CHEMGLASS

Operating and Maintenance Instructions

PTFE Diaphragm Laboratory Vacuum Pumps

Models: CG-4812-10
CG-4812-30

Features

- CHEMGLASS CG-4812 series of contamination-free diaphragm vacuum pumps feature solid PTFE heads combined with our exclusive PTFE coated molded diaphragm. They are capable of pumping highly aggressive gases without attack to the pump or contamination of the gas stream.
- Solid PTFE completely eliminates blistering or peeling of pump components, assuring the longest duty available for corrosive gas pumping applications. This pump is available in single-head and our unique twin-head designs fitted for either table-top use or for OEM applications mounted directly into your equipment.
- CONTAMINATION-FREE TRANSFER: The diaphragm design uses no coated-metal wetted parts. This insures a leak-tight seal and prevents contamination of the pumped medium while at the same time increasing system reliability.
- DuPont's solid PTFE fluorocarbon resin heads and Kalrez® (FFKM) valves* are resistant to most corrosive gases and vapors, reducing periodic maintenance. **Kalrez® valves are standard. PTFE valves optional. Please consult factory.*
- EASY MAINTENANCE: With a CG pump, special tools or training are unnecessary if cleaning is required. The heads and valves are disassembled and reassembled in minutes.

Performance Specifications

Model	MAX Vacuum	MAX Pressure	Flow Rate
CG-4812-10	50 Torr (67 mbars)	20 PSIG	17L/min
CG-4812-30	10 Torr (13 mbars)	Vacuum Only	17L/min

Notes:

1. CG-4812-30 is designed for vacuum applications only.
2. Pressure ratings listed are continuous.

Operating Instructions

The following guidelines should be observed to promote safe and reliable operation of your vacuum pump.

1. All units are 100% oil-free. No maintenance at all is necessary for the bearings. All bearings are sealed and permanently lubricated. Lubrication should not be attempted. For bearing replacement, call CHEMGLASS.
2. Be sure that the available electric power matches specifications of the electric motor listed on the identification plate. Serious damage may occur to the motor if connected to an improper voltage. All units must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product is equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.
3. The pump should be placed where the surrounding temperature remains between 40°F and 104°F (5°C and 41°C). This is particularly important when the unit is installed in a confined space. Do not block the ventilation ports located on the motor housing.

4. Standard models are designed to start against atmospheric pressure only, not under any vacuum load. Care must be taken to eliminate vacuum load after pump is turned off for any reason.
5. Use only to pump air or gas, not liquids or particulates. Damage to the pump or loss of performance can occur if liquids or particulates enter the system. The life of the pump can be prolonged if the formation of condensate within the pump is avoided.
6. Always install the pump in such a location that its external parts are protected from direct or indirect moisture contact.
7. Avoid operating the pump in very dusty conditions. If this cannot be prevented, then install a suction filter. Be sure to inspect and change it frequently to avoid excessive pressure build-up on the pressure side.
8. Output flow should not be throttled or restricted for any reason. The maximum rated operating pressure is not to be exceeded, particularly if the pump is used as a compressor.
9. Be sure that the pump is installed at the highest point within the system to prevent possible condensate from entering the unit.
10. Please remove any protective plastic plugs supplied in the intake or pressure ports of your pump prior to applying power to the motor.

WARNING!: CHEMGLASS portable pumps are not explosion proof, however, most have been evaluated and approved by UL for laboratory use, according to General Requirement UL3101.1. As with all laboratory procedures, safety codes (i.e., NFPA 45, Fire Protection for Laboratories Using Chemicals) pertaining to proper laboratory ventilation and solvent handling should be adhered to, especially when processing potentially toxic and/or combustible liquids and vapors.

The motor is thermally protected and will automatically restart unexpectedly when the overload device resets.

The following precautions should be taken:

1. Run the pump for a few minutes to warm it up before handling saturated or nearly saturated vapors.
2. After use, let the pump run for about 2 minutes in air before switching it off, to purge out droplets of liquid that may have formed on the inside of the pump.

This prevents crystallization and/or absorption of liquids by the pump materials.

Troubleshooting

Your CHEMGLASS vacuum pump should perform to specifications for years if the simple operating instructions and precautions are observed. If you experience a problem and suspect the pump, try these simple checks prior to calling for assistance.

