Shaker@ BRDG

Refrigerated

CO2 Tanks & Regulator

CO2 @BRDG

Shaker@FV

Isotemp @ FV

28cuft Sheldon

40 cuft w CO2

30 cuft Precision
Precision 30M Incubator
@ Trophomax

LabCompanion
@ FV

Chicago LabLine @FV

LabLine Imperial III @FV

Incubators

Detect on Instrument Picture to Jump to that SOP

Percival Plant Diurnal @ BRDG

Prepared by: Bob Morrison
CPLS - Instrumentation Specialist
Oct 2008, Latest rev Oct 2012

Link to SERVICE/REPAIR INFO

Hybridization

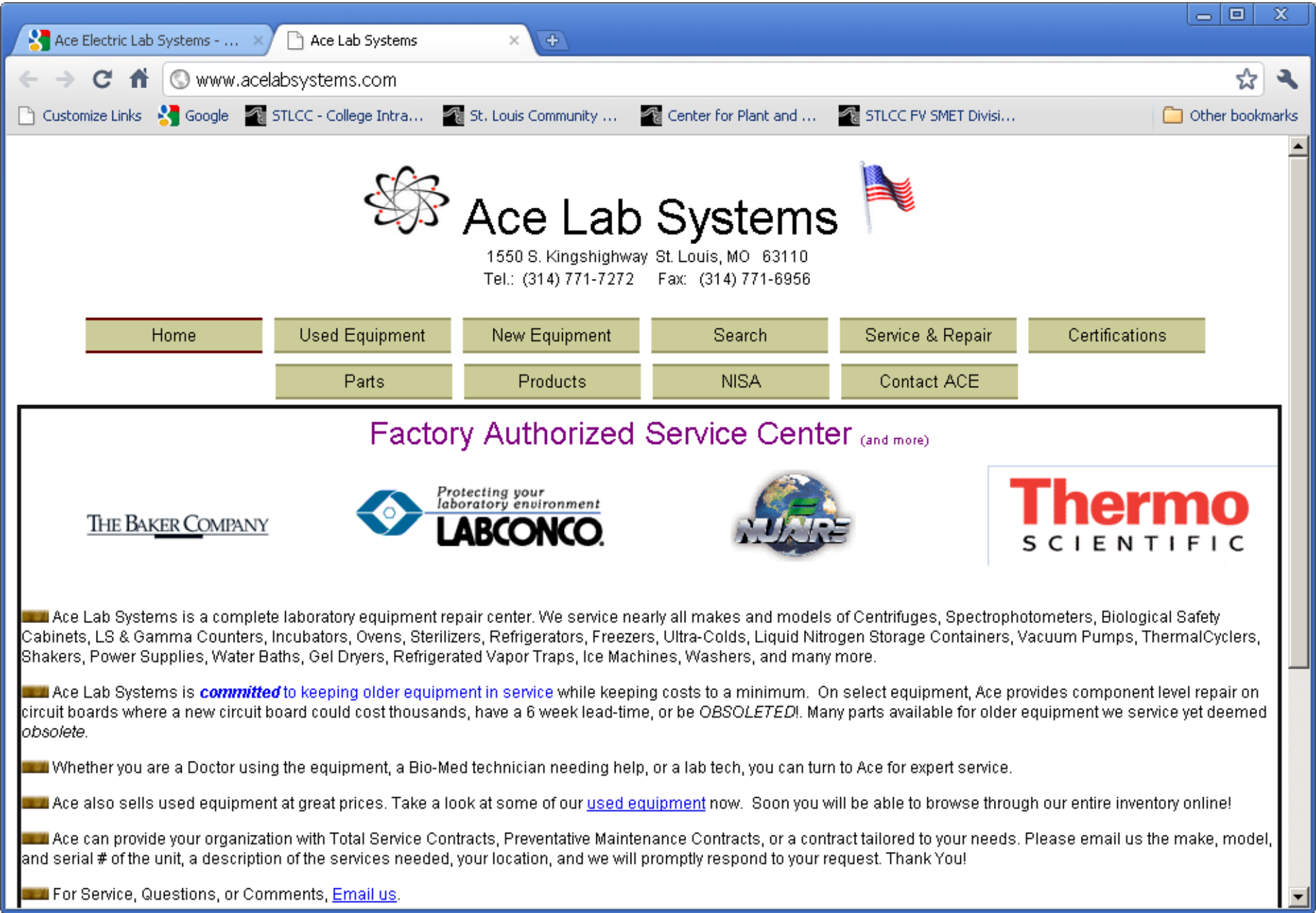
Microwave Countertop

Bench

Oven, 2cuft Gravity

UV Crosslinker

Incubators: Local Service Center



Incubator: OVEN, 2 Cu.ft, Gravity Convection, Quincy Labs via MIDSCI

Model: 30GC, SN: G3-008946
Capacity: 2.0
Max Temp: 450F/232C,
Min: Ambient +25F or ~37C (specs), but tested at 44C
Watts: 1200
Amps: 10.43
W,H, D: 18x16x12 inch
W,H, D; 20x25x14 cm
Weight: 78lbs

Temperature Dial Calibration

Calibrating the actual chamber temperature to the temperature printed on the knob/dial, should only be done if the chamber temperature, as measured by a known accurate device, is off by more than +/- 15°F (8°C) from any indicated dial setting. The most accurate calibration possible for any analog-type control is at a single temperature setting. Therefore, calibrate the control at the most frequently used temperature.

To calibrate: Set dial temperature to a frequently used temperature then remove knob (allen screw). Be careful not to move the position of the shaft when removing the knob. Allow oven to achieve a stable temperature. Remove compression pin (newer models only) to access the trim-screw recessed in shaft center. Using a small blade driver, turn the trim-screw clockwise (CW) to adjust temperature down and (CCW) to adjust the temperature upward. Make only small 1/16th adjustments at a time. Allow the temperature to settle before making any subsequent adjustments. NOTE: Use pliers to keep outer shaft from turning when making trim-screw adjustments.

⚠ Do not adjust control to operate above the oven's stated maximum operating temperature.

Incubator: Refrigerated, Shel-Lab, Bench/Floor

Model: LI5, SN 09009810
Microprocessor Control
P.I.D. Temperature Control
LED Display of Setpoint and Chamber Temperature
High and Low Limit Thermostats
Interior Electrical Outlet
Fan Assisted/Forced-Air Circulation
Hermetically Sealed Compressor

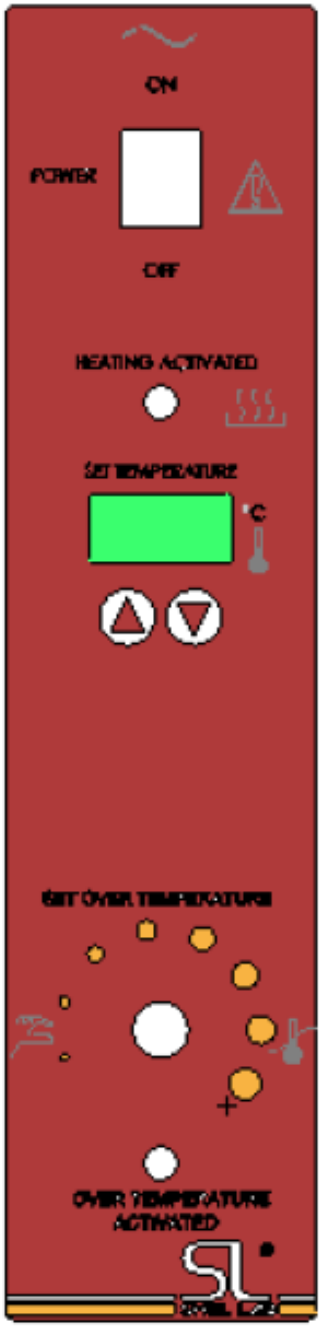
Capacity 3.2 cu.ft.
Interior Dimensions WxDxH in. (cm) 16 x 14 x 25 (41 x 36 x 64)
Exterior Dimensions WxDxH in. (cm) 24 x 22 x 33 (61 x 56 x 84)
Temperature Range 0°C to 45°C (at 21°C ambient)
Temperature Uniformity +/- 0.5°C at 20°C Electrical
Specifications Volts: 120V Hertz: 50/60Hz Watts: 400W Amps:
Capacity of Standard B.O.D. Bottles 62 Shelving 2 Supplied
Interior Outlet 110V-1

Hot link to Sheldon Incubator User Manual … pdf

Incubator: Low Temp, ShelLab, Basic Operations

- **Set Main Temperature**
  - Press either the Up or Down arrow ONE TIME
  - While the display is blinking, continue to press the up or down arrows to reach the desired set point
  - Temporarily set the Over-temperature dial to the maximum position (clockwise) until the desired set point is reach.
  - After the set point has stabilized, turn the Over-temperature dial back (counter-clockwise) until the light goes out, then clockwise again just past this mark.

Incubator; Refrigerated Control Panel



3.1 **Power Switch:** The main power I/O (on/off) switch controls all power to the unit and must be in the I/ON position before any systems are operational.

3.2 **Main Temperature Control:** This control is marked SET TEMPERATURE and consists of the digital display and UP/DOWN arrow pads for inputting set point temperatures and calibration.

3.3 **Heating Lamp:** This pilot lamp is marked TEMPERATURE ACTIVATED and is ON when the unit is heating up to set point and is blinking when controlling temperature at set point.

3.4 **Overtemperature Thermostat:** This control is marked SET OVERTEMPERATURE and is completely independent of the Main controller. It acts as an override in the event that the Main control fails in the ON position.

3.5 **Overtemperature Light:** This pilot lamp is marked OVERTEMPERATURE ACTIVATED and is on when the thermostat has been activated. Under normal operating conditions, this pilot light should never be on.

3.6 **Circuit Breaker:** (Non-CE units) Adjacent to the power cord the circuit breaker is an added measure of protection against power source variations that if tripped, must be reset by pushing in the button once the reason for interruption has been cleared.

3.7 **Fuse:** (CE units only) Located at the back of the unit within the power inlet, the fuse is an added measure of protection against power source variations that, if blown, must be replaced once the reason for the interruption has been cleared. Note that the unit will not power up unless the fuse is in place.

Incubator; Refrigerated, Sheldon, Operations

4.1 Check power supply against unit serial plate. They must match.

4.2 Plug service cord into the grounded electrical outlet.

4.3 Push the power switch to the I/On position, and turn the Overtemperature Thermostat to its maximum position, clockwise using a coin or flat edged tool.

4.4 **Set Main Temperature Controller:** Enter desired set point temperature. To enter set point mode on the controller, press either the Up or Down arrow pad one time. The digital display will start to blink, going from bright to dim. While blinking, the digital display is showing the set point. To change the set point, use the Up and Down arrow pads. If the arrow pads are not pressed for five (5) seconds, the display will stop blinking and will read the temperature of the unit. Note that the Overtemperature Thermostat should be turned to its maximum position, (clockwise) until the unit has stabilized at desired set point temperature. Allow the incubator at least 24 hours to stabilize.

4.5 **Calibration:** It is recommended that calibration is done once the unit is installed in its working environment and has been stabile at set point for several hours. Place a certified reference thermometer in the chamber. Be certain the thermometer is not touching any shelving. Allow the temperature to stabilize again until the thermometer reads a constant value for one hour. Compare the digital display with the reference thermometer. If there is an unacceptable difference, put the display into calibration mode by pressing both the Up and Down arrow pads at the same time until the two outside decimal points begin to flash. While the decimal points are flashing the display can be calibrated by pressing the Up or Down arrow pads until the display reads the correct value. Allow the incubator temperature to stabilize again, and recalibrate if necessary.

4.6 **Set Overtemperature Thermostat:** As mentioned previously, the Overtemperature Thermostat should be initially set to its maximum position, (clockwise), to allow the unit to stabilize. Once the incubator is stabile at the desired set point, turn the Overtemperature Thermostat counterclockwise until the OVERTEMPERATURE ACTIVATED light turns on. Next, turn the Thermostat clockwise just until the light turns off. Then turn the Thermostat clockwise 1/16 of an inch past the point where the light went out. This will set the Overtemperature Thermostat at approximately 1°C above main Temperature set point.

4.7 **Accessory Outlet:** This unit has been supplied with a 1 amp accessory outlet inside the chamber to provide power for equipment such as magnetic stirrers, rockers, etc. Be certain the apparatus draws 1 amp or less. The power switch on the front panel controls power to the outlet. Note that the apparatus may provide additional heat that could affect the temperature range of this incubator. It is recommended that testing be done with the incubator and any accessory equipment to insure that the desired operating conditions can be met.

91945337

Incubator: 3.7cft, VWR, Gravity Convection

48.5W x 40.9D x 53.6H cm ($19^{1}/_{8}$ x $16^{1}/_{8}$ x $21^{1}/_{8}$")
64.5W x 57.7D x 84.1H cm ($25^{13}/_{32}$ x $22^{23}/_{32}$ x $33^{1}/_{8}$")
120V, 60Hz,
320W 88 kg (191 lbs.)
69.9W x 65D x 100.1H cm ($27^{1}/_{2}$ x $25^{5}/_{8}$ x $39^{13}/_{32}$")
105 L (3.7 cu. ft.) –
14004-622 Each $1,928.56

Seven Segment LED Digital Display
Two-Year Parts and Labor Warranty
VWR® Gravity Convection Incubators are ideal for safe incubation with reduced air changes, providing a stable environment while minimizing the potential of drying out samples. The digital advanced adaptive microprocessor control system provides superior temperature accuracy. The PT100 temperature sensor provides the best overall advantages in repeatability and stability over extended time periods.

All incubator units feature a 3.3cm (1.3") stainless steel ventilation cap, two doors (one solid, one glass), high temperature grade foamed silicone rubber door gaskets, over-temperature and over-current protection, and sensor error detection. Units are constructed with a durable, powder-coated steel exterior, stainless steel interior, two stainless steel shelves, and glass wool insulation. Units are also equipped with an internal 110V outlet for auxillary equipment.

