Protector® Glove Boxes

Protecting your laboratory environment

LABCONCO®
Protector® Glove Boxes

INTRODUCTION

Overview
A glove box is a sealed enclosure that allows handling of materials through long, relatively impermeable gloves secured to ports in the walls of the enclosure. The purpose of a glove box is protection or isolation, which is provided by the physical barrier. Depending on the type of glove box, the physical barrier may be to isolate a sensitive material inside the box from environmental contamination or to protect the operator from hazardous materials being manipulated inside the box.

Protector® Glove Boxes—Top of the line protection
With this latest generation of Protector Glove Boxes, Labconco has engineered and manufactured our most leak-tight boxes ever. Fewer leaks mean greater protection to the user and better control of the glove box atmosphere. Protector Glove Boxes are rigorously tested to exacting standards. Every Protector Glove Box is leak tested using a helium mass spectrometer. A test probe checks for the presence of leaks at all joints, seals and seams. Protector Glove Boxes have no detectable leaks greater than $1 \times 10^{-6}$ ml/second, which calculates to less than 0.09 ml per day.

Labconco’s Protector line of glove boxes consists of vented filtered glove boxes, controlled atmosphere glove boxes and combination vented/controlled atmosphere glove boxes. These types of glove boxes are described below.

Protector® Filtered Glove Boxes
These glove boxes have inlet and outlet filters (either HEPA or ULPA) that protect the operator from hazardous particulates and establish a “clean room” environment inside the box. Protector Filtered Glove Boxes are available in three configurations:
- Single-width HEPA-filtered glove boxes with one-piece molded fiberglass liners
- Single-width ULPA-filtered glove boxes with stainless steel liners
- Double-width UPLA-filtered glove boxes with stainless steel liners

Protector Filtered Glove Boxes are available in double width suitable for two operators.
Protector® Controlled Atmosphere Glove Boxes
These glove boxes isolate sensitive material inside the box from environmental contamination. Since the materials inside the box are often sensitive to oxygen or moisture, the ambient environment inside the box is replaced with an inert gas such as nitrogen, argon or helium. These glove boxes are sometimes called "dry boxes." Protector Controlled Atmosphere Glove Boxes are available in the following configurations:

Single-width glove boxes with one-piece molded fiberglass liners
- Basic Models (with manual control)
- Auto Pressure Controller Models

Single-width glove boxes with stainless steel liners
- Basic Models (with manual control)
- Auto Pressure Controller Models

Double-width glove boxes with stainless steel liners
- Basic Models (with manual control)
- Auto Pressure Controller Models

Protector Combination Glove Boxes
A combination glove box has the capability to function as either a filtered box or a controlled atmosphere glove box. Opening two internal valves converts the box from controlled atmosphere mode to filtered mode. Laboratories that have multiple types of glove box applications or anticipate that their applications may change in the future are ideal users of this type of glove box. All of these glove boxes include an Auto-Pressure Controller. Protector Combination Glove Boxes are available in three configurations:

- Single-width glove boxes with one-piece molded fiberglass liners and HEPA filters
- Single-width glove boxes with stainless steel liners and ULPA filters
- Double-width glove boxes with stainless steel liners and ULPA filters

Basic Models vs. Auto Pressure Controller Models
To reduce moisture and oxygen levels below 1% in the main chamber requires from 75 to 100 evacuation and fill cycles. An additional 100 cycles further reduce moisture and oxygen levels below 0.3% (3000 ppm). Basic Models with analog gauges and vacuum outlet and gas inlet valves allow the user to manually fill the controlled atmosphere glove box with inert gas and evacuate with a vacuum pump. For infrequent use or for laboratories with a plentiful and inexpensive supply of inert gas, the Basic Model is a viable option. However, this manual process is time consuming and requires constant supervision. Some Protector Controlled Atmosphere Glove Boxes and all Protector Combination Glove Boxes include the Auto-Pressure Controller. Auto-Pressure Controller Models may be programmed to regulate the evacuation and backfill of the glove box, up to 499 times for the main chamber and up to 199 times for the transfer chamber. In addition, the Auto-Pressure Controller monitors and controls glove box pressure. The user establishes an operating pressure range by setting upper and lower pressure limits. Glove box pressure is automatically adjusted as barometric pressure and laboratory temperature change. With the Auto-Pressure Controller, the process is automated so that the glove box may be left unattended during the evacuation and fill cycles.
The AtmosPure Re-Gen Gas Purifier is an optional accessory that further reduces the oxygen and moisture levels in controlled atmosphere glove boxes below 0.3%. In addition, it saves the time and inert gas expense of repeated evacuating and filling the glove box to maintain the desired atmosphere. The AtmosPure circulates the established inert atmosphere through copper catalyst and molecular sieve to achieve oxygen and moisture levels below 1 ppm. The chart below shows that after 220 evacuation and filling cycles and 60 minutes, the main chamber of the Protector Stainless Steel Controlled Atmosphere Glove Box was reduced to 653.6 ppm. The AtmosPure Re-Gen Gas Purifier further reduced the oxygen level to 0.7 ppm after 150 minutes (a total of 210 minutes). The large capacity molecular sieve and catalyst require regeneration as little as once every one to three months.

**Equivalent to 5 liters**

*Results were attained at Labconco Corporation under controlled conditions. Actual results may vary.

### Particulate containment

Labconco measured the ability of the Protector HEPA-Filtered Glove Box to contain powders. Naproxen sodium, a non-potent active pharmaceutical ingredient, was selected for the study because it is safe to handle, readily detectable in air at very low concentrations, has a high dustiness quotient and challenging electrostatic properties. Three separate operators performed repeated small scale weighing operations and samples were taken from the operator breathing zones, HEPA filter, transfer chamber and room. The samples on filter cassettes were analyzed using high performance liquid chromatography coupled with fluorescence detection capable of detecting as little as two nanograms. SafeBridge Consultants, Incorporated, confirmed the test results: all samples showed particulates below 20 nanograms per cubic meter indicating excellent particulate containment.

### Excellent stability

Weighing potent fine powders is a common application for Protector Filtered Glove Boxes. Since analytical balances may be sensitive to motion disturbances, the vibration of the Protector HEPA-Filtered Glove Box was tested at various airflow volumes. Less than 0.38 x 10^{-5} inches displacement was detected at the center of the work surface.

The glove box was also tested using a five-place analytical balance placed inside with and without the Balance Vibration Isolator 5234600 (marble slab with stainless steel cover) positioned in the center of the work surface. The glove box was tested at various airflow speeds and under typical laboratory conditions. No efforts were made to isolate the glove box from foot traffic and laboratory equipment operating in the area. Results were excellent. The analytical balance readings remained stable to five decimal places.

### Liner Material

Protector Glove Boxes are available in two liner types: one-piece molded fiberglass or stainless steel. Both stainless steel and fiberglass are more impermeable to oxygen and moisture than less favorable materials such as acrylic, polycarbonate and vinyl. Stainless steel is slightly less permeable to oxygen than fiberglass, which may be a consideration in some ultra low oxygen controlled atmosphere applications. Selection between fiberglass and stainless steel, therefore, should be based on personal preference, corrosion-resistance and heat-resistance related to the operator’s applications. The chart that follows compares the two liner materials.

*Results were attained at Labconco Corporation under controlled conditions. Actual results may vary.

