

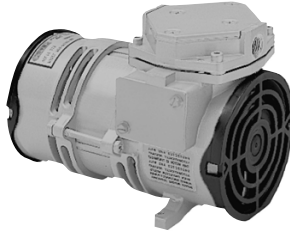
PART NO. 70-3000 G442PL (REV. K)

# OIL-LESS DIAPHRAGM VACUUM PUMPS & COMPRESSORS

## OPERATION & MAINTENANCE MANUAL



Model DOA Shown



Model MOA Shown



Model DAA Shown

Thank you for purchasing this Gast product. It is manufactured to the highest standards using quality materials. Please follow all recommended maintenance, operational and safety instructions and you will receive years of trouble free service.



### WARNING



**PLEASE READ THIS MANUAL COMPLETELY BEFORE INSTALLING AND USING THIS PRODUCT. SAVE THIS MANUAL FOR FUTURE REFERENCE AND KEEP IN THE VICINITY OF THE PRODUCT**

#### Product Use Criteria:

- Pump only clean, dry air.
- Operate at 40°F - 104°F (4.4°C - 40°C).
- Protect unit from dirt & moisture.
- Do not pump flammable or explosive gases or use in an atmosphere that contains such gases.
- Protect all surrounding items from exhaust air. This exhaust air can become very hot.
- Corrosive gases and particulate material will damage unit. Water vapor, oil-based contaminants or other liquids must be filtered out.
- Consult your Gast Distributor/Representative before using at high altitudes.



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ISO 9001 CERTIFIED

**Your safety and the safety of others is extremely important.**

We have provided many important safety messages in this manual and on your product. Always read and obey all safety messages.



This is the safety alert symbol. This symbol alerts you to hazards that can kill or hurt you and others. The safety alert symbol and the words "DANGER" and "WARNING" will precede all safety messages. These words mean:

**! DANGER**

You will be killed or seriously injured if you don't follow instructions.

**! WARNING**

You can be killed or seriously injured if you don't follow instructions.

All safety messages will identify the hazard, tell you how to reduce the chance of injury, and tell you what can happen if the safety instructions are not followed.

**INSTALLATION**

**! WARNING**



**Electrical Shock Hazard**

Disconnect electrical power at the circuit breaker or fuse box before installing this product.

Install this product where it will not come into contact with water or other liquids.

Install this product where it will be weather protected.

Electrically ground this product.

Failure to follow these instructions can result in death, fire or electrical shock.

**Correct installation is your responsibility.** Make sure you have the proper installation conditions and that installation clearances do not block air flow.

**Blocking air flow over the product in any way can cause the product to overheat.**

**Mounting**

This product can be installed in any orientation. Mounting the product to a stable, rigid operating surface and using shock mounts will reduce noise and vibration.

**Plumbing**

Remove plugs from the IN and OUT ports. Connect with pipe and fittings that are the same size or larger than the product's threaded ports. Be sure to connect the intake and exhaust plumbing to the correct inlet and outlet ports.

**Accessories**

Filters and mufflers are supplied with some models. These should be checked periodically and replaced when necessary. Please consult your Gast Distributor/Representative for additional filter recommendations.

Install relief valves and gauges at inlet or outlet, or both, to monitor performance. Check valves may be required to prevent back streaming through the pump.

**Motor Control**

**It is your responsibility to contact a qualified electrician and assure that the electrical installation is adequate and in conformance with all national and local codes and ordinances. The metal capacitor shell must be grounded.**

Determine the correct overload setting required to protect the motor (see motor starter manufacturer's recommendations). Select fuses, motor protective switches or thermal protective switches to provide protection. Fuses act as short circuit protection for the motor, not as protection against overload. Incoming line fuses must be able to withstand the motor's starting current. Motor starters with thermal magnetic overload or circuit breakers protect motor from overload or reduced voltage conditions.

The wiring diagram supplied with the product provides required electrical information. Check that power source is correct to properly operate the dual-voltage motors.

**OPERATION**

**! WARNING**

**Injury Hazard**

**Install proper safety guards as needed.**

**Product surfaces become very hot during operation, allow product surfaces to cool before handling.**

**Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.**

**Failure to follow these instructions can result in burns, eye injury or other serious injury.**

**It is your responsibility to operate this product at recommended pressures or vacuum duties and room ambient temperatures.**

**Start Up**

If motor fails to start or slows down significantly under load, shut off and disconnect from power supply. Check that the voltage is correct for motor and that motor is turning in the proper direction.

