . . .90-125 VAC, 50/60 Hz, 1 PH, 3.6 FLA

Circuit Breaker/Power Switch . . . . . .6 Amp/2 Pole

Alarm Contacts . . Power interruption, deviation of temp., CO_2 customer connections through jack on back of unit. 30 V, 1 A max.

Installation Category . . . . . .Overvoltage Category II

Pollution Degree 2

Maximum Leakage Current . . . . With ground disconnected, 0.65 mA

. . . . . .Maximum permissible leakage, 3.5 mA

Dimensions

Interior . . . . . .21.3” W x 26.8” H x 20.0” F-B

. . . . . .(54.1 cm x 68.1 cm x 50.8 cm)

Exterior . . . . . .26.3” W x 39.5” H x 25.0” F-B

. . . . . .(66.8 cm x 100.3 cm x 63.5 cm)

Weight (per unit)

Net . . . . . .265 lb. (120.2 kg)

Net Operational . . . . . .365 lb. (165.6 kg)

Shipping . . . . . .324 lb. (147.0 kg)

Safety Specifications

Indoor Use Only

Altitude . . . . . .Up to 2000 meters

Temperature . . . . . .5°C to 40°C

Humidity . . Maximum 80% RH for temperatures up to 31°C, decreasing linearly to 50% RH at 40°C non-condensing

Mains Supply Fluctuations . . .not to exceed ±10% of nominal voltage

Installation Category 2[1]

Pollution Degree 2[2]

Class of Equipment 1

---

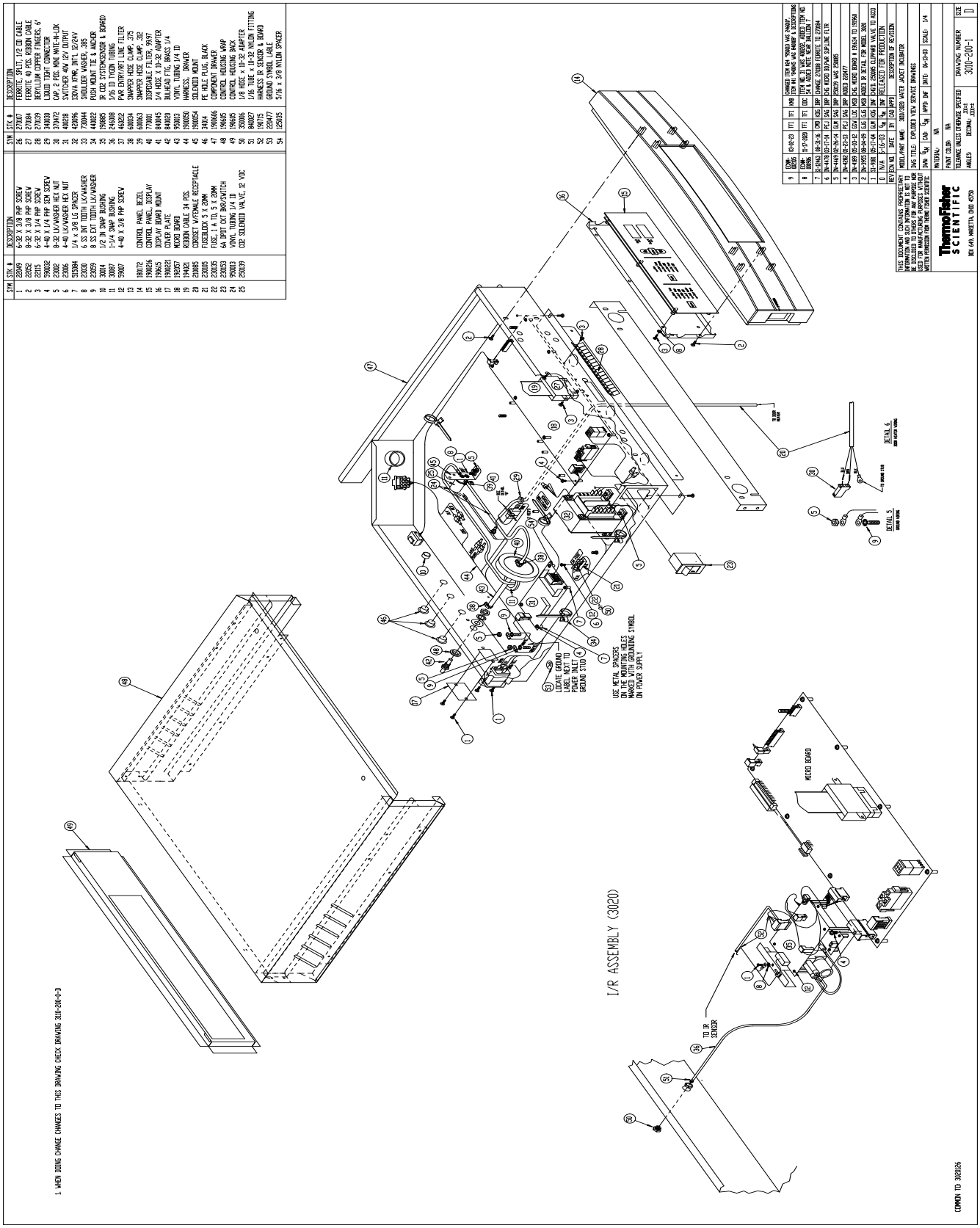
1 Installation category (overvoltage category) defines the level of transient overvoltage which the instrument is designed to withstand safely. It depends on the nature of the electricity supply and its overvoltage protection means. For example, in CAT II which is the category used for instruments in installations supplied from a supply comparable to public mains such as hospital and research laboratories and most industrial laboratories, the expected transient overvoltage is 2500 V for a 230 V supply and 1500 V for a 120 V supply.

