



AL-234 Technical Bulletin

Sigma-Aldrich Lecture-Bottle Station Instructions

Station for Non-Corrosive Gases, Brass Regulator, Z562599

SPECIFICATIONS:

Regulator- Single stage, panel-mounted brass body with stainless steel pressure diaphragm, brass nozzle, PCTFE seat, Viton® seals, self seating type relief valve, 1 ½ in. diameter gauges, 3,000 psig maximum inlet pressure, 0-80 psig delivery range, brass outlet valve with ¼ in. NPTF connection.

Cabinet- 14 in. W x 12 in. D x 8½ in. H, Weight: 14lb, without lecture-bottles.



COMPONENTS:

1. Station base
2. Brass regulator, includes brass outlet valve
3. Stainless hose
4. Grommet, rubber
5. CGA connection, includes nut, nipple & PTFE washer

START UP:

Place lecture bottle to be used, into bottle slot at top of station. Place the PTFE washer included with the CGA fitting into the CGA nut. Push it in so that it is snug against the face of the nipple. Thread the nut onto the lecture bottle valve and tighten with a wrench. (Never use PTFE tape on any Cylinder CGA fitting. CGA 170 & 180 connections are designed to use a specific washer for sealing. Make sure the regulator adjusting knob is turned out (counter clockwise) and the regulator outlet valve is closed (clockwise), so there will be no flow of gas when the lecture bottle is opened. Connect your use line to the regulator outlet valve, ¼ inch NPTF using PTFE tape as a sealant. Tighten outlet connection with a wrench. Open the lecture bottle slowly so that the valve is fully open. Check the CGA and outlet connections for leaks using Snoop or other compatible leak detector. Re-tighten or re-do if necessary. Slowly adjust the regulator adjusting knob clockwise to increase delivery pressure to your desired pressure. Open regulator outlet valve to allow gas to flow.

SHUT DOWN:

Turn off lecture bottle cylinder valve. Turn regulator adjusting knob clockwise until a small amount of delivery pressure shows on the delivery gauge. Open outlet needle valve and allow residual pressure from the regulator and hose to drain from the system. Allow all gas pressure to drain from the high and low pressure gauges. Close outlet needle valve.

Station for High-Purity Gases, Stainless Steel Regulator, Z562602

SPECIFICATIONS:

Regulator-Single stage, panel-mounted stainless steel body and pressure diaphragm, cartridge type seat PCTFE, PTFE and PCTFE seals, 2 inch diameter stainless steel gauges, helium leak rate tested at 1×10^{-8} ssc/sec., 3,000 psig maximum inlet pressure, 0-80 psig delivery range, Stainless steel outlet valve with ¼ inch NPTF connection.

Cabinet-14 in. W x 12 in. D x 8½ in. H, Weight: 14lb, without lecture-bottles.



COMPONENTS:

1. Station base
2. Stainless steel regulator, includes stainless steel outlet valve
3. Stainless hose
4. Grommet, rubber
5. CGA connection, includes nut, nipple & PTFE washer 1

START UP:

Place lecture bottle to be used, into bottle slot at top of station. Place the PTFE washer included with the CGA fitting into the CGA nut. Push it in so that it is snug against the face of the nipple. Thread the nut onto the lecture bottle valve and tighten with a wrench. (Never use PTFE tape on any Cylinder CGA fitting. CGA 170 & 180 connections are designed to use a specific washer for sealing.) Make sure the regulator adjusting knob is turned out (counter clockwise) and the regulator outlet valve is closed (clockwise) so there will be no flow of gas when the lecture bottle is opened. Connect your use line to the regulator outlet valve, ¼ in. NPTF using PTFE tape as a sealant. Tighten outlet connection with a wrench. Open the lecture bottle slowly so that the valve is fully open. Check the CGA and outlet connections for leaks using Snoop or compatible leak detector. Re-tighten or re-do if necessary. Slowly adjust the regulator adjusting knob clockwise to increase delivery pressure to your desired pressure. Open regulator outlet valve to allow gas to flow.

SHUT DOWN:

Turn off lecture bottle cylinder valve. Turn regulator adjusting knob clockwise until a small amount of delivery pressure shows on the delivery gauge. Open outlet needle valve and allow residual pressure from the regulator and hose to drain from the system. Allow all gas pressure to drain from the high and low pressure gauges. Close outlet needle valve.

Station for Mildly Corrosive Gases, Stainless Steel Regulator with T-Purge, Z562610

Purge valve sits between the lecture-bottle and regulator to purge system with inert gas to remove air, moisture, and process gas to maintain high-purity conditions and to minimize gas hydrolysis and corrosion damage to equipment. Purge system with dry, inert gas before introducing mildly corrosive gases and again immediately after use.