## MAINTENANCE

### **WARNING**



#### **Electrical Shock Hazard**

**Disconnect electrical power supply cord before performing maintenance on this product.**

**If product is hard wired into system, disconnect electrical power at the circuit breaker or fuse box before performing maintenance on this product.**

**Failure to follow these instructions can result in death, fire or electrical shock.**

### **WARNING**

#### **Injury Hazard**

**Product surfaces become very hot during operation, allow product surfaces to cool before handling.**

**Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.**

**Clean this product in a well ventilated area.**

**Failure to follow these instructions can result in burns, eye injury or other serious injury.**

**It is your responsibility to:**

- **Regularly inspect and make necessary repairs to product in order to maintain proper operation.**
- **Make sure that pressure and vacuum is released from product before starting maintenance.**

Check intake and exhaust filters after first 500 hours of operation. Clean filters and determine how frequently filters should be checked during future operation. This one procedure will help to assure the product's performance and service life.

#### **Solvent Cleaning**

**Use only Gast recommended Solvent or other non-petroleum based solvent. Do Not use kerosene or ANY other combustible solvent to clean product.**

1. Remove the four (MOA) or five (DOA) screws in the top of the product. Remove the top plate.
2. Remove filters and clean with Gast recommended solvent or other non-petroleum based solvent. Use compressed air to dry filters and make sure that all moisture is removed. Reinstall filters.
3. Clean the gasket with water and dry thoroughly. Reinstall gasket.
4. Reinstall top plate and screws.

**Check that all external accessories such as relief valves and gauges are attached to cover and are not damaged before re-operating product.**

## SHUTDOWN PROCEDURES

**It is your responsibility to follow proper shutdown procedures to prevent product damage. NEVER ADD OIL TO THIS OIL-LESS PUMP.**

Proper shutdown procedures must be followed to prevent pump damage. Failure to do so may result in premature pump failure. Gast Manufacturing Oil-Less Diaphragm Vacuum Pumps and Compressors are constructed of ferrous metals or aluminum which are subject to rust and corrosion when pumping condensable vapors such as water. Follow the steps below to assure correct storage and shutdown between operating periods.

1. Disconnect plumbing.
2. Operate product for at least 5 minutes without plumbing.
3. Run at maximum vacuum for 10 to 15 minutes.
4. Repeat step 2.
5. Disconnect power supply.
6. Plug open ports to prevent dirt or other contaminants from entering product.

## SERVICE KIT INSTALLATION

### **WARNING**



#### **Electrical Shock Hazard**

**Disconnect electrical power supply cord before installing service kit.**

**If product is hard wired into system, disconnect electrical power at the circuit breaker or fuse box before installing service kit.**

**Disconnect air supply and vent all air lines to release pressure or vacuum.**

**Failure to follow these instructions can result in death, fire or electrical shock.**

**Gast will NOT guarantee field-rebuilt product performance. For performance guarantee, the product must be returned to a Gast Authorized Service Facility.**

Service Kit contents vary. Most contain gaskets and filter parts.

1. Disconnect electrical power to pump.
2. Disconnect air supply and vent all air lines to release pressure or vacuum.
3. Remove the socket cap screws from the head of the pump. Remove the head of the pump.

**Replacing Diaphragm**

1. Remove the two Phillips-head screws then the retainer plate and diaphragm.
2. Install the new diaphragm, pattern side up for compressors, pattern side down for vacuum pumps, onto the connecting rod.
3. Replace the retainer plate and attach with two screws. Torque the screws to 30 in. lbs. on DOA and DAA units and to 12 in. lbs. on MOA and MAA units.

**Replacing Inlet and Outlet Valves**

1. Remove the slotted machine screw that holds each valve in place.
  2. Clean the stainless steel valves with water. Valves are interchangeable on DOA and DAA units.
  3. Replace the outlet valve or install a new valve so that the retaining bar is near the machine screw hole. The retainer bar holds the valve in place.
  4. Replace the inlet valve or install a new valve so that the notch marked on the valve is in the lower right hand corner towards the inlet of the air chamber.
4. Replace the head on the pump. Torque the socket cap screws to 90-100 in. lbs. on the DOA and DAA units and 30 in. lbs. on the MOA and MAA units.

