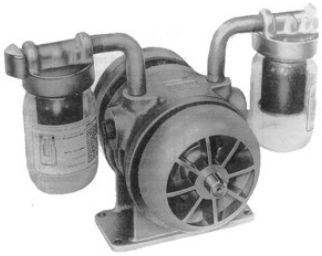
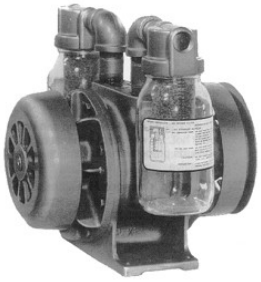
PART NO. 70-480 G405PL (REV-F)

OIL-LESS ROTARY VANE VACUUM PUMPS & COMPRESSORS

OPERATION & MAINTENANCE MANUAL

0440 Oilless





3040 Oilless

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 MOTOR. SAVE THIS MANUAL FOR FUTURE REFERENCE AND KEEP IN THE VICINITY OF THE MOTOR.

General information

- Model numbers ending in “X” have automatic thermal protectors which protect the motor by shutting the motor off if it overheats. The motor will automatically restart once the motor has cooled.

Product Use Criteria:

- Pump only clean, dry air.
- Operate at 32ºF - 104ºF (0ºC - 40ºC).
- 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 before using at high altitudes.
- Oil-Less rotary-vanes require NO lubrication.
- Sealed bearings are grease packed.
- Use of petroleum or hydrocarbon products will reduce carbon-vane service life.

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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. Proper guards should be installed to prevent contact with moveable parts of this pump. Do Not lift the unit by the fan shroud.

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.

Accessories
The product's internal intake and exhaust filters will provide adequate filtration in most applications. Check filters periodically and replace when necessary. All units should have an intake and exhaust filter to prevent contaminants from entering the pump or the pneumatic system. Please consult your Gast Distributor/Representative for additional filter recommendations.

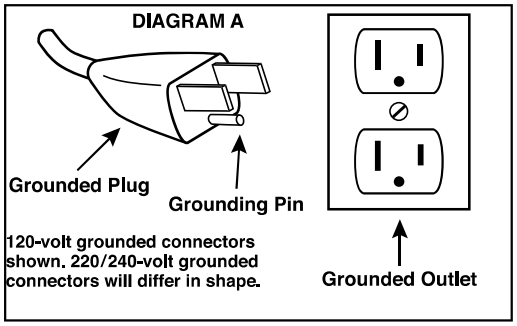
Install relief valves and gauges at inlet or outlet, or both, to monitor performance. Check valves may be required to prevent back streaming through the pump.

Motor Control
It is your responsibility to contact a qualified electrician to assure that the electrical installation is adequate and in conformance with all national and local codes and ordinances.

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 help 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.

Electrical Connection



Model with a power supply cord:
This product must be grounded. For either 120-volt or 220/240-volt circuits connect power supply cord grounding plug to a matching grounded outlet. Do not use an adapter. (See DIAGRAM A)

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 may be equipped with a power supply 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.

Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if you are not sure 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.

Model that is permanently wired:
This product must be connected to a grounded, metallic, permanent wiring system, or an equipment grounding terminal or lead on the product.

Power supply wiring must conform to all required safety codes and be installed by a qualified person. Check that supply voltage agrees with that listed on product nameplate.

Be sure the 3-phase motor turns in the proper direction of rotation after installation. Turning in the wrong direction will drastically reduce vane life.

Extension cords:
Use only a 3-wire extension cord that has a 3-blade grounding plug. Connect extension cord plug to a matching 3-slot receptacle. Do not use an adapter. Make sure your extension cord is in good condition. Check that the gage wire of the extension cord is the correct size wire to carry the current this product will draw.

Minimum gage for extension cords

Amps	Volts	Length of cord in feet								
	120v	25	50	100	150	200	250	300	400	500
	240v	50	100	200	300	400	500	600	800	1000
0-2		18	18	18	16	16	14	14	12	12
2-3		18	18	16	14	14	12	12	10	10
3-4		18	18	16	14	12	12	10	10	8
4-5		18	18	14	12	12	10	10	8	8
5-6		18	16	14	12	10	10	8	8	8
6-8		18	16	12	10	10	8	6	6	6
8-10		18	14	12	10	8	8	6	6	4
10-12		16	14	10	8	8	6	6	4	4
12-14		16	12	10	8	6	6	6	4	2
14-16		16	12	10	8	6	6	4	4	2
16-18		14	12	8	8	6	4	4	2	2
18-20		14	12	8	6	6	4	4	2	2

OPERATION

WARNING

Injury Hazard

Install proper safety guards as needed. Pumps with glass jars need safety guards to protect against breaking glass.