---

2 Pollution Degree describes the amount of conductive pollution present in the operating environment. Pollution Degree 2 assumes that normally only non-conductive pollution such as dust occurs with the exception of occasional conductivity caused by condensation.

Section 7 Parts List

Part #	Description
360171	Liquid Level Switch
191534	Feather Gasket
113002	5/16-18 Glide Foot
132046	115/230 V Dual Heater
132056	Face Heater 27 W, 24 VAC
1900203	Heated Inner Door
700046	Lower Inner Door Hinge Nylon Bearing
700013	Upper Inner Door Hinge Nylon Bearing
990026	Door Gasket w/ Magnet
290184	Temp Probe 2252 Ohm
192057	Micro Board
1900216	Display Board Assembly
230153	6A Circuit Breaker/Switch
460157	Line Filter/Power Inlet
420096	130 VA Transformer, 12/24 V
230159	3.5 Amp Fuse - Door
230158	2.5 Amp Fuse - Face Heater
250087	Solenoid Valve Kit with assorted fittings
770001	Bacterial Air Filter (CO_2 line, air sample and access port)
100113	Blower Wheel 3.5x1.5 CCW
190831	Blower Scroll Assembly
1900601	Service Kit (for p/n 290090 T/C type CO_2 Sensor Assembly
190885	IR Sensor
190985	#6 Silicone Stopper w/ Filter (770001)
180001	Polypropylene Funnel
1900071	Blower Motor Replacement Kit
190651	Motor, Sensor Gasket Replacement Kit
247013	Drain Fitting Hose Barb
190634	Inner Door Strike with Door Switch
400218	40 W Switcher Kit (replaces 400201 & 400119)
400132	Low Leakage Current Power Supply
117044	Fill Port Cap
1900548	Exterior Door Assembly SRO