**Equivalent to 5 liters**
<table>
<thead>
<tr>
<th>APPLICATION/MATERIAL</th>
<th>RECOMMENDED GLOVE BOXES</th>
<th>KEY ATTRIBUTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work with hazardous airborne particulates or powders</td>
<td>Protector Fiberglass HEPA Filtered Glove Box</td>
<td>Airborne particulate cleanliness</td>
</tr>
<tr>
<td>• Pharmaceutical R &amp; D and manufacturing</td>
<td>Protector Stainless Steel ULPA Filtered Glove Box</td>
<td>• Exceeds ISO Class 4</td>
</tr>
<tr>
<td>• Biochemistry</td>
<td>Protector Double Stainless Steel ULPA Filtered Glove Box</td>
<td>• Achieves ISO Class 3</td>
</tr>
<tr>
<td>• Non-biohazardous microorganisms</td>
<td></td>
<td>Particulate containment below 20 nanograms/m³ (naproxen sodium surrogate)</td>
</tr>
<tr>
<td>• Particulate chemical carcinogens</td>
<td></td>
<td>ASHRAE 110-1995 tracer gas &lt;0.01 ppm average</td>
</tr>
<tr>
<td>• Asbestos handling</td>
<td></td>
<td>Low vibration, &lt;0.28 x 10⁻⁵ displacement</td>
</tr>
<tr>
<td>• Weighing potent fine powders (5441300 Blower Foot Switch recommended)</td>
<td></td>
<td>Analytical balance readings to five places</td>
</tr>
<tr>
<td>• Cleanroom applications with materials sensitive to airborne particulates and requiring ISO Class 3 conditions (5441200 Positive Pressure Conversion Kit required)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Nanoparticle manipulation</td>
<td>Protector Stainless Steel ULPA Filtered Glove Box</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protector Double Stainless Steel ULPA Filtered Glove Box</td>
<td></td>
</tr>
<tr>
<td>Work with contamination-sensitive materials in a controlled environment</td>
<td>Basic Models</td>
<td>Manual inert gas filling and vacuum pump evacuation</td>
</tr>
<tr>
<td>• Organometallic chemistry</td>
<td>Protector Fiberglass Controlled Atmosphere Glove Box with manual control</td>
<td>Exceeds Class I atmosphere containment per ISO 10648-2</td>
</tr>
<tr>
<td>• Hydrophilic chemical handling</td>
<td>Protector Stainless Steel Controlled Atmosphere Glove Box with manual control</td>
<td>Low oxygen level</td>
</tr>
<tr>
<td>• Organic synthesis</td>
<td>Protector Double Stainless Steel Controlled Atmosphere Glove Box with manual control</td>
<td>Low moisture level</td>
</tr>
<tr>
<td>• Electronic component assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Lithium battery handling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Hemoglobin research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Metabolic research</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Automatic Pressure Controller Models</td>
<td>Automatic inert gas filling and vacuum pump evacuation</td>
</tr>
<tr>
<td></td>
<td>Protector Fiberglass Controlled Atmosphere Glove Box with auto pressure control</td>
<td>Exceeds Class I atmosphere containment per ISO 10648-2</td>
</tr>
<tr>
<td></td>
<td>Protector Stainless Steel Controlled Atmosphere Glove Box with auto pressure control</td>
<td>Low oxygen level</td>
</tr>
<tr>
<td></td>
<td>Protector Double Stainless Steel Controlled Atmosphere Glove Box with auto pressure control</td>
<td>Low moisture level</td>
</tr>
<tr>
<td></td>
<td>AtmosPure Re-Gen Gas Purifier accessory with any Protector Controlled Atmosphere Glove Box</td>
<td>Manual or automatic inert gas filling and vacuum pump evacuation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exceeds Class I atmosphere containment per ISO 10648-2</td>
</tr>
<tr>
<td></td>
<td>Protector Fiberglass Controlled Atmosphere Glove Box with AtmosPure Re-Gen Gas Purifier</td>
<td>Ultra low oxygen level to 0.4 ppm</td>
</tr>
<tr>
<td></td>
<td>Protector Stainless Steel Controlled Atmosphere Glove Box with AtmosPure Re-Gen Gas Purifier</td>
<td>Ultra low moisture level to 2 ppm</td>
</tr>
<tr>
<td></td>
<td>Protector Double Stainless Steel Controlled Atmosphere Glove Box with AtmosPure Re-Gen Gas Purifier</td>
<td>Ultra low oxygen level to 0.2 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ultra low moisture level to 1 ppm</td>
</tr>
<tr>
<td>Work with hazardous airborne particulates or powders when in filtered glove box mode</td>
<td>Same Protector Filtered Glove Box attributes listed above</td>
<td>Automatic inert gas filling and vacuum pump evacuation</td>
</tr>
<tr>
<td>See specific applications listed above</td>
<td></td>
<td>Exceeds Class I atmosphere containment per ISO 10648-2</td>
</tr>
<tr>
<td>Work with contamination-sensitive materials when in controlled atmosphere glove box mode</td>
<td>Same Protector Filtered Glove Box attributes listed above</td>
<td>Low oxygen level</td>
</tr>
<tr>
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<td></td>
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</tr>
<tr>
<td></td>
<td>AtmosPure Re-Gen Gas Purifier accessory with any Protector Combination Glove Box</td>
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<td></td>
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<td></td>
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<td>Protector Fiberglass Combination Glove Box with auto pressure control</td>
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<td></td>
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</tr>
</tbody>
</table>
Protector Filtered Glove Boxes are ventilated boxes that use ambient air to provide user protection from extremely hazardous particulates for applications such as nanoparticle manipulation, toxic powder weighing, pharmaceutical research and biochemistry. Microorganisms, low-level radiochemicals, chemical carcinogens and asbestos may also be used in these boxes. In addition, by reversing the negative air pressure in the main chamber to positive pressure, these boxes may be used for cleanroom applications requiring ISO Class 3 conditions. Models with one-piece molded fiberglass liners feature inlet and outlet HEPA filters. Models with stainless steel liners feature inlet and outlet ULPA filters.

- Large laminated safety glass viewing window
- Dry-powder epoxy-coated steel exterior
- LCD real time display of air volume dilution rate and main chamber static pressure
- Built-in blower with speed control
- Space-saving inner and outer transfer chamber doors
- Neoprene gloves
- Pass-through with plug
- Exclusive Fatture
Protector® Filtered Glove Boxes

FEATURES & BENEFITS

**Inlet and outlet HEPA or ULPA filters** prevent particulate contaminants from entering or leaving the glove box chamber. HEPA filters, which are standard on fiberglass-lined boxes, are 99.99% efficient on 0.3 micron particulates. ULPA filters, which are standard on stainless steel-lined boxes, are 99.999% efficient on 0.12 microns.

**True Bag-in/Bag-out Filter Disposal System** allows for safe filter removal and replacement.

**Exclusive Feature**

The Protector Combination Glove Box functions as a filtered glove box with the added ability to be switched to a controlled atmosphere box as needed. See pages 13-14 for more information.

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**Exclusive Feature**

The Protector Combination Glove Box functions as a filtered glove box with the added ability to be switched to a controlled atmosphere box as needed. See pages 13-14 for more information.
All models feature:

- Particulate containment <20 nanograms per cubic meter (naproxen sodium surrogate) as confirmed by SafeBridge Consultants, Incorporated.
- Fast "clean up" time. 0.05 ppm average tracer gas levels or less detected during perimeter scan testing (surpasses ASHRAE 110 standards) after 5 minute dilution.
- Airborne particulate cleanliness (measured under positive and negative pressures per ISO 14644-1 test method) exceeds ISO Class 4 conditions and achieves ISO Class 3 conditions.
- Factory leak-tested with a mass spectrometer while pressurized with helium at 1 inch of water gauge. No detectable leaks greater than 1 x 10^-6 ml/sec.
- Inlet and outlet particulate (HEPA or ULPA) filters.
- Test port for challenging HEPA or ULPA filter integrity.
- True Bag-In/Bag-Out Filter Disposal System.
- LCD display and programmable alarm levels of volume dilution rates in cubic feet per minute (CFM), air changes/minute (ACM), and main chamber pressure (inches of water).
- Mutable, audible/visual low airflow/pressure alarm.
- Built-in blower with speed control capable of airflow from 15 CFM to 85 CFM depending on voltage and frequency.
- Laminated safety glass, 3/8" thick, viewing window. Viewing area, 36" w x 27.7" high.
- Inner and outer pivoting transfer chamber doors, counterbalanced and equipped with quick-latches.
- Interior right-hand side wall-mounted electrical receptacle (duplex on 100/115 volt models) with 10 amp maximum.
- Interior left-hand side wall-mounted pass-through with plug.
- Pair of neoprene gloves, 0.015" thick, 30" long, size 9 ¾.
- Switches for light, blower and electrical receptacle.
- Two 8" ID, epoxy-coated aluminum, double-grooved glove ports with neoprene gaskets.
- Two 25-watt fluorescent lights.
- Dry-power epoxy-coated, 18 and 20 gauge steel exterior panels.
- ETL listing, UL 61010-1 and CAN/CSA C22.2 No. 1010.1 conformity (North America models).
- CE Conformity Marking (International models).
- Four fluorescent lights.
- Illumination exceeds 80 footcandles.
- Centrally-mounted electrical receptacle.
- Two viewing windows.
- Four neoprene gloves and glove ports.

Options include:

- Factory installed left side door. See page 24.
- Factory installed valves. Contact Labconco for ordering information.

See pages 9 and 21-24 for ordering information on optional accessories.

See page 8 for dimensional data.

Fiberglass-lined models feature:

- Inlet and outlet HEPA filters, 99.99% efficient on 0.3 micron particulates.
- One-piece molded fiberglass liner.
- Clear acrylic inner and outer transfer chamber doors.
- Illumination exceeds 120 footcandles.

Stainless steel-lined models feature:

- Inlet and outlet ULPA filters, 99.999% efficient on 0.12 micron particulates.
- Type 304 stainless steel liner.
- Type 304 stainless steel inner and outer transfer chamber doors.
- Type 304 stainless steel front panel.
- Illumination exceeds 80 footcandles.

