

OPERATING MANUAL

VACUUM/PRESSURE STATION

MODEL NO. 420-3901 (115V AC)

MODEL NO. 420-3902 (230V AC)



A-1299-5105
Edition 03

Thermo Fisher Scientific
1-800-637-3739 (U.S. and Canada only)
11 (847) 381-7050 (Outside U.S.) • (847) 381-7050 (Local)
www.thermo.com • fluidhandling@thermofisher.com

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FLUOREL - Reg TM Minnesota Mining and Manufacturing Company

VALOX - Reg TM General Electric Co.

DACRON, VITON - Reg TM E.I. DuPont de Nemours and Co.

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SAFETY PRECAUTIONS

DANGER: Improper use of grounding plug can result in a risk of electric shock.



DANGER: Unplug power cord before any cleaning operation is started.



WARNING: Gas under pressure should not be used for supply as a hazardous bursting condition could develop in the pump head. Use only gases contained at atmospheric pressure.



CAUTION: Do not operate pump when pressure ports of both heads are in a blocked condition.



CAUTION: Do not use metal fittings with any Air Cadet Pump.



DESCRIPTION

The Vacuum/Pressure Station is designed to provide a convenient, portable source of regulated vacuum and/or pressure for bench-top laboratory or commercial use. Each function is regulated independently by clearly identified valves and the easy-to-read compound function gauge eliminates the need for an elaborate plumbing network. The convoluted diaphragm and the unique head cavity of the pump are designed to provide extended diaphragm life by minimizing stress, wear and heat buildup. This has been done while ensuring and optimizing pressure and vacuum characteristics. The brushless pump motor is totally enclosed, thermally protected and has sealed ball bearings. No regular maintenance of the motor is required. A six foot long, three conductor power supply cord is supplied with the unit and the 115V AC motor is a U.L. recognized component.

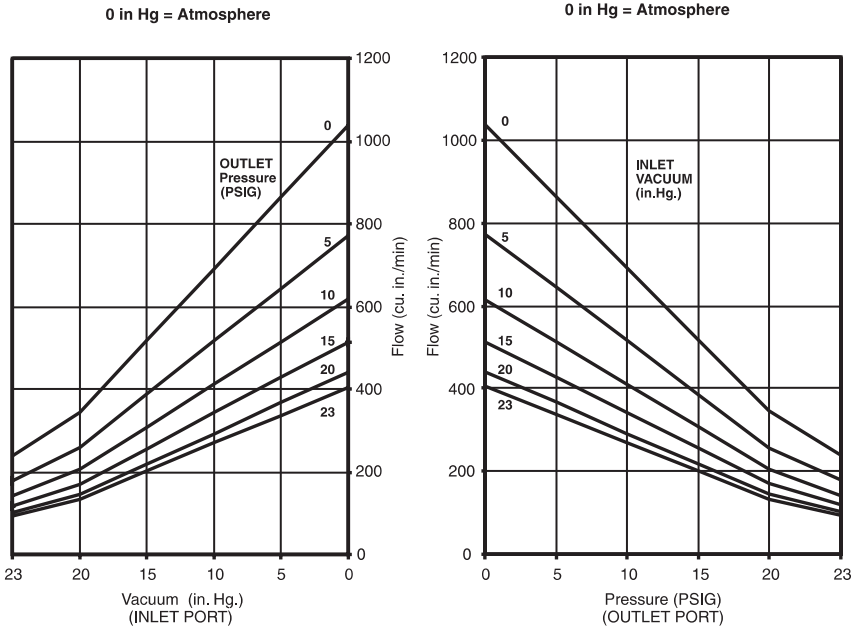
Figure 1 shows the typical flow characteristics of the 115V station as related to pressure and vacuum. The corresponding flow data for the 230V station are 5/6 of the values shown in Figure 1. Also note that, even though model 420-3902 is designed for 50 Hz applications, it can be run on 230V AC, 60 Hz line current. In this condition, the flow data will equal that of the 420-3901 station but available torque will decrease. All units are intended to be started without load (both ports open to atmosphere). If either a vacuum or pressure exists, the pump may not start.

Always consider material compatibility before running any service through the Vacuum/Pressure Station.