Incubator: Shaker, Floor, LabCompanion, @BRDG

Model: IS-971 Incubated Shaker, Cat#AAH23336U :

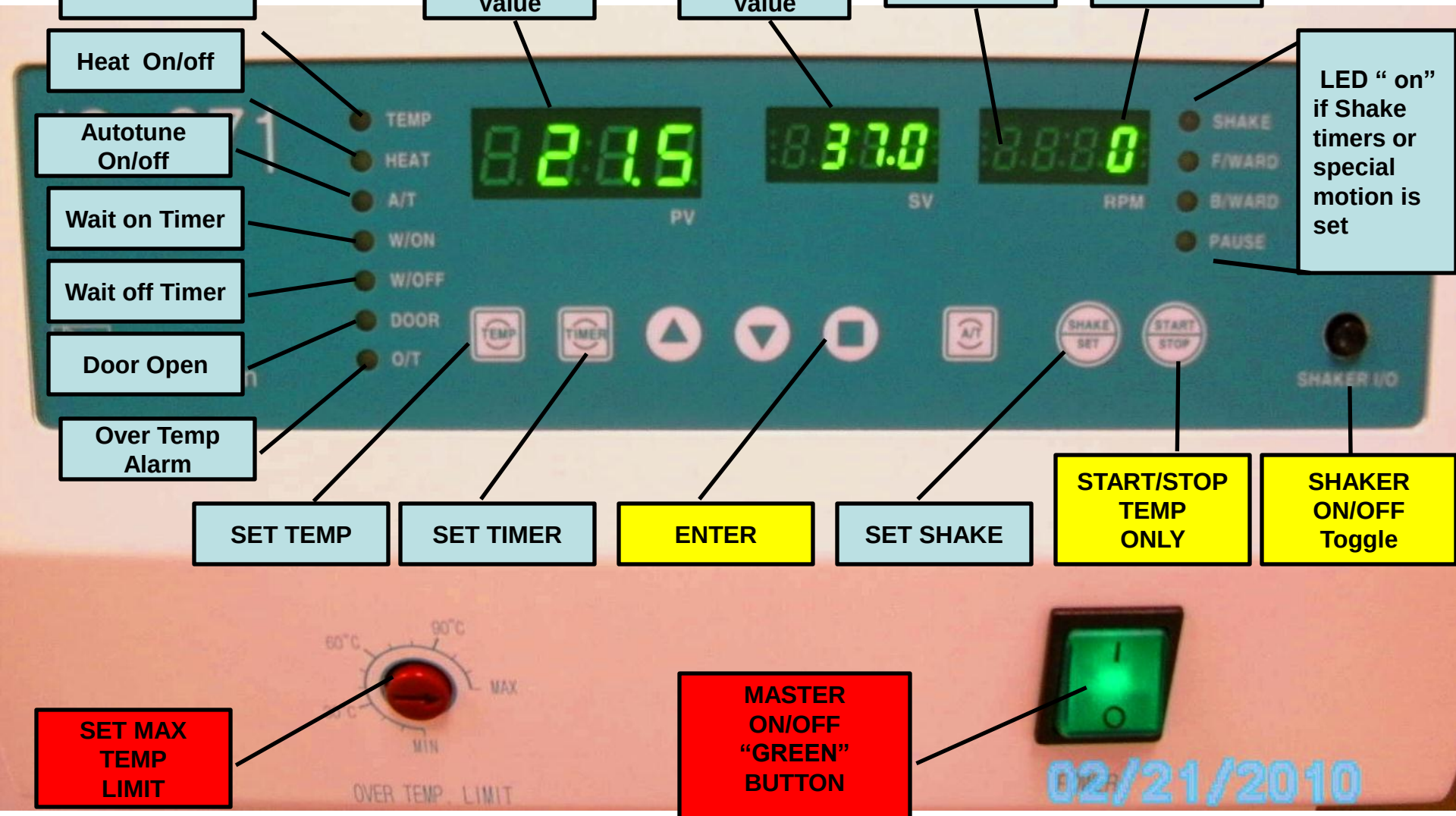
Digital PID Microprocessor Controller
Patented CLS (Custom Logical Safety) System, exceeding DIN Class 2
Chamber Volume 250L
Temperature Control Range Amb.+ 5.0 ~ 60.0 C (R Type + 4.0 ~ 60.0C)
Auto Tuning and Bias Function (Internal Sensor Calibration)
99h 59m Timer with Time Delay ON-OFF
Door & Over Temperature Alarms
Shaking amplitude 30, 40, 50, 60 and 70mm (30mm standard)
RS 232 with FREE LabTracer Software
10 to 300 rpm Shaking Speed with Opto-Electronic Feedback
999h 59m Shaking Timer
Programmable motion - Clockwise, Anti-Clockwise and Pause
Dimenstions: 44.6x31.9x41.1 inches, Weight 379 lbs
Optional : Flask Clamp, Universal Platform, Spring Wire Rack,
Separate Funnel Clamp, Test Tube Rack, Rubber Mat

Link to Jeiotech IS_971 User Manual … pdf

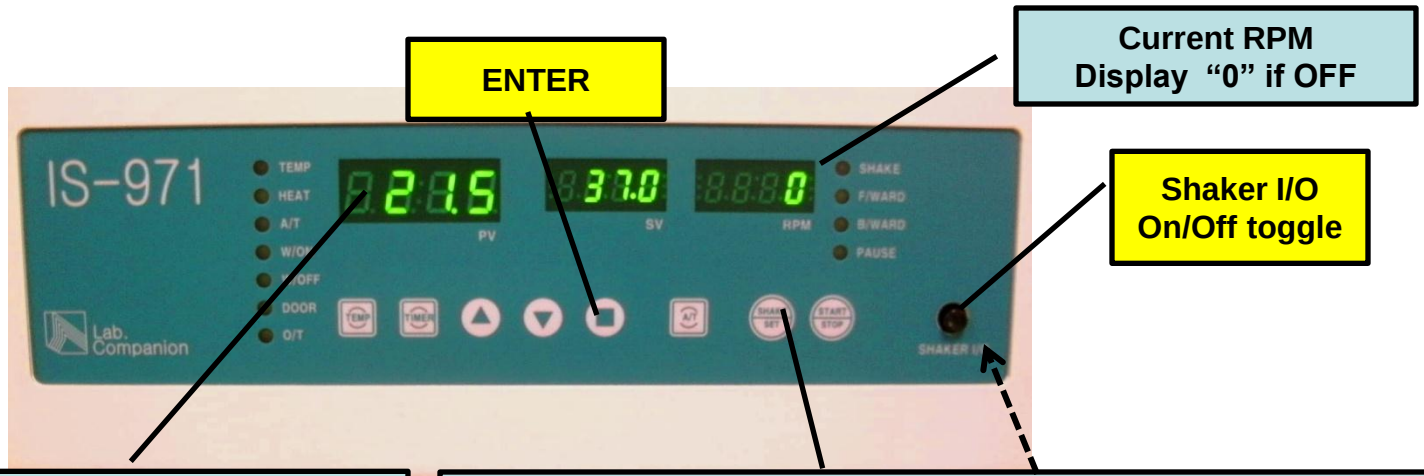
Link to Jeiotech IS_971 Engineering data … pdf

Link to Jeiotech IS_971 Calibration Supplement … pdf

Incubator: Shaker, Control Panel , @BRDG



Incubator: Shaker, Basic Controls; Set Temp, Set RPMs



SET and HOLD TEMP

Turn on device with GREEN button

1. Press TEMP once or until SV blinks
   (PV LED may cycle thru Sv1, Sv2, SV3 Uni, 0.0) until blink mode is reached
2. Use Up/Down arrows to change value
3. Press ENTER and wait until SV blinking stops
4. Press START button to activate temp control
5. Observe TEMP LED "on"
6. HEAT LED blinks until temp SV is reached

- ❑ Three frequently used temps can be saved in the Sv1, Sv2, Sv3 modes, ENTER to activate.
- ❑ Press TEMP until "Uni" is displayed in PV LED to change units from "C" to "F"
- ❑ To Synchronize TEMP with RPM settings you must cycle SHAKE button to "Snch" and set mode to "YES", then ENTER

SET and HOLD SHAKER RPMs, CHANGE RPMs, TURN OFF RPMs

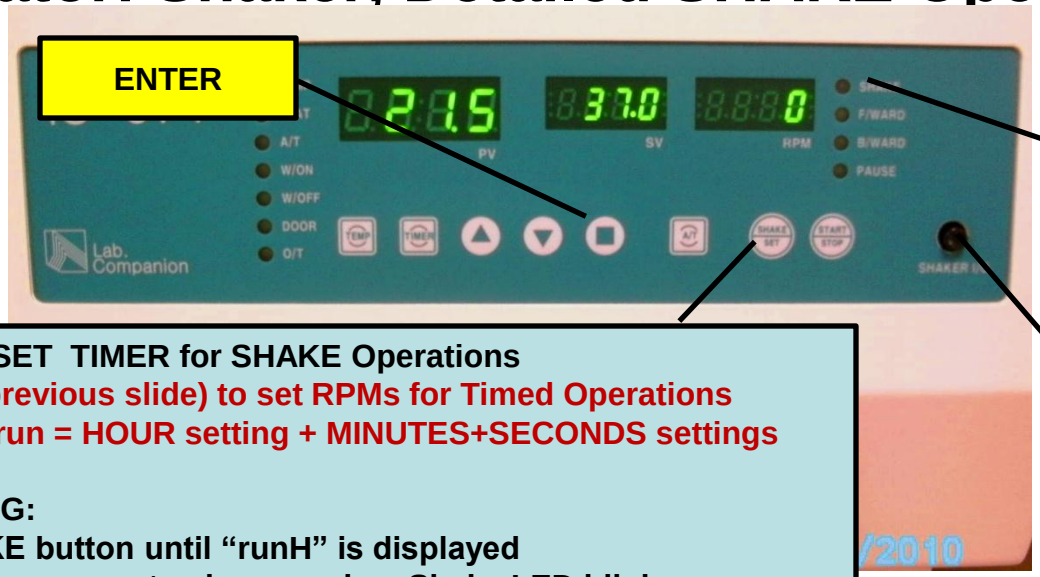
1. Press SHAKE button until "rPm" is shown in PV LED
2. Use Up/Down arrows to change value
3. Press ENTER to accept value for RMP set point
4. Press START to begin motion immediately
5. Press SHAKER I/O ONCE to start motion
6. Observe RMPs climb and rotating symbol to SV is reached

7. To Change RPM value, press SHAKE until "rPM" is displayed, up/down arrows to new SV, then press ENTER

- ❑ To Turn off Shaker, press SHAKER I/O once only
  Observe drop in RPMs, motion symbol at bottom and finally stopped will display "0"

- ❑ To Synchronize TEMP with RPM settings you must cycle SHAKE button to "Snch" and set mode to "YES", then ENTER

Incubator: Shaker, Detailed SHAKE Operations



SET TIMER for SHAKE Operations

Use RPM set mode (previous slide) to set RPMs for Timed Operations

NOTE: Total time for run = HOUR setting + MINUTES+SECONDS settings

1. **For HOUR SETTING:**
   - **Press SHAKE button until "runH" is displayed**
   - **Use Up/Down arrows to change value, Shake LED blinks**
   - **Press ENTER to accept value, press SHAKE I/O to start timer**
2. **For MINUTES and SECONDS SETTING:**
   - **Press SHAKE button until "runS" is displayed**
   - **Use Up/Down arrows to change value**
   - **Press ENTER to accept value, press SHAKE I/O to start timer**
3. **For FORWARD Clockwise Time Shaking**
   - **Press SHAKE button until "For.S" is displayed**
   - **Use Up/Down arrows to change value**
   - **Press ENTER to accept value, press SHAKE I/O to start timer**
4. **For BACKWARD Counter-clockwise Shaking**
   - **Press SHAKE button until "bAC.S" is displayed**
   - **Use Up/Down arrows to change value**
   - **Press ENTER to accept value, press SHAKE I/O to start timer**
5. **For PAUSE in shaking time**
   - **Press SHAKE button until "Pau.S" is displayed**
   - **Use Up/Down arrows to change value**
   - **Press ENTER to accept value, press SHAKE I/O to start timer**
6. **To Synchronize TEMP with RPM settings you must cycle SHAKE button to "Snch" and set mode to "YES", then ENTER**

Incubator: Floor Shaker, Start Issues

If the Shaker does not start when all setting have been made, Check the Door/Lid Open/Close switch on the right corner.

Cycle this several times to made sure it is responsive

Incubator: Shaker, Temp Calibration

Should be run at initial setup and after any significant relocation or changes in ambient environment.

Step 1: Press the **power** **switch** to turn the unit on, if it is not already on. Allow the controller to stabilize and the main display to appear, as shown in Figure 3.21.

Step 2: Place a scientific digital thermometer into the chamber, close the door and allow the thermometer to stabilize. Make sure the thermometer display is readable through the incubated shaker's observation window if it does not have a remote display.

Step 3: Compare the thermometer reading to that shown on the PV display.

Step 4: If there is a difference, press the **TEMP** **key** six (6) times. The PV display will show the revised value and the SV display will read BIAS (as shown below).

Step 5: Press the **UP** **key** or **DOWN** **key** to reflect the difference between the present value and the thermometer reading the BIAS value display.

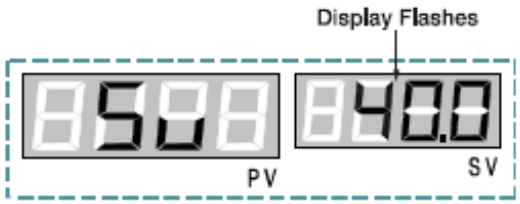
Step 6: Press the **ENTER** **key** to complete the calibration adjustment.

Step 7: Press the **ENTER** **key** to return to the main display.

Incubator: Shaker, Auto-tune Function

Should be run at initial setup and after any significant change in operating system environment or extreme run conditions. During auto-tuning the controller heats to 75% of the set point temperature, where it oscillates above and below the set point as many as three (3) times before loading the new tuning parameters. After the tuning parameters are loaded it heats to the set point temperature. Auto-tuning is dependent on the operating conditions and can take up to 45 minutes. It is best done before any experiment is run.