Double width models feature:

- Inlet and outlet ULPA filters, 99.999% efficient on 0.12 micron particulates.
- Type 304 stainless steel liner.
- Type 304 stainless steel inner and outer transfer chamber doors.
- Type 304 stainless steel front panel.
- Four fluorescent lights.
- Illumination exceeds 80 footcandles.
- Centrally-mounted electrical receptacle.
- Two viewing windows.
- Four neoprene gloves and glove ports.

All models require:

Use this key to configure the **seven digit catalog number** to order your Protector Filtered Glove Box. For example, a **5065010** is a Protector HEPA-Filtered Glove Box with fiberglass liner and North America, 100-115 volts receptacle and plug type.

### Configure Your Catalog Number:

**5 0 6 5 0 1 0**

- The first five digits indicate liner material and filter type.
- The last two digits indicate receptacle and plug type and glove box width.

**Step 1. Choose one of two liner/filter options:**

**Option 1:** Fiberglass-lined, HEPA filtration. The first five digits are **50650**.

**Option 2:** Stainless steel-lined, ULPA filtration. The first five digits are **50655**.

**Step 2. Select your Receptacle and Plug Type and Glove Box Width.**

**Option 1:** North America, 100-115 volts. The last two digits are **10** for single width, **12** for double width.

**Option 2:** British (UK). The last two digits are **31** for single width, **33** for double width.

**Option 3:** Schuko. The last two digits are **35** for single width, **37** for double width.

**Option 4:** China/Australia. The last two digits are **40** for single width, **42** for double width.

**Option 5:** North America, 208-230 volts. The last two digits are **45** for single width, **47** for double width.

### Electrical Receptacle & Plug Configurations & Electrical Requirements

<table>
<thead>
<tr>
<th>North America, 110-115 volts</th>
<th>British (UK)</th>
<th>Schuko</th>
<th>China/Australia</th>
<th>North America, 208-230 volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-115 volts, 50/60 Hz, 10 amps</td>
<td>208-230 volts, 50/60 Hz, 10 amps</td>
<td>208-230 volts, 50/60 Hz, 10 amps</td>
<td>208-230 volts, 50/60 Hz, 10 amps</td>
<td>208-230 volts, 60 Hz, 10 amps</td>
</tr>
</tbody>
</table>

For Catalog Numbers ending in 10 or 12

For Catalog Numbers ending in 31 or 33

For Catalog Numbers ending in 35 or 37

For Catalog Numbers ending in 40 or 42

For Catalog Numbers ending in 45 or 47

### Built-in Blower Information (115 volt, HEPA-filtered models only)**

<table>
<thead>
<tr>
<th>% Blower Speed Control Setting</th>
<th>Air Volume Changes Per Minute (ACM)</th>
<th>Exhaust Volume (CFM)</th>
<th>Noise Pressure (db(A))</th>
<th>Static Pressure in Glove Box (in. of H2O)</th>
<th>Total System Static Pressure (in. of H2O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. 18%</td>
<td>0.9</td>
<td>15</td>
<td>52</td>
<td>0.12</td>
<td>0.31</td>
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<tr>
<td>35%</td>
<td>1.8</td>
<td>30</td>
<td>54</td>
<td>0.30</td>
<td>0.62</td>
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<tr>
<td>55%</td>
<td>2.8</td>
<td>48</td>
<td>59</td>
<td>0.54</td>
<td>1.14</td>
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<tr>
<td>75%</td>
<td>3.8</td>
<td>65</td>
<td>63</td>
<td>0.87</td>
<td>1.65</td>
</tr>
<tr>
<td>100%</td>
<td>5.0</td>
<td>85</td>
<td>68</td>
<td>1.28</td>
<td>2.48</td>
</tr>
</tbody>
</table>

**Contact Labconco for blower information on other models.**
5225105 Replacement Inlet or Outlet HEPA Filter
99.99% efficient on 0.3 micron diameter particles. May also be used in place of standard inlet or outlet ULPA filter. Shipping weight 6.5 lbs. (3 kg)

5225106 Replacement Inlet or Outlet ULPA Filter
99.99% efficient on 0.12 micron diameter particles. May also be used in place of standard inlet or outlet HEPA filter. Shipping weight 6.5 lbs. (3 kg)

5241700 Bag Set for Bag-In/Bag-Out HEPA Filter Replacement
Includes two bags and two straps necessary for changing and disposing of one inlet or outlet filter. Shipping weight 1 lb. (0.5 kg)

5441200 Positive Pressure Conversion Kit
Changes the built-in blower operation from standard negative pressure to positive pressure operation. The blower pushes instead of pulls HEPA/ULPA filtered air through the main chamber. Typical applications for positive pressure operation include handling materials that are highly sensitive to airborne particulate contaminants. The Positive Pressure Conversion Kit creates particulate cleanliness inside the box measured to ISO 14644-1 test method, achieving ISO Class 3 conditions (1 particle 0.5 µm or larger per cubic foot of air per minute). Includes hose, two clamps and harness assembly. Not recommended for use with applications involving hazardous substances. Shipping weight 6 lbs. (3 kg)

5441100 Recirculation Kit
Allows the built-in blower exhaust to be connected to the inlet HEPA/ULPA filter, providing total recirculation of air volume useful for semi-dry atmosphere operations. Includes hose, clamps and epoxy-coated steel adapter. Other accessories, such as Valves, Traps and Diaphragm Pumps, may be combined with the Recirculation Kit to maintain specific air chemistry conditions inside the main chamber. See page 20 for ordering information on Drying Train accessories. Shipping weight 5.5 lbs. (2.5 kg)

5242400 DOP Test Kit for HEPA Filters
Includes the connections, hoses and test procedure necessary to conduct a HEPA filter leak test on both the inlet and outlet filter. Test should be performed by a qualified technician using calibrated equipment. Shipping weight 5 lbs. (2 kg)

5441300 Blower Foot Switch
Provides a hands-free means to temporarily shut off power to the blower when obtaining sensitive balance readings or manipulating fine powders. Includes foot pedal and power cord. Shipping weight 4.5 lbs. (2 kg)

Thimble Exhaust Connectors
Epoxy-coated steel for connecting the glove box to ductwork attached to building exhaust, remote blower or FilterMate Portable Exhauster. Contact Labconco for ordering information on the FilterMate Portable Exhauster.

Remote Blowers
For ducting Protector Filtered Glove Boxes. Direct drive blower has a 1/4 hp TEFC-type motor and overcomes external static pressure of 0.5" at 420 CFM. Housing and impeller are corrosion-resistant, phenolic-coated steel. Blower inlet is 5 9/16 OD and is sized to accept 6" nominal diameter PVC duct. Blower outlet is 4 25/32" OD. Dimensions: 14 6/8" w x 13 5/8" d x 13 1/2" high (37.1 x 34.3 x 33.7 cm). Dampers is required.

Remote Blowers

<table>
<thead>
<tr>
<th>CFM @ Static Pressure – Inches of H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.P.</td>
</tr>
<tr>
<td>CFM</td>
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Dampers

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Description</th>
<th>Shipping Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>4724200</td>
<td>6&quot; diameter, PVC</td>
<td>1 lb (0.5 kg)</td>
</tr>
<tr>
<td>3924000</td>
<td>6&quot; diameter, Powder-coated steel</td>
<td>1 lb (0.5 kg)</td>
</tr>
</tbody>
</table>
Protector Controlled Atmosphere Glove Boxes provide a leak-tight environment for work with contamination-sensitive materials. Organometallic chemistry, lithium battery handling, hemoglobin research and other procedures using oxygen- or moisture-sensitive materials may be performed in these boxes.

Stainless steel-lined glove boxes have ultralow oxygen permeation rates (<0.16 ppm/min) while fiberglass-lined models have rates as low as <0.3 ppm/min, both achieving Class I atmosphere conditions. On Auto Pressure Controller models, the evacuation and filling cycles may be automated and monitored.
Leak-tight. Each box is factory-tested with a mass spectrometer while pressurized with helium at 5 inches of water gauge and found to have no detectable leaks greater than $1 \times 10^{-6}$ ml/sec.

Low oxygen and moisture levels maintained*. Fiberglass models maintained oxygen levels as low as 0.4 ppm and moisture levels as low as 2 ppm. Stainless steel models maintained oxygen levels as low as 0.2 ppm and moisture levels as low as 1 ppm.

Exceed Class 1 atmosphere containment conditions for low oxygen permeation per ISO 10648-2. Fiberglass models achieve $<0.3$ ppm/min. Stainless steel models achieve the lowest permeation at $<0.16$ ppm/min.

Four inlet/outlet valves, two on the main chamber and two on the transfer chamber, allow for evacuating and filling the chambers via an accessory vacuum pump and inert gas.