Use only recommended air handling parts acceptable for pressure not less than 70 psi..

Keep fingers and objects away from openings and rotating parts.

When provided, motor terminal covers must be in place for safe operation.

Check that coupling guard and shroud are in place before operating.

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

Do Not direct air stream at body. Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.

Do Not spray flammable or combustible liquid.

Wear hearing protection. Sound level from product may exceed 85 dBA.

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. Do Not start against a vacuum or pressure load.

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. Vane life will be drastically reduced if motor is not operating properly. Vanes can break or be damaged if motor/pump runs in the wrong 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

Wear eye protection when flushing this product.

Air stream from product may contain solid or liquid material that can result in eye or skin damage.

Flush this product in a well ventilated area.

Do Not use kerosene or other combustible solvents to flush this product.

Failure to follow these instructions can result in 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.

Clean filters when necessary by removing and washing in a solvent or soap and water. After cleaning, dry with compressed air to make sure all moisture is removed before replacing filters.

Flushing

Flushing this product to remove excessive dirt, foreign particles, moisture or oil that occurs in the operating environment will help to maintain proper vane performance. If your pump is not getting the vacuum or pressure level expected, flushing is required. Vanes will stick when dirty and may cause pump to be noisy or inefficient.

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

1. Disconnect electrical power supply.
2. Release all pressure and vacuum from pump.
3. Remove all accessories at the inlet and exhaust ports.
4. Remove filter.
5. Start product. Place towel over exhaust port to clean up solvent. If using liquid solvent, pour several tablespoons directly into inlet port. If using Gast recommended Flushing Solvent, spray solvent for 5-10 seconds into inlet port.
6. Block the inlet port and draw a deep vacuum for 15-20 seconds. Release the vacuum.
7. Listen for changes in the sound of the motor. If motor sounds smooth, go to next step. If motor does not sound like it is running smoothly, repeat steps 5 and 6 until you can hear a difference in the operating sound of the pump.
8. Start the pump and let it run for 1 minute, then turn pump off.
9. Replace all accessories at the inlet and exhaust ports.
10. Replace filter before resuming operation.

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. The Gast Manufacturing Rotary Vane Oil-Less 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 10-15 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.

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 vanes, gaskets and filter parts.

Do Not attempt to remove the rotor. It is held in place by Loctite and can only be serviced by a Gast Authorized Service Facility.

Do Not loosen or adjust motor thru-bolts to prevent misalignment and damage to the pump.

Disassembly

1. Remove the shroud and fan.
2. Use a wheel puller to remove the dead-end plate and bearing from the pump body. Note the direction of the bevel edge on the vane. Do not damage the dowel pins between the end plate and the body. Save the bearing spacer on the dead-end of the shaft for reassembly. Remove the snap ring from the end plate. Save the snap ring, belleville springs and washer for reassembly.
3. Remove the bearing from the dead-end plate.
4. Check the exposed surfaces of the rotor, body, and end plate for scoring. If you find no scoring, you can perform a Minor Rebuild to replace only the vanes and the dead-end bearing. If you find severe damage, perform the Major Rebuild.

Minor Rebuild

5. Install the new vanes supplied with the kit. Be careful to face the vane bevels in the proper direction (as noted in step 2).
6. Place end plate over the shaft with dowel pins aligned. Place bearing spacer on dead end of shaft. Place the new bearing in its bore in the dead end plate. Be careful to press only on the inner bearing race.
7. Install and tighten the pump body bolts, install the belleville springs with the washer between them and the snap ring.

Major Rebuild

5. Remove the drive end cap. Use a wheel puller to remove the drive-end plate and bearing from the body. Do not remove or damage the dowel pins in the body. Save the bearing spacer and end plate gasket for reassembly.
6. Place one shoulder ring in its seat in the drive-end plate, then place one of the new bearings in the seat. Using an arbor press, press the bearing onto the shaft. Be careful to press only on the inner bearing race. Tighten the pump body bolts.
7. Install the new vanes supplied with the kit. Be careful to face the vane bevels in the proper direction (as noted in step 2).
8. Perform step #6 from Minor Rebuild.
9. Install the belleville springs with the washer between them and the snap ring. Install and tighten the pump body bolts.
10. Apply a thread-lock adhesive and start the drive-end cap into its thread in the drive-end plate, but do not tighten it.
11. Place a dial indicator against the dead-end of the shaft to measure axial movement.Tighten the drive-end cap until the indicator shows:
    001” (for models 0240, 0440, 0740) and .002” (for models 1550, 3040) of shaft movement against the belleville springs.
12. Clean and reinstall filter(s).