The Materials in contact with the service are as follows:

- 1) Pump — VALOX® (polyester), FLUOREL®, DACRON® and VITON®.
- 2) Manifold chamber and fittings — PVC, silicone, linear polyethylene and stainless steel 303.
- 3) Pressure/Vacuum Gauge — Bronze tubing and brass socket.

FIGURE 1



OPERATING INSTRUCTIONS

The pump supplied with the Vacuum/Pressure Station must always be plugged into a grounded outlet. Both models are supplied complete with a grounded plug and an on-off rocker switch.

Grounding Instructions

This product should 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.

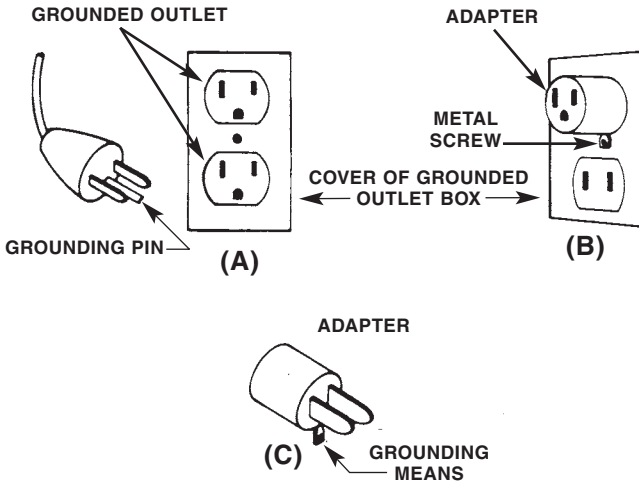
DANGER: Improper use of grounding plug can result in a risk of electric shock.



If repair or replacement of the cord or plug is necessary, do not connect the grounding wire to either flat blade terminal. The wire with insulation having an outer surface that is green with or without yellow stripes is the grounding wire. Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the product is properly grounded. Do not modify the plug provided; if it will not fit the outlet, have the proper outlet installed by a qualified electrician.

This product is for use on a nominal 120 volt circuit for Model 420-3901 and a 230 volt, 50 cycle circuit for Model 420-3902. Model 420-3901 has a grounding plug that looks like the adapter illustrated in Figure 2(A). A temporary adapter, which looks like the adapter illustrated in Figure 2(B) and (C) may be used to connect this plug to a 2-pole receptacle as shown in Figure 2(B) if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet, Figure 2(A), can be installed by a qualified electrician. The green colored rigid ear, lug or the like extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box cover. Whenever the adapter is used, it must be held in place by a metal screw.

FIGURE 2



Extension Cords

Use only a 3-wire extension cord that has a 3-blade grounding plug and a 3-slot receptacle that will accept the plug on the product. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. The correct size to use depending on cord length and nameplate ampere rating is No. 18 AWG, 3 conductor up to 100 feet. If in doubt, use the next heavier gage. NOTE: The smaller the gage number, the heavier the cord.

Operation (see Figure 3)

For pressure delivery, the manifold port marked “TO PUMP” should be connected via the 9 inch long tube to the pump port marked “FOR PRESSURE,” with pressure regulated by the valve marked “PRESSURE ADJUST.” The “INPUT/OUTPUT” port should be connected to suitable containers for receiving pressurized air or gas. If a medium other than ambient air is to be pressurized, the source of supply should be connected to the pump inlet port marked “FOR VACUUM.”

WARNING: Gas under pressure should not be used for supply as a hazardous bursting condition could develop in the pump head. Use only gases contained at atmospheric pressure.



CAUTION: Do not operate pump when pressure ports of both heads are in a blocked condition.



To draw a regulated vacuum from a source, first, connect the source of supply to the port marked “INPUT/OUTPUT” and then connect the “TO PUMP” port to the pump inlet, marked “FOR VACUUM.” If the Vacuum/Pressure Station was previously used for pressure delivery, be sure all pressures are relieved before disconnecting tubing from the “FOR PRESSURE” and/or the “INPUT/OUTPUT” port(s). This can be done best by stopping the pump and gradually relieving pressure by turning the “PRESSURE ADJUST” valve screw counterclockwise until the gauge reads zero.