Two 3/4" OD rear-mounted inlet and outlet compression fittings allow for easy connection to optional AtmosPure Re-Gen Gas Purifier or other accessory drying train.

Auto pressure controller, on models without analog gauges, provides monitor and control of the main chamber pressure, main chamber evacuation and filling cycles (up to 499) and transfer chamber evacuation and filling cycles (up to 199).

- The controller regulates vacuum/pressure between -5 and +5 water gauge in the main chamber and between 0 and -29.5 inches mercury in the transfer chamber.
- An audible alarm sounds when pressure/vacuum level is outside set limits.
- The LCD displays main and transfer chamber pressure.
- Three-position foot pedal provides hands-free control: increase gas/fill, off, and evacuate/decrease gas.
- Input/output port provides connection to optional AtmosPure Re-Gen Gas Purifier.

Main and transfer chamber analog pressure gauges, on models without auto pressure controller, provide a means to monitor pressure levels inside the box.

Factory-installed, rear-mounted, low profile stainless steel pressure relief bubbler helps to protect against over or under pressurization. Pressure is maintained between -6 and +6 inches water gauge.

Bright interior. Fluorescent illumination exceeds 120 foot-candles on fiberglass-lined models and 80 footcandles on stainless steel-lined models.

Interior, left-hand side, wall-mounted pass-through with plug allows for on-site installation of an optional electrical receptacle or optional pass-through port for RS-232, gas/liquid or oxygen or moisture monitor.

Large laminated safety glass viewing window provides maximum visibility (36" wide x 27.7" high) and is removable to allow for placement of large equipment. A powder-coated steel frame and neoprene gasket form a tight seal.

Space-saving inner and outer transfer chamber doors pivot upward to conserve space and are counterbalanced and equipped with quick latches for easy operation.

Interior right-hand side wall-mounted electrical receptacle allows quick transfer of materials and equipment between the laboratory and main chamber.

One-piece molded fiberglass or type 304 stainless steel liner provides a smooth, durable surface that resists chemical corrosion and simplifies cleaning.

Dry-powder epoxy-coated steel exterior has superior corrosion resistance.

ETL-listed. All North America models carry the ETL mark signifying they are certified to UL 61010-1 and CAN/CSA C22.2 No. 1010.1.

CE mark. All international models conform to the CE (European Community) requirements for electrical safety and electromagnetic compatibility.

Full one-year warranty on parts and labor.

Optional AtmosPure Re-Gen Gas Purifier, sold separately, maintains low oxygen/moisture atmosphere by circulating the glove box’s gas through an oxygen/moisture scavenger that can be regenerated with a reducing gas and heat cycle. See pages 16-18 for more information.

The Protector Combination Glove Box functions as a controlled atmosphere glove box with the added ability to be switched to a filtered box as needed. See pages 13-14 for more information.

* Oxygen and moisture levels were achieved using the accessory AtmosPure Re-Gen Gas Purifier. See pages 16-18 for more information.
All models feature:
- Factory leak-tested with a mass spectrometer while pressurized with helium at 5 inches of water gauge. No detectable leaks greater than 1 x 10⁻⁶ m³/sec.
- Exceed Class 1 atmosphere containment conditions for oxygen permeation <1.67 ppm/min per ISO 10648-2 test method.
- Laminated safety glass, 3/8" thick, viewing window. Viewing area, 36" w x 27.7" high (91 x 70 cm).
- Inner and outer pivoting transfer chamber doors, counterbalanced and equipped with quick-latches.
- Four manual valves with 3/8" compression fittings—two on the main chamber and two on the transfer chamber.
- Factory-installed, rear-mounted stainless steel pressure relief bubbler at 36 inches of water gauge.
- Two rear-mounted inlet and outlet 3/4" OD compression fittings for connection to optional AtmosPure Re-Gen Gas Purifier or other accessory drying train.
- Interior right-hand side wall-mounted electrical receptacle (duplex on 100/115 volt models) with 10 amp maximum.
- Interior left-hand side wall-mounted pass-through with plug.
- Pair of neoprene gloves, 0.015" thick, 30" long, size 9¾.
- Switches for light and electrical receptacle.

Basic models also feature:
- Two 8" ID, epoxy-coated aluminum, double-grooved glove ports with neoprene gaskets.
- Two 25-watt fluorescent lights.
- Dry-powder epoxy-coated, 18 and 20 gauge steel exterior panels.
- ETL listing, UL 61010-1 and CAN/CSA C22.2 No. 1010.1 conformity (North America models).
- CE Conformity Marking (International models).

Excluding Feature

Fiberglass-lined models feature:
- One-piece molded fiberglass liner with clear acrylic inner and outer transfer chamber doors.
- Performance tested to maintain oxygen levels as low as 0.4 ppm and moisture levels as low as 2 ppm.
- Oxygen permeation <0.16 ppm/min per ISO 10648-2.
- Illumination exceeds 80 footcandles.

Stainless steel-lined models feature:
- Type 304 stainless steel liner with Type 304 stainless steel inner and outer transfer chamber doors. Type 304 stainless steel front panel.
- Performance tested to maintain oxygen levels as low as 0.2 ppm and moisture levels as low as 1 ppm.

Auto Pressure Controller Models also feature:
- Automatic control of the main chamber pressure (-5 to +5 inches of water gauge), main chamber evacuation and filling cycles (up to 499 cycles), and transfer chamber evacuation and filling cycles (up to 199 cycles).
- Regulation of vacuum/pressure between -5 and +5 inches of water gauge in the main chamber and between 0 and -29.5 inches of mercury in the transfer chamber.
- Mutually, audible/visual alarm that sounds when pressure/vacuum level is outside set limits.
- LCD display of main chamber and transfer chamber pressure in inches of water, inches of mercury and mBar.
- Three-position foot pedal (increase gas/fill, off, evacuate/decrease gas).

Input/output port for optional AtmosPure Re-Gen Gas Purifier.

Double width models feature:
- Type 304 stainless steel liner.
- Type 304 stainless steel inner and outer transfer chamber doors.
- Type 304 stainless steel front panel.
- Four fluorescent lights.
- Illumination exceeds 80 footcandles.
- Centrally-mounted electrical receptacle.
- Two viewing windows.
- Four neoprene gloves and glove ports.

All models require:
- Supporting base Adjustable Height Mobile and Stationary Base Stands are available. See pages 23-24.
- Vacuum pump for evacuating. Rotary Vane Vacuum Pumps are available. See page 19.
- Inert gas for filling. Contact your laboratory supply distributor.

Options include:
- Factory installed left side door. See page 24.

See pages 18-22 for ordering information on optional accessories. See pages 16-18 for ordering information on the AtmosPure Re-Gen Gas Purifier. See page 15 for dimensional data.
Filtered glove box features:

- Particulate containment <20 nanograms per cubic meter (naproxen sodium surrogate) as confirmed by SafeBridge Consultants, Incorporated.
- Fast “clean up” time. 0.05 ppm average tracer gas levels or less detected during perimeter scan testing (surpasses ASHRAE 110 standards) after 5 minute dilution.
- Airborne particulate cleanliness (measured under positive and negative pressures per ISO 14644-1 test method) exceeds ISO Class 4 conditions and achieves ISO Class 3 conditions.
- Inlet and outlet particulate (HEPA or ULPA) filters to prevent contaminants from entering or leaving the glove box chamber.
- Test port for challenging HEPA or ULPA filter integrity.
- True Bag-In/Bag-Out Filter Disposal System for safe filter removal and replacement.
- Built-in blower with speed control capable of airflow from 15 CFM to 85 CFM depending on voltage and frequency.
- Mutable, audible/visual low airflow/pressure alarm.

Controlled atmosphere glove box features:

- Exceed Class 1 atmosphere containment conditions for oxygen permeation <1.67 ppm/min per ISO 10648-2 test method.
- Four manual valves with 3/8” compression fittings—two on the main chamber and two on the transfer chamber.
- Automatic control of the main chamber pressure (-5 to +5 inches of water gauge), main chamber evacuation and filling cycles (up to 499 cycles), and transfer chamber evacuation and filling cycles (up to 199 cycles).
- Regulation of vacuum/pressure between -5 and +5 inches of water gauge in the main chamber and between 0 and -29.5 inches of mercury in the transfer chamber.
- Mutable, audible/visual alarm that sounds when pressure/vacuum level is outside set limits.
- Three-position foot pedal (increase gas/fill, off, evacuate/decrease gas).
- Input/output port for optional AtmosPure® Re-Gen Gas Purifier.
- Factory-installed, rear-mounted, low profile stainless steel pressure relief bubbler at ±6 inches of water gauge.
- Two rear-mounted inlet and outlet 3/4” OD compression fittings for easy connection to optional AtmosPure® Re-Gen Gas Purifier or other accessory drying train.