1. Check that all system interconnections are gas-tight.
2. Remove the head assembly as described in "Changing the Diaphragm and Valve Disks". Look for any foreign matter; commonly bits of PTFE tape or particulates carried into the valve system or crystallized material from previously pumped vapors. All of the above must be cleared out and the pump reassembled with clean parts.

3. If pitting of the pump parts or tearing of the diaphragm is observed, it is possible that the gas/vapor being pumped is capable of dissolving the PTFE or Kalrez® wetted parts of the pump. There are very few materials that will attack the pump parts, such as Nitric and Fluorine vapors. Chemical resistance charts should be consulted if you are in doubt. Generally, replacement of the diaphragm and valves will restore the pump.

Spare Parts Kits *(per head)*

For Head Materials

Kit Part Number: K726-0FTK, To Consist of:

Qty	ID#	Description
1	K	Molded Diaphragm
2	T	Kalrez® Valve Disks
2	S	O-Rings

PLEASE NOTE: ABOVE KIT IS TO RENEW ONE HEAD ONLY. TWO KITS ARE REQUIRED TO RENEW A TWIN-HEAD PUMP.

Individual Spare Parts *(per head)*

ID#	Description
C	Pressure Plate
D	Socket Screw (6/Head)
E	Clamp Ring (2/Head)
F	Exhaust Valve Body
G	Suction Valve Body
H	Large Socket Screw (4/Head)
J	Air Gate (Suction Valve Only)
K	Molded Diaphragm
Q	Diaphragm Spacers (See Note 1)
R	Spring Washers (7 Required/Screw)
S	O-Ring (2/Head)
T	Kalrez® Valve Disk (2/Head)
U	PTFE Protection Ring (2/Head)

Notes:

1. Use same quantity as originally supplied.
2. Contact Chemglass Customer Service for ordering information.

Maintenance Procedures

During normal use, the diaphragm and valves are the only part of the pump that needs to be replaced. Changing them is a simple process when the following steps are taken.

If you run into a problem or have a question regarding the following procedure, please call CHEMGLASS Technical Service for assistance.

PLEASE NOTE: FOR TWIN-HEAD PUMPS, ALWAYS CHANGE THE DIAPHRAGM AND VALVE PLATES IN BOTH HEADS AT THE SAME TIME. FOLLOW THE PROCEDURES FOR EACH HEAD.

Materials Needed:
K726-0FTK replacement kit(s)
Marking Pencil
Roll of PTFE Tape (do not substitute other types of tape)
Tools Required:
4mm Socket Key
20mm Open-End Wrench
27mm Socket and Driver
5/8" Deep-Socket Driver
Slotted-Head Screwdriver