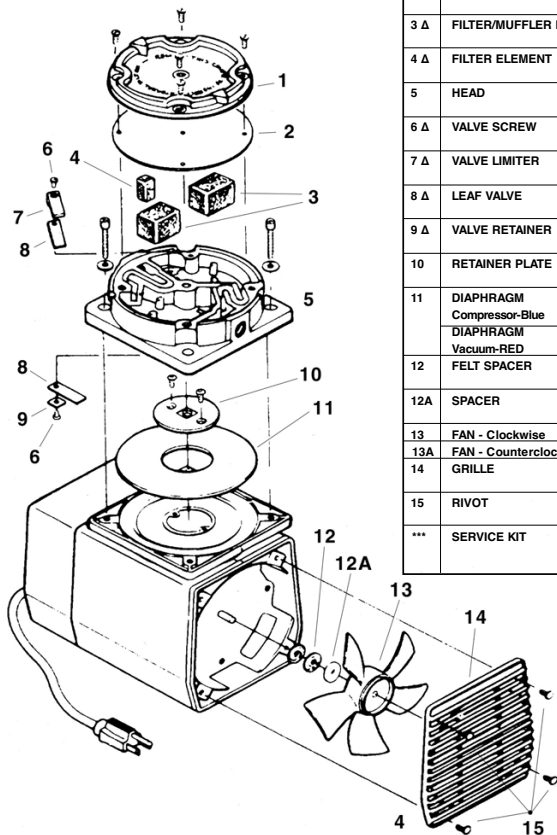
**Do Not replace the connecting rod or motor bearings.**

**Check that all external accessories such as relief valves and gauges are attached to cover and are not damaged before re-operating product.**

If pump still does not produce proper vacuum or pressure, send unit to a Gast Authorized Service Facility for repair.

## EXPLODED PRODUCT VIEW, PARTS & ORDERING INFORMATION

### DAA / DOA SERIES



REF	DESCRIPTION	QTY	DOA-P101-AA DOA-P101-BN	DAA-V155-EB*
1	COVER	1 2	AF808	AF808
2 Δ	HEAD GASKET	1	AF820	AF820
3 Δ	FILTER/MUFFLER ELEMENT	2	AT713	AT713
4 Δ	FILTER ELEMENT	2 4	AT712A	AT712A
5	HEAD	1 2	AF804	AF804
6 Δ	VALVE SCREW	2 4	BB317	BB317
7 Δ	VALVE LIMITER	1	AF856	AF856
8 Δ	LEAF VALVE	2 4	AF817	AF817
9 Δ	VALVE RETAINER	1 2	AF819A	AF819A
10	RETAINER PLATE	1 2	AF809	AF809
11	DIAPHRAGM Compressor-Blue	1	AF818A****	AF818A****
	DIAPHRAGM Vacuum-RED	2		AF818B
12	FELT SPACER	3 6	AA929	AA929
12A	SPACER	1 2	AD996	AD996
13	FAN - Clockwise	1	AT837	AT837
13A	FAN - Counterclockwise	1	AT837A	AT837A
14	GRILLE	1	AF807	AF807
15	RIVOT	4 8	AE946	AE946
***	SERVICE KIT	1 2	K294A	K294K

\* DOA shown. The Double-ended (DAA – not illustrated) models are two DOAs mounted back to back with heads rotated.  
 \*\*\* Item not shown.

\*\*\*\*Pattern side up for compressors. Pattern side down for vacuum pumps.

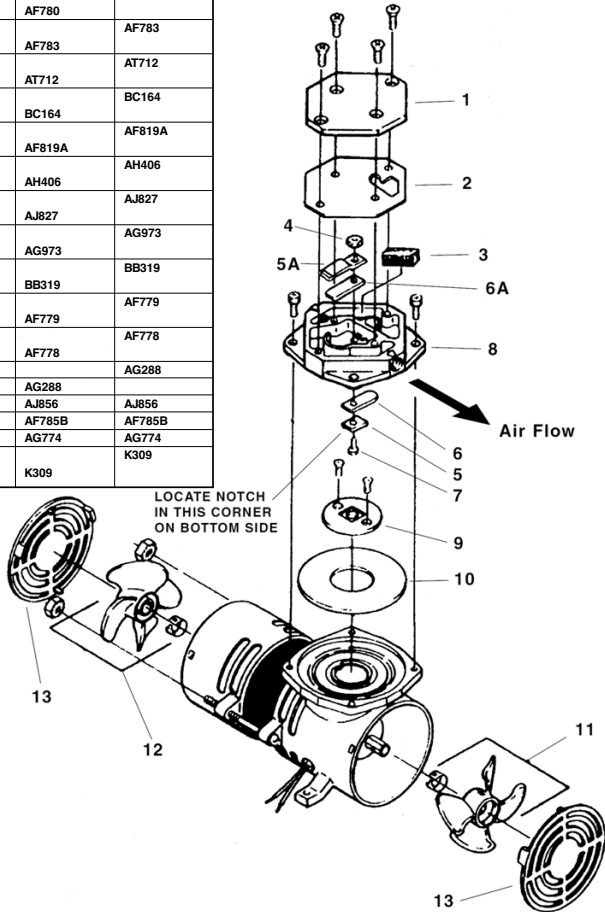
Δ Denotes parts included in the Service Kit.