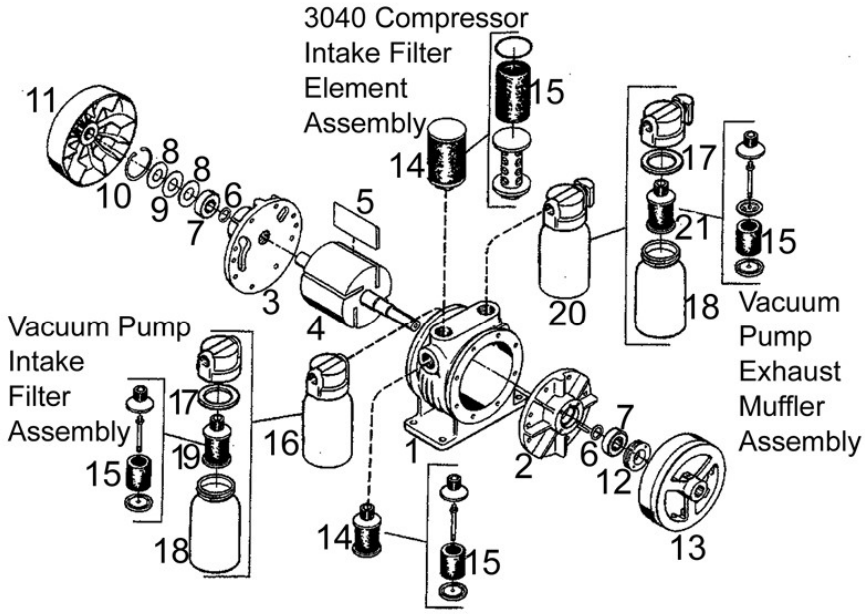
We have Gast Authorized Repair Facilities throughout the world. For the most up-to-date listing, contact one of our sales offices below:

Gast Manufacturing, Inc.
2300 M139 Highway
Benton Harbor, Mi. 49022-6114
Phone: 269-926-6171
www.gastmfg.com

Gast Jun-Air Europe BV
Hengelderweg 24,
NL-6942 NB, Didam
Netherlands
Phone: +44 (0)1527 504040
www.gastmfg.com

IDEX Technology (Suzhou) Co., Ltd
No.51 TangBang Road
CaoHu Boulevard
Xiang Cheng District
Suzhou, China 215131
Phone: (86) 512 6283 3000