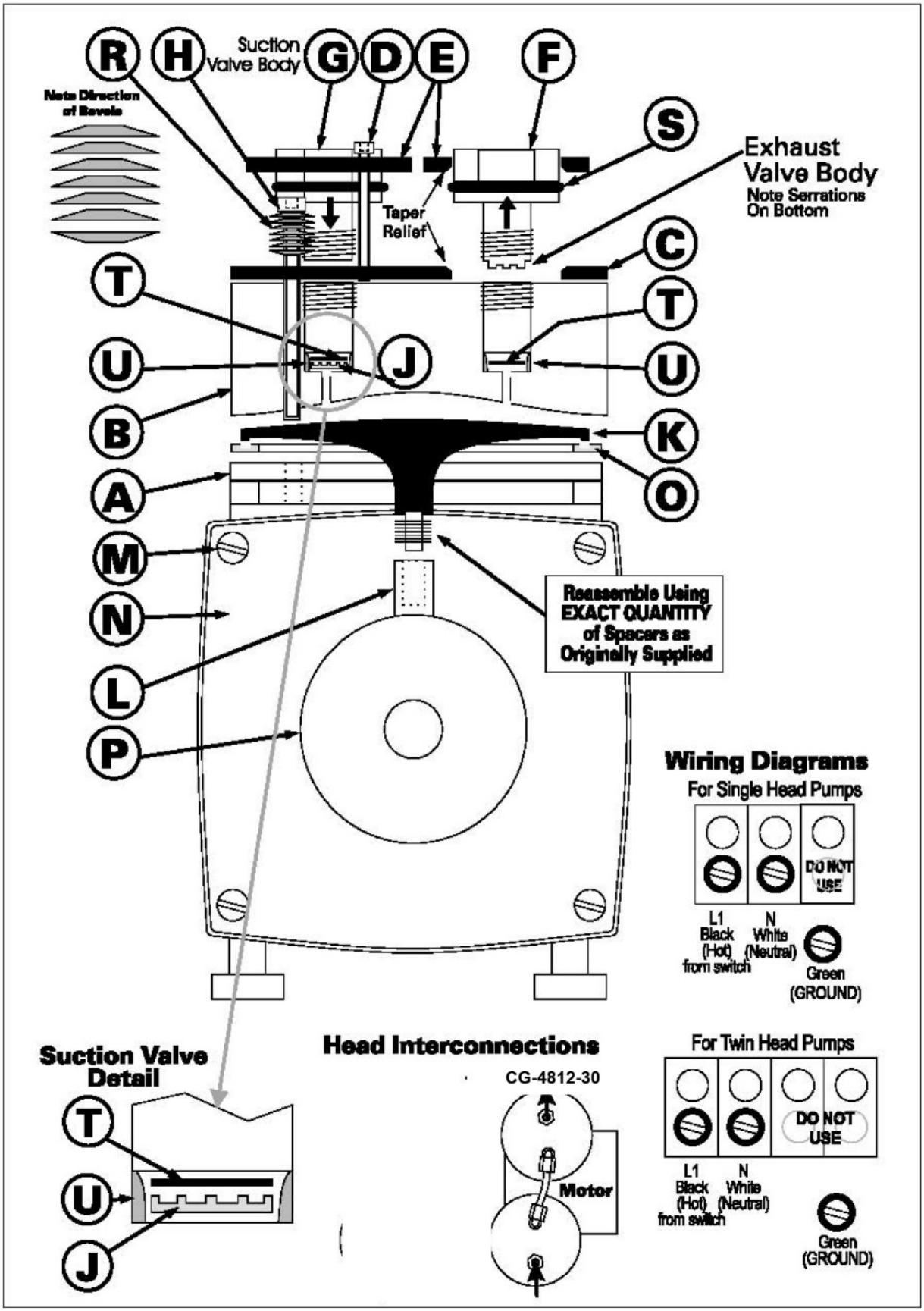
Changing the Diaphragm and Valve Disks

1. Unplug the pump from electrical power. Make a sketch of the position of interconnecting tubes and fittings for ease of reassembly later. Remove them by undoing nuts with the 20mm wrench and carefully pulling tubing from fittings.
2. Mark the position of the pressure plate **C**, PTFE head **B** and crankcase **A** relative to each other by drawing a line on the edges with a pencil or other marker to assure proper reassembly.
3. Mark the pressure **F** and the suction **G** valve bodies as they are unique and must be properly re-installed in their respective holes.
4. Remove the six socket screws **D** with the 4mm socket key and remove both clamp rings **E**. Unscrew valve bodies **F** and **G** using 27mm socket. Important: Clean off any residual PTFE tape from the threads of the valve bodies and inside the threaded holes of the head to avoid clogging the valves after the system is reassembled. Discard both old O-Rings **S**.
5. Remove the four screws and washers **M** and housing cover **N**.
6. Remove the four socket screws **H** and lift off the pressure plate **C** and head **B** as an assembly, maintaining their relative position to each other.
7. Unscrew the old diaphragm **K** by turning it counter-clockwise using both hands. Do not use tools. Important: Take care not to lose any of the spacers, as the exact quantity must be reassembled later for proper operation of the pump.
8. Position the same quantity of spacers removed in step 6 above onto the threaded stud of the new diaphragm. Carefully screw the new diaphragm **K** into the connecting rod **L** and hand-tighten firmly without using tools.
9. Turn the counterweight **P** until the diaphragm **K** is in mid-position (flat across). Carefully align and seat the bead of the diaphragm **K** in the groove of the head spacer ring **O**.
10. Position the head **B** and pressure plate **C** according to your previously drawn markings, then tighten the four socket screws **H** until the 7 disc springs **R** are flattened. Do not over-tighten. Turn the counterweight **P** by hand to insure that the pump turns freely and then replace the cover **N** and four screws **M**.
11. Apply a fresh, single layer of PTFE tape centered (not overhanging edge) around the threads of each valve body **F** and **G**, being sure that it is smooth, overlapped and applied in a clockwise direction so it will adhere when the valve bodies are screwed back into the PTFE head. Do not use in excess or substitute any other type of tape.