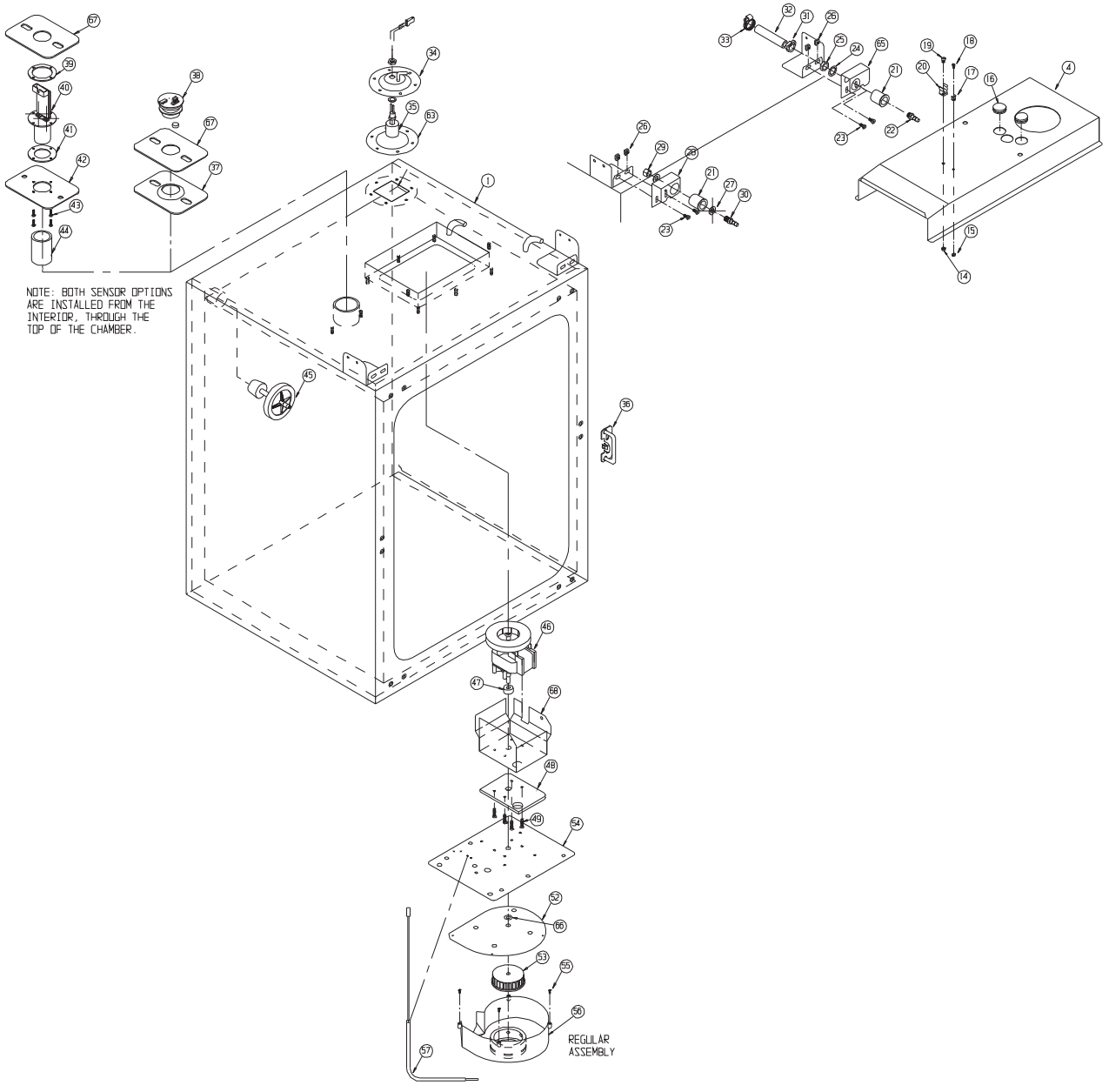
SYM	STK #	DESCRIPTION	SYM	STK #	DESCRIPTION
1	22049	6-32 X 3/8 PHP SCREW	26	270107	FERRITE, SPLIT, 1/2 ID CABLE
2	22052	8-32 X 3/8 PHP SCREW	27	270184	FERRITE 40 POS. RIBBON CABLE
3	22115	6-32 X 1/4 PHP SCREW	28	270139	BERYLLIUM COPPER FINGERS, 6'
4	594032	4-40 X 1/4 PHP 3CM SCREW	29	340030	LIQUID TIGHT CONNECTOR
5	23082	8-32 LK/WASHER HEX NUT	30	370472	CAP, 2 POS., NON WHITE-IN-LOK
6	23084	4-40 LK/WASHER HEX NUT	31	400258	SCREW, #6-32 X 1/2 FLT SOCKET
7	23086	1/4 X 1/4 LG SPACER	32	420005	LENS, PANEL, INTEL 22/64
8	23201	6 SS INT TOOTH LK/WASHER	33	730044	SHIELDED WASHER, 3/8
9	23959	8 SS EXT TOOTH LK/WASHER	34	440822	PUSH MOUNT TIE & ANCHOR
10	30004	1/2 IN SNAP BUSHING	35	190985	IR CO2 SYSTEMSENSOR & BOARD
11	30007	1-1/4 SNAP BUSHING	36	246098	1/16 ID TYGON TUBING
12	59007	4-40 X 3/8 PHP SCREW	37	460222	PWR ENTRY/FRT LINE FILTER
13			38	600034	SNAPPER HOSE CLAMP, .375
14	180172	CONTROL PANEL BEZEL	39	600063	SNAPPER HOSE CLAMP, .312
15	1906035	CONTROL PANEL DISPLAY	40	770001	BIOSTOPABLE FILTER, 99.97
16	190615	DISPLAY BOARD MOUNT	41	9406045	1/4 HOSE X 1/8-27 ADAPTER
17	1906057	COPPER PLATE	42	9406050	1/4 HOSE X 1/8-27 ADAPTER
18	192057	MICRO BOARD	43	950013	VINYL TUBING 1/4 ID
19	194021	RIBBON CABLE 34 PIN.	44	1900050	HARNESS, BRAKER
20	210085	CORDSET W/FEMALE RECEPTACLE	45	1900054	SOLENOID MOUNT
21	230105	FUSEBLOCK 5 X 20MM	46	34014	PE HOLE PLUG, BLACK
22	230135	FUSE, 1 A TD, 5 X 20MM	47	1906606	COMPONENT BRAKER
23	230153	6A DPDT CKT BKR/SWITCH	48	190605	CONTROL HOUSING WRAP
24	950013	VINYL TUBING 1/4 ID	49	190606	CONTROL HOUSING BACK
25	230139	CO2 SOLENOID VALVE, 12 VDC	50	350006	1/8 HOSE X 10-32 ADAPTER
			51	9406027	1/4 TUBE X 10-32 NYLON FITTING
			52	1900053	HARNESS, DISPLAY BOARD
			53	220477	GROUND SYMBOL LABLE
			54	125025	5/16 x 3/8 NYLON SPACER