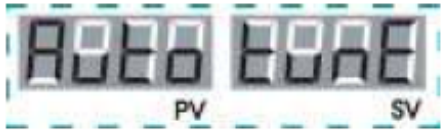
Step 1: Press the **Temp** key one (1) time. The setting in the SV display will flash.

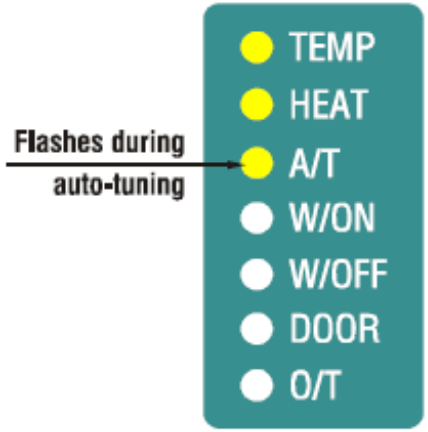


Step 2: Press the **UP** key or **DOWN** key to set the desired temperature.

Step 3: Press the **ENTER** key to finish setting the temperature.

Step 4: Press and hold down the **A/T** key for one (1) second or until the A/T LED illuminates and the PV and SV displays change to the following.





Step 5: Press **START/STOP** key. The TEMP and HEAT LEDs will illuminate and the A/T LED flashes to indicate that the controller is tuning itself. When the A/T LED light stops flashing, the controller is

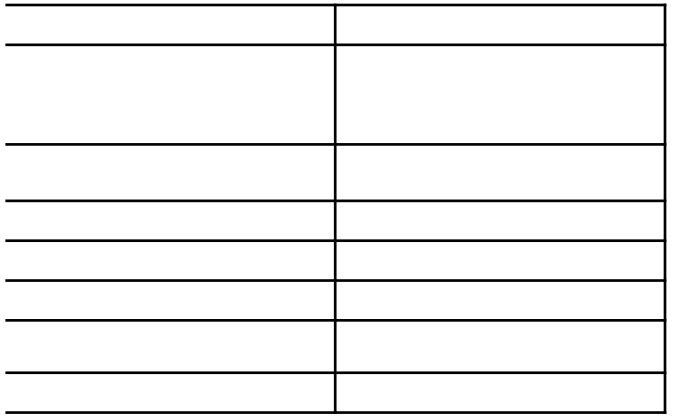
8.50 x 11.00 in

Done

Unknown Zone

Incubator: Shaker, Racks/Clamps, MIDSCI LabCompanion

http://shop.midsci.com/productdetail/M50/AAH23336U

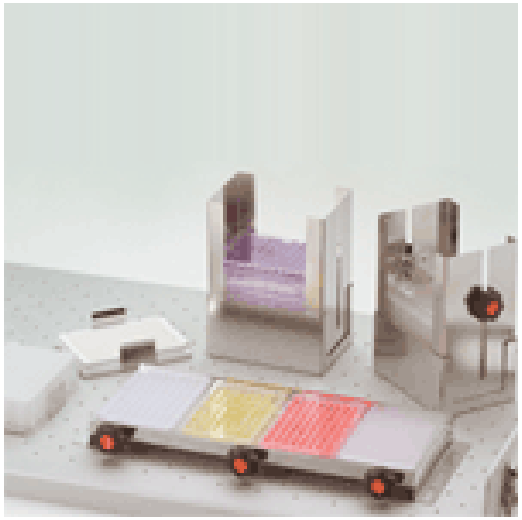


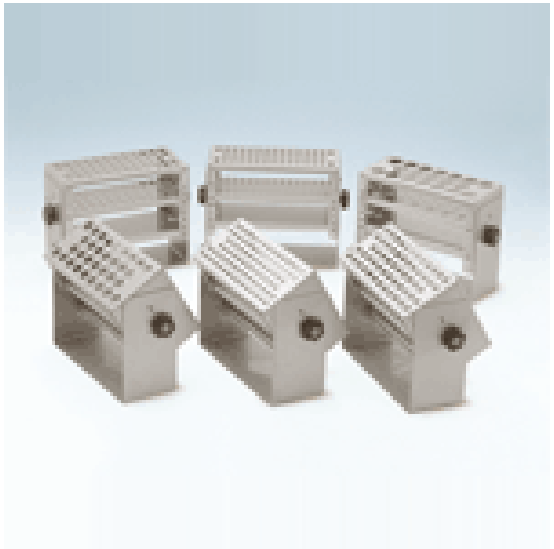
Capacities:

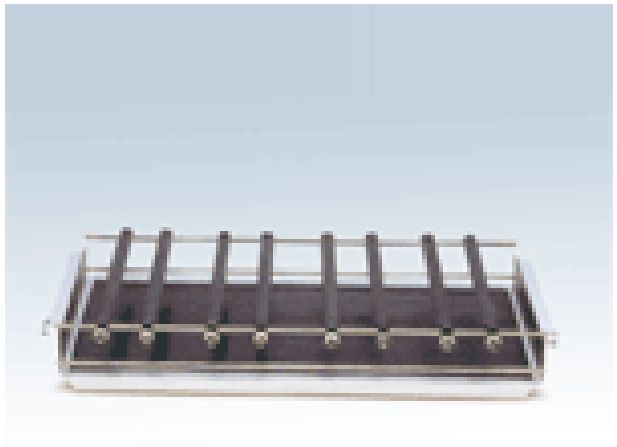
Attachment	Size	IS-971/R
flask clamp	50ml	99
flask clamp	100ml	74
flask clamp	250ml	39
flask clamp	300ml	39
flask clamp	500ml	25
flask clamp	1000ml	14
flask clamp	2000ml	9
flask clamp	2800ml	6
flask clamp	4000ml	4
flask clamp	6000ml	4
test-tube rack	n/a	6
funnel clamp	250ml	11
funnel clamp	500ml	9
funnel clamp	1000ml	5
funnel clamp	2000ml	4
microplate rack (tower)	n/a	16
microplate rack (4-flat)	n/a	3
microplate rack (3-flat)	n/a	5
microplate rack (single)	n/a	25

Incubator: Shaker, Platform Options

http://www.gmi-inc.com/Genlab/Jeiotech%20971%20Series%20Incubator.htm







Incubators: Floor/Shaker, Parts List

PART NAME	DESCRIPTION	QUANTITY	CODE NUMBER
Shaking System	Flywheel, Rotation Pin Set and Belt Pulley	1 Set	EEA3142
Belt	J-type, 4-thread, 40"	1 EA.	FAA3113
Motor	DC50.5V, 60W, BLDC	1 EA.	CGA3110
Lamp Starter		1 EA	CHE4101
Lamp	20W	1 EA.	CHE4410
Filter	12t x 145.6 x 135.6mm	1 EA.	EDA9128
Bolt	M4x8mm, Flat Head Screw, Phillips	1 EA.	BAA3310
Bolt	M4x8mm, Truss Head Screw, Phillips	1 EA.	BAA2606
Fuse	6STL, 18A	1 EA.	CDE5575
	6STL, 15A	1 EA.	CDE5541
	6STL, 12A	1 EA.	CDE5542
	6STL, 10A	1 EA.	CDE5543
	6STL, 08A	1 EA.	CDE5544

Incubator: Shaker; Floor,Belt, Jeiotech Lab Companion

JEIO TECH

1-A Gill Street
Woburn, MA 01801
Phone: (781) 376-0700
Fax: (781) 376-0704
Email: customerservice@jeiotech.com

Quotation

Date	Quote No.
7/9/2012	Q12-1207091

Invoice To
St. Louis Community College at BRDG Park Center for Plant and Life Sciences 1005 N. Warson Rd, Room 123 Creve Coeur MO 63132

Contact	Contact information
Bob Morrison	bmorrison@stlcc.edu

Ship To
St. Louis Community College at BRDG Park Center for Plant and Life Sciences 1005 N. Warson Rd, Room 123 Creve Coeur, MO 63132

Company: JEIO TECH INC
Reference Number: CW-4468
7/12/12 RGM ordered v. MC
Subtotal: $50.74
Tax: $0.00
Shipping: $0.00
Total: $50.74

Terms	Transportation Method	Ship Date	Currency of Payment	Validity	
Credit Card	Ground	7/11/2012	USD	60 Days	MT

Item	Description	Qty	Rate	Total
FAA3113	Belt for IS-971/ SK-71	1	34.84	34.84
	* SHIPPING CHARGES ARE NOT INCLUDED * * PLEASE NOTE: PART WILL BE SHIPPED WITHIN 1-2 DAYS AFTER WE RECEIVE PAYMENT * Out-of-state sale, exempt from sales tax		0.00%	0.00

Incubator : Shaker, Floor, NewBrunswick, @FV

New Brunswick Scientific C25 Incubated Floor Model Shaker
Part Number: M1246-0000

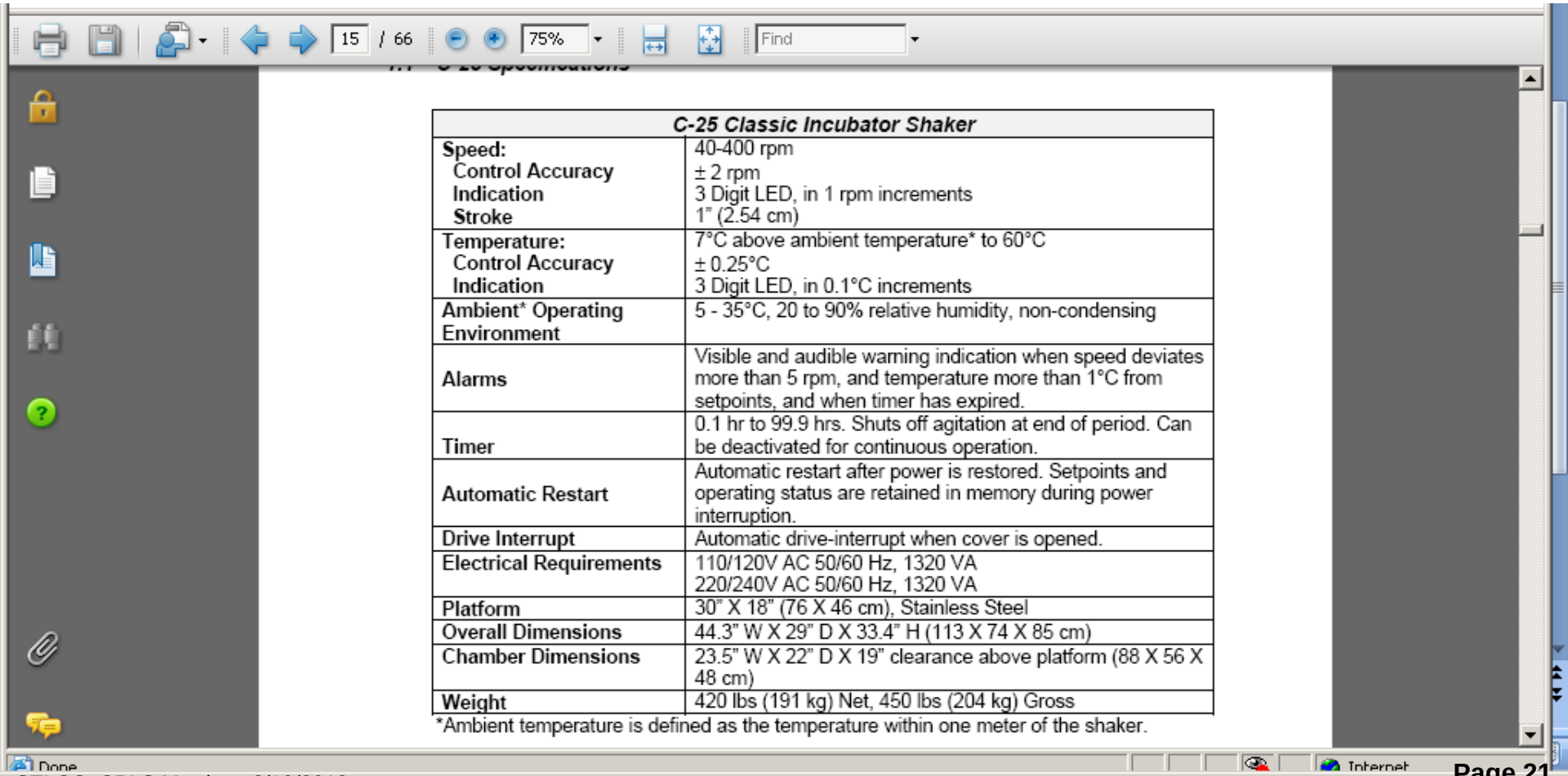
44” W x 25” D x 34” H

The C-25 Classic Incubator and C-25KC Classic Refrigerated Incubator Shakers are large capacity shakers utilizing an eccentric counter balanced drive to provide horizontal plane rotary motion in a 1" (2.54 cm) circular orbit. A Proportional/Integral (PI) Microprocessor controller with instantaneous digital feedback controls the speed over a range of 50-400 rpm. The C-25 provides temperature control over a range of 7°C above ambient to 60°C, and the C-25KC provides temperature control over a range of 15°C below ambient (minimum 4°C) to 60°C. Ambient temperature is defined as the temperature within one meter of the shaker. The shakers may be operated either continuously or in a timed mode via a programmable timer for shaking periods of 0.1 hr. to 99.9 hrs. For safe operation, both the C-25 and C-25KC are designed with a safety switch that automatically stops the shaker mechanism when the lid is lifted. In addition, the C-25 and C-25KC are equipped with visual and audible alarms that alert the user to the following conditions:

- The end of a timed run
- Deviations of shaking speed
- Deviations of temperature setpoint
- Power failure
- Lid open

A wide variety of platforms can be used with the C-25 or C-25KC.
Product Family: C-25, C25, C 25, C-25KC, C25KC, C 25KC

Incubator: Shaker, Floor, @FV, C-25 Specifications



C-25 Classic Incubator Shaker	
Speed: **Control Accuracy** **Indication** **Stroke**	40-400 rpm ± 2 rpm 3 Digit LED, in 1 rpm increments 1" (2.54 cm)
Temperature: **Control Accuracy** **Indication**	7°C above ambient temperature* to 60°C ± 0.25°C 3 Digit LED, in 0.1°C increments
Ambient* Operating Environment	5 - 35°C, 20 to 90% relative humidity, non-condensing
Alarms	Visible and audible warning indication when speed deviates more than 5 rpm, and temperature more than 1°C from setpoints, and when timer has expired.
Timer	0.1 hr to 99.9 hrs. Shuts off agitation at end of period. Can be deactivated for continuous operation.
Automatic Restart	Automatic restart after power is restored. Setpoints and operating status are retained in memory during power interruption.
Drive Interrupt	Automatic drive-interrupt when cover is opened.
Electrical Requirements	110/120V AC 50/60 Hz, 1320 VA 220/240V AC 50/60 Hz, 1320 VA
Platform	30" X 18" (76 X 46 cm), Stainless Steel
Overall Dimensions	44.3" W X 29" D X 33.4" H (113 X 74 X 85 cm)
Chamber Dimensions	23.5" W X 22" D X 19" clearance above platform (88 X 56 X 48 cm)
Weight	420 lbs (191 kg) Net, 450 lbs (204 kg) Gross

*Ambient temperature is defined as the temperature within one meter of the shaker.