Fiberglass-lined models feature:

- Inlet and outlet HEPA filters, 99.99% efficient on 0.3 micron particulates.
- One-piece molded fiberglass liner with clear acrylic inner and outer transfer chamber doors.
- Performance tested to maintain oxygen levels as low as 0.4 ppm and moisture levels as low as 2 ppm.
- Oxygen permeation <0.3 ppm/min per ISO 10648-2.
- Illumination exceeds 120 footcandles.

Stainless steel-lined models feature:

- Inlet and outlet ULPA filters, 99.99%, efficient on 0.12 micron particulates.
- Type 304 stainless steel liner with Type 304 stainless steel inner and outer transfer chamber doors. Type 304 stainless steel front panel.
- Performance tested to maintain oxygen levels as low as 0.2 ppm and moisture levels as low as 1 ppm.
- Oxygen permeation <0.16 ppm/min per ISO 10648-2.
- Illumination exceeds 80 footcandles.

Double width models feature:

- Inlet and outlet ULPA filters, 99.99%, efficient on 0.12 micron particulates.
- Type 304 stainless steel liner.
- Type 304 stainless steel inner and outer transfer chamber doors.
- Type 304 stainless steel front panel.
- Four fluorescent lights.
- Illumination exceeds 60 footcandles.
- Centrally-mounted electrical receptacle.
- Two viewing windows.
- Four neoprene gloves and glove ports.

All models require:

- Vacuum pump for evacuating. Rotary Vane Vacuum Pumps are available. See page 19.
- Inert gas for filling. Contact your laboratory supply distributor.

Options include:

- Factory installed left side door. See page 24.
- See pages 9 and 18-22 for ordering information on optional accessories. See pages 16-18 for ordering information on the AtmosPure Re-Gen Gas Purifier.
- See page 15 for dimensional data.
Configure Your Protector Controlled Atmosphere or Combination Glove Box Catalog Number:

Step 1. Choose one of two options:
Option 1: Manual valve operation. The first four digits are 5060.
Option 2: Auto Pressure Control operation. The first four digits are 5080.

Step 2. Choose one of two options:
Option 1: Stainless steel lined. The fifth digit is 1.
Option 2: fiberglass lined. The fifth digit is 0.

Step 3. Select your Receptacle and Plug Type.
Option 1: North America, 100-115 volts. The last two digits are 10 for single width controlled atmosphere, 12 for double width controlled atmosphere, 60 for single width combination, and 62 for double width combination.
Option 2: British (UK). The last two digits are 31 for single width controlled atmosphere, 33 for double width controlled atmosphere, 65 for single width combination, and 67 for double width combination.
Option 3: Schuko. The last two digits are 35 for single width controlled atmosphere, 37 for double width controlled atmosphere, 70 for single width combination, and 72 for double width combination.
Option 4: China/Australia. The last two digits are 40 for single width controlled atmosphere, 42 for double width controlled atmosphere, 75 for single width combination, and 77 for double width combination.
Option 5: North America, 208-230 volts. The last two digits are 45 for single width controlled atmosphere, 47 for double width controlled atmosphere, 100 for single width combination, and 80 for double width combination.

Protector Controlled Atmosphere Glove Boxes

<table>
<thead>
<tr>
<th>Base Catalog Number</th>
<th>Glove Box Width</th>
<th>Operation Type</th>
<th>Liner Material</th>
<th>Shipping Weight lbs/kg</th>
<th>North America 115 Volts</th>
<th>British (UK)*</th>
<th>Schuko*</th>
<th>China/Australia*</th>
<th>North America 230 Volts</th>
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<tbody>
<tr>
<td>50600</td>
<td>Single</td>
<td>Manual</td>
<td>fiberglass</td>
<td>500/227</td>
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<td>35</td>
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<td>45</td>
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<td>50601</td>
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<td>Manual</td>
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<td>650/295</td>
<td>10</td>
<td>31</td>
<td>35</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>50602</td>
<td>Double</td>
<td>Manual</td>
<td>stainless steel</td>
<td>1300/590</td>
<td>12</td>
<td>33</td>
<td>37</td>
<td>42</td>
<td>47</td>
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<td>50800</td>
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<td>Auto</td>
<td>fiberglass</td>
<td>500227</td>
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<td>31</td>
<td>35</td>
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<td>50801</td>
<td>Single</td>
<td>Auto</td>
<td>stainless steel</td>
<td>650/295</td>
<td>10</td>
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<td>45</td>
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<tr>
<td>50802</td>
<td>Double</td>
<td>Auto</td>
<td>stainless steel</td>
<td>1300/590</td>
<td>12</td>
<td>33</td>
<td>37</td>
<td>42</td>
<td>47</td>
</tr>
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</table>

*International electrical configuration

Protector Combination Glove Boxes

<table>
<thead>
<tr>
<th>Base Catalog Number</th>
<th>Glove Box Width</th>
<th>Filter Type</th>
<th>Liner Material</th>
<th>Shipping Weight lbs/kg</th>
<th>North America 115 Volts</th>
<th>British (UK)*</th>
<th>Schuko*</th>
<th>China/Australia*</th>
<th>North America 230 Volts</th>
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</thead>
<tbody>
<tr>
<td>50800</td>
<td>Single</td>
<td>HEPA</td>
<td>fiberglass</td>
<td>500/227</td>
<td>60</td>
<td>65</td>
<td>70</td>
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<td>80</td>
</tr>
<tr>
<td>50801</td>
<td>Single</td>
<td>ULPA</td>
<td>stainless steel</td>
<td>650/295</td>
<td>60</td>
<td>65</td>
<td>70</td>
<td>75</td>
<td>80</td>
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<tr>
<td>50802</td>
<td>Double</td>
<td>ULPA</td>
<td>stainless steel</td>
<td>1300/590</td>
<td>62</td>
<td>67</td>
<td>72</td>
<td>77</td>
<td>82</td>
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</tbody>
</table>

*International electrical configuration

Electrical Receptacle & Plug Configurations & Electrical Requirements

North America, 110-115 volts
100-115 volts, 50/60 Hz, 10 amps

For Catalog Numbers ending in 10, 12, 60 or 62

British (UK)
208-230 volts, 50/60 Hz, 10 amps

For Catalog Numbers ending in 31, 33, 65 or 67

Schuko
208-230 volts, 50/60 Hz, 10 amps

For Catalog Numbers ending in 35, 37, 70 or 72

China/Australia
208-230 volts, 50/60 Hz, 10 amps

For Catalog Numbers ending in 40, 42, 75 or 77

North America, 208-230 volts
208-230 volts, 60 Hz, 10 amps

For Catalog Numbers ending in 45, 47, 80 or 82
The AtmosPure Re-Gen Gas Purifier produces an ultrapure inert atmosphere inside a controlled atmosphere glove box for materials sensitive to moisture and/or oxygen. It circulates an inert gas in the glove box, removing oxygen and moisture. Compatible with any Protector® or Precise® Controlled Atmosphere Glove Box, the AtmosPure allows these glove boxes to meet or exceed ISO 10648-2 test methods. The Purifier has the capacity to remove up to five liters of oxygen (13,500 ppm) and 660 grams of moisture (18 million ppm) at standard temperature and pressure (STP). Depending on the application, glove box liner material and frequency of use, regeneration may be necessary only once every one to three months and completed in only 13 hours.

Indicator lights show each step of the 13 hour regeneration process. Once complete, regeneration may only be needed again every one to three months.

Start/stop button initiates and ends the regeneration process.

Indicator lights show isolation valve status (closed/open).

Blower button toggles circulation air purifier blower between ON, OFF and AUTO. Indicator lights show status.

Vacuum release button may be used, if desired, to momentarily release vacuum after regeneration is complete.

Main Power On/Off switch

Two 3/4" manually-operated ball valves isolate the AtmosPure from the glove box during regeneration.

Flow control valve sets the 4% hydrogen/inert gas mixture flow rate from 10 to 25 CFH during regeneration.

Connections for glove box, vacuum pump and gas mixture are easily accessible from the back of the Purifier.