REV	ECN NO	DATE	BY	CKD	APPD	DESCRIPTION OF REVISION
9	ECNR-1000	10-06-20	TTI	TTI	KNB	CHANGED ITEM #24 *9506 WAS 440489
8	ECNR-1000	09-07-2800	TTI	TTI	DBC	ITEM NO. 13 WAS 400222, ADDED ITEM NO 54 & ADDED NOTE NEAR BALLOON 7
7	ECR-10463	08-10-26	CMO	HDS	JMP	CHANGE 270108 FERRITE TO 270184
6	ECN-1478	05-07-14	TJC	JMC	JMP	ADD MICRO BOARD SOFTWARE FLTR
5	ECN-1458	05-05-23	TJC	JMC	JMP	ADDED 2 HOLES
4	ECN-1438	05-05-03	TJC	JMC	JMP	ADDED 22417
3	ECN-1409	05-03-12	CDA	LTC	MCD	DCN, MICRO BOARD # 190634 TO 190960
2	ECN-1395	08-04-09	CJG	CJG	MCD	ADDED ID DETAIL FOR MODEL 3020
1	ECR-981	05-01-04	CJM	MDC	DMC	FIXED ZOOMS CLIPPARD VALVE TO A023
0	IN/A	04-06-03	Tjm	Tjm	DMC	RELEASED FOR PRODUCTION

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND SHALL NOT BE REPRODUCED IN WHOLE OR IN PART NOR BE DISCLOSED TO OTHERS FOR ANY PURPOSE NOR USED FOR MANUFACTURING PURPOSES WITHOUT WRITTEN PERMISSION FROM THERMO ELECTRON CORP.

MODEL/PART NAME: 3000/3020 WATER JACKET INCUBATOR
DWG TITLE: EXPLODED VIEW SERVICE DRAWINGS
DWN Tjm | CKD Tjm | APPD JMP | DATE 06-10-03 | SCALE: 1/4
MATERIAL: NA
PAINT COLOR: NA
TOLERANCE UNLESS OTHERWISE SPECIFIED
ANGLES: DECIMAL .XX=± .XXX=±