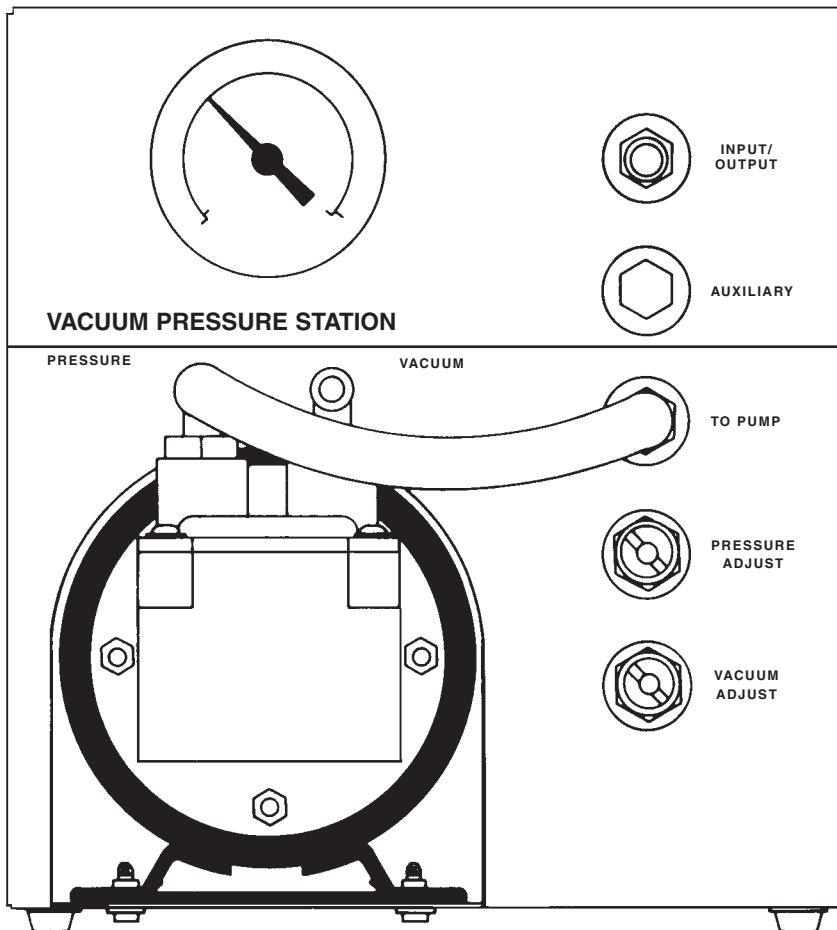
The motor is supplied with an internal thermal overload switch which may trip if something happens to the pump. If this should occur, check the pump to ensure that everything is normal. Allow motor to cool for approximately 30 minutes, then restart. If overload trips again, return the complete unit to your dealer for repair. Refer to return policy in back of manual.

DANGER: Unplug power cord before any cleaning operation is started.



When the pump is not in use, store in a clean, dry area. If ports on pump are open, cover to keep dust and dirt from entering. Wipe power cord down with dry towel and inspect for cracks in insulation after each use. Have cord repaired, if found defective, prior to reusing.

FIGURE 3



SPECIFICATIONS		
MODEL NO.	420-3901	420-3902
Power	100–115 +/- 10%, V AC, 60 Hz, 1.5A	230 +/- 10%, V AC, 50 Hz, 0.75A
Air Capacity (Vac.)	1050 Cu. Inch per min	900 Cu. Inch per min
Air Capacity (Press.)	900 Cu. Inch per min	750 Cu. Inch per min
Max. Pressure	18/21 psig*	18/21 psig*
Max. Suction	23 Inches Hg**	23 Inches Hg**
Housing Dimensions	9 in L x 8 in W x 8.75 in H	9 in L x 8 in W x 8.75 in H

Air capacity will depend on the application. Refer to Figure 1. It indicates the approximate flow with various input and output conditions.

*Recommended Pressure: 18 psig Max.; continuous duty / 21 psig Max.; intermittent duty

**Recommended Vacuum: 23 in Hg continuous or intermittent

SPECIFICATIONS (CONT.)

Models 420-3901 and 420-3902

Operating Temperature Range:	0° to 40° C (32° to 104° F)
Humidity Range:	10% to 90% non-condensing
Altitude:	Less than 2000 m
Pollution Degree:	Pollution Degree 2 (Indoor usage - lab, office)
Enclosure Rating:	IP 20 per IEC 60529
Weight:	4.1 kg (9 lbs)
Compliance:	230V (For CE Mark): EN61010-1 (EU Low Voltage Directive) and EN61326 (EU EMC Directive)

MAINTENANCE

DANGER: Unplug power cord before any cleaning operation is started.