EXPLODED VIEW AND PARTS ORDERING INFORMATION

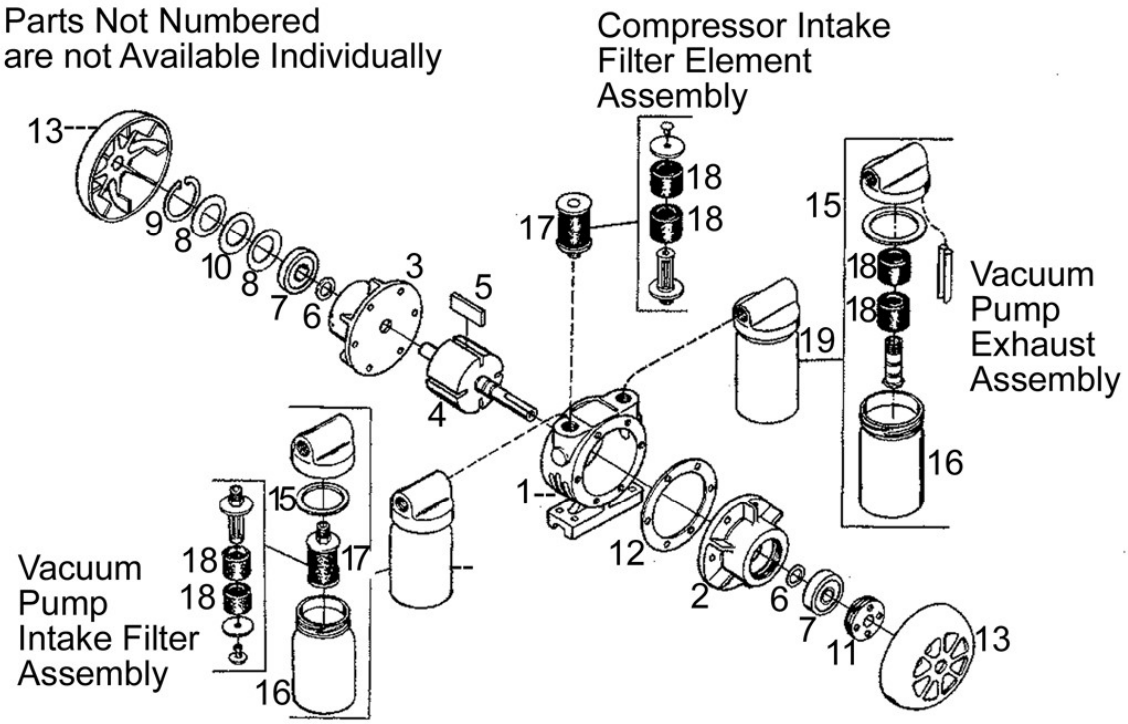


REF NO.	DESCRIPTION	QTY	1550-V136B VACUUM	1550-P139B COMPRESSOR	3040-V115A VACUUM	3040-P118B COMPRESSOR
1	BODY	1	AB111J	AB111J	AB955	AB955
2	DRIVE END PLATE	1	AC314	AC314	AB986	AB986
3	DEAD END PLATE	1	AC315	AC315	AB987	AB987
4	ROTOR ASSEMBLY	1	AD238	AD238	AB794	AB794
5 Δ	VANE	4	AB125B	AB125B	AB934A	AB934A
6	BEARING SHIM (SHDR RING)	2	AD255	AD255	AB926T	AB926T
7 Δ	BEARING	2	AC894	AC894	AB964J	AB964J
8	BELLEVILLE SPRING	2	AB337	AB337	AB791	AB791
9	SHIM WASHER	2	AB338	AB338	AB792	AB792
10	RETAINING RING	1	AB335	AB335	AB793	AB793
11	FAN	1	AC326C	AC326C	AD236	AD236
12	END CAP	1	AB339	AB339	AB790	AB790
13	FAN PULLEY	1	AB140	AB140	AC374B	AC374B
14	INTAKE FILTER ELEMENT ASSY	1		AC433		AD750
15 Δ	CARTRIDGE OR FELT	1 or 2	AC393	AC393	AC393	AD752
16	INTAKE FILTER ASSEMBLY	1	AB600F		AA900D	
17 Δ	COVER GASKET	2	AA405		AA405	
18	JAR	1	AA805		AA401	
19	FILTER ELEMENT ASSEMBLY	1	AC433-1			
20	EXHAUST MUFFLER ASSEMBLY	1	AB600J		AA900F	
21	FILTER ELEMENT ASSEMBLY	1	AC434-1		AC436-1	
***	SERVICE KIT	1	K231A	K231A	K233A	K233A

Δ Denotes parts in the service kit.

Parts listed are for stock models. For specific OEM models, contact the factory. When corresponding or ordering parts, please give complete model number and serial number.

EXPLODED VIEW AND PARTS ORDERING INFORMATION



REF NO.	DESCRIPTION	QTY	0240-V105A VACUUM	0440-V105A VACUUM	0440-P103A COMPRESSOR	0740-V104A VACUUM	0740-P106A COMPRESSOR
1	BODY	1	B2321	B1321	B1321	B1321B	B1321B
2	DRIVE END PLATE	1	AC638	AC638	AC638	AC636	AC636
3	DEAD END PLATE	1	AC637	AC637	AC637	AC635	AC635
4	ROTOR ASSEMBLY	1	AC645	AC646	AC646	AC647	AC647
5 Δ	VANE (CARBON)	4	AD286	AD372	AD372	AA510A	AA510A
6 Δ	DEFLECTOR	2	AC649	AC649	AC649	AC649	AC649
7 Δ	BEARING	2	AC416	AC416	AC416	AC416	AC416
8	BELLEVILLE SPRING	2	AC657	AC657	AC657	AC657	AC657
9	RETAINING RING	1	AC658	AC658	AC658	AC658	AC658
10	WASHER	1	AC659	AC659	AC659	AC659	AC659
11	END CAP	1	AC639	AC639	AC639	AC639	AC639
12	BODY SPACER	1	B330F	B330F	B330F	B330F	B330F
13	COOLING FAN	2	B340C	B340C	B340C	B340C	B340C
14	INTAKE FILTER ELEMENT ASSY	1	V400C	V400C		V500D	
15 Δ	COVER GASKET	2	B62A	B62A		B62A	
16	JAR	1	AA125	AA125		AA125	
17	FILTER ELEMENT ASSEMBLY	1	B343B	B343B	B343B	B343B	B343B
18 Δ	FILTER FELT	4	B344A	B344A	B344A	B344A	B344A
19	EXHAUST MUFFLER ASSEMBLY	1	V425A	V425A		V525A	
***	SERVICE KIT	1	K225A	K227A	K227A	K229A	K229A

Δ Denotes parts in the service kit.