ThermoFisher SCIENTIFIC
BOX 649, MARIETTA, OHIO 45750

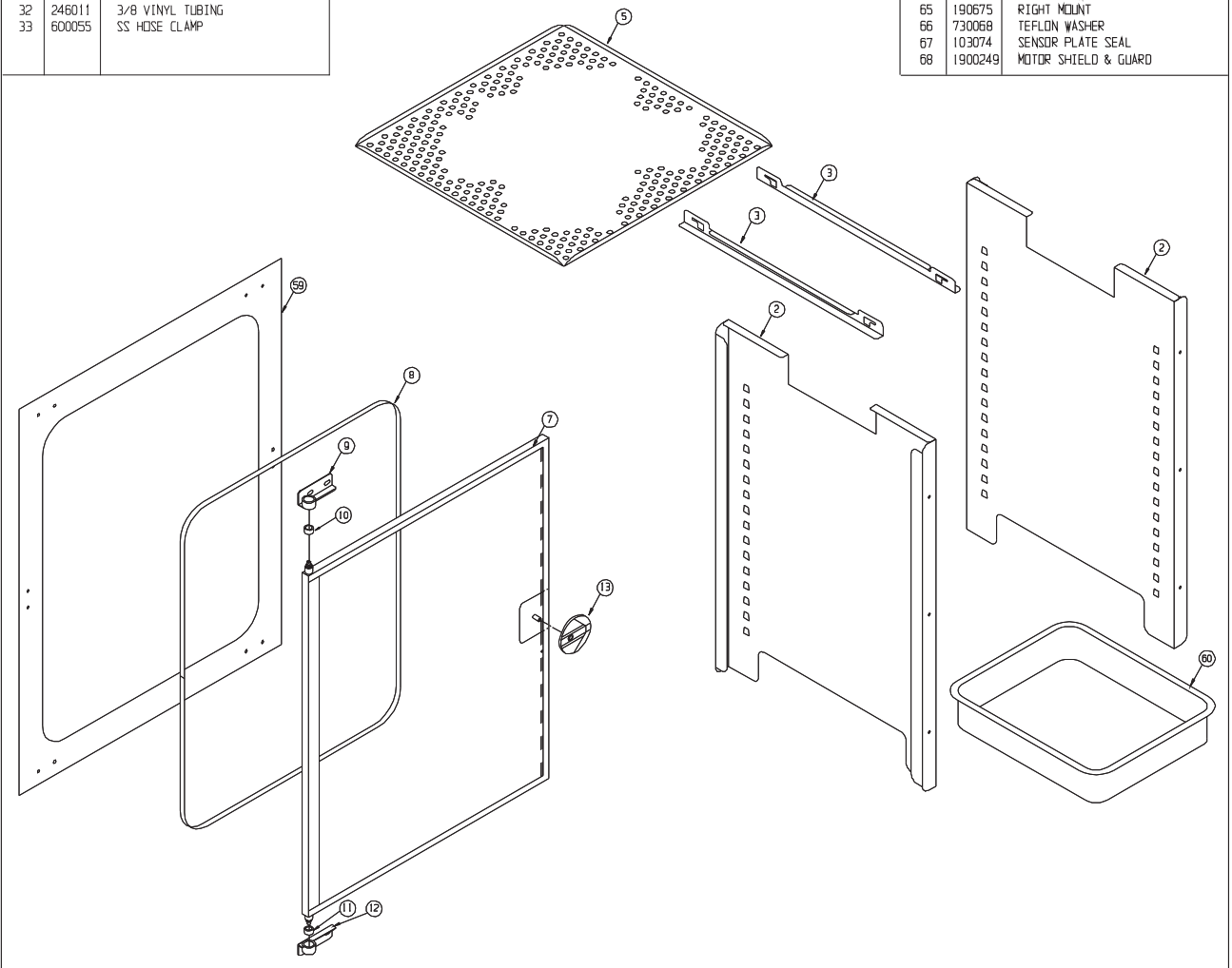


CABINET ASSEMBLY

3010-201-1-D Rev. 4
Page 1 of 2

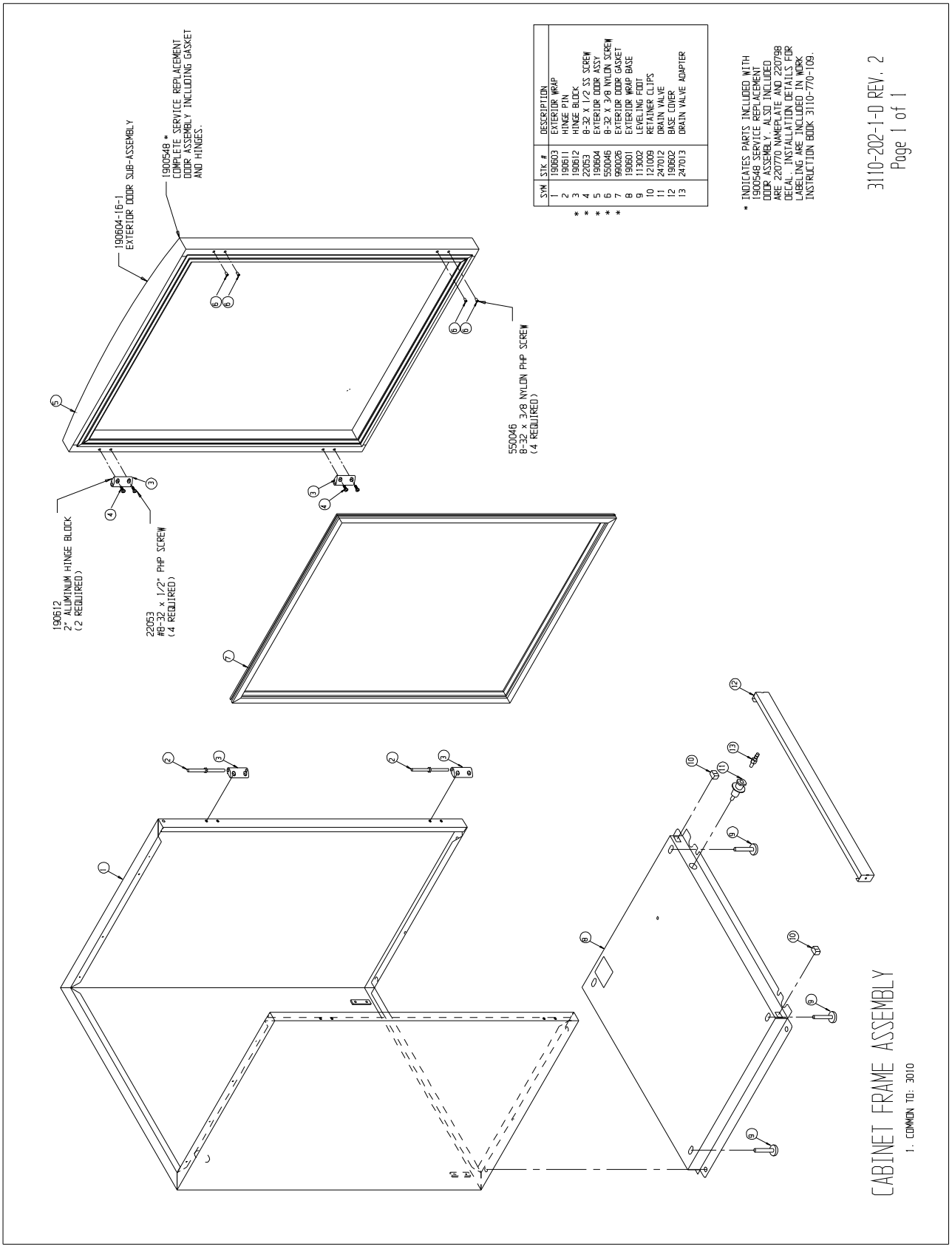
SYM	STK #	DESCRIPTION
1	1900215	WATER JACKET CHAMBER
2	1900218	INTERIOR DUCT SHEETS
3	1900220	SHELF CHANNELS
4	1900219	TOP DUCT(1900057 COPPER)
5	224175	SHELF
6	------	----------
7	1900203	INNER GLASS DOOR
8	103108	INNER DOOR GASKET
9	190618	TOP INNER DOOR HINGE
10	700013	TOP INNER DOOR HINGE BUSHING
11	700046	BOTTOM INNER DOOR HINGE BUSHING
12	190619	BOTTOM INNER DOOR HINGE
13	180210	INNER DOOR KNOB
14	23010	8-32 SS NUT
15	23005	4-40 SS NUT
16	114022	15/16 BLIND GROMMET
17	111022	1/4" PROBE CLIP
18	22130	4-40 X 1/4 SS SCREW
19	22051	8-32 X 1/4 SS SCREW
20	111007	13/32 RH PROBE CLIP
21	190294	FILL PORT ACCESS
22	840043	PLASTIC HOSE BARB
23	22052	8-32 X 3/8 SS SCREW
24	290128	1/2" LOCK WASHER
25	840043	NUT (PART OF #22)
26	610055	8-32 CLIP NUT
27	730060	SEAL WASHER
28	190675	LEFT MOUNT
29	840035	3/16 ADAPTER
30	840065	1/4 HOSE BARB
31	600065	SNAPPER CLAMP
32	246011	3/8 VINYL TUBING
33	600055	SS HOSE CLAMP