Incubator: Floor, Upright,Reach-in, Sheldon Manf

RI28 28 cu ft Reach-In Incubator (120V), Sheldon Manf.

Reach In The Model RI28 incubator provides extra-large capacities while minimizing the amount of floor space used. This large space is kept uniform by intergrating a highly responsive mircoprocessor with the appropriatly sized heating element. A totally independent secondary temperature controller offers the added security of over-temperature protection. Our unique forced air circulation system creates a one-pass circulation pattern that provides both exceptional temperature uniformity and rapid heat recovery. The chamber floors are ruggedly reinforced to support roller apparatus or shakers.

The RI28 is supplied with:
six (6) study shelves that will not sag or bend under heavy loads.
Microprocessor Control
5C to 70C
Power: 120V, 8.5A
28 cuft internal
Viewing Window
Accomodates Roller Bottle Apparatus
Power Coated White Interior
Supplied with 6 Shelves
12 Month Warranty

Hotlink to Shel-Lab RI28 Incubator User Manual … pdf

Incubator: Shel-Lab, 28 cuft, Main Controls

5.5 **Set Main Temperature Controller:** Enter desired set point temperature. To enter set point mode on the controller, press either the Up or Down arrow pad one time. The digital display will start to blink, going from bright to dim. While blinking, the digital display is showing the set point. To change the set point, use the Up and Down arrow pads. If the arrow pads are not pressed for five (5) seconds, the display will stop blinking and will read the chamber temperature. Note that the Overtemperature Thermostat should be turned to its maximum position, (clockwise) until the unit has stabilized at desired set point temperature. Allow the incubator at least 24 hours to stabilize.

5.6 **Calibration:** It is recommended that calibration is done once the unit is installed in its working environment and has been stabile at set point for several hours. Place a certified reference thermometer in the chamber where it can be easily viewed through the window. Be certain the thermometer is not touching any shelving. Allow the temperature to stabilize again until the thermometer reads a constant value for one hour. Compare the digital display with the reference thermometer. If there is an unacceptable difference, put the display into calibration mode by pressing both the Up and Down arrow pads at the same time for five (5) seconds until the two outside decimal points begin to flash. While the decimal points are flashing the display can be calibrated by pressing the Up or Down arrow pads until the display reads the correct value. Allow the incubator temperature to stabilize again, and recalibrate if necessary.

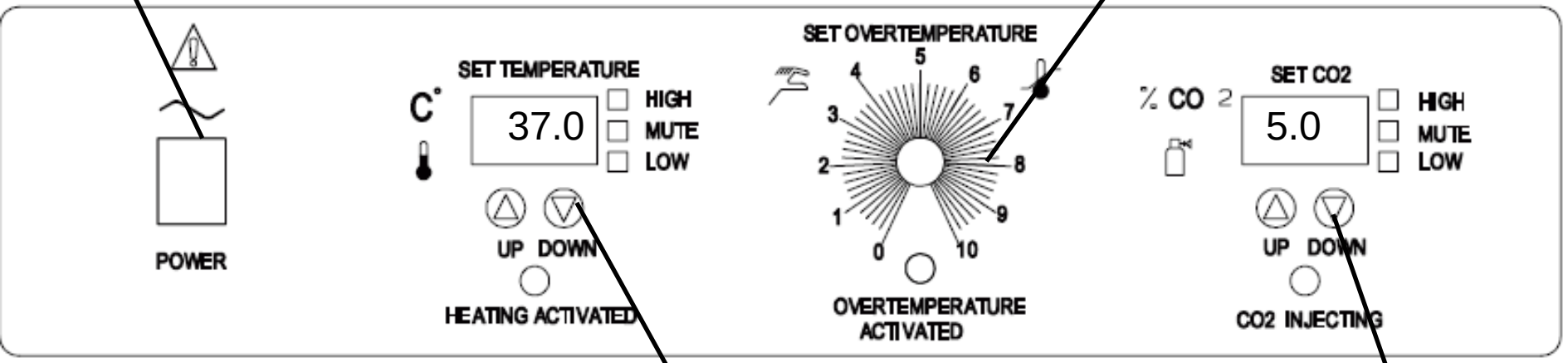
5.7 **Set Overtemperature Thermostat:** As mentioned in step 5.2, the Overtemperature Thermostat should be initially set to its maximum position, to allow the unit to stabilize. Once the incubator is stabile at the desired set point, turn the Thermostat counterclockwise until the OVER TEMP light turns on. Next, turn the Thermostat clockwise just until the light turns off. Then turn the Thermostat clockwise two of the smallest divisions on its scale past the point where the light went out. This will set the Overtemperature Thermostat at approximately 1°C above Main temperature set point.

Incubator: Shel lab 40cuft, Reach-in, CO2 Regulated

- 42”w x 34”deep x 88” high
- Sheldon Model 1927 SN 1200300
- Heat control Tested at Oakland Warehouse 6/8/11
- Moved to BRDG by July 2011
- CO2 Loss rate 1% per hour tested 9/13/11 or about 24 cu ft per day without door openings and at Zero input pressure (gas off).

Hotlink to Shel-Lab Model 1927 Incubator User Manual … pdf

Incubator: Temp and CO2, Control Panel Shel-lab, 40cuft



Power ON/OFF

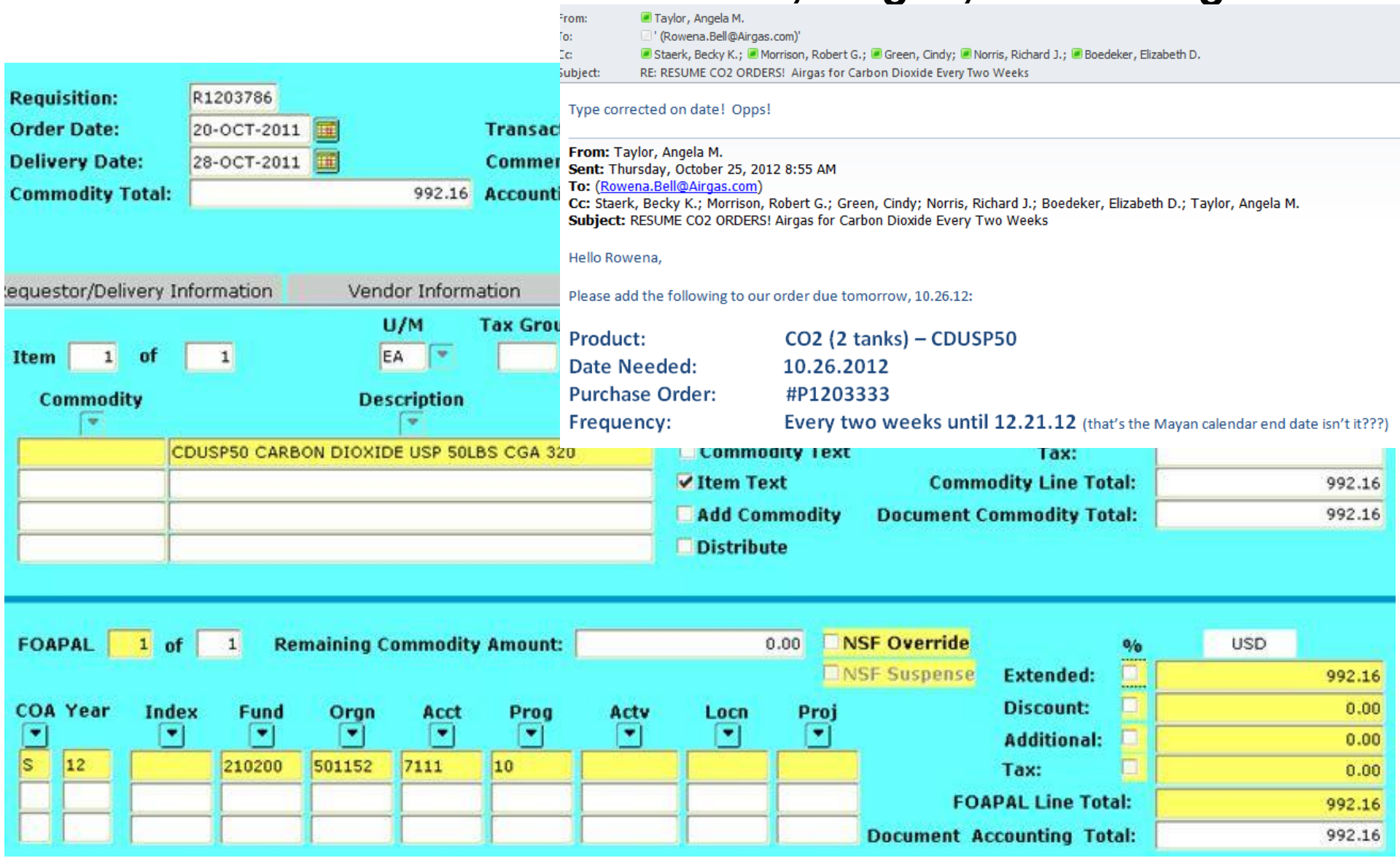
Set for max allowed over set temp value

Use up/down to set Temp, degrees C

Use up/down to set Desired CO2 level %

Set Regulator on Supply tank to about 12 PSI Max

Incubators: CO2 Tank order, Airgas, continuing



Requisition: R1203786
Order Date: 20-OCT-2011
Delivery Date: 28-OCT-2011
Commodity Total: 992.16

From: Taylor, Angela M.
To: ' (Rowena.Bell@Airgas.com)'
Cc: Staerk, Becky K.; Morrison, Robert G.; Green, Cindy; Norris, Richard J.; Boedeker, Elizabeth D.
Subject: RE: RESUME CO2 ORDERS! Airgas for Carbon Dioxide Every Two Weeks

Type corrected on date! Opps!

From: Taylor, Angela M.
Sent: Thursday, October 25, 2012 8:55 AM
To: (Rowena.Bell@Airgas.com)
Cc: Staerk, Becky K.; Morrison, Robert G.; Green, Cindy; Norris, Richard J.; Boedeker, Elizabeth D.; Taylor, Angela M.
Subject: RESUME CO2 ORDERS! Airgas for Carbon Dioxide Every Two Weeks

Hello Rowena,

Please add the following to our order due tomorrow, 10.26.12:

Product: CO2 (2 tanks) – CDUSP50
Date Needed: 10.26.2012
Purchase Order: #P1203333
Frequency: Every two weeks until 12.21.12 (that's the Mayan calendar end date isn't it???)

Requestor/Delivery Information | Vendor Information

Item 1 of 1 U/M EA Tax Grou

Commodity: CDUSP50 CARBON DIOXIDE USP 50LBS CGA 320
Description

Commodity Text
Item Text
Add Commodity
Distribute

Tax:
Commodity Line Total: 992.16
Document Commodity Total: 992.16

FOAPAL 1 of 1 Remaining Commodity Amount: 0.00
NSF Override
NSF Suspense

% USD

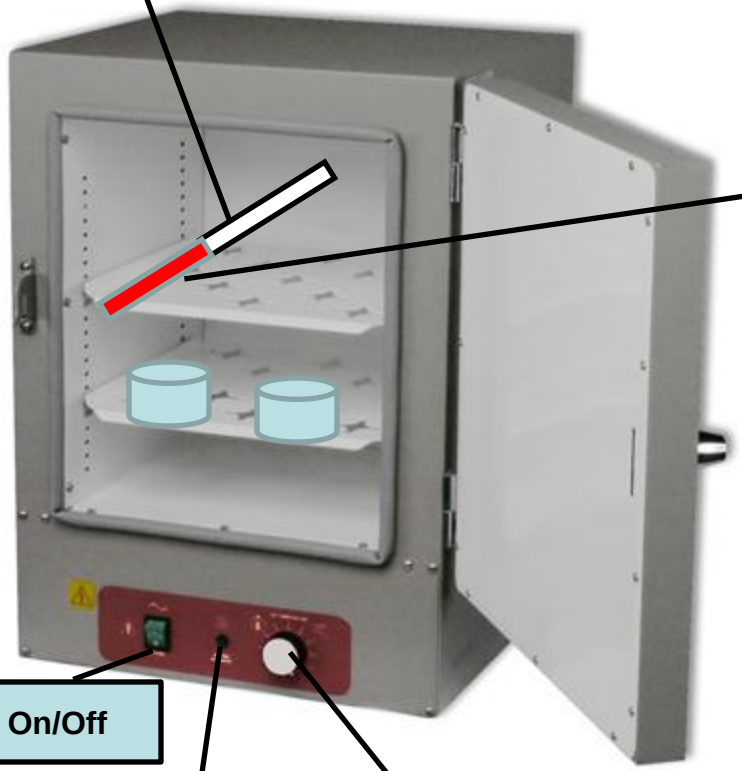
COA	Year	Index	Fund	Orgn	Acct	Prog	Actv	Locn	Proj
S	12		210200	501152	7111	10			

Extended: 992.16
Discount: 0.00
Additional: 0.00
Tax: 0.00
FOAPAL Line Total: 992.16
Document Accounting Total: 992.16