SPECIFICATIONS:

Regulator-Single stage, panel-mounted stainless steel body and pressure diaphragm, cartridge type seat PCTFE, PTFE and PCTFE seals, 2 inch diameter stainless steel gauges, helium leak rate tested at 1×10^{-8} ssc/sec., 3,000 psig maximum inlet pressure, 0-80 psig delivery range, Stainless steel outlet valve with $\frac{1}{4}$ in. NPTF connection.

T-Purge valve-316L stainless steel body and valve, 3,000 psig maximum inlet pressure, with $\frac{1}{4}$ in. NPTF connection.

Cabinet-16 in. W x 12 in. D x $8\frac{1}{2}$ in. H, Weight: 16lb, without lecture-bottles.



COMPONENTS:

1. Station base
2. Stainless steel regulator, includes stainless steel outlet valve
3. T-purge assembly, SS
4. Stainless hose
5. CGA connection, includes nut, nipple & PTFE washer
6. Grommet, rubber

PURGE (to cleanse)-Anytime corrosive gases are used in a gas system, a purging procedure must be used to remove oxygen, air, moisture and other contaminants from the system. Oxygen & moisture can adversely affect your results, create unwanted reactions and permanently damage your gas regulator and other connected equipment. Many gas products such as HCL, NH_3 , Cl_2 , etc...react with moisture, forming corrosive acids that will attack and destroy the interior surfaces of your equipment. Gas regulation equipment attacked by corrosion can rarely be repaired and is not covered under warranty.

PROCESS-Whenever the process gas is toxic, mildly corrosive or hazardous, purging must be done using an inert gas, usually Dry Nitrogen (N_2). The purge procedure must be done correctly to provide a clean and dry path for your process gas to follow without adverse reactions or damage to your regulation system. A purge process utilizing Dry Nitrogen flowing into the system and exiting through a properly vented disposal system will assure you of better results and longer lasting equipment.

PROCEDURE-There are 3 procedures used for the purge process. The first method is used for 'Initial Hook Up' when a gas cylinder is connected to the system. The second method is used for 'Cylinder Change Out'. The third is 'Shut Down'.

INITIAL HOOK UP:

- Connect lecture bottle to system with proper CGA connection using the correct PTFE washer. Leave connection loose.
- Connect Nitrogen (N₂) inlet line to lecture bottle station as designated.
- Connect process (or Use) gas line to the intended use point.
- Make sure all valves are closed and regulator adjusting screw is backed out counter clockwise so that there is no gas flow. (counter clockwise on regulator adjusting screw closes off flow. clockwise opens flow.)
- Set purge N₂ delivery pressure between 5 - 30 psig at the N₂ source. Open N₂ valve and allow N₂ to flow through CGA hose at cylinder connection for 2-5 minutes. Tighten CGA connection using wrench.

1. Open N₂ inlet (**BLUE**) valve.
2. Open regulator adjusting screw (clockwise) slightly.
3. Open process gas Use valve (**BLACK**). The positive N₂ pressure will force out residual contaminants and moisture.
4. Close process Gas Use valve (**BLACK**).
5. At this time check for leaks at all connections using Snoop leak detector. Re-tighten any leaking connections.

- **Repeat these steps TEN (10) times** to thoroughly purge the system of contaminants and moisture.
- Make sure N₂ inlet (**BLUE**) valve and regulator adjusting screw are closed tightly (counter clockwise).
- Open lecture bottle cylinder valve. This allows process gas into hose & T-purge.
- Adjust regulator adjusting screw to desired delivery pressure.
- Open regulator Use needle valve (**BLACK**) when downstream process system is ready for use.
- Leave N₂ inlet hose line connected for purging the system at change out and shutdown.

**CYLINDER CHANGE OUT:**

- Close lecture bottle cylinder valve.
- Verify Nitrogen (N₂) inlet line is properly connected. Make sure process gas is properly vented away to a hood or scrubber.
- Set purge N₂ delivery pressure at 5 - 30 psig at the N₂ source.
 1. Open N₂ inlet (**BLUE**) valve.
 2. Open regulator adjusting screw (clockwise) slightly. The positive N₂ pressure will force out residual contaminants and moisture.
 3. Close regulator adjusting screw (counter clockwise).
- **Repeat these steps SEVEN (7) times** to thoroughly purge the system of process gas.
- Make sure N₂ inlet (**BLUE**) valve and Regulator adjusting screw (counter clockwise) are closed tightly.
- Disconnect lecture bottle cylinder and replace cylinder.
- With new lecture bottle properly connected, repeat purge procedure in 'Initial Hook Up'.