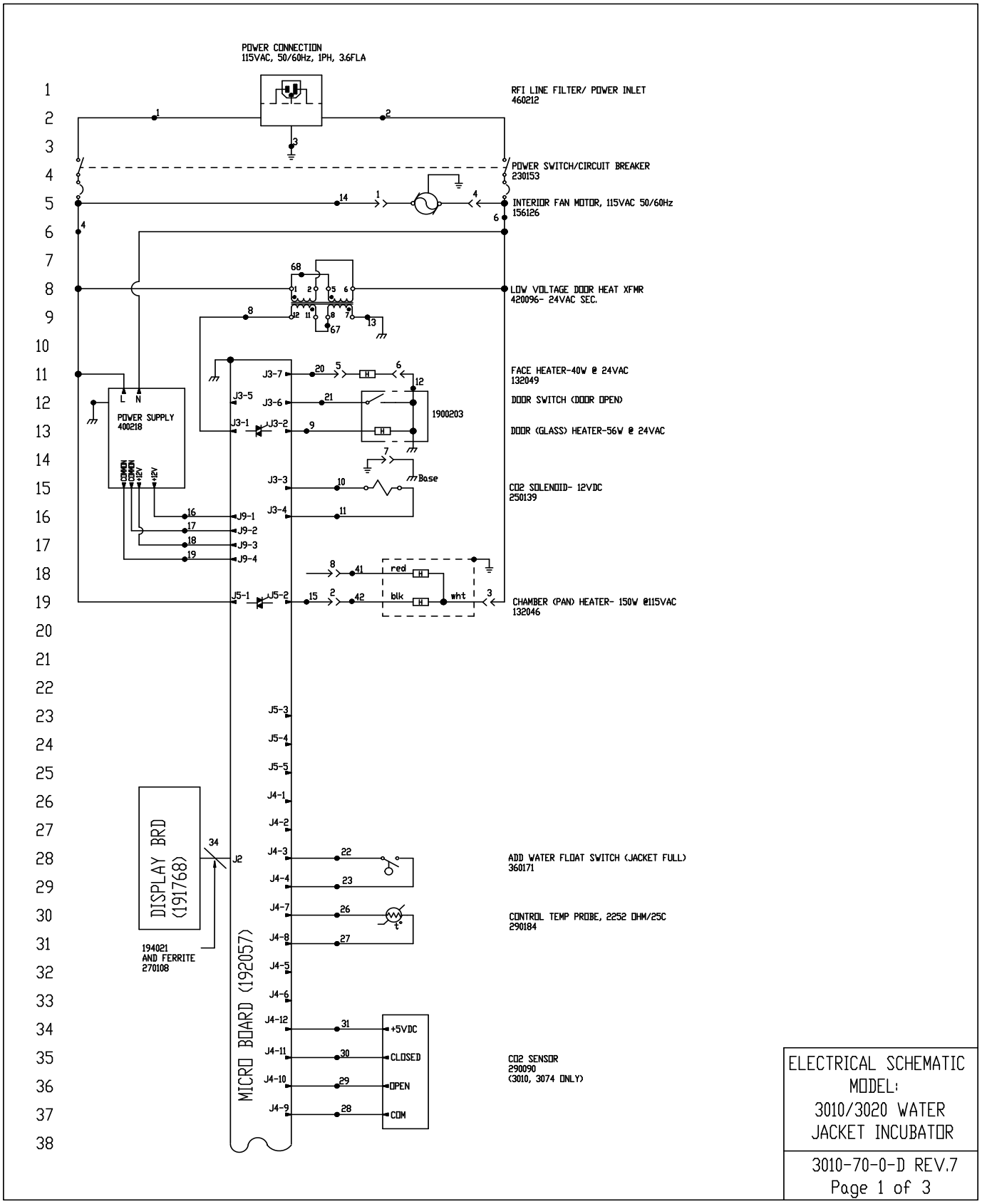
SYM	STK #	DESCRIPTION
34	190306	FLOAT SWITCH MOUNT
35	360171	FLOAT SWITCH
36	190634	INNER DOOR LACTH
37	190649	TC SENSOR PLATE
38	290090	TC SENSOR
39	190712	IR MOUNTING RING
40	190708	"DCS" IR SENSOR
41	103083	IR SENSOR GASKET
42	190711	IR MOUNTING PLATE
43	22130	4-40 X 1/4 SS SCREW
44	190708	IR SENSOR FILTER (PART OF ITEM 40)
45	190985	FILTERED STOPPER ASSEMBLY
46	156126	BLOWER MOTOR
47	730069	MOTOR SHAFT SEAL
48	190655	MOTOR SPACER PLATE
49	590023	8-32 X 3/4 SS SCREWS
50	------	----------
51	------	----------
52	190893	SCROLL PLATE
53	100113	BLOWER WHEEL "D" SHAFT
54	1900053	STANDARD BLOWER PLATE
55	22134	6-32 X 1/2 "FILISTER" HEAD SCREW
56	190846	BLOWER SCROLL
57	290184	TEMPERATURE PROBE
58	------	----------
59	180174	PVC FACE FRAME
60	237016	HUMIDITY PAN
61	------	----------
62	------	----------
63	103032	FLOAT SWITCH GASKET
64	23024	3/8 FLAT WASHER
65	190675	RIGHT MOUNT
66	730068	TEFLON WASHER
67	103074	SENSOR PLATE SEAL
68	1900249	MOTOR SHIELD & GUARD