Δ The service kit may contain parts for more than one model or style diaphragm pump. Parts not needed may be discarded.  
 Parts listed are for stock models. For specific OEM models, please consult the factory.  
 When corresponding or ordering parts, please give complete model and serial numbers.

## EXPLODED PRODUCT VIEW, PARTS & ORDERING INFORMATION

### MAA / MOA SERIES

REF	DESCRIPTION	QTY	MAA-V103-HB*	MOA-P101-AA MOA-P101-CD MOA-P101-JH**
1	COVER	1		AF780
2 Δ	HEAD GASKET	2	AF780	
		1		AF783
		2	AF783	AF783
3 Δ	FILTER/MUFFLER ELEMENT	2		AT712
		4	AT712	
4 Δ	NUT	1		BC164
		2	BC164	
5 Δ	VALVE RETAINER	1		AF819A
		2	AF819A	
5A Δ	LIMITER	1		AH406
		2	AH406	
6 Δ	LEAF VALVE	1		AJ827
		2	AJ827	
6A Δ	EXHAUST LEAF VALVE	1		AG973
		2	AG973	
7 Δ	SCREW	1		BB319
		2	BB319	
8	HEAD	1		AF779
		2	AF779	
9	RETAINER PLATE	1		AF778
		2	AF778	
10	DIAPHRAGM-Pressure-Red	1		AG288
****	DIAPHRAGM-Vacuum-Red	2	AG288	
11	FAN	1	AJ856	AJ856
12	**FAN	1	AF785B	AF785B
13	**GRILLE	2	AG774	AG774
***	SERVICE KIT	1		K309
		2	K309	



\* MOA shown. The Double-ended (MAA – not illustrated) models are two MOAs mounted back to back with heads rotated.

\*\*MOA-P101-JH does not have an AF785B fan and has only qty (1) AG774 Grille (#13).

\*\*\* Item not shown.

\*\*\*\*Pattern side up for compressors. Pattern side down for vacuum pumps.

Δ Denotes parts included in the Service Kit.

Δ The service kit may contain parts for more than one model or style diaphragm pump. Parts not needed may be discarded.

Parts listed are for stock models. For specific OEM models, please consult the factory.

When corresponding or ordering parts, please give complete model and serial numbers.



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**TROUBLESHOOTING CHART**

Low		High		Pump Overheat	Motor Overload	Excess Noise	Reason and remedy for problem.
Vacuum	Pressure	Vacuum	Pressure				
•	•	At Pump		•	•		Filter dirty. Clean or replace.
•	•		At pump	•	•		Muffler dirty. Clean or replace.
•	•						Valves dirty or valves bent. Clean or replace.
•	•						Worn piston rings. Repair or replace.
			•	•	•		Relief valve set too high. Inspect and adjust.
•	•						Relief valve set too low. Inspect and adjust.
•	•	At pump	At pump	•	•		Plugged vacuum/pressure line. Inspect and repair.
•		At pump					Collapsed vacuum line. Inspect and repair.
				•	•		Low voltage, won't start. Check power source.
				•	•	•	Voltage wrong. Check power source.
•	•					•	Worn rings/piston hitting cylinder. Replace.
				•		•	Cylinder misadjustment. Realign.
•	•						Leaky hose or check valve. Replace.
•	•			•	•	•	Dirt or liquid on top of piston. Inspect and clean.
•	•			•	•		Motor not wired correctly. Check wiring diagram/line voltage.
•	•					•	Blown head gasket. Replace.

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