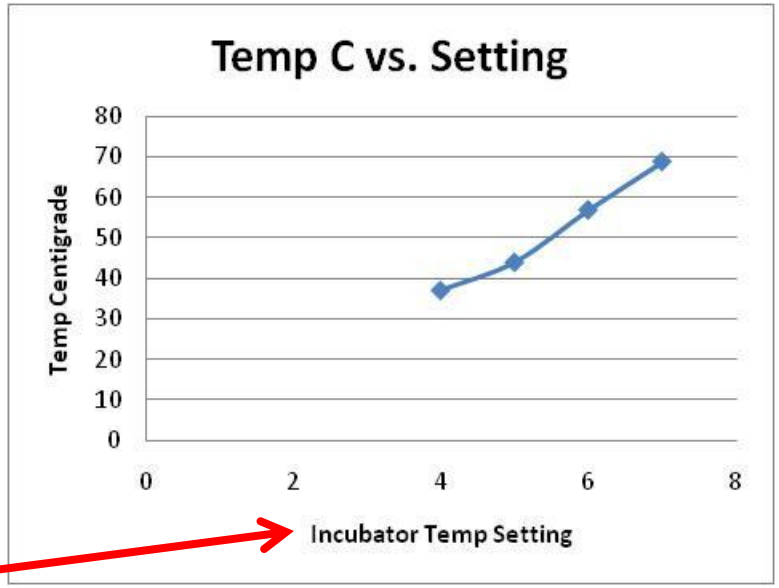
Incubator: Bench, 2 cft, VWR

Model: VWR E1510, 2cuft, from Sheldon Manf.
Weight 71.00 lbs
Incubator Interior Dimensions WxDxH in. (cm) 17 x 12 x 17 in.
Interior Dimensions WxDxH in. (cm) 21.5 x 18 x 25.5 in.
Temperature Range 5°C above ambient to 70°C
www.shellab.com

2. Place thermometer and samples on shelves



5. Monitor Actual vs. Desired Temperature, Adjust setting as needed



1. On/Off

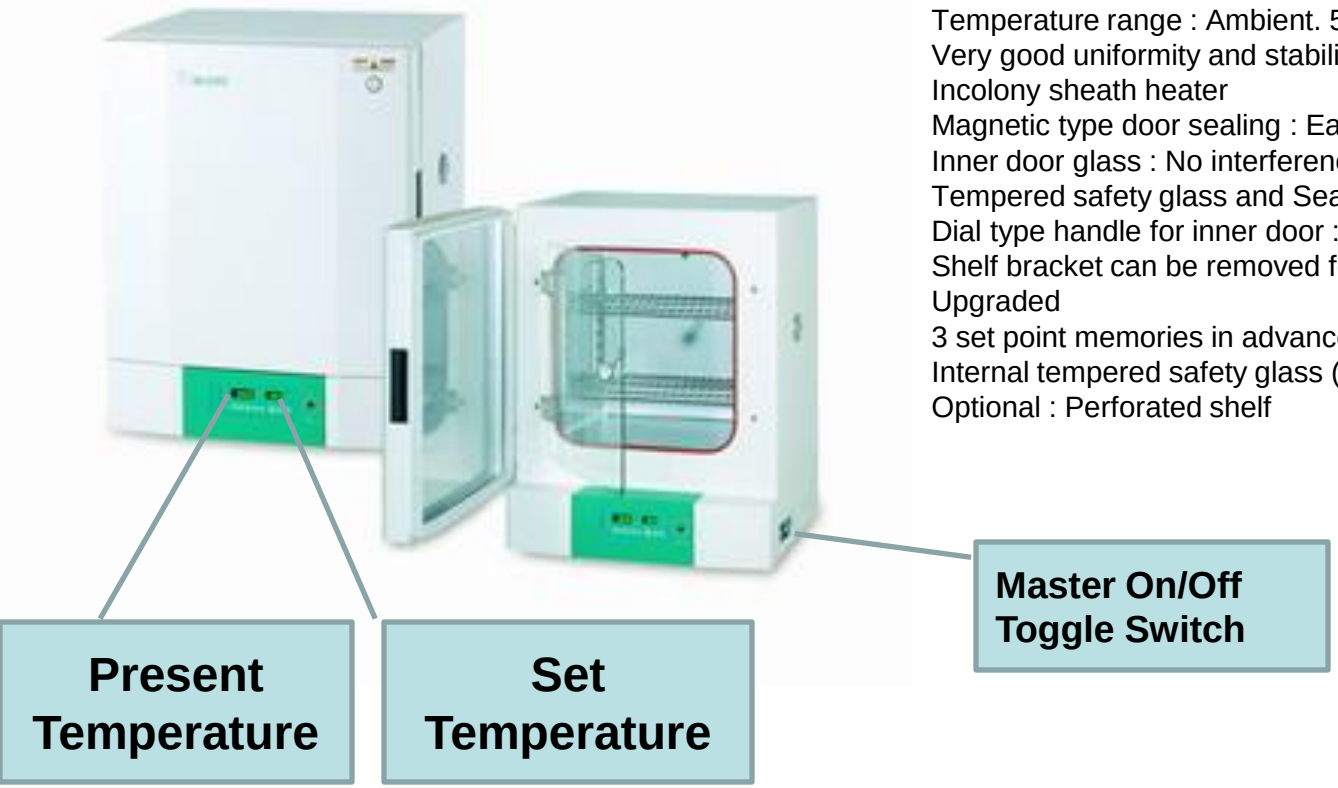
4. Note Heat ON Light

3. Set Temp Control Per Chart for Approx Temperature C

Incubator: Benchtop or Stacked, @FV, LabCompanion,

Lab Companion™ Air-Jacketed Incubators (Jeio Tech Inc, China)

IB-25G Incubator



CLS - Control System and PID microprocessor controller with enhanced safety features.
Temperature safety exceeds DIN Class II controller.
Auto-Tuning function & Bias function - internal built in re-calibration
Timer : Time Delay ON / OFF (standard 99hr 59min)
Selectable measuring temperature units C and F
Selectable Auto-run or Manual -run
Audible visual and audio alarm - OT and Door Open
Temperature range : Ambient. 5 to + 70.0 C
Very good uniformity and stability
Incolony sheath heater
Magnetic type door sealing : Easy and convenient door open and close.
Inner door glass : No interference during outer door open.
Tempered safety glass and Sealing chamber perfectly.
Dial type handle for inner door : Solid and Easy open and close.
Shelf bracket can be removed for easy cleaning with disinfectant - Upgraded
3 set point memories in advance : Save time without AUTO-TUNING
Internal tempered safety glass (5 mm)
Optional : Perforated shelf

Incubator: Bench, LabCompanion @FV, Control Panel

PV: Present Value of chamber

SV: Set value of chamber

RUN; lit when unit is on and monitoring preset values for temp

HEAT: blinking or lit when heater is on

A/T: flickers in auto-tune mode

W/ON: Lit in wait mode for timer

W/OFF: Lit waiting off time

DOOR: Lit if door is open, alarm if > 1 min. Heat will turn off.

O/T: Lit if alarm and overheated

AUTOTUNE: Special test/tune operation mode

Lock; hold for 3 sec to lock/protect other keys; hold again to release

TEMP: To set temperature

TIMER: To set timer mode

ENTER: To accept values

START/STOP: Start or resume. Note, if inner door is open > 1min, press START to resume heating, look for blinking heat light.

If Door is open >1min, Alarm will sound and you must press START to resume previous settings/temperatures

Models	30M
Chamber Volume	30 cu. ft.
	(849.6. liters)
Convection Technique	Mechanical
Temperature Control	Hydraulic Thermostat
Temperature	
Range	Ambient +5 °C to 70 °C
Uniformity	±0.5 °C at 37 °C
Sensitivity	±0.2 °C
Recovery Time @ 37 °C	14 minutes
Dimensions (L x W x H)	
Chamber	24.25 x 30 x 72 in.
	(61.6 x 72.2 x 182.9 cm)
Shelf (each)	23.5 x 28.5 in.
	(60.0 x 72.4 cm)
Exterior[1]	31.5 x 36 x 88.5 in.
	(74.3 x 91.4 x 224.8 cm)
Electrical Specs	(50/60 Hz)
120 V	1450 Watts
	12.1 Amps
BTU Output	4952
Shelves	6 supplied
Shipping Data	
Dimensions[2]	42 x 95 x 40 in.
	(106.7 x 241.3 x 101.6 cm)
Weight	685 lbs.
	(310.7 kg)
Volume	92.6 cu. ft.
	(2.62 cu. meters)
Catalog Number	
LH Hinge, Solid Door	3971
LH Hinge, Glass Door	3973

[1] Add 2.25 inches to depth of unit for door handle.
[2] Unit is shipped on its back in a wooden crate.

Incubator: 30cuft, Precision Sci, Model 30M

Property of:

St. Louis Community College CPLS

(Donated by Gallus)

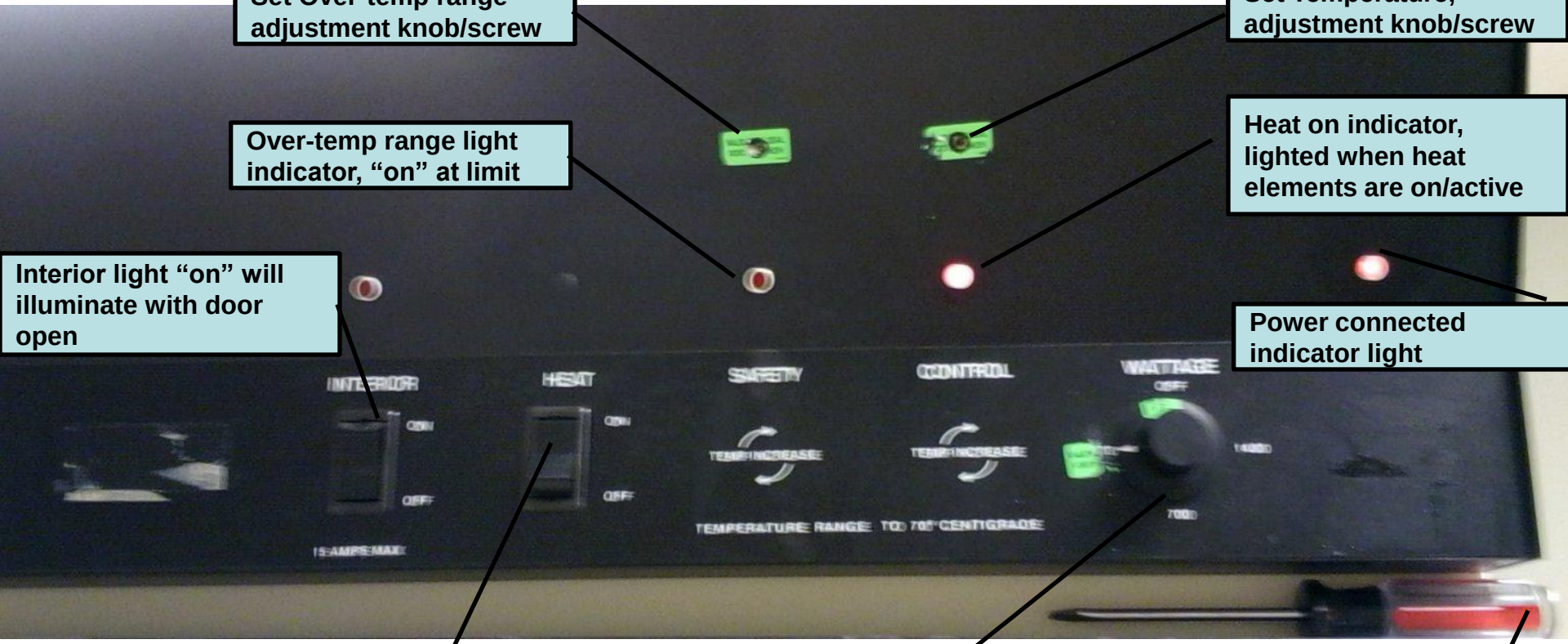
Precision 30M Incubator

The temperature range is ambient +5C to 65C.

Precision Mechanical Convection Incubator
Model # 30M Glass; S/N # 699050714
Biological Indicator testing (55C – 60C) ~10 -12 years
Unit has been maintained, validated and calibrated on scheduled basis.
Production speeds N/A - 120V; 1450 W; 12.1 Amps

Jean Stuckey
QC Microbiology Manager
Gallus BioPharmaceuticals, LLC
(314) 733-3107 (office)
(618) 407-3880 (cell)
4766 LaGuardia Drive
St. Louis, MO 63134-3117

Incubator: Precision, 30cuft, Controls, (Donated-Gallus)



Set Over-temp range adjustment knob/screw

Set Temperature, adjustment knob/screw

Over-temp range light indicator, "on" at limit

Heat on indicator, lighted when heat elements are on/active

Interior light "on" will illuminate with door open

Power connected indicator light

Heating Master Switch Set "on" for normal use

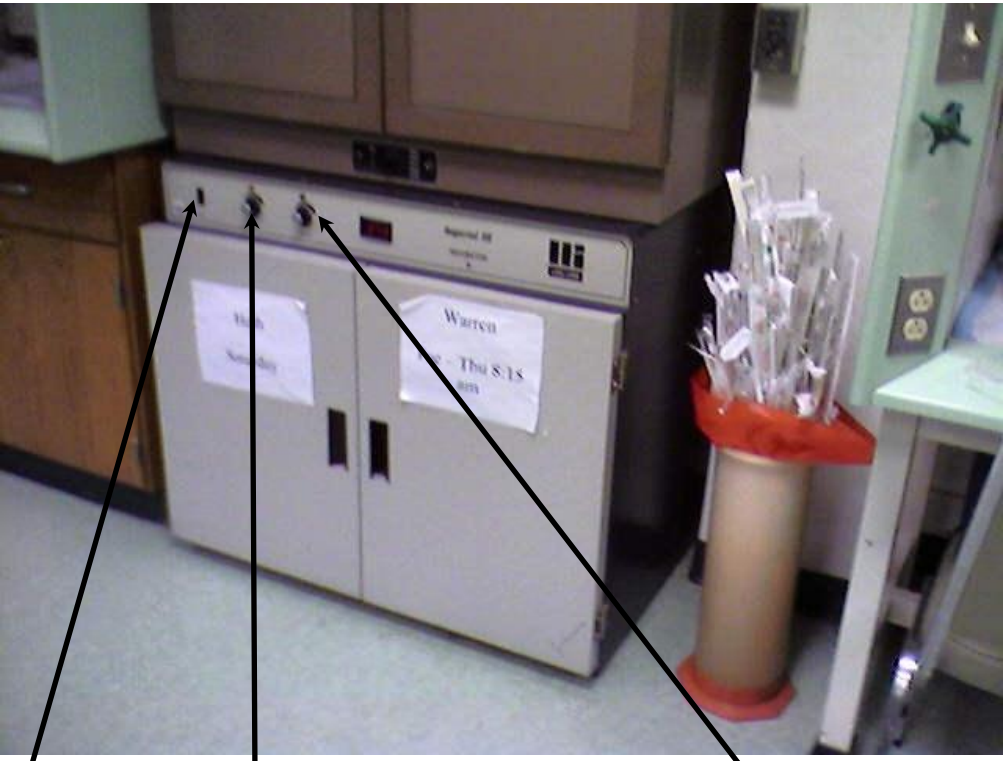
Heat Wattage Knob: 350, 700, 1400
Use Higher settings to reach set-point faster, then set to lower wattage to maintain

Temporary tool to adjust heat/range screws

GENERAL OPERATIONS:

1. Turn temperature set screw/knob clockwise to increase temperature setting
2. Set wattage to highest value (1400) t o reach set point faster
3. Set limit or range for allowance above set point temperature
4. Monitor temperature gage and adjust temperature screw/knob until desired temperature is reached
5. Set wattage to a lower value to maintain temperature, monitor for other changes.