CABINET ASSEMBLY

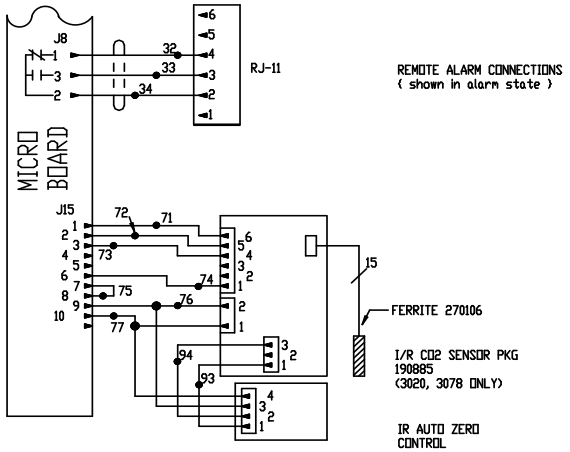
3010-201-1-D Rev. 4
Page 2 of 2


190604-16-1
EXTERIOR DOOR SUB-ASSEMBLY
1900548 *
COMPLETE SERVICE REPLACEMENT
DOOR ASSEMBLY INCLUDING GASKET
AND HINGES.
550046
8-32 x 3/8 NYLON PHP SCREW
(4 REQUIRED)
190612
2" ALUMINUM HINGE BLOCK
(2 REQUIRED)
22053
#8-32 x 1/2" PHP SCREW
(4 REQUIRED)
SYM | STK # | DESCRIPTION
1 | 190603 | EXTERIOR WRAP
2 | 190611 | HINGE PIN
3 | 190612 | HINGE BLOCK
* * 4 | 22053 | 8-32 X 1/2 SS SCREW
* * 5 | 190604 | EXTERIOR DOOR ASSY
* * 6 | 550046 | 8-32 X 3/8 NYLON SCREW
* 7 | 980026 | EXTERIOR DOOR GASKET
8 | 190601 | EXTERIOR WRAP BASE
9 | 113002 | LEVELING FOOT
10 | 121009 | RETAINER CLIPS
11 | 247012 | DRAIN VALVE
12 | 190602 | BASE COVER
13 | 247013 | DRAIN VALVE ADAPTER
* INDICATES PARTS INCLUDED WITH
1900548 SERVICE REPLACEMENT
DOOR ASSEMBLY. ALSO INCLUDED
ARE 220770 NAMEPLATE AND 220798
DECAL. INSTALLATION DETAILS FOR
LABELING ARE INCLUDED IN WORK
INSTRUCTION BOOK 3110-770-109.
3110-202-1-D REV. 2
Page 1 of 1
CABINET FRAME ASSEMBLY
1. COMMON TO: 3010