<table>
<thead>
<tr>
<th>Tests show that ultra low oxygen and moisture levels are attainable with the AtmosPure Re-Gen Gas Purifier.</th>
<th>Gas Permeant</th>
<th>Controlled Atmosphere Glove Box Type/Liner Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attainable Purity (ppm)*</td>
<td>O₂</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>H₂O</td>
<td>1</td>
</tr>
</tbody>
</table>

| Oxygen Permeation at -4° w.g. per ISO 10648-2 Test Method (ppm/min) | O₂ | 0.16 |

| ISO 10648-2 Acceptance Level for Class I Controlled Atmosphere Glove Boxes (ppm/min) | O₂ | <1.67 |

<table>
<thead>
<tr>
<th>Normal Permeation with Pressure from -1° w.g. to +1° w.g. (ppm/min)</th>
<th>O₂</th>
<th>0.14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H₂O</td>
<td>0.10</td>
</tr>
</tbody>
</table>

*Results were attained at Labconco Corporation under controlled conditions. Actual results may vary.
All models feature:

- Automatic regeneration process may be completed in as little as 13 hours and while unattended.
- Internal cylinder contains 5 pounds of copper catalyst capable of removing up to 5 liters of oxygen (13,500 ppm) and 5 pounds of molecular sieve capable of removing 660 grams of moisture (18 million ppm) with normal oxygen and moisture permeation rates 0.3 ppm/min or lower.
- Fully factory-regenerated cylinder is ready to use. Isolation valves arrive closed to maintain molecular sieve and copper catalyst capacity.
- From a 1000 ppm starting condition, able to reduce oxygen to 1 ppm in less than 2 hours.*
- From a 1000 ppm starting condition, able to reduce moisture below 15 ppm in 2 hours, below 10 ppm in 6 hours, below 5 ppm in 16 hours, below 2-3 ppm in 2 days, and as low as 1 ppm in 3-6 days.*
- System automatically compensates for power outages and starts the regeneration process over if interrupted for 10 minutes or longer. This feature ensures complete regeneration of the copper catalyst and molecular sieve since proper regeneration cannot occur if the system has cooled.
- Factory leak-tested with a mass spectrometer while pressurized with helium at 5 inches of water gauge. No detectable leaks greater than 1 x 10^-6 ml/sec.
- Internal stainless steel gas purification lines have oxygen and moisture permeation below 0.1 ppm/min.
- Achieved less than 1.67 ppm/minute oxygen permeation when using ISO 10648-2 test methods at -4 inches of water gauge on Protector Fiberglass and Stainless Steel and Precise Controlled Atmosphere Glove Boxes. Lowest attainable oxygen levels are 0.2 ppm for stainless steel, 0.4 ppm for fiberglass, and 3.5 ppm for polyethylene. Lowest attainable moisture levels are 1 ppm for stainless steel, 2 ppm for fiberglass and 5 ppm for polyethylene.*
- Vacuum pump outlet is rated at 115 volts, 8 amps or 230 volts, 4.5 amps.
- Three microprocessor-controlled solenoid valves, located on the back, for connection to 4% hydrogen/inert gas mixture, vacuum pump and vent exhaust.
- Communications port, located on the back, allows for shared access to the vacuum pump with the glove box. An optional accessory 6-Pin Cable 5442000 is available for communication between the AtmosPure and Auto Pressure Controller of the Precise Controlled Atmosphere Glove Box or accessory Auto Pressure Controller used with the Precise Glove Box.
- Flow control valve sets 4% hydrogen/inert gas mixture between 10-25 CFH.
- Blower button toggles circulation gas purifier blowing between ON, OFF and AUTO. ON allows the blower to run continuously. OFF shuts the blower off, and AUTO allows the blower to be programmed for auto mode and controlled by the oxygen or moisture control ranges.
- Start/Stop button initiates and ends the 13 hour regeneration process.
- Regeneration heater delivers 180 watts for 5 hours of the 13 hour regeneration cycle.
- 3/4" Inlet/outlet compression fittings for connection to Protector Fiberglass or Stainless Steel Controlled Atmosphere Glove Boxes. Accessory 3/8" adapter is available for connection to Precise Controlled Atmosphere Glove Boxes or other glove box models.
- Compact dimensions. Designed to fit on the accessory Glove Box Base Stand beneath the transfer chamber without interfering with the operator’s leg space. Dimensions: 14.9” w x 31.8” d x 21.9” h (38 x 81 x 56 cm).
- Durable epoxy-coated steel housing.
- ETL listing. UL 61010-1 conformity (North America models).
- CE Conformity Marking (International models).
- Shipping weight 90 lbs. (41 kg) See page 18 for AtmosPure accessories.

* Results were attained at Labconco Corporation under controlled conditions. Actual results may vary.

### Plug Configurations & Electrical Requirements

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Electrical Requirements</th>
<th>Plug Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>5121810</td>
<td>100-115 volts, 50/60 Hz</td>
<td>North America, 100-115 Volts</td>
</tr>
<tr>
<td>5121831</td>
<td>208/230 volts, 50/60 Hz</td>
<td>British (UK)</td>
</tr>
<tr>
<td>5121835</td>
<td>208/230 volts, 50/60 Hz</td>
<td>Schuko</td>
</tr>
<tr>
<td>5121840</td>
<td>208/230 volts, 50/60 Hz</td>
<td>China/Australia</td>
</tr>
<tr>
<td>5121845</td>
<td>208/230 volts, 60 Hz</td>
<td>North America, 208-230 Volts</td>
</tr>
</tbody>
</table>

**North America, 100-115 volts**
100-115 volts, 50/60 Hz, 10 amps

**British (UK)**
208-230 volts, 50/60 Hz, 10 amps

**Schuko**
208-230 volts, 50/60 Hz, 10 amps

**China/Australia**
208-230 volts, 50/60 Hz, 10 amps

**North America, 208-230 volts**
208-230 volts, 60 Hz, 10 amps
AtmosPure® Re-Gen Gas Purifiers

ACCESSORIES

5441500 AtmosPure Roughing Prefilter Kit. Filters the inlet and outlet of the glove box as the inert gas is purified. Includes two roughing prefilters and clamp plates to mount inside Protector Glove Boxes. Shipping weight 5 lbs. (2 kg)

5441600 AtmosPure P100 Particulate Filter Kit. Filters the inlet and outlet of the glove box as the inert gas is purified. Includes two P100 particulate filters and mount housings. Shipping weight 5 lbs. (2 kg)

5441700 AtmosPure Regeneration Plumbing Kit. Includes flexible tubing and fittings required to make the regeneration plumbing connections to the 4% hydrogen/inert gas mixture, vacuum and vent. Shipping weight 2 lbs. (1 kg)

AtmosPure Circulation Tubing Kits. Include the plumbing to make the connection from the AtmosPure to the glove box.

<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Circulation Tubing Kit Description</th>
<th>For Use with</th>
<th>Shipping Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5441800</td>
<td>3/4&quot; ID Neoprene-lined flexible hose</td>
<td>All glove boxes, single width</td>
<td>5 lbs. (2 kg)</td>
</tr>
<tr>
<td>5441801</td>
<td>3/4&quot; ID Neoprene-lined flexible hose</td>
<td>All glove boxes, double width</td>
<td>8 lbs. (4 kg)</td>
</tr>
<tr>
<td>5441802</td>
<td>3/4&quot; OD Stainless steel, hard-ducted</td>
<td>Protector Glove Boxes, single width</td>
<td>10 lbs. (5 kg)</td>
</tr>
<tr>
<td>5441803</td>
<td>3/4&quot; OD Stainless steel, hard-ducted</td>
<td>Protector Glove Boxes, double width</td>
<td>20 lbs. (9 kg)</td>
</tr>
</tbody>
</table>

AtmosPure 3/4” to 3/8” Adapter Kits. Fittings permit 3/4” ID neoprene hose included with 5441800 and 5441801 Kits (sold separately above) to attach to glove box’s 3/8” inlet/outlets. Two fittings included with each kit. Not required on current Protector Glove Boxes (manufactured after November 2010).

<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Description</th>
<th>For Use with</th>
<th>Shipping Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5441900</td>
<td>Elbows</td>
<td>Precise Glove Boxes</td>
<td>5 lbs. (2 kg)</td>
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<tr>
<td>5441901</td>
<td>Reducers</td>
<td>Pre-2011 Protector Glove Boxes</td>
<td>5 lbs. (2 kg)</td>
</tr>
</tbody>
</table>

5442000 AtmosPure 6-Pin Communication Cable. Required for use when AtmosPure and glove box configured with Auto Pressure Controller are sharing one vacuum pump. Shipping weight 2 lbs. (1 kg)

5442100 AtmosPure 9-Pin Oxygen/Moisture Monitor Cable. Required for use when the AtmosPure is used in AUTO mode. Allows for automatic control of the AtmosPure blower from an accessory Oxygen or Moisture Monitor (sold separately). Shipping weight 2 lbs. (1 kg)