Incubator : LabLine Imperial III @FV



LabLine Imperial III 120V

41” W x 28” D x 35” H

Incubator : Chicago Surgical/LabLine @FV, Model Cat 600

Cat 600, SN 0-69,
120V, 500Watts

41” W x 26” D x 40” H

On/Off

Analog Dial
Temp Control 0-9

Incubator : Fisher Scientific Isotemp @FV

Fisher Scientific Isotemp Incubator STLCC 001804 25” w x 25” D x 45” H

Woods -20 C Freezer (ref)

Fisher Scientific Isotemp Incubator STLCC 001805 25” w x 25” D x 45”

Set at 36.8C

Incubator : Microwave Oven, Countertop, Turntable, @FV

GE .7 cu ft Typical
PN: DE68-40289B

Incubator: Microwave, Benchtop, VWR/Argos

Compact Microwave Oven, Argos Technologies

The compact design of this 19.8L capacity oven makes it ideal for the crowded lab, as it occupies only minimal counter top area. The control panel is easy to read and use. The Minute Plus* feature sets the oven at high power with a single touch. An internal turntable rotates during operation for even heat distribution. (Argos 111 071)

Note: Unit is not explosion-proof and is not intended for use in acid digestion applications.

Meets or exceeds all safety performance and sanitation standards set for Commercial Food Service Microwave Ovens by HHS, FCC, and NSF. UL listed.

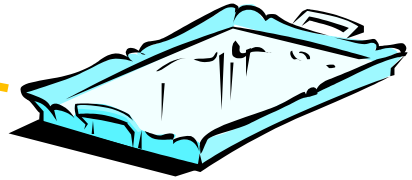
Capacity: 19.8 L (0.7 cu. ft.)
Electrical: 120V, 60Hz, 700W
Interior Dimensions: 32.1W x 33.7D x 20H cm
(125/8 x 131/4 x 77/8")
Shipping Weight: 15 kg (33 lbs.)

Incubator : Plant, Percival Upright

Percival Adv Intellus Environment Control
Model: CU36L4.A SN: 9012.01.061
110V, 10amp Refr: 134A, 15oz
Temp Range: (All lights on) 10-44±0.7 ºC Interior Space Volume: 29.6 ft3 (0.84 m3)
Total Shelving Floor Area: 22 ft2 (2.4 m2) Maximum Growing Height: 7 7/8 in. (20 cm)
Exterior Dimensions: inches(cm) Height: 77(195.6) Width: 33.5(85.1) Depth: 33.9(86.1)
Light Intensity:(6" from lamps unless otherwise noted) 140 µmol/m2/s

Link to User Manual … pdf

Link to Installation/Maintenance Manual ..pdf

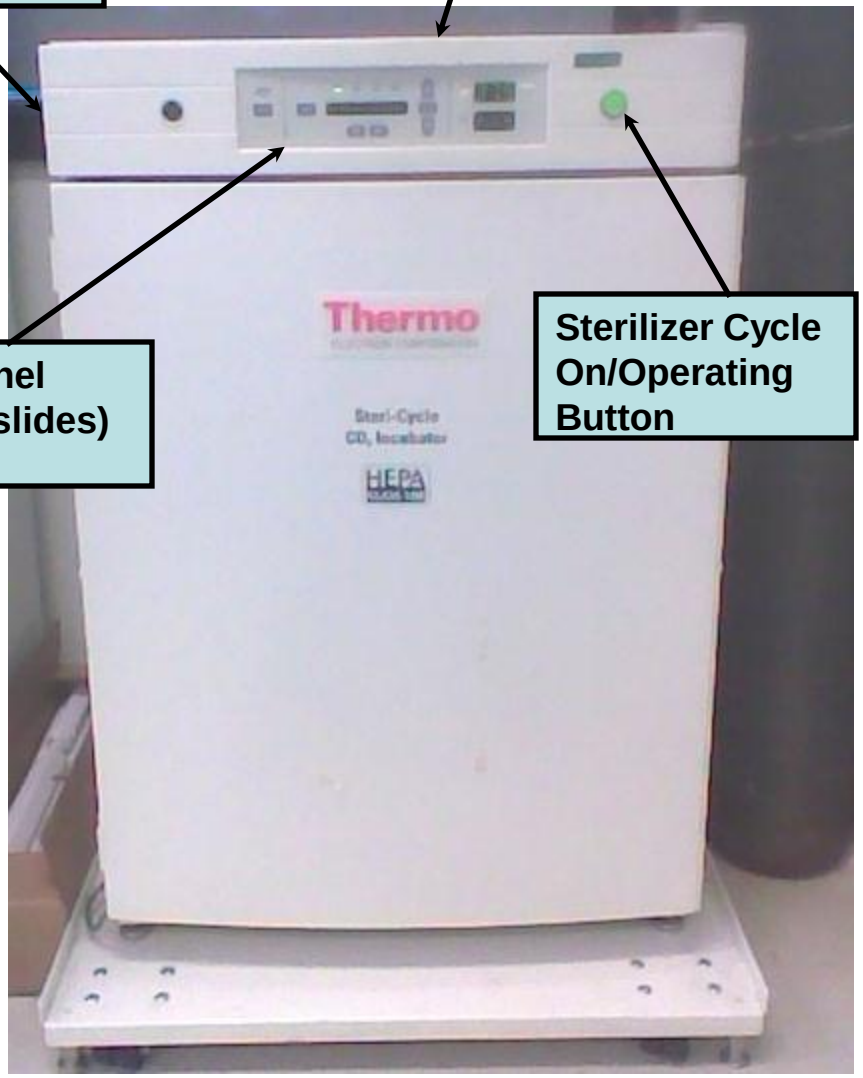


Place a pan under the center of the unit to capture any condensation; dump periodically

If individual lights in a bay are not “on”, check to ensure that the lamp metal end probes extend into the plastic end-caps at both ends and make sure the end-caps are securely in place. If this is the case and the lamp does not light it is probably burned out/bad. Swap a suspected burned out lamp with another rack spot that is working to validate this.

If an entire bay of lamps are out, one or more lamps may be improperly secured in the plastic end-caps. Remove each and make sure the lamp metal ends extend into the end-cap and re-secure end caps.

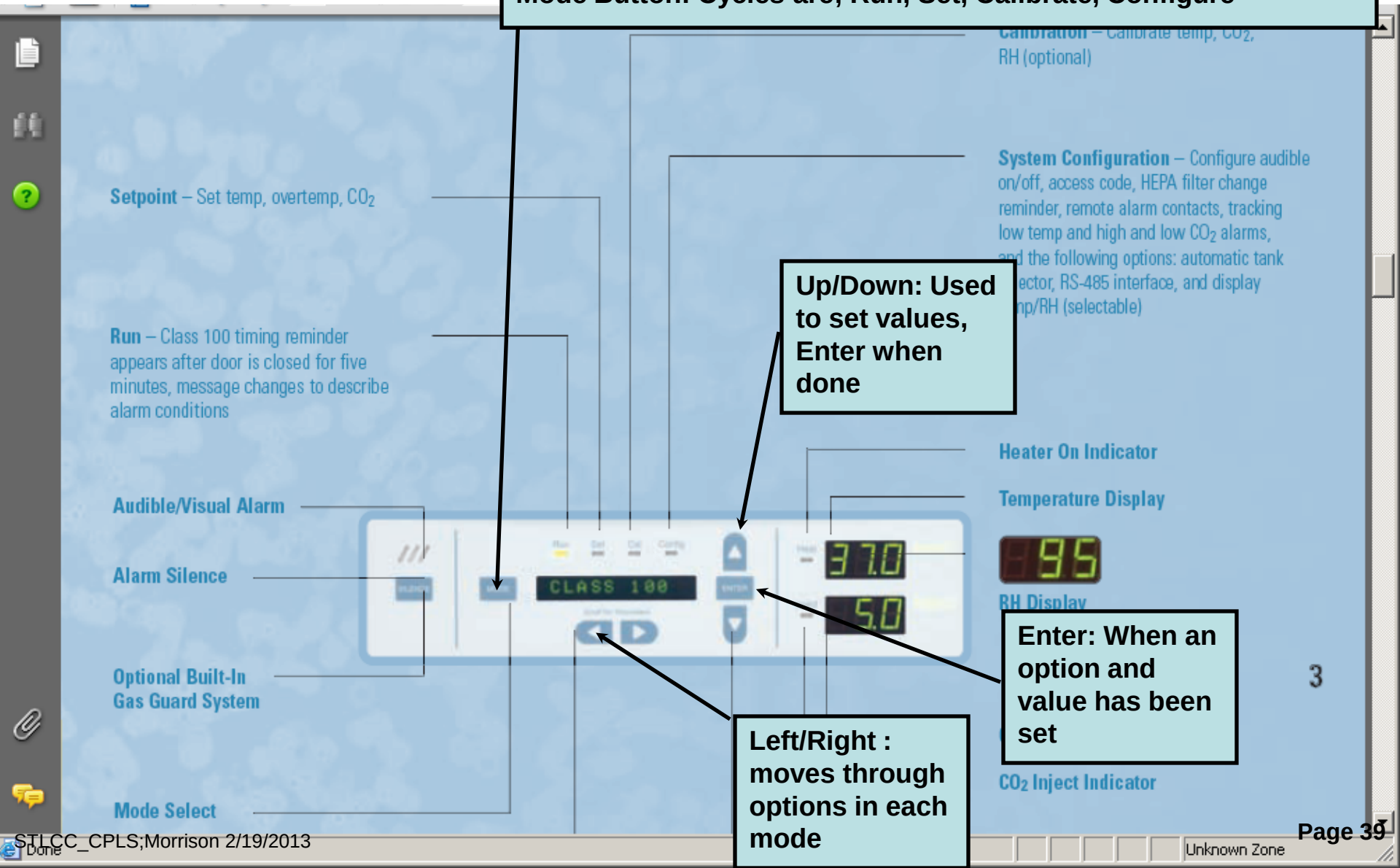
Incubator: CO2, Steri-Cycle, Thermo Electron



The Model 370 direct heat Steri-Cycle CO2 incubator combines the best of both worlds - a unique in-chamber HEPA air filtration system providing continuous protection against unwanted airborne contaminants and an on-demand, **high temperature sterilization cycle,** to simplify your routine cleaning practices. Providing precise CO2 control with choice of TC (thermal conductivity), excellent temperature uniformity and recovery characteristics

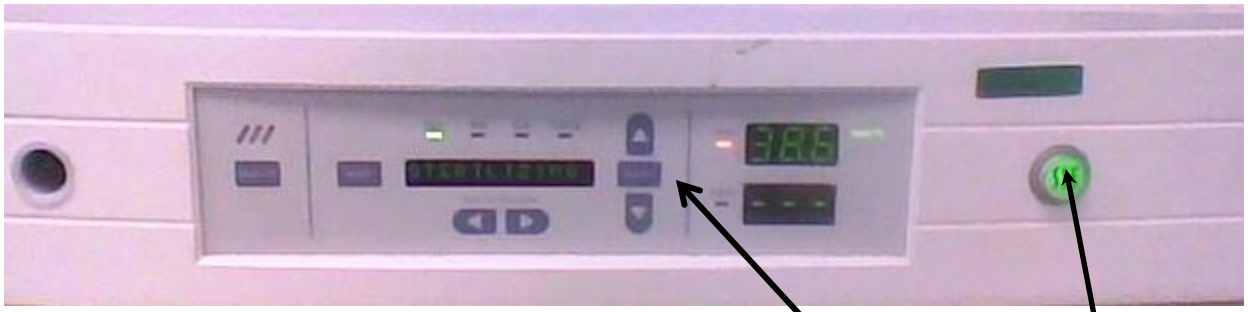
Specifications:
Temperature Range : +5C above ambient to +50C
Temperature Uniformity : +/-0.3C @ 37C
Humidity System : 3.2 quart (3.0 liter) pan
Humidity Range : Ambient to 95% @ 37C
Interior Volume : 6.5 cu.ft. (184.1 liters)
Interior W x H x F-B : 21.3" x 26.8" x 20.0" (54.1cm x 68.1cm x 50.8 cm)
Exterior W x H x F-B : 26.3" x 39.5" x 25.0" (66.3cm x 100.3cm x 63.5cm)
Ship Weight : 315 lbs. (142.9 kg.)

