



# COMPACT GLOVE BOX

Model

**SG828/835/848/860**

**Instruction Manual**  
**- February 2022 -**

- Thank you for purchasing the Compact Glove Box SG828/835/848/860, of Yamato Scientific.
- To use this unit properly, read this "Instruction Manual" thoroughly before using the unit. Keep this instruction manual around this unit for reference at any time.



**WARNING:**

Carefully read and thoroughly understand the important warning items described in this manual before using this unit.

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# **COMPACT GLOVE BOXES SG SERIES**

## **Controlled Atmosphere**

This chamber has been designed to provide an enclosure which will enable the operator to replace the ambient room atmosphere with alternative choices, such as NITROGEN, ARGON, PLASMA or other inert type gases.



## **EXPLOSIVE GASES OR OPEN FLAMES.**

The units are shipped as complete systems. Nothing needs to be added except your gas of choice.

# POSSIBLE VARIATIONS OF CONTROLLED ATMOSPHERE GASES

There are several possible atmosphere variations when using Yamato Controlled Atmosphere Chambers and glove boxes.

**However, in all cases when using Controlled Atmosphere Chambers you must use the small amount of Hydrogen to cause the chemical reaction which reduces the Oxygen into water vapor.**

## **WARNING** **DO NOT EXCEED THE 10% LEVEL OF HYDROGEN**

**NOTE:** When using Basic or Compact Glove Boxes, it is not necessary to use the 10% Hydrogen mix. The Hydrogen addition is for Controlled Atmosphere chambers only.

Variations using INERT GASES are as follows:

For an ARGON ATMOSPHERE use:	90% Argon <u>10% Hydrogen</u> 100% gas mixture
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For a HELIUM ATMOSPHERE use:	90% Helium <u>10% Hydrogen</u> 100% gas mixture
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For a NITROGEN ATMOSPHERE use:	85% Nitrogen 10% Hydrogen <u>5% CO2</u> 100% gas mixture
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**NOTE:** The CO2 should be used when working with living Organisms such as anaerobes.

Yamato SG Series “Compact Glove Boxes” have been engineered to be self-contained, compact, and easily portable on a standard laboratory cart (trolley). The unit is very useful when working with toxic substances, asbestos fibers, sewage residue, and harmful liquid vapors.

### CHAMBER HOUSING INFORMATION

The basic housing is formed of .375 thick optically clear acrylic plastic to eliminate the possibility of through the wall leakage between exterior and interior atmospheres. The Transfer Chamber wall thickness is .500” thick rigid acrylic plastic and the formed doors are .375” thick. Included with the glove box is a white plastic leveling tray which is useful for transferring into and out of the chamber. The clear acrylic provides constant visual awareness of the Transfer Chamber contents. Hidden or dark spots are minimized. The top section is removable to allow for insertion of large pieces of equipment such as “Top Loaders’ and Analytical Balances.

### CHAMBER FEATURES

Standard features included with the glove box are;

- A. White ambidextrous Hypalon gloves
- B. One (1) hospital grade multiple electrical outlet strip.
  - 1. 115-120 Volts for domestic USA units.
  - 2. 220-240 volts for export models.
- C. Four (4) ground key cock valves for purging.
- D. All door clamps are stainless steel and adjustable.
- E. A six (6’) foot long electrical power cord is also included.
- F. Pressure Relief Valve and exhaust filter Catalog #830-FILTER

### PRESSURE RELIEF “POP” VALVE

A small “pop” or relief valve has been installed to minimize glove “fight back” when using the gloves. As the gloves are pushed into the chamber, the excess positive pressure is released through the pop valve. Before it can escape into the room atmosphere, it is filtered through a small canister type filter device. The filter is comprised of both HEPA and Activated Carbon materials. Refer to photos on pages 5 and 6.