Parts listed are for stock models. For specific OEM models, contact the factory. When corresponding or ordering parts, please give complete model number and serial number.

WARRANTY

Gast finished products, when properly installed and operated under normal conditions of use, are warranted by Gast to be free from defects in material and workmanship for a period of twelve (12) months from the date of purchase from Gast or an authorized Gast Representative or Distributor. In order to obtain performance under this warranty, the buyer must promptly (in no event later than thirty (30) days after discovery of the defect) give written notice of the defect to Gast Manufacturing Incorporated, 2300 M139 Highway, Benton Harbor Michigan USA 49022-6114 or an authorized Service Center (unless specifically agreed upon in writing signed by both parties or specified in writing as part of a Gast OEM Quotation). Buyer is responsible for freight charges both to and from Gast in all cases.

This warranty does not apply to electric motors, electrical controls, and gasoline engines not supplied by Gast. Gast's warranties also do not extend to any goods or parts which have been subjected to misuse, lack of maintenance, neglect, damage by accident or transit damage.

THIS EXPRESS WARRANTY EXCLUDES ALL OTHER WARRANTIES OR REPRESENTATIONS EXPRESSED OR IMPLIED BY ANY LITERATURE, DATA, OR PERSON. GAST'S MAXIMUM LIABILITY UNDER THIS EXCLUSIVE REMEDY SHALL NEVER EXCEED THE COST OF THE SUBJECT PRODUCT AND GAST RESERVES THE RIGHT, AT ITS SOLE DISCRETION, TO REFUND THE PURCHASE PRICE IN LIEU OF REPAIR OR REPLACEMENT.

GAST WILL NOT BE RESPONSIBLE OR LIABLE FOR INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND, however arising, including but not limited to those for use of any products, loss of time, inconvenience, lost profit, labor charges, or other incidental or consequential damages with respect to persons, business, or property, whether as a result of breach of warranty, negligence or otherwise. Notwithstanding any other provision of this warranty, BUYER'S REMEDY AGAINST GAST FOR GOODS SUPPLIED OR FOR NON-DELIVERED GOODS OR FAILURE TO FURNISH GOODS, WHETHER OR NOT BASED ON NEGLIGENCE, STRICT LIABILITY OR BREACH OF EXPRESS OR IMPLIED WARRANTY IS LIMITED SOLELY, AT GAST'S OPTION, TO REPLACEMENT OF OR CURE OF SUCH NONCONFORMING OR NON-DELIVERED GOODS OR RETURN OF THE PURCHASE PRICE FOR SUCH GOODS AND IN NO EVENT SHALL EXCEED THE PRICE OR CHARGE FOR SUCH GOODS. GAST EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE WITH RESPECT TO THE GOODS SOLD. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTIONS SET FORTH IN THIS WARRANTY, notwithstanding any knowledge of Gast regarding the use or uses intended to be made of goods, proposed changes or additions to goods, or any assistance or suggestions that may have been made by Gast personnel.

Unauthorized extensions of warranties by the customer shall remain the customer's responsibility.

CUSTOMER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF GAST PRODUCTS FOR CUSTOMER'S USE OR RESALE, OR FOR INCORPORATING THEM INTO OBJECTS OR APPLICATIONS WHICH CUSTOMER DESIGNS, ASSEMBLES, CONSTRUCTS OR MANUFACTURES.

This warranty can be modified only by authorized Gast personnel by signing a specific, written description of any modifications.

TROUBLESHOOTING CHART

Low		High		Pump	Motor	Reason and remedy
Vacuum	Pressure	Vacuum	Pressure	Overheat	Overload	for problem.
•	•	At pump		•	•	Filter dirty. Clean or replace.
	•		At pump	•	•	Muffler dirty. Clean or replace.
•		At pump		•	•	Vacuum line collapsed. 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.
•	•					Vanes sticking. Clean or replace.
•	•					Vanes worn. Replace.
•	•					Shaft seal worn. Replace.
•	•			•	•	Dust or offset powder in pump. Inspect and clean.
•	•			•		Motor not wired correctly. Check wiring diagram and line voltage.
		•	•	•	•	Running at too high an RPM. Check wiring diagram and line voltage.