SHUTDOWN:

- Close lecture bottle cylinder valve.
- Verify Nitrogen (N₂) inlet line is properly connected. Make sure process gas line is properly vented to a hood or scrubber.
- Set purge N₂ delivery pressure at 5-30 psig at the N₂ source.
- Open N₂ inlet (**BLUE**) valve.
- Screw regulator adjusting screw in slightly to allow gas flow.

- Open Regulator Use needle valve (**BLACK**).
- Allow N₂ flow through regulator and process line for several minutes
- Close regulator needle valve (**BLACK**), Close N₂ inlet (**BLUE**) valve tightly.
- Turn regulator adjusting screw counter clockwise to 'Closed' position. This will hold N₂ inside regulator.
- Disconnect lecture bottle cylinder, process & vent hoses if desired.

Station for Corrosive Gases, Corrosion Resistant Regulator with Cross-Purge, Z562629

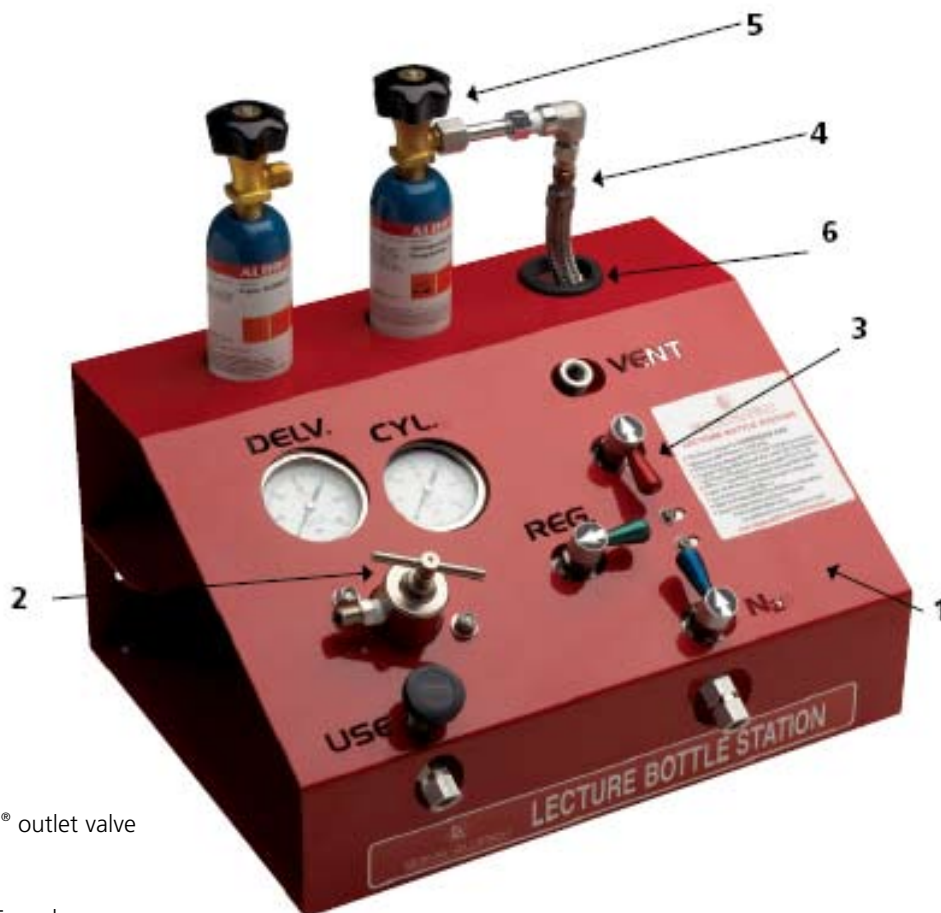
For use with hydrogen chloride, hydrogen bromide, hydrogen fluoride, and silicon tetrafluoride. Cross-purge valve sits between the lecture-bottle and regulator to prevent escape of toxic and flammable gases when changing cylinders and permits purging system with inert gas to remove air, moisture, and process gas to minimize gas hydrolysis and corrosion damage to equipment. Purge system with dry, inert gas before introducing corrosive gases and again immediately after use. We recommend attaching a Bonnet vent adapter to the Bonnet vent of the regulator as a safety measure in case there is a diaphragm failure. This will allow the gas to vent into the hood if the regulator diaphragm fails.