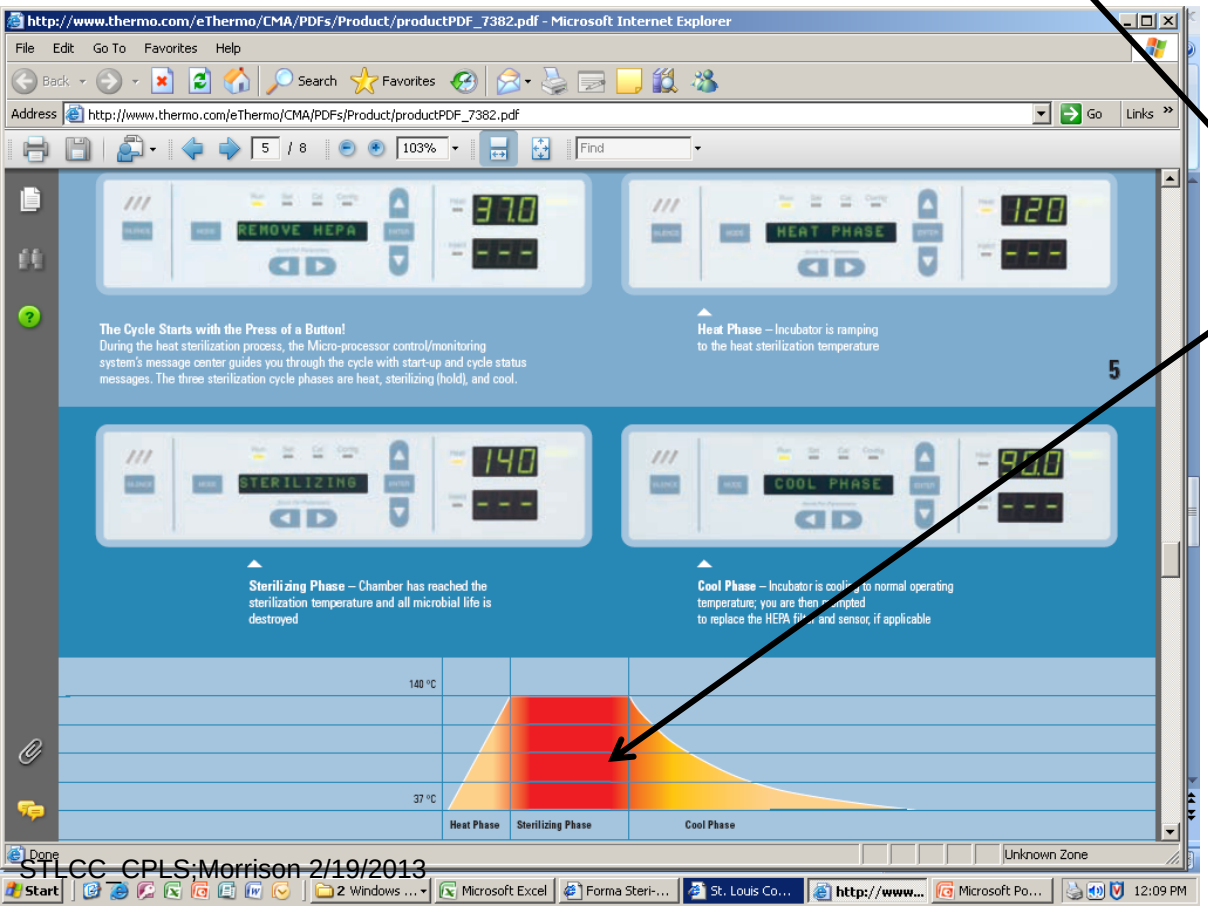
Incubator: CO2, Control Panel



Incubator: CO2; Activating Sterilizer Cycle

(Recommended at Semester Breaks and/or before new Projects)





1. Turn on device on left side
2. Use Mode button to select RUN
3. Press and Hold HEAT button > 5 seconds to activate
4. Follow messages; remove HEPA, remove Water
5. Press ENTER when ready to start Sterilization Cycle
6. Cycle runs through four phases, total about 5 hours.

Incubator: CO2 ThermaForma 370; HEPA and In-line Filter

- **Replacing the Filter:**
  - Open the outer and inner glass door
  - Remove the old filter by twisting and pulling downward.
  - Locate a replacement filter and write date of replacement on it
  - Install the replacement (see info at right) filter and make sure it is pushed completely against the mounting cylinder/ring.
- **Setting the HEPA filter reminder**
  - Press the Mode key until the Config indicator lights
  - Press the right arrow until REPL HEPA XX is displayed
  - Press the up/down arrow to choose the number of months desired
  - Press ENTE to save the number
  - Press the MODE key to return to the RUN mode or right/left to go to the next parameter
  - To check the setting, go to the CONFIG mode, then right arrow until the NEW HEPA XX displays. This is the number of days remaining until the replacement interval runs out.
  - **A suggested interval of 6 months is the default setting, however the interval may be adjusted due to environmental or other considerations.**

HEPA Filter Information

ThermoForma, Part number 760175, SN TF0529411316 H
Air Flow 4 CFM, Resistance <.44 inches w.g., Efficiency> 99.97 (0.3 microns)

1/18/12 Info:
Main HEPA Filter; For 3110 Series, 310 Series (w/ HEPA option), Steri-Cycle Series incubators
Fisher Sci Cat #15-497-022
Thermo Scientific
No.:760175 Each for $66.03

LabSource Catalog # 15497026
Manufactured By: Thermo Forma Replacement in-line filters
Manufacturer's Part No: 760210
Description: NAPCO 8000 GAS FILTER PK
Incubator accessories
Gas Line Filters, Incubator Accessory; For Isotemp Large Capacity and NAPCO 8000 Series CO2 Incubators;
Item No
15497026 $130.40 PK

Incubators: CO2 Thermo, Warning Messages

Description	Message	Delay	Ringback	Relay
No alarm condition exists	SYSTEM OK or CLASS 100	-----	-----	-----
Temp > Otemp Set point	SYS IN OTEMP	0 min.	15 min.	Yes
Air Temp Sensor Fault	AIR SNSR ERR	0 min.	15 min.	No
Temperature Controller Failure	TMP CTRL ERR	0 min.	15 min.	YES
CO2 Sensor Fault	CO2 SNSR ERR	0 min.	15 min.	No
Replace HEPA filter reminder-set time expired (See Section 3)	REPLACE HEPA	0 min.	-----	No
Inner Door is Open	DOOR OPEN	15 min.	15 min.	No
CO2 is higher than CO2 High Tracking Alarm	CO2 IS HIGH	15 min.	15 min.	Programmable
CO2 is lower than CO2 Low Tracking Alarm	CO2 IS LOW	15 min.	15 min.	Programmable
TEMP is lower TEMP Low Tracking Alarm	TEMP IS LOW	15 min.	15 min.	Programmable
RH is lower than RH Low Limit Alarm (RH option)	RH IS LOW	30 min.	30 min.	Programmable
Tank 1 is low, switch to Tank 2 (Gas Guard only)	TANK1 LOW	0 min.	----	No
Tank 2 is low, switch to Tank 1 (Gas Guard only)	TANK2 LOW	0 min.	----	No
Both tanks are low (Gas Guard only)	TANK 1 and 2 LOW	0 min.	15 min.	No

- All alarm delays and ringback times are ±30 seconds -

When multiple alarm conditions occur, active messages are displayed in the message center one at a time, updating at 5 second intervals. Pressing Silence during multiple alarms causes all active alarms to be silenced and to ring back in 15 minutes.

The TEMP IS LOW alarm is disabled when the Temp set point is 10°C. The CO_2 alarms are disabled when the CO_2 set point is 0.0%.

CO2 Incubator/Sterilizer ; Model 370 Specifications

Thermo Scientific Steri-Cycle™ CO_2 Incubators

Specifications

Temperature	
Control	±0.1°C
Range	5°C above ambient to 50°C (122F)
Uniformity	±0.3°C @ 37°C (98.6F)
Tracking Alarm	User-programmable low
Overtemperature	
Sensor	Precision thermistor
Setability	0.1°C
Function	Shuts off heat
Temperature Safety	
Sensor	Independent thermostat
Controller	Independent analog electronic
Sterilization Cycle	
Sensor	Precision thermistor
Cycle Temperature	140°C (284F)
Cycle Length	Under 12 hours
CO_2	
Control	Better than ±0.1%
Range	0-20%
Inlet Pressure	15 PSIG (1.0 bar)
Sensor	T/C or IR
Readability & Setability	0.1%
Tracking Alarm	User-programmable high/low
Humidity	
RH	Ambient to 95% @ 37°C (98.6F)
Humidity Pan	3.2 qt. (3.0 liters) standard
Display (opt.)	In 1% increments
Fittings	
Access Port	1.3" (3.3cm) with removable silicone plug with filter
CO_2 Inlet	1/4" hose (barbed)
Unit Heat Load	
115V/230V	293 BTUH (86 Watts)

Shelves	
Dimensions	18.5" x 18.5" (47.0cm x 47.0cm)
Construction	Stainless steel, perforated
Surface Area	2.4 sq. ft. (0.2 sq. m)
Max. per Chamber	36.0 sq. ft. (3.3 sq. m)
Standard, Maximum	4, 15
Construction	
Interior Volume	6.5 cu. ft. (184.1 liters)
Interior	Type 304, polished 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	
370/380	115V, 50/60 Hz, 9.6 FLA (Operating range 90-125V)
371/381	230V, 50/60 Hz, 4.4 FLA (Operating range 180-250V)
Circuit Breaker/	12 Amps/2 Pole
Power Switch	
Convenience	75 Watts maximum
Receptacle	(matches cabinet voltage)
Plug	115V: NEMA 5-15P Plug
	230V: CEE 7/7 Plug
Alarm Contacts	Power interruption; deviation of temp, CO_2,
	RH; customer connections through jack on back of unit
Data Outputs (opt.)	RS-485, 0-1V, 0-5V, 4-20 milliamp (select one)
Dimensions	
Exterior	26.3"W x 39.5"H x 25.0"F-B (66.8cm x 100.3cm x 63.5cm)
Interior	21.3"W x 26.8"H x 20.0"F-B(54.1cm x 68.1cm x 50.8cm)
Weight	
Net	260 lbs. (117.9 kg)
Shipping (Motor)	315 lbs. (142.9 kg)

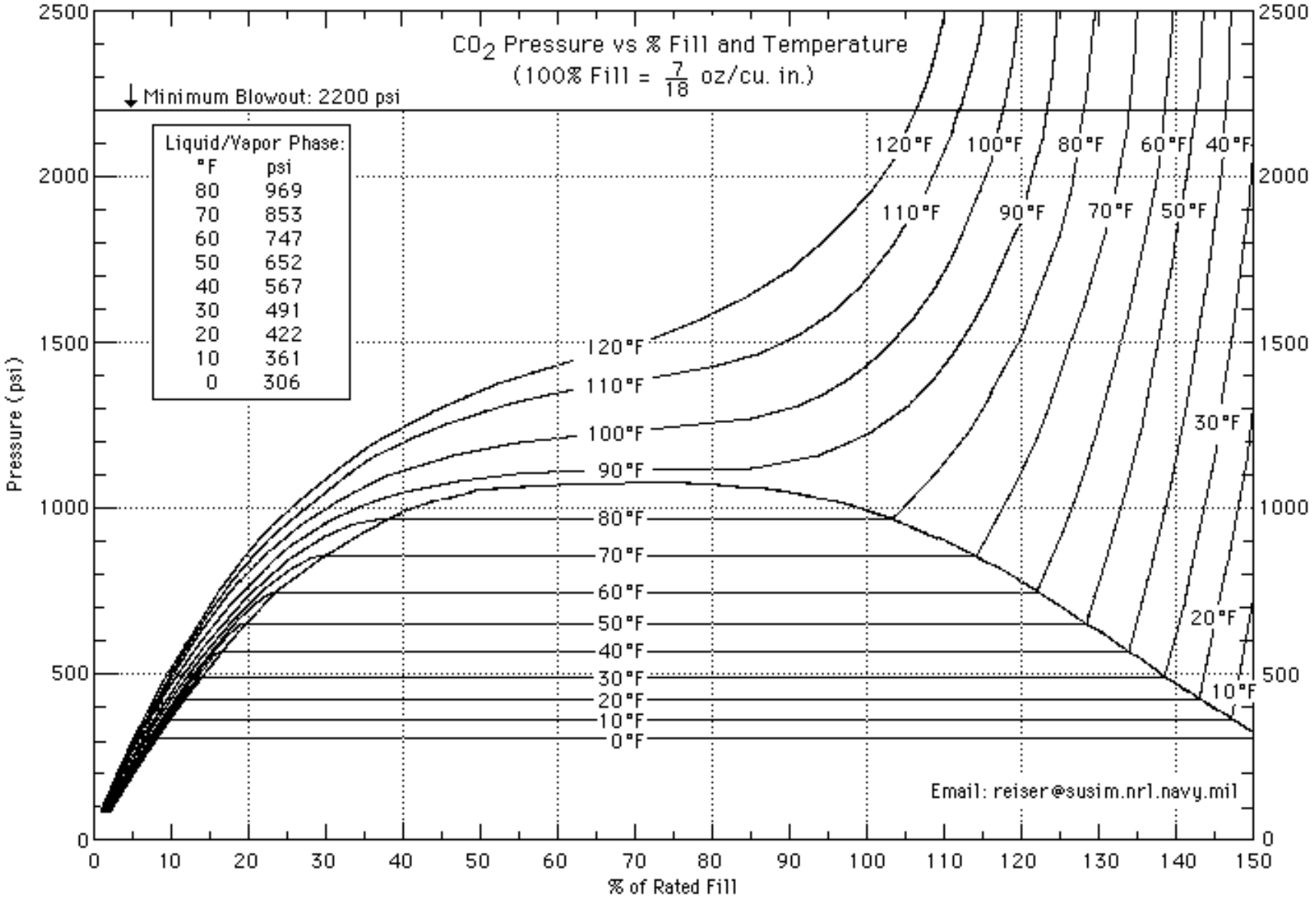
RH Display	
Humidity (RH) Display, readable in 1% increments, includes low RH programmable alarm (alerts you of need to add water to humidity pan), factory installed	1900091
Shelving, Ductwork, and Humidity Pans	
Stainless Steel Components –	
Stainless Steel Shelf and Channels	190884
Stainless Steel Humidity Pan	237016
Stainless Steel Ductwork Kit, includes side ducts and shelf channels	190670
Solid Copper Components –	
Copper Interior Components Kit; includes side ducts, shelf channels, four shelves, and humidity pan; factory installed at time of order	1900095
Copper Perforated Shelf with Channels	190879
Copper Humidity Pan (Fig. 01)	237020
Filters[1] and Filter Kits	
Replacement HEPA Filter (Fig. 04)	760175
HEPA Value Pack (four filters)	760209
10 Disposable Polypropylene In-Line Filters	760210
HEPA Filter Replacement Kit, includes HEPA, in-line, and access port filters	1900067
Replacement HEPA[2] VOC Filter	760200
HEPA[2] VOC Filter Replacement Kit, includes HEPA[2], in-line and access port filters	1900094
HEPA[2] VOC Filtration System (kit), converts HEPA Filter Airflow System to HEPA[2] Filtration System, includes HEPA[2] filter and two silicone plugs	760199
Door Kit and Right Hand Door Swing	
Independent Inner Glass Door Kit (eight glass doors with latches), mounts inside heated inner glass door, is removable and can be autoclaved (Fig. 02)	190650
Right Hand Door Swing, factory installed at time of order	190666
CO_2 Accessories	
Built-In CO_2 Gas Guard, monitors CO_2 and automatically switches from one cylinder to the other when the supply is exhausted, factory installed	1900086
Wall Clamp for a CO_2 Bottle, includes cylinder holder with web strap	950316
Two-Stage CO_2 Gas Regulator with barbed connection and shut off valve (Fig. 03)	965010
CO_2 Fyrite® Analyzer Kit, 0-20%	155021
Roller Dolly	
Roller Dolly (heavy-duty, powder coated steel base) with dual-wheel, swivel locking casters and leveling feet; supports one or two (stacked) incubators; raises unit 3.0" (7.6cm) off the floor (Fig. 06)	1900063
Data Outputs (select one), factory installed	
RS-485 interface	1900085
4-20 milliamp	190512
0-5V analog	190543
0-1V analog	190544

