WARRANTY

The Manufacturer warrants this product to be free from significant deviations from published specifications. If repair or adjustment is necessary within the warranty period, the problem will be corrected at no charge if it is not due to misuse or abuse on your part as determined by the Manufacturer. Repair costs outside the warranty period, or those resulting from product misuse or abuse, may be invoiced to you.

The warranty period for this product is noted on the Warranty Card.

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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061000

OPERATING MANUAL

VACUUM/PRESSURE PUMPS

MODEL NO. 400-1901
MODEL NO. 400-1902

Barnant Company
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Barrington, Illinois U.S.A. 60010-2392

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A-1299-0339
Edition 06

ISO 9001 REGISTERED

EU Declaration of Conformity

Name of Apparatus: Vacuum/Pressure Pump
Model Number: 400-1902
Description of Apparatus: Vacuum/Pressure Pump

Barnant Company declares that the above model is in conformity to the following harmonized standards and directives:

Applicable Directives	Applicable Specifications	Manufacturer's Report Number
73/23/EEC 93/68/EEC	EN61010-1/A2:1995	TR9528
89/336/EEC 92/31/EEC 93/68/EEC	EN61326-1/A1:1998	TR9529

The last two digits of the year in which the current configuration of the above model was assessed per the Low Voltage Directive is: 00.

Manufacturer: Barnant Company Division
Cole-Parmer Instrument Company
28W092 Commercial Avenue
Barrington, IL 60010-2392
USA
Tel.: 847-381-7050

Manufacturer's Signature: James W. Doll — 27 October, 2000

James W. Doll
Vice President, Engineering

Date

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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.

DESCRIPTION

The diaphragm-operated Vacuum Pressure Pump is designed for pressure, suction and gas circulating applications. The convoluted diaphragm and the unique pump cavity 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 media being pumped will come in contact with NORYL®, nitrile, and TEFLON® PTFE. Polyethylene fittings are supplied. This provides much better chemical resistance than conventional aluminum or stainless steel pumps. The motor is painted with an epoxy paint.

Pumps are available for 115V AC or 230V AC applications. They are intended for either industrial or commercial use.

The brushless motor is totally enclosed, thermally protected and has sealed ball bearings. No regular maintenance is required. A six-foot length, three conductor power supply cord is supplied with the unit and the 115V AC rated motor is a U.L. recognized component.

The polyethylene fittings provided with the pump will accept 3/8 in I.D. flexible tubing.

Figure 1 shows the typical flow characteristics of the 400-1901 pump as related to pressure and vacuum. The corresponding flow data for the 400-1902 pump (230V AC) are 5/6 of those in Figure 1.

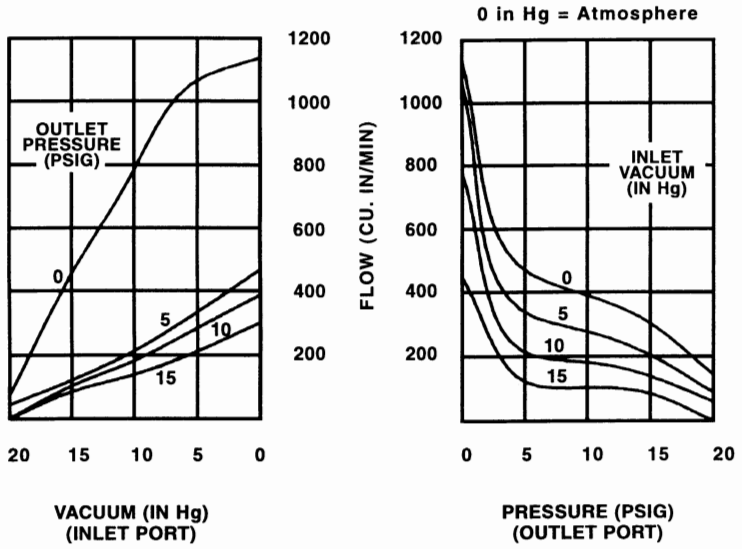
Note that, even though model 400-1902 is designed for 230V AC, 50 Hz applications, it can be used on 230V AC, 60 Hz. In this case, the flow data will increase to that of 400-1901; however, the available torque will decrease. All Pumps are intended to be started without load (both ports open to atmosphere). If either a vacuum or pressure exists, the pump may not start.

OPERATING INSTRUCTIONS

Model 400-1901 is supplied complete with a three-prong grounded plug. Model 400-1902 requires assembly of a required plug to the line cord.

PLEASE NOTE: **This motor, when operated as outlined in this manual, will run fairly hot. This condition is normal.**

FIGURE 1



Grounding Instructions for 400-1901

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.