Protector® Controlled Atmosphere & Combination Glove Boxes

ACCESSORIES

Automatic Pressure Controllers. For use with Protector Controlled Atmosphere Glove Boxes without Automatic Pressure Controller. Easily reduce glove box oxygen and moisture levels by automating the evacuation/purge process. Automatically regulate pressure and vacuum within the main chamber and transfer chamber and automate evacuation/fill cycles up to 499 for the main chamber and 199 for the transfer chamber. Vacuum and pressure may be regulated between -5 to +5 of w.g. in the main chamber and between 0 to -29 inches of mercury in the transfer chamber. A mutable, audible alarm sounds when pressure/vacuum level is outside set limits. Consist of epoxy-coated steel casing with a front panel LCD display and a rear panel with power switch, power inlet connection with circuit breakers, electrical receptacle for connection to vacuum pump (sold separately), electrical connection for foot pedal, two solenoid valves for controlling gas in and gas/vacuum out to transfer chamber, and two solenoid valves for controlling gas in and gas/vacuum out to main chamber. Unit of measure display options are inches of water, inches of mercury, and mBar. A three-position foot pedal (increase gas/fill, off, evacuate/decrease gas) provides hands-free control of the gas inlet and vacuum outlet valves. Include mounting bracket, 3/16” ID polyvinyl tubing, 3/32” ID polyvinyl tubing, and power cord with plug. Shipping weight 20 lbs. (9 kg)

<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Electrical Configuration</th>
<th>For Use with</th>
<th>Shipping Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5238600</td>
<td>100/115 volts, 50/60 Hz operation</td>
<td>All Protector Glove Boxes</td>
<td>2 lbs. (0.9 kg)</td>
</tr>
<tr>
<td>5238601</td>
<td>230 volts, 50/60 Hz operation</td>
<td>All Protector Glove Boxes</td>
<td>2 lbs. (0.9 kg)</td>
</tr>
</tbody>
</table>

Gas and Vacuum Tubing Connection Kits
Include the flexible vinyl tubing and fittings necessary to connect user-supplied inert gas supply tank and rotary vane vacuum pump to valves located on the glove box.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>5245100</td>
<td>Manual Valve Gas and Vacuum Connection Kit</td>
<td>All Protector Glove Boxes</td>
<td>2 lbs. (0.9 kg)</td>
</tr>
<tr>
<td>5245200</td>
<td>Automatic Pressure Controller Gas and Vacuum Tubing Connection Kit</td>
<td>All Protector Glove Boxes</td>
<td>2 lbs. (0.9 kg)</td>
</tr>
</tbody>
</table>

5075619 Electrical 9-Pin Sealed Pass-Through Kit. Provides a leak-tight connection for data transfer from an electronic device inside the glove box to computer, printer or other electronic device outside the glove box. For example, an interior-mounted Oxygen or Moisture Monitor may transfer data through the Pass-Through port to the AtmosPure Re-Gen Gas Purifier connected to a 5442100 Cable. Includes sealed 9-pin connector (D-subminiature with male pins on one side and female pins on the other) and 10’ cord. Shipping weight 1 lb. (0.5 kg)
10.4” high (16.5 x 43.2 x 26.4 cm). Shipping weight 62 lbs. (28 kg)

Isolation valve seals the inlet and prevents oil and air contamination of the system in the event of a power failure. Constructed of cast aluminum casing with lift handle and rubber feet. Include four adapters (1/2” and 3/4” OD); mode selector with High Vacuum and High Throughput positions. Single-phase, direct drive motor, totally enclosed and fan cooled. Thermal overload device switches off the pump when overheated and automatically restarts when cooled.

Exterior Monitor Tubing Kits. Provide attachment tubing to allow placement of Oxygen or Moisture Monitors outside the glove box. Shipping weight 5 lbs. (2 kg)

Moisture Monitors, 0-10,000 ppm
Measure absolute moisture content in gas. Detect levels from 0 to 10,000 ppm (with three ranges from 0-100 ppm, 100-1000 ppm, and 1000-10,000 ppm) with ±1% accuracy. Consist of chemically-inert ceramic technology moisture monitor, sampling block, digital display monitor, sampling pump, switching power supply and on/off switch. For placement inside the glove box’s main chamber unless plumbed with Kit 5442400 (sold separately). Dimensions: 7.7” w x 9.0” d x 7.2” high (19.6 x 22.9 x 18.3 cm). Shipping weight 13 lbs. (6 kg)

Catalog # Description
5244900 For use with Oxygen Monitor 5244500 and 5244501
5244901 For use with Moisture Monitor 5244900 and 5244901

5244800 Hand-held Digital Hygrometer
Battery-operated instrument measures both percent relative humidity from 0.1-100% with ±2% accuracy and temperature in °F or °C with ±1° F (±0.5° C) accuracy. Calculates the dew point temperature and wet bulb temperature based on the relative humidity and temperature readings. Minimum and maximum temperature and relative humidity readings may be stored in memory. Hold function freezes reading. Memory function stores up to 25 sample readings. Includes 9 volt alkaline battery. Shipping weight 1.5 lbs. (0.7 kg)

Oxygen Monitors, 0-10,000 ppm
For detecting trace oxygen levels using an electrochemical sensor. Provide a digital readout in three measurement ranges of 0-100 ppm, 100-1000 ppm and 1000-10,000 ppm. Accuracy is ±1% of full scale. Readout displays on 4-1/2 digit LCD. Equipped with three user-configurable oxygen alarm relays and one user configurable status alarm relay. Include audible alarm and three front panel LED visual alarms. 4-20 mA DC and 0-2 VDC analog outputs. Casing is watertight polycarbonate with gasketed seals. Gas inlet and outlet connections are 1/4” stainless steel compression fittings. Dimensions: 8.3” w x 6.2” d x 10.9” high (21.1 x 15.7 x 27.7 cm). For placement inside the glove box’s main chamber unless plumbed with Kit 5442400 (sold separately). Shipping weight 13 lbs. (6 kg)

Catalog # Description
5244500 110/115 volts, 50/60 Hz operation
5244501 230 volts, 50/60 Hz operation
Drying Trains
Provide a means for reducing the humidity within the glove box to less than 5 ppm (rated for achieving a dew point of -65° C).
Include 1 CFM diaphragm pump, stainless steel column with molecular sieve (one or two depending on model), stainless steel tubing to connect column to pump and 3-wire cord and plug. An on/off switch is located on the cord on 115 volt models. 3/8” OD copper tubing and two isolation valves are required.

5117000 Optional Second Column
Stainless steel column that contains molecular sieve rated for achieving a dew point of -65° C. Provides immediate replacement column for Drying Train 5061300 or 5061302. Shipping weight 5 lbs. (2.3 kg)

7837300 Molecular Sieve Replacement Media
For replacing spent media in Drying Train column. Provides two refills. Shipping weight 6 lbs. (2.7 kg)

Drying Train Accessories
A chemical trap to remove organic solvents, acids, ammonia, radioisotopes or moisture may be added to any glove box. The trap is connected to two main chamber valves and a diaphragm pump for recirculation of the main chamber atmosphere and contaminant removal. Diaphragm vacuum pump is required.

5244100 Flowmeter
For inline drying train connection to provide visual confirmation of drying train circulation. Shipping weight 2.5 lbs. (1.1 kg)

5242500 Drying Train Tubing Kit
Includes 25’ x 3/8” OD fluorinated ethylene propylene (FEP) tubing and eight tube inserts to connect drying train components. Shipping weight 3 lbs. (1.4 kg)

5240100 Gas and Vacuum 0.2 Micron Filter
Traps particulates. For drying train or vacuum pump exhaust. 0.25”- 0.38” ID. Shipping weight 0.5 lb. (0.2 kg)

Diaphragm Vacuum Pumps
For drying train circulation. Single cylinder, oil-free diaphragm pumps with permanently lubricated bearings and mounted on rubber feet. Provide 206 mBar ultimate vacuum 1/8 hp motor. Die cast aluminum 3/8” OD diameter inlet and outlet connections. Dimensions: 4.8” w x 8.0” d x 7.0” h (12.2 x 20.3 x 17.8 cm). Shipping weight 11 lbs. (5 kg)

Vacuum Pump and Pressure Relief Bubbler HEPA Filter Kits
Kits include 5” diameter round HEPA filter, 99.9% efficient on 0.3 micron particulates and two plastic hose barbs for attachment to tubing.
Gloves, Sleeves and Hands

Neoprene Gloves
Highly resistant to abrasion and tearing. Impermeable to water vapor, gases and toxic chemicals. One piece, seamless, 0.015 gauge. With O-rings. One pair of size 9 3/4 is included with each Protector Glove Box.

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<tr>
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<tbody>
<tr>
<td>5005500</td>
<td>Size 8 1/2, one pair</td>
<td>3 lbs. (1.4 kg)</td>
</tr>
<tr>
<td>5005600</td>
<td>Size 9 3/4, one pair</td>
<td>3 lbs. (1.4 kg)</td>
</tr>
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</table>

Butyl Gloves
Highly impermeable to water vapor, gases and toxic chemicals. Resistant to oxygenated solvents and most oxidizing chemicals. High dexterity. One piece, seamless, 0.015 gauge. With O-rings.