For diaphragm replacement, disassemble top part of the Pump Head. Then unscrew the diaphragm and install the new diaphragm. Reassemble the Pump Head. It is good practice to replace the Pump Head when the diaphragm is replaced. This ensures new, clean valves and maximum performance. Dirty valves will reduce performance.

Do not disassemble the pump housing from the motor. Proper assembly (factory-adjusted) is critical for proper pump performance.

Keep the pump enclosure clean by using a mild detergent solution. Never immerse nor use excessive fluid when cleaning the pump.

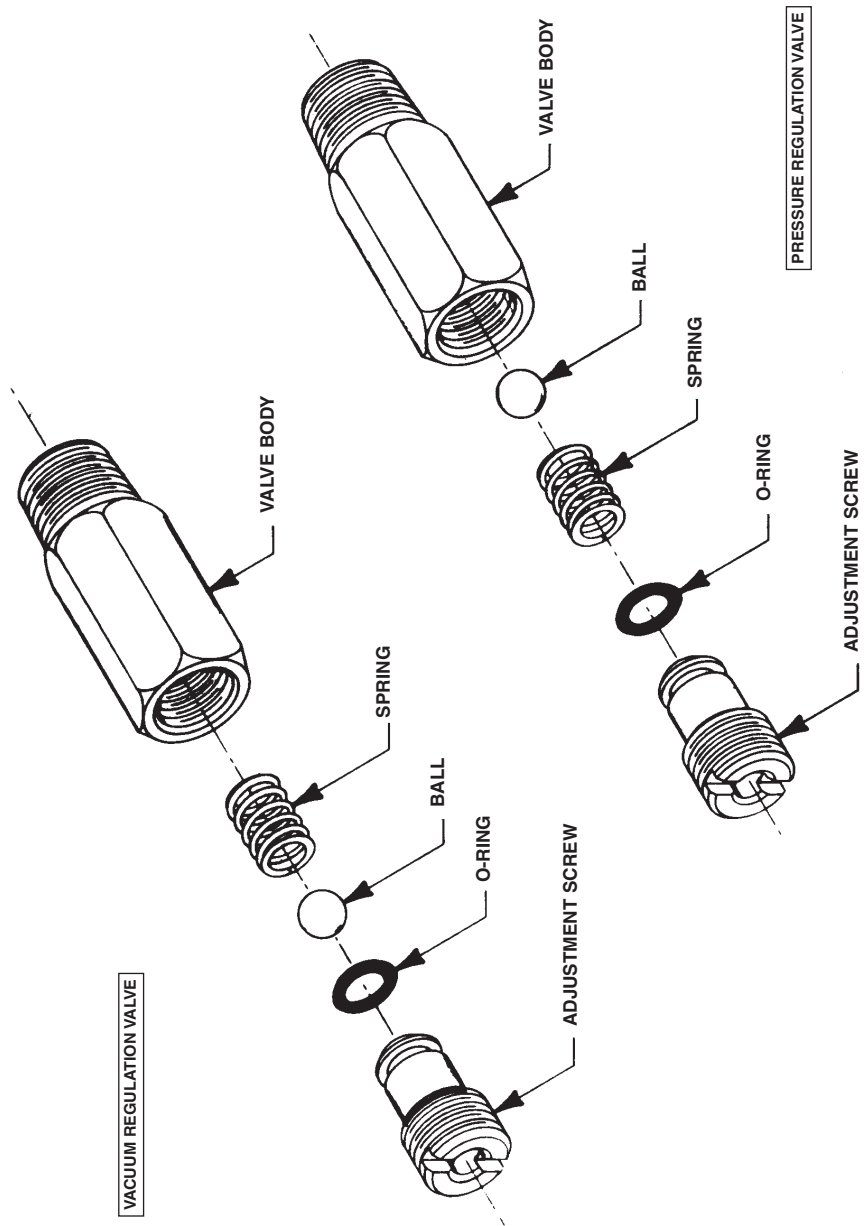
The regulation valves should be occasionally inspected for contamination (frequency depends upon the application) by removing the adjustment screw, spring and ball from each valve body—see Figure 4. Look for dirt or grit around the venting holes in the adjustment screw and the valve body and around the valve seating surfaces. These areas can easily be cleaned with a cotton swab or clean cloth.