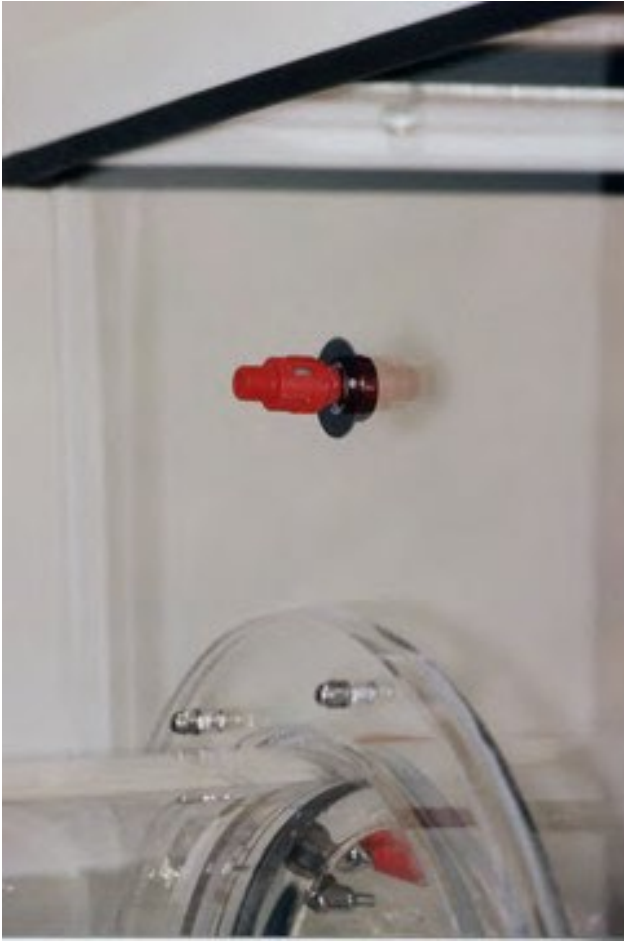
## Filter to Minimize “Glove Box Glove Fight Back” (Simple Face Mask Style)

Section containing small HEPA filter



Diameter (Ø) of this  
small filter is about 3”

This small filter should be replaced about every month, depending upon amount of daily use.  
Part number PLA-830FILTER (Package of two filters).



Close-up pressure relieved 'pop" valve  
(Part no. PLA-HW3126)



Close-up view of new filter mounted inside  
(Part no. PLA-830ABC)

1. Place glove box in your desired laboratory location. **NOTE:** If you have one of the larger units, be very careful when moving the box through narrow doorways.
2. Inspect the gloves for any tears or cuts. If there are any, you will need to replace them before using the glove box. Please refer to the “**Glove Change Out procedures**” in this manual.
3. Carefully remove the white top section of the unit by loosening the black knobs on top. If necessary, clean the inside walls and top section of the unit. Make sure all the black gaskets on the doors and top section are clean. Please refer to “**Cleaning Procedures**” in this manual.
4. Install all large pieces of equipment inside the glove box. Plug the device into the interior electrical outlet.
5. Carefully replace the top white section on the glove box. Make sure it is in the same position as when you removed it. Make sure the holes line up and both the top and bottom section are aligned properly. **Be careful not to “cross thread” the knobs.** At first only partially tighten each knob using a “criss cross” pattern. Once each knob has been started into its respective hole, back track your steps and tighten each knob. Use the same “criss cross” pattern.
6. All clamps have been pre-set at the factory. Over time during shipping, they may become loose and need re-adjusting. They can be adjusted by loosening the nut(s) and retightened. Be careful not to over compress the clamps or gaskets.
7. You may now attach your incoming inert gas line. In most cases, you will want to use the ground key cock valve located by the transfer chamber. Please refer to the section “**Purging the Main Working Chamber.**”
8. **(Optional)** If you ordered a unit with the top vent outlet port, attach the exhaust connection at this time. This is normally a three (3”) inch outlet. It is also important you seal the connection with vinyl sealing tape to ensure chamber integrity.



# Technique for Purging the Main Working Chamber

From this point on, use the gloves as an indicator of pressure within the glove box. Watch them carefully as they move in and out of the main chamber. Positive pressure pushes the gloves out and negative pressure draws the gloves back into the chamber.

## STEP #1

Attach the hose for your choice of inert gas:

If using Nitrogen (N<sub>2</sub>) attach the incoming gas line (hose) to the key cock valve on the upper left side of the glove box. Connect a small vacuum pump to the key cock valve on the lower right side of the glove box.