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<td>5005501</td>
<td>Size 8 1/2, one pair</td>
<td>3 lbs. (1.4 kg)</td>
</tr>
<tr>
<td>5005601</td>
<td>Size 9 3/4, one pair</td>
<td>3 lbs. (1.4 kg)</td>
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Hypalon Gloves
Mixture of neoprene and butyl. Resistant to abrasion, ozone and oxidizing chemicals. One piece, seamless, 0.015 gauge. With O-rings.

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<tr>
<td>5005902</td>
<td>Size 8 1/2, one pair</td>
<td>3 lbs. (1.4 kg)</td>
</tr>
<tr>
<td>5005602</td>
<td>Size 9 3/4, one pair</td>
<td>3 lbs. (1.4 kg)</td>
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5005603 Latex Gloves
For use when dexterity is needed. Limited protection. Size 9 3/4. One piece, seamless, 0.015 gauge. With O-rings. One pair. Shipping weight 3 lbs. (1.4 kg)

5005800 Neoprene Straight Sleeves
For use with any Hands listed at right. With O-rings and springs. One pair. Shipping weight 3 lbs. (1.4 kg)

5005900 Neoprene Accordion Sleeves
For use with any Hands listed at right. With O-rings and springs. One pair. Shipping weight 3 lbs. (1.4 kg)

Neoprene Hands
Lightweight, embossed with firm-hold finish. For use with either Neoprene Straight or Accordion Sleeves. 0.017 gauge.

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<tr>
<td>5006000</td>
<td>Size 7 1/2, package of 12 pairs</td>
<td>2 lbs. (0.9 kg)</td>
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<tr>
<td>5006100</td>
<td>Size 9, package of 12 pairs</td>
<td>2 lbs. (0.9 kg)</td>
</tr>
<tr>
<td>5003300</td>
<td>Size 10, package of 12 pairs</td>
<td>2 lbs. (0.9 kg)</td>
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Latex Hands
White, surgical-type. For use with either Neoprene Straight or Accordion Sleeves, 0.009 gauge.

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<tr>
<td>5006200</td>
<td>Size 7, package of 12 pairs</td>
<td>2 lbs. (0.9 kg)</td>
</tr>
<tr>
<td>5006300</td>
<td>Size 9, package of 12 pairs</td>
<td>2 lbs. (0.9 kg)</td>
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5242200 Exterior Glove Port Covers
May be placed over glove ports with or without gloves attached to facilitate and expedite the evacuation/fill operation and preserve inert atmosphere. Molded rubber. Includes two clamps. Set of two. Shipping weight 3.5 lbs. (1.6 kg)

5060400 Interior Glove Port Cover
Quickly seals glove box should sudden leak occur due to glove damage. Stainless steel with molded rubber gasket and spring-loaded latches with adjustable closure knob. Shipping weight 8 lbs. (3.6 kg)

5066700 Polycarbonate Viewing Window
Polycarbonate, 0.4” thick (1 cm), with dry powder epoxy-coated steel frame, replaces standard laminated glass window. Viewing dimensions: 36.0” w x 27.7” high (91.4 x 70.4 cm). Shipping weight 120 lbs. (54 kg)
**5225701 Add-A-Valve Kit**
Includes the manual ball valve, compression fitting, hose connector fitting, O-ring and nut to add a service valve to the main chamber. Requires installation and 0.688” diameter hole. Valve may be used for a variety of services including vacuum, gas, nitrogen, air, carbon dioxide or cold water. Shipping weight 1 lb. (0.5 kg)

**5225703 Add-A-Valve Installation Kit**
Includes 0.688” diameter hole saw, arbor and instructions. For use with fiberglass-lined glove boxes only. Shipping weight 0.5 lb. (0.2 kg)

**Electrical Power Strips**
Provide electrical receptacles for connecting instruments and equipment inside the glove box. Include an electrical cord and plug for connection to the glove box’s interior receptacle. Shipping weight 3 lbs. (1.4 kg)

**5075619 Electrical 9 Pin Sealed Pass-Through Kit**
Provides a leak-tight connection for data transfer to a customer-supplied printer or computer located outside the glove box. Includes sealed 9 pin connector (d-subminiature with male pins on one side and female pins on the other) and 10’ cord. Requires drill hole. Shipping weight 1 lb. (0.5 kg)

**5240800 Installation Kit for Electrical Pass-Through**
Includes drill bits for installing Electrical Pass-Through on a fiberglass-lined glove box. Shipping weight 0.5 lb. (0.3 kg)

**5234600 Balance Vibration Isolator**
Minimizes vibration to sensitive balances. Includes a 13.4” w x 20.4” d x 2.7” thick (34.0 x 51.8 x 6.9 cm) marble slab, four isolator pads, and a type 304 stainless steel protective cover. Shipping weight 75 lbs. (34 kg)

**5061600 Interior Shelves Kit**
Provides shelf space across the back wall of the glove box interior. Three stainless steel storage shelves are attached to epoxy-coated steel upright supports. Shelves have adjustable height and measure 30” wide x 6” deep (76.2 x 15.2 cm). Installation hardware and instructions are included. Shipping weight 15 lbs. (6.8 kg)

**524400 Anti-Static Ionizer Fans**
Circulate ionized air inside the glove box to reduce static charge. Requires installation. Shipping weight 5 lbs. (2 kg)

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<tr>
<td>5234400</td>
<td>For 100/115 volt, 50/60 Hz operation, with 24 VDC power supply</td>
</tr>
<tr>
<td>5234401</td>
<td>For 230 volt, 50/60 Hz operation, with 24 VDC Schuko power supply</td>
</tr>
</tbody>
</table>

**Catalog #**
- 5211500 North American Electrical Configuration, 115 volts, 50/60 Hz, 10 amps, 4 receptacles
- 5210601 British (UK) Electrical Configuration, 208-230 volts, 50/60 Hz, 10 amps, 6 receptacles
- 5290401 Schuko Electrical Configuration, 208-230 volts, 50/60 Hz, 10 amps, 6 receptacles
- 5332601 China/Australia Electrical Configuration, 208-230 volts, 50/60 Hz, 10 amps, 6 receptacles
Adjustable Height Base Stands

Support Protector Glove Boxes. Available with casters or leveling feet. Durable 2” tubular glacier white epoxy-coated steel frame has lower shelf, 47” w x 18” d (119.4 x 45.7 cm), with 17” w x 27” d (43.2 x 68.6 cm) area on right-hand side to support optional AtmosPure Re-Gen Gas Purifier. Telescoping legs adjust in 1” increments to seven overall height positions from 33.0” to 40.0” (83.8 x 101.6 cm). Black laminate hard board work surface, 60.0” w x 31.0” d (152.4 x 78.7 cm) is permanently mounted to the frame. Shipping weight 225 lbs. (102 kg)

5235500 Adjustable Height Mobile Base Stand

5235501 Adjustable Height Stationary Base Stand

Catalog # Description
5235500 Adjustable Height Mobile Base Stands with 5” diameter, toe-locking ball-bearing polyurethane casters.
5235501 Adjustable Height Stationary Base Stand with leveling feet. Overall depth: 31.0” (78.7 cm)
Protector Glove Boxes

DOUBLE MOBILE BASE STAND & LEFT SIDE DOOR OPTION

5062020 Double Mobile Base Stand
Supports Protector Double Glove Boxes. Durable 2” tubular glacier white epoxy-coated steel frame has lower shelf, 54” w x 23” d (137.9 x 58.4 cm), with 16” w x 29” d (41 x 74 cm) area on right-hand side to support optional AtmosPure Re-Gen Gas Purifier. Includes 5” diameter, toe-locking, non-marking polyurethane casters with ball bearings for quiet operation. When ordered with a Protector Double Glove Box, the Stand ships premounted to the glove box. Shipping weight 400 lbs. (181 kg).

Left Side Door Option
Any stainless steel-lined Protector Glove Box may be factory prepared with a large left side door for use in loading large equipment. It provides a convenient alternative to removing the window and frame to load oversized items. The left side door has an opening of 16.5” wide x 23” high (41.9 x 58.9 cm). Contact Labconco for ordering information.
Precise® Glove Boxes are constructed of durable molded polyethylene. Over 70 accessories allow these glove boxes to be customized to fit application requirements.
Contact Labconco for more information about these quality products for your Laboratory.

Precise® Glove Boxes
Fume Hoods & Ductless Enclosures
Balance & Bulk Powder Enclosures
Biological Safety Cabinets, Enclosures & Clean Benches
Laboratory Animal Research Stations

Nanotechnology Enclosures
Glassware Washers
Water Purification Systems
Freeze Dry Systems
Vacuum Concentrators & Cold Traps

Multiple Sample Evaporation Systems
Laboratory Carts & Mobile Benches
Blood Drawing Chairs
Agricultural Chemistry Products
Vacuum Desiccator

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