If vacuum cannot be regulated by adjusting the “VACUUM ADJUST” valve, the valve’s O-ring has probably been damaged. Remove the adjustment screw and replace the O-ring with a new one, Part No. B-1169-0011. Always use caution when disassembling the regulation valves to avoid losing the valve ball and spring after the adjustment screw has been removed. When reassembling, remember that in the “VACUUM ADJUST” valve, the spring goes back in first, followed by the ball and the adjustment screw and in the “PRESSURE ADJUST” valve, the ball must go in before the spring.

HELPFUL HINTS

- 1) If it is necessary to draw a vacuum or pressurize two lines simultaneously, the plastic pipe plug in the “AUXILIARY” port can be replaced by any tube fitting with a standard 1/4 NPT male pipe thread on one end. Be sure, however, to use a pipe thread sealant or tape on the male thread to insure a leak-free fit.
- 2) The Station has been designed so the pump head can be serviced without removing the pump from the Station.
- 3) The easiest way to remove the silicone tubing from a barbed fitting is to grasp the tubing around the fitting and twist it back and forth two or three times. This releases the natural vacuum between the tube and the fitting and minimizes stretching of the tubing.
- 4) The regulation valves can be adjusted with any narrow, flat instrument such as a small coin or head of a key if a screwdriver is not available.

FIGURE 4



REPLACEMENT PARTS LIST

Item	Part No.
Vacuum regulation valve assembly	B-2067-CR
Pressure regulation valve assembly	B-2066-CR
Manifold Chamber Assy (with valves)	D-1819
Vacuum/Pressure gauge	B-2898

PUMP HEAD REPLACEMENT PARTS LIST

Item	Part No.
Service Kit (Reinforced FLUOREL diaphragm, two retainers, two valves and plastic head)	420-9005
Service Kit Replacement DACRON-reinforced VITON diaphragm	420-9004
Service Kit Eccentric Assembly	7530-75
Service Kit Pump Head Assembly	7530-77
Service Kit Housing	7530-78
Service Kit Diaphragm Shaft	7530-79
Service Kit Cover Bottom	7530-83

SPECIAL APPLICATIONS

Technical information and advice concerning the use of this product in specific applications may be obtained from our Engineering Department. If volume justifies, modifications can be made to adapt the unit to special customer applications. OEM inquiries are welcome and encouraged.

NOTE

The manufacturer reserves the right to make improvements in design, construction and appearance of our products without notice.

WARRANTY

This product is warranted against defects in material or workmanship, and at the option of the manufacturer or distributor, any defective product will be repaired or replaced at no charge, or the purchase price will be refunded to the purchaser, provided that: (a) the warranty claim is made in writing within the period of time specified on this warranty card, (b) proof of purchase by bill of sale or receipted invoice is submitted concurrently with the claim and shows that the product is within the applicable warranty period, and (c) the purchaser complies with procedures for returns set forth in the general terms and conditions contained in the manufacturer's or distributor's most recent catalog.

This warranty shall not apply to: (a) defects or damage resulting from: (i) misuse of the product, (ii) use of the product in other than its normal and customary manner, (iii) accident or neglect, (iv) improper testing, operation, maintenance, service, repair, installation, or storage, (v) unauthorized alteration or modification, or (b) post-expiration dated materials.

THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER, AND THE MANUFACTURER AND DISTRIBUTOR DISCLAIM ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO EMPLOYEE, AGENT, OR REPRESENTATIVE OF THE MANUFACTURER OR DISTRIBUTOR IS AUTHORIZED TO BIND THE MANUFACTURER OR DISTRIBUTOR TO ANY OTHER WARRANTY. IN NO EVENT SHALL THE MANUFACTURER OR DISTRIBUTOR BE LIABLE FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES.

The warranty period for this product is one (1) year from date of purchase.

PRODUCT RETURN

To limit charges and delays, contact the seller or Manufacturer for authorization and shipping instructions before returning the product, either within or outside of the warranty period. When returning the product, please state the reason for the return. For your protection, pack the product carefully and insure it against possible damage or loss. Any damages resulting from improper packaging are your responsibility.

TECHNICAL ASSISTANCE

If you have any questions about the use of this product, contact the Manufacturer or authorized seller.

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