(continued)

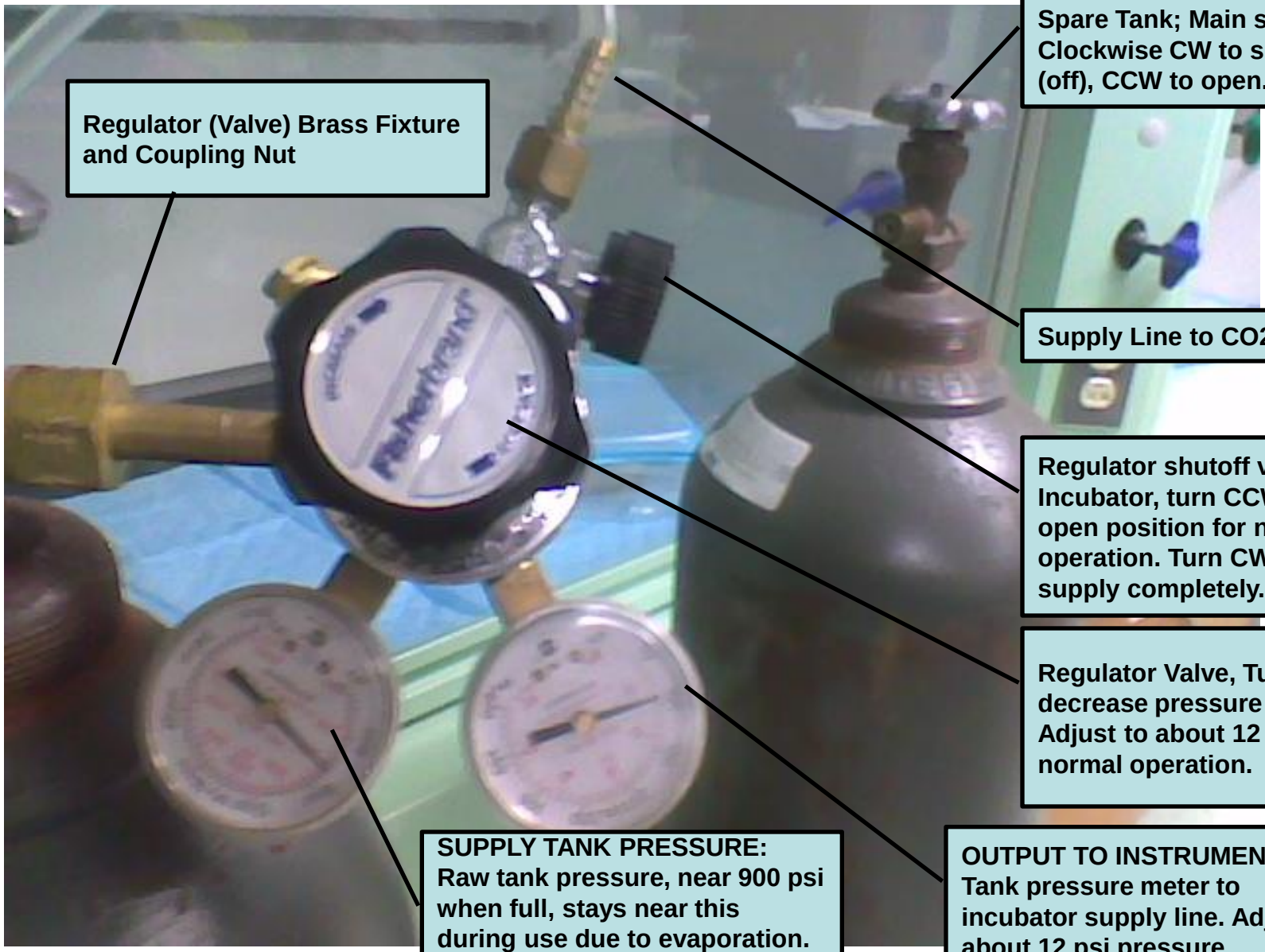
CO2 Incubator Sterilizer ; Model 370 PartNos

Link to ThermaForma Brochure.(pdf)

Incubators: CO2 Tank Pressure vs. Volume



Incubator CO2: Tank and Regulators



Regulator (Valve) Brass Fixture and Coupling Nut

Spare Tank; Main shut-off valve. Clockwise CW to shut valve (off), CCW to open.

Supply Line to CO2 Incubator

Regulator shutoff valve to Incubator, turn CCW to full open position for normal operation. Turn CW to shut off supply completely.

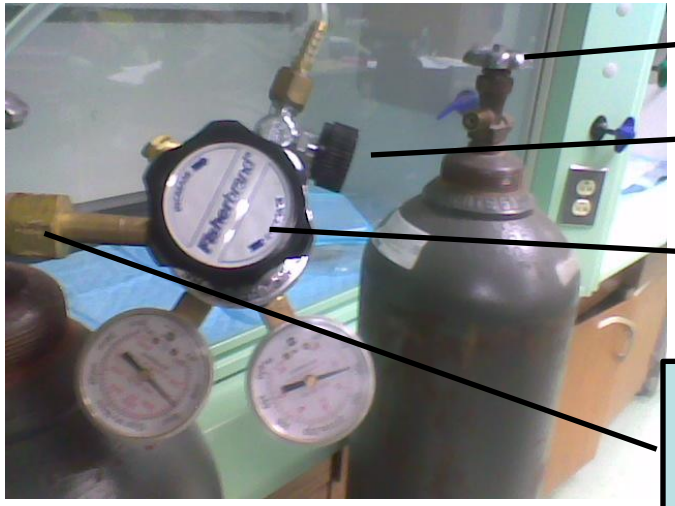
Regulator Valve, Turn CCW to decrease pressure to incubator. Adjust to about 12 psi for normal operation.

SUPPLY TANK PRESSURE: Raw tank pressure, near 900 psi when full, stays near this during use due to evaporation.

When it starts to drop, supply tanks is near empty.

OUTPUT TO INSTRUMENT: Tank pressure meter to incubator supply line. Adjust to about 12 psi pressure maximum.

Incubator CO2: Changing Tanks, transfer regulator



Supply Tank Shut off valve

Regulator Shut off valve

Regulate pressure to instrument or device

Regulator Coupling Nut

Note: on CO2, do not use washer
Check for leaks using soap bubbles

ON ACTIVE TANK

1. Turn Regulator shutoff valve on active tank Clockwise CW to full off position.
2. Turn Tank shutoff valve on the current active tank Clockwise CW to full off position
3. Loosen the Regulator coupling nut with large pliers or wrench (counter clockwise ,CCW to loosen)

ON SPARE or NEW TANK

4. Add pipe thread teflon tape if available.
5. Transfer the Regulator valve assembly to the spare or secondary full tank and tighten the coupling nut by turning it CW until resistance is felt. Be careful not to strip the brass coupling nut or over-tighten.
6. Open the Regular shutoff valve by turning CCW to the full open position
7. Open the Tank shutoff valve by turning CCW slowly until a pressure of <20psi is achieved.
8. Adjust the Regulator main valve to a setting of about 12 psi maximum on the meter.
9. Verify and/or reset CO2 pressure settings on the incubator and wait until desired set level is achieved.

Crosslinker: Stratalinker 1800 UV

The Stratalinker® UV crosslinker is designed to crosslink DNA or RNA to nylon, nitrocellulose, or nylon-reinforced nitrocellulose membranes. The process takes only 25–50 seconds, in contrast to the traditional method of baking filters at 80°C for 2 hours. Additionally, crosslinking has been shown to significantly increase hybridization signals when compared to oven-baking. Each UV crosslinker is equipped with an internal photodetector designed to compensate for the natural shift in power output of aging ultraviolet bulbs.

The crosslinker may be used for Northern, Southern, dot or slot blot analysis,1–3 colony or plaque screening, nicking of DNA in agarose gels prior to blotting,4 dimer formation to perform partial digests for rapid restriction mapping,5 UV sensitivity testing for host strain verification,6 and UV irradiation of PCR samples.

Internal Dimensions (cm) 33.7 W x 18.1 D x 16.8 H
External Dimensions (cm) 46.2 W x 22.4 D x 26.7 H
Weight 9.7 kg
UV Bulbs 8 Watts Each
Power Delivered ~3000 µwatts/cm²

Three independent modes of operation: Time, Energy, or Autocross.

Link to Stratagene Stratalinker Manual ..(pdf)

UV Crosslinking: Modes of Operation-Stratalinker 1800

Selecting the Mode of Operation

The mode of operation selected depends on the specific results desired. Below is a brief explanation of each operating mode.

Energy Mode

When selecting the *Energy* mode, the beeper will sound and the yellow indicator next to the digital display will illuminate. The numbers on the display represent microjoules/cm^2 × 100. Enter the specific microjoule level desired and begin the irradiation. Stratagene recommends 120,000 microjoules for most membranes; if selecting this amount, the LED display will read 1200. If an error is made while entering the energy level, press *Reset* to clear the display and then reenter the desired value.

Time Mode

When selecting the *Time* mode, the beeper will sound and the green indicator next to the digital display will illuminate. The numbers on the display represent minutes. Enter the specific length of exposure desired in minutes from 0.1–999.9.

Autocrosslink Mode

When selecting the *Autocrosslink* mode, the beeper will sound and a preset exposure of 1200 microjoules (× 100) will be displayed. No further entries are required. The crosslinking will be complete in ~25–50 seconds.

8.50 x 11.00 in

UV Crosslinking: Standard Procedures

Stratagene has found that a setting of 120,000 microjoules/cm^2 (1200 on the LED display) is optimal for attachment of RNA or DNA to nylon, nitrocellulose, or reinforced nitrocellulose membranes in any of the procedures listed above.

1. Place one or two sheets of absorbent paper lightly dampened with transfer buffer (such as 10× SSC) on the floor of the Stratalinker UV crosslinker. Place the membrane on top of the absorbent paper with the side with the attached nucleic acids **facing upwards**, enabling direct irradiation of the nucleic acids by the ultraviolet bulbs.

   Note *To obtain the best results, place the membrane into the Stratalinker UV crosslinker while the membrane is still damp (but not dripping) after the DNA or RNA transfer step.*

2. Close the door of the Stratalinker UV crosslinker.

3. Press the *Start* button to initiate the desired function. When the UV light bulbs turn on, the display will immediately begin to count down from the entered value. If the door is opened at any point during exposure, the irradiation will stop and the remaining exposure value will be displayed. (Close the door to continue irradiation.)

4. When the irradiation is complete, the beeper will sound for approximately 3–4 seconds. The *Autocrosslink* setting will take approximately 25–50 seconds.

5. Remove the membranes and close the door. The irradiation is now complete. Clean the floor of the Stratalinker UV crosslinker after each use to remove any residual salt.

Incubator: Hybridization Oven, Rotation, Fisher @BRDG

Fischer Biotech, Model FBH110, 110V
Approx Dim: 14 x 13 x 16 inches

Hybridization Notes from Wikipedia: is the process of establishing a non-covalent, sequence-specific interaction between two or more complementary strands of nucleic acids into a single hybrid, which in the case of two strands is referred to as a duplex. Oligonucleotides, DNA, or RNA will bind to their complement under normal conditions, so two perfectly complementary strands will bind to each other readily. In order to reduce the diversity and obtain the most energetically preferred hybrids, a technique called annealing is used in the laboratory practice. However, due to the different molecular geometries of the nucleotides, a single inconsistency between the two strands will make binding between them less energetically favorable. Measuring the effects of base incompatibility by quantifying the rate at which two strands anneal can provide information as to the similarity in base sequence between the two strands being annealed. The hybrids may be dissociated by thermal denaturation also referred to as melting. Here, the solution of hybrids is heated to break the hydrogen bonds between nucleic bases, after which the two strands separate. In the absence of external negative factors, the processes of hybridization and melting may be repeated in succession indefinitely long, which lays the ground for polymerase chain reaction. Most commonly, the pairs of nucleic bases A=T and G=C are formed, of which the latter is more stable.