If using an inert gas such as Argon, attach the incoming gas line (hose) to the key cock valve on the lower right side. Connect a small vacuum pump to the key cock valve on the upper left side of the glove box.

For vacuum pump data, refer to “**Glove Box Accessories**” on page twelve (12).

## STEP #2

Set the incoming gas source **OR** cylinder (bottle) regulator to 25-50 PSI. (170 kPa maximum.) Blow in a slow flow of the inert gas. Raise the level of gas input until the gloves extend out of the glove box approximately 14” inches (34 or 35 cm).

## STEP #3

Turn off the incoming gas and turn on the vacuum pump. This will exhaust the inner atmosphere until the gloves extend into the glove box. The vacuum should be left on until the gloves extend into the glove box approximately 14” inches (34 or 35 cm).

## STEP #4

Repeat steps #2, #3, and #4 at least eight (8) or nine (9) more times (purge cycles) then turn off the gas and vacuum pump.

**You have now successfully “purged” your glove box and the inner atmosphere is primarily your inert gas of choice.**

## Entry through the Transfer Chamber

The transfer chamber is used for inserting materials into and out of the main working chamber without disturbing the main chamber atmosphere.

It is important to keep both transfer chamber doors closed during normal operation. This is a safeguard in case the outer door is opened by mistake.

1. With the inner door closed and locked, open the outer door and place the desired materials inside the chamber. The white plastic tray is useful for liquids.
2. Close and lock the outer door.
3. Open the vacuum valve and push the button to turn on the vacuum chamber pump. Draw a vacuum down to 18" to 20" of Hg. Watch the vacuum gauge. When that level is reached, turn off the vacuum pump and close the vacuum valve.
4. Now open the ground key cock valve to introduce your gas of choice. Continue this until the gauge reads "O"

**TIP: Slow down the gas flow when the gauge nears five (5") inches. You can control the incoming flow procedure easier.**

According to the U.S. Centers for Disease Control protocol

**REPEAT THIS PROCEDURE A TOTAL OF THREE (3) TIMES**

5. Upon completion of the third (3rd) sequence, you may safely open the inner door and transfer your materials into the main chamber.

**TIP: The white plastic leveling tray is helpful when transferring liquids.**

## General Maintenance Schedule

It is strongly recommended that operators remove all jewelry during use of the glove box (isolator).

- Weekly:** General cleaning (refer to our cleaning procedures) **NOTE:** This will vary as to your in house protocol.
- Monthly:** Check gloves and gasketing for excessive wear and tear.  
Check to see if any clamps need adjusting.
- Semi Annually:** Perform your standard main chamber leak test.
- Annually:** Replace the Hypalon gloves. Check all gasketing for excess wear and tear.  
Make sure mechanical fasteners (screws) have not vibrated loose. If so, tighten them carefully.

Refer to “**Replacement Parts and Accessories**” sections of this manual.

## Glove Change Out Procedure

The glove change out procedure should be well defined and practiced before the actual change out takes place. Establish a contingency plan in case containment is lost.

The glove box (isolator) is equipped with glove ports, each with an 8.75"Ø machined groove for the glove ring. Before you remove a glove, be sure to have a glove port "plug" (PLA-800PLUG) inside the chamber. The glove port plug is used to seal the inside of the glove port during the change out. **NOTE:** It is very useful to keep a glove port plug inside the chamber at all times.

1. Insert your hand into the glove that is to be changed. Pull the glove port plug into the inside glove port opening and tighten securely. It is tightened by rotating the big **RED** knob clockwise. Make sure you have the damaged glove completely out of the chamber.