SPECIFICATIONS:

Regulator-Single stage, panel-mounted electroless nickel-plated brass body with PTFE-lined stainless steel pressure diaphragm, Monel® nozzle with PCTFE seat, Viton® seals, captured vent for safe operation (¼ in. NPTM connection), 2.7 in. diameter stainless steel gauges, helium leak rate tested at 1×10^{-6} ssc/sec., 3,000 psig maximum inlet pressure, 0-80 psig delivery range, Monel® outlet needle valve with ¼ in. NPTF connection.

Cross-purge valve-316L stainless steel body and valves with color-coded handles, welded construction, electropolished and cleaned for oxygen service, 3,000 psig maximum inlet pressure, with ¼ in. NPTF connections.

Cabinet-16 in. W x 12 in. D x 8½ in. H, Weight: 20lb, without lecture-bottles.



COMPONENTS:

1. Station base
2. Corrosion resistant regulator, includes Monel® outlet valve
3. Cross-purge assembly, SS
4. Stainless hose
5. CGA connection, includes nut, nipple & PTFE washer
6. Grommet, rubber

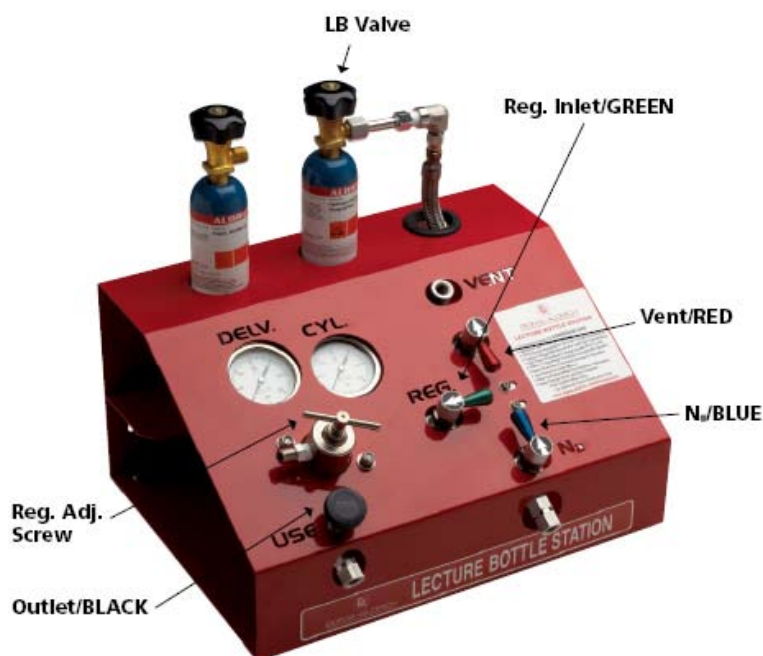
PURGE (to cleanse)-Anytime corrosive gases are used in a gas system, a purging procedure must be used to remove oxygen, air, moisture and other contaminants from the system. Oxygen & moisture can adversely affect your results, create unwanted reactions and permanently damage your gas regulator and other connected equipment. Many gas products such as HCL, NH₃, Cl₂, etc...react with moisture, forming corrosive acids that will attack and destroy the interior surfaces of your equipment. Gas regulation equipment attacked by corrosion can rarely be repaired and is not covered under warranty.

PROCESS-Whenever the process gas is toxic, corrosive or hazardous, purging must be done using an inert gas, usually Dry Nitrogen (N₂). The purge procedure must be done correctly to provide a clean and dry path for your process gas to follow without adverse reactions or damage to your regulation system. A purge process utilizing Dry Nitrogen flowing into the system and exiting through a properly vented disposal system will assure you of better results and longer lasting equipment.

PROCEDURE-There are 3 procedures used for the purge process. The first method is used for 'Initial Hook Up' when a gas cylinder is connected to the system. The second method is used for 'Cylinder Change Out'. The third is 'Shut Down'.

INITIAL HOOK UP:

- Connect lecture bottle to system with proper CGA connection using the correct PTFE washer. Leave connection loose.
- Connect Nitrogen (N₂) inlet line and Vent line to lecture bottle station as designated. Make sure Vent line is properly vented to a hood or scrubber.
- Connect process (or Use) gas line to the intended use point.
- Make sure all valves are closed and regulator adjusting screw is backed out counter clockwise so that there is no gas flow.
- Set purge N₂ delivery pressure at 5-30 psig at the N₂ source. Open N₂ valve and allow N₂ to flow through CGA hose at cylinder connection for 2-5 minutes. Tighten CGA connection using wrench.
- Open regulator inlet (**GREEN**) valve. This will allow N₂ into the high pressure side of the regulator.
- Open N₂ inlet (**BLUE**) valve. Check for leaks at all connections using Snoop leak detector. Re-tighten any leaking connections. Close N₂ Inlet Valve.
 1. Open N₂ inlet (**BLUE**) valve.
 2. Close N₂ inlet (**BLUE**) valve.
 3. Open Vent (**RED**) valve. The positive N₂ pressure will force out residual contaminants and moisture.
 4. Close Vent (**RED**) valve.
- **Repeat these steps TEN (10) times** to thoroughly purge the system of contaminants and moisture.
- Make sure N₂ inlet (**BLUE**) valve and Vent (**RED**) valve are closed tightly.
- Open lecture bottle cylinder valve. This allows process gas into Cross-purge and high pressure regulator.
- Check all connections for leaks using Snoop or compatible leak detector.
- Adjust regulator adjusting screw to desired delivery pressure.
- Open regulator Use needle valve (**BLACK**) when downstream process system is ready for use.
- Leave N₂ inlet and Vent hose lines connected for purging the system at change out and shutdown.



CYLINDER CHANGE OUT:

- Close lecture bottle cylinder valve & regulator inlet (**GREEN**) valve.
- Verify Nitrogen (N₂) inlet line and Vent line are both properly connected. Make sure Vent line is properly vented to a hood or scrubber.
- Make sure all valves are closed and regulator adjusting screw is backed out counter clockwise so there is no gas flow.
- Set purge N₂ delivery pressure at 5-30 psig at the N₂ source.
 1. Open N₂ inlet (**BLUE**) valve.
 2. Close N₂ inlet (**BLUE**) valve.
 3. Open Vent (**RED**) valve. The positive N₂ pressure will force out residual contaminants and moisture.
 4. Close Vent (**RED**) valve.
- **Repeat these steps SEVEN (7) times** to thoroughly purge the system of process gas.
- Make sure N₂ inlet (**BLUE**) valve and Vent (**RED**) valve are closed tightly.
- Disconnect lecture bottle cylinder and replace cylinder.
- With new lecture bottle properly connected, repeat purge procedure in 'Initial Hook Up'.

SHUTDOWN:

- Close lecture bottle cylinder valve.
- Verify Nitrogen (N₂) inlet line and Vent line are both properly connected. Make sure Vent line is properly vented to a hood or scrubber.
- Make sure all valves are closed and regulator adjusting screw is backed out counter clockwise so there is no gas flow.
- Set purge N₂ delivery pressure at 5-30 psig at the N₂ source.
 1. Open N₂ inlet (**BLUE**) valve.
 2. Close N₂ inlet (**BLUE**) valve.
 3. Open Vent (**RED**) valve. The positive N₂ pressure will force out residual contaminants and moisture.
 4. Close Vent (**RED**) valve.
- **Repeat these steps SEVEN (7) times** to thoroughly purge the system of process gas.
- Open N₂ inlet (**BLUE**) valve.
- Screw regulator adjusting screw in slightly to allow gas flow.
- Open regulator Use needle valve (**BLACK**).
- Open regulator inlet (**GREEN**) valve to allow N₂ flow through regulator and process line for several minutes. Make sure process line is properly vented to hood or scrubber.
- Close regulator needle valve (**BLACK**), Close N₂ inlet (**BLUE**),
- Make sure N₂ inlet (**BLUE**) valve and Vent (**RED**) valve are closed tightly.
- Turn regulator adjusting screw counter clockwise to 'Closed' position. This will hold N₂ inside regulator.
- Disconnect lecture bottle cylinder, process & vent hoses if desired.

Express Service™ Program (for US customers only)

Regulator Repair-is offered as a service to all Sigma-Aldrich customers. We offer this convenience in order to expedite the repair of your equipment. We are able to repair regulation equipment subject to normal wear & tear such as replacement pressure gauges, seals, o-rings, diaphragm replacement, CGA fittings, needle valves, springs, etc...

Regulator Replacement-is another service offered to Sigma-Aldrich Customers. If you have a Sigma-Aldrich regulator that has been sent to us but can not be repaired by our service center due to costs associated with the repair, damage due to corrosion or some other valid reason, we will offer you a new replacement regulator for your application at an affordable cost.

The procedure for this program is explained on our website at sigma-aldrich.com/gases where you will find complete instructions. For additional information, call our Technical Services Department at **1-800-231-8327**.

Accessories

CGA adapters-Allows for adapting the fittings on the lecture-bottle stations to all other cylinder fittings.

CGA	NPTM(in.)	Prod No.
350	¼	Z564494
660	¼	Z564508
330	¼	Z564486
170	¼	Z564478

4-way wrench

One wrench to fit both CGA and NPTM fittings.

Z564516

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