12. Slip a new O-ring **S** onto the EXHAUST valve body **F**. Prior to assembly, make sure that the PTFE protection ring **U** is correctly positioned with the taper up and that it is flat on the bottom of the valve cavity. Remove the old valve disk **T** and replace with a new one. Carefully thread the EXHAUST valve body **F** into the head **B** and tighten gently. Do not over tighten.
13. Slip a new O-ring **S** onto the SUCTION valve body **G.** Prior to assembly, make sure that the PTFE protection ring **U** is correctly positioned with the taper up and that it is flat on the bottom of the valve cavity, and the PTFE serrated airgate **J** is positioned on the bottom with the grooves up. Remove the old valve disk **T** and replace with a new one. Carefully thread the SUCTION valve body **G** into the head **B** and tighten gently. Do not over tighten.
14. Set the clamping rings **E** over each valve body and tighten the six socket screws **D** securely.
15. Carefully apply three layers of PTFE tape around the center of each fitting (not overhanging edge) and re-install the head connecting tubing and fittings as previously sketched in step 1 above. Do not use in excess or substitute any other type of tape. Ensure that the compression rings (ferrules) are correctly positioned under the union nuts before tightening.

PLEASE NOTE: SHOULD YOU NEED TO SEND A CHEMGLASS PUMP TO OUR FACTORY FOR REPAIRS, PLEASE BE SURE TO READ THE INSTRUCTIONS IN THE LIMITED WARRANTY SECTION WITH REGARD TO OBTAINING A RA# (RETURN AUTHORIZATION NUMBER) PRIOR TO SHIPMENT. PLEASE CONTACT CHEMGLASS CUSTOMER SERVICE FOR RA#.

Cutaway View Of The Pump Head



Limited Warranty

CHEMGLASS warrants to buyer that its products will be free from defects in material and workmanship under normal and appropriate use, and agrees to repair or replace any of its products without charge for parts or labor within one year from the date of shipment to the original purchaser.

Products to be evaluated for warranty coverage:

Determination of coverage under this warranty is the sole responsibility of the manufacturing engineering representative of CHEMGLASS. This determination will frequently require the return of the product to CHEMGLASS. All product returns will be handled in accordance with CHEMGLASS'S product return policy. CHEMGLASS reserves the right to inspect custom installations and devices that use CHEMGLASS products as part of the warranty evaluation process. This warranty does not cover any misuse, negligence, deterioration by chemical action, unauthorized repair or alteration in any way, inappropriate handling or storage that in our judgment caused the product failure. Chemglass shall not be liable for any inconvenience, loss of use, or any consequential loss, damage or injury arising from any cause whatsoever. No employee, agent or representative of CHEMGLASS shall have any right or authority to vary or alter the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Limitations:

CHEMGLASS offers engineering and technical assistance to support the application and selection of our products. **Except as otherwise agreed to in writing, it is expressly understood that this warranty is in lieu of any and all other warranties, whether expressed or implied, with respect to the goods sold, including any warranty of merchantability and fitness for a particular purpose. Sole responsibility or liability of CHEMGLASS shall be to replace any products or parts thereof which shall not conform to such warranty, provided that the products are used in accordance with CHEMGLASS specifications. Customer is responsible for determining the suitability of our products for customer's use or resale, or for incorporating them into objects or for applications which customer designs, assembles constructs or manufactures.** Please call Technical Service for further information.

Return Requests/Inquiries:

Direct all warranty and repair requests to CHEMGLASS Technical Service for instructions before returning any unit for repair or evaluation. We will send you a "Return Instruction Sheet" for guidance on the proper marking, packing and documentation requirements. Important information conforming to the "Right To Know" act, such as a Material Safety Data Sheet may be required.

Products shipped to CHEMGLASS must have a Return Authorization Number (RA#) marked on the outside of the package. Otherwise the shipment will be refused by our receiving department. Please contact CHEMGLASS Customer Service for RA#.

For service or parts, contact:

Chemglass, Inc
3800 North Mill Road
Vineland, NJ 08360
US and Canada Phone: 1-800-843-1794 * Fax: 1-800-922-4361
customer-service@chemglass.com * www.chemglass.com