**NOTE:**

**You do not need to use the glove port plug if the glove box is shut down for periodic cleaning.**

2. Remove the old yellow vinyl tape and stainless steel worm gear clamp.
3. Remove the old damaged glove. **NOTE:** You may want to place a disposable plastic bag around the old glove when you pull it off the machined groove on the port ring.
4. Make sure there is **no debris on the glove port ring**. It must be completely clean before mounting the new glove.
5. Insert the new glove into the port ring (and glove box). **Make sure the thumb is pointed up, and the glove end (BEAD) is securely placed into the machined groove.**
6. Re-tape and seal the beaded end of the glove to the glove port ring. Wrap the tape three (3) times around the glove and port ring. **NOTE:** It is important you do not have any wrinkles in the tape.
7. Re-attach the stainless steel worm clamp making sure it covers the beaded end of the glove. Secure it snugly, but do not over tighten.
8. To remove the glove port plug, reverse the original procedure as in Step #1. Turn the red knob counter-clockwise until the plug is released.

Most components consist of thermoplastic and 304 stainless steel. Like any piece of fine laboratory equipment, care should be taken to avoid dropping, mishandling, and misapplication

### Sterilization

This isolator can be sterilized with a diluted alcohol solution such as; 70-30 isopropyl alcohol/filtered water or 70-30 ethanol alcohol/filtered water. Manually wipe down the isolator walls with the solution and then rinse with filtered water. NOTE: It is recommended that the HEPA filter remains dry.

Good all-around sterilants are:

- A. Bacteria - Isopropyl Alcohol and Water (70/30)
- B. Virocidal - Ethanol Alcohol and Water (70/30)

### Cleaning

Cleaning thermoplastics is best accomplished with a non-abrasive soap or detergent and water solution. In cases where residues left by the agents is undesirable, special cleaning solvents may be used. Soaps and detergents will not harm plastics, but several common solvents will.

Recommended cleaners include: Novus™ Plastic Polish #1, Brillianize™ cleaner, and Rez-N-Kleen™

**In general, aromatic and chlorinated hydrocarbons will attack most plastic surfaces. This applies to all plastics used in our chamber products.**

Examples of these products include, but are not limited to, acetone, ether, gasoline, lacquer thinner, methyl-ethyl-keytone, methylene chloride, and toluene.

### **Polishes**

While the above cleaning solutions have some polishing capabilities, they will not remove scratches from plastic. This can only be done with automotive type waxes or the finer grades of rubbing or polishing compounds. These products should be specifically for acrylic enamels and lacquer base paint.

### **Scratch Removers**

Deep scratches should be first sanded with a fine grit (600 or finer) wet sandpaper. Steel wool (0000 finest grade) is also very helpful. Use the polishing materials (rubbing compounds) mentioned above for the final stage.

### **Stainless Steel Components**

Stainless steel is resistant to all solvents and detergents. Polishing can be accomplished by using fine grades of steel wool and/or #707 Scotch™ Brite pads. For the final stage use any type of stainless steel spray polish.

<b>Part #</b>	<b>Description</b>
PLA-CH6015	#1 Novus™ Cleaner
PLA-CH6016	#2 Novus™ Cleaner
PLA-800GH	White ambidextrous Hypalon gloves (pair)
PLA-HW3124	9" worm drive clamp
PLA-MS2027	Yellow 3M vinyl tape
PLA-830FILTER	Multipurpose filter Cartridge (two [2] per pack)MS2046 Gasket, Neoprene, for transfer chamber door
PLA-MS2029	Gasket, Neoprene, 1" wide x .500" thick
PLA-MS2028	Gasket, Neoprene, 2" wide x .500" thick

## ACCESSORIES

<b>Part #</b>	<b>Description</b>
PLA-800PLUG	Glove Port Plug (pair)
PLA-800PUMP	Vacuum Diaphragm Pump with 5' hose on intake sideOpen Flow: 1.1 CFM (31 LPM) 115/Volt, 60Hz.
PLA-800PUMP/EXP	220/Volt, 50Hz.
PLA-800AS/SPI	Work Station Ionizer. Effectively eliminates all static charges within 36" of unit. Non-air assisted. 115/Volt, 60Hz.
PLA-800AS/SPI/CE	220/Volt, 50Hz.
PLA-830CART	Stainless Steel Support Cart with casters
PLA-800DOI	Digital Oxygen Analyzer (0-10,000 ppm) 115/Volt. 60Hz.800-
PLA-DOI/EXP	220/Volt, 50Hz.
PLA-800DHI	Digital Humidity Indicator (0-100% Rh) 115/Volt, 60Hz.
PLA-800DHI/EXP	220/Volt, 50Hz.
PLA-800DPI	Digital Pressure Indicator (-2-0-2" of WC) 115/Volt, 60Hz.
PLA-800-DPI/EXP	220/Volt, 50Hz.
PLA-800PRV	Pressure Relief Valve