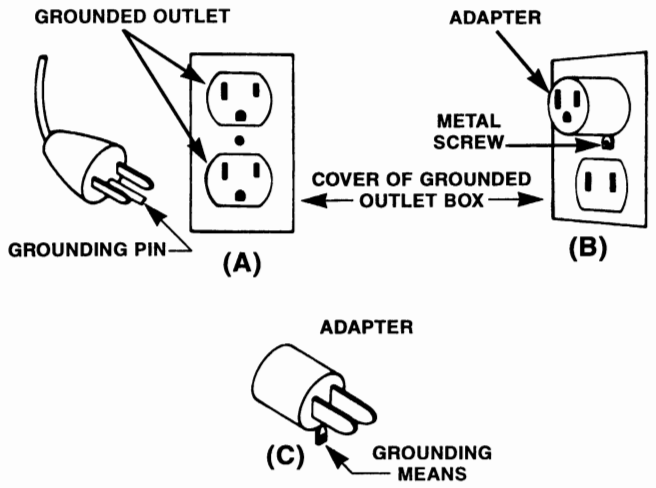
DANGER: Improper use of grounding plug can result in a risk of electric shock.

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 and has a grounding plug that looks like the plug 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



Note: In Canada, the use of a temporary adapter is not permitted by the Canadian Electric Code.

Grounding Instructions for 400-1902

Refer to a qualified electrician to install the proper plug on the motor cord and to supply the proper electrical outlet.

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

Wrap the TEFLON sealing tape supplied around the fitting thread (to eliminate any possible leakage) and assemble into the port. **DO NOT OVERTIGHTEN!** Use only a single turn of tape—hand tighten—then give one more turn with a wrench. Instead of the standard fittings supplied with the pump, any other appropriate system can be attached to the pump.

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

A muffler can be used at the outlet to decrease the noise level if desired. Usually, three feet lengths of tubing at both ends is more than adequate for quiet operation. If the air or gas being pumped is relatively dirty, use of an air filter is desirable. Otherwise, excessive amounts of dust and other particles will collect at the valve seats. This may interfere with the proper seating of the valves and will decrease flow, pressure and vacuum characteristics and may make the flow values erratic.

Sudden changes in the diameter of system tubes, fittings, bends and other obstructions will increase pressure and/or vacuum in the system and will decrease the available flow. Intentional reduction in flow can be achieved by a simple valve or pinching of the tube at inlet (preferred for the diaphragm life) or outlet systems.

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.

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 BARNANT 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.

SPECIFICATIONS

MODEL NO.	400-1901	400-1902
Power	115 +/- 10%, V AC, 60 Hz, 1.2A	230 +/- 10%, V AC, 50 Hz, 0.75A
Air Capacity	1050 Cu. Inch per min	900 Cu. Inch per min
Max. Pressure	12/18 psig*	12/18 psig*
Max. Suction	20 Inches Hg**	20 Inches Hg**
Motor	1/45 hp at 1550 rpm	1/55 hp at 1300 rpm
Pump-Motor Dimensions	7 1/4 in L x 4 in W x 5 1/2 in H	7 1/4 in L x 4 in W x 5 1/4 in H
Motor Dimensions	4 1/2 in L x4 in W x 4 1/4 in H	4 1/2 in L x 4 in W x 4 1/4 in H
Port Connections	3/8 (F) NPT	3/8 (F) NPT

*Intermittent Duty: Limit output to 18 psig
Continuous Duty: Limit output to 12 psig
**Intermittent or Continuous Duty

SPECIFICATIONS (CONT.)

Models 400-1901 and 400-1902

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 per IEC 664 (Indoor usage - lab, office)
Enclosure Rating:	IP 20 per IEC 529
Weight:	2.7 kg (6 lbs)
Installation Category:	Installation category II per IEC 664 (Local level, appliances, portable equipment, etc...)
Compliance:	115V: UL508, CSA C22.2, No. 14-M91 230V (For CE Mark): EN61010-1/A2: 1995 (EU Low Voltage Directive) and EN61326-1/A1: 1998 (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.

PUMP HEAD REPLACEMENT PARTS LIST

Item	Part No.
Service Kit (Nitrile diaphragm, two retainers, two valves and plastic head)	401-0050
Service Kit (FLUOREL® diaphragm, two retainers, two valves and plastic head)	7530-04
Eccentric Assembly (eccentric and bearing)	7530-75
Set Screw for Eccentric Assembly	B-1079-0121
Diaphragm Clamp	B-1352-0012

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