ELECTRICAL SCHEMATIC
MODEL:
3010/3020 WATER
JACKET INCUBATOR

3010-70-0-D REV.7
Page 1 of 3



ELECTRICAL SCHEMATIC MODEL: 3010/3020 WATER JACKET INCUBATOR
3010-70-0-D REV.7 Page 2 of 3

77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107

WIRE REFERENCE CHART

NO.	GA.	COLOR	NO.	GA.	COLOR
1	16	BROWN	26	22	YELLOW
2	16	BLUE	27	22	YELLOW
3	16	GRN/YEL	28	22	GREEN
3B	16	GREEN	29	22	GRAY
4	18	BLACK	30	22	PURPLE
5	N/U		31	22	ORANGE
6	18	WHITE	32	22/3	BLACK
7	N/U		33	22/3	RED
8	18	BROWN	34	22/3	WHITE
9	18	BLUE	41	18	RED
10	18	YELLOW	42	18	BLACK
11	18	YELLOW	67	18	RED
12	18	BLACK	68	18	ORANGE
13	18	GREEN	71	22	BLUE
14	18	BLUE	72	22	ORANGE
15	18	ORANGE	73	22	YELLOW
16	18	RED	74	22	BROWN
17	18	GREEN	75	22	BLACK
18	18	ORANGE	76	22	RED
19	18	GREEN	77	22	GREEN
20	18	ORANGE	78		
21	22	BROWN		24/15	I/R CABLE
22	22	BLUE	91		
23	22	BLUE	92	22	BLACK
24	22	RED	93	22	BROWN
25	22	RED	94	22	WHITE

SENSOR REFERENCE VALUES

CO2 (290090) DIFFERENCE VOLTAGE OF 3-6MV/%CO2
J4-9 & J4-10 TO J4-9 & J4-11

MODEL	DESCRIPTION
3010	WATER JACKET INCUBATOR - TC CO2
3020	WATER JACKET INCUBATOR - IR CO2
3074	WATER JACKET INCUBATOR - TC CO2 (VWR)
3078	WARWE JACKET INCUBATOR - IR CO2 (VWR)

ATTENTION
OBSERVE PRECAUTIONS
ELECTROSTATIC
SENSITIVE DEVICES

ELECTRICAL SCHEMATIC
MODEL:
3010/3020 WATER
JACKET INCUBATOR

3010-70-0-D REV.7
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. The Watlow EZ-ZONE PM controller is covered for one additional year for repair or replacement (parts only), provided the unit has not been misapplied. 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.

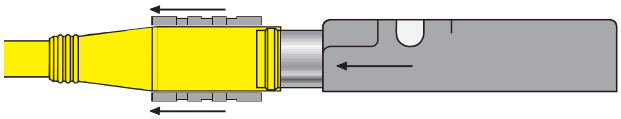
Rev. 5 8/13

ISO 9001 REGISTERED

TURCK
Industrial Connectivity Products

picofast® "Snap Lock" Connector Instructions

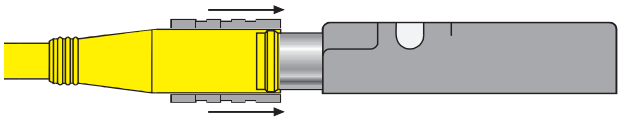
UNLOCK



With TURCK's patented Locking Sleeve pulled back, any ***picofast*** sensor slides on without any difficulty.

LOCK

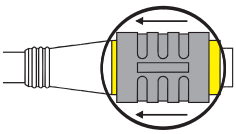
After sensor is connected, push Locking Sleeve forward to create a watertight connection. It's a snap!



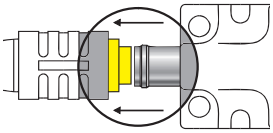
Installation Instructions

To Attach:

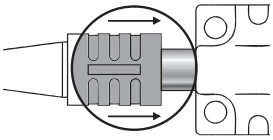
1. Be sure black locking sleeve is pulled back.



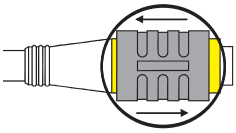
2. Line up pins and push connector onto plug. You will feel a "snap." Do not twist.



3. Push locking sleeve forward on connector until it is flush with the front of the connector.



4. If sleeve is difficult to slide on a new connector, "exercise" it a few times. Do not use tools.

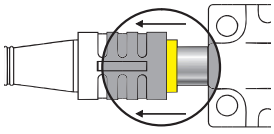


To Detach:

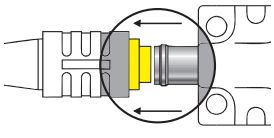
1. Do not twist.



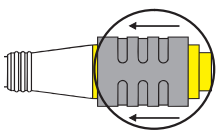
2. Pull locking sleeve back to "unlocked" position.



3. Pull connector straight off.



4. Leave locking sleeve in unlocked position.



Clearwater Tech - Phone: 800.894.0412 - Fax: 208.368.0415 - Web: www.clrwtr.com - Email: info@clrwtr.com

thermoscientific.com

© 2023 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details.

Thermo Fisher Scientific (Asheville) LLC
401 Millcreek Road
Marietta, Ohio 45750
United States

Thermo SCIENTIFIC

A Thermo Fisher Scientific Brand