## Main Working Chamber:

Walls	.375" thick clear cast acrylic
Bottom:	.250" thick white cast acrylic
	.375" thick white cast acrylic (830-ABD only)
Top and Bottom:	.250" thermoformed white Noryl™
Top viewing panel:	.250" thick clear cast acrylic
Top Gasketing:	1" wide x 1" thick black "skinned" Neoprene
Gas Key Cock Valves:	Nickle plated brass

## Transfer Chamber:

Doors:	.500" thick clear cast acrylic
Gaskets:	.500" Ø neoprene
Clamps:	Rivets: type 430 stainless steel
	Stamped parts: 302/304 stainless steel
	Handle: PVC
Hinges	
Fasteners	18-8 type stainless steel
Pop Valve	Body: polypropylene
	O-ring: Buna-N
	Springs: type 316 stainless steel

## Recommended Operational Pressures

For containment purposes:	-0.5" of water column
For isolation purposes:	0.5" of water column

### Main chamber:

Max. pressure	+6" of WC (11.2 torr)
Max. vacuum	-6" of WC (11.2 torr)

### Transfer chamber:

Max. pressure	Not engineered to support positive pressure
Max vacuum	-26" of Hg. (660 torr)

### **Yamato Warranty Policy**

Yamato Scientific America warrants, from the date of shipment from Yamato warehouse, for a period of one (1) year. All products, parts and materials shall be free of defects in material and workmanship under normal use consistent with the product instructions. This product warranty does not apply to products purchased from unauthorized resellers/distributors.

Yamato reserves the right to inspect the product under claim before having an obligation to repair or replace the defective unit covered by this warranty. All costs of shipping to Yamato for inspection shall be borne solely by the purchaser. Products repaired or replaced under the terms of the warranty may be refurbished or new product will be provided at the discretion of Yamato.

### **Warranty Conditions**

This warranty does not apply to equipment or parts which fail because of abuse, accident, alteration, misuse, erosion, improper installation, or improper replacement of a repaired item.

Consumables such as gloves, bulbs, or filters are not covered under this warranty.

The buyer assumes all risks for results obtained from these products, whether used alone or in combination with other items. It is expressly understood that we are not responsible and will not be held liable for damage and/or injury caused using our products.

### **Product Return Policy**

If you are not satisfied with your purchase and wish to make a return, contact our customer service to inquire about a Return of Merchandise Authorization Number (RMA). Merchandise returned without an RMA number will not be accepted and will be returned to the sender. Return requests must be made within 15 days of the customer's receipt of the merchandise.

All returns must be unused and in unopened original packaging and include all items and manuals originally shipped.

The purchaser is responsible for the shipping cost of return shipment. Insurance on the return shipment is required. Damage or loss of merchandise during shipping is the responsibility of the sender. Returned shipments that arrive damaged will be returned back to the sender, and credit will not be rendered.

All returned products, parts and materials are subject to a 25% restocking fee. Shipping and handling cost are non-refundable. All retrofitted, customized and special order item sales are final and non-returnable.

### **In Case of Request for Repair**

If the failure occurs, stop the operation, turn OFF the power switch, and unplug the power plug. Please contact the sales agency that this unit was purchased, or the Yamato Scientific's sales office.

#### **< Check following items before contact >**

- ◆ Model Name of Product
- ◆ Production Number
- ◆ Purchase Date
- ◆ About Trouble (as detailed as possible)



## **Responsibility**

Please follow instructions in this document when using this unit. Yamato Scientific has no responsibility for accidents or breakdown of device due to failure to comply. Never conduct what this document forbids as unexpected accidents or breakdown may result.

**Instruction Manual for Compact Glove Boxes**  
**Model SG828/835/848/860**  
**February 2022**

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