

INNOVATIVE
TECHNOLOGY
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NEUBERGER, INC.

Operating and Maintenance Instructions

For Installation Series: UN84, UN85, UN86, UN87, UN89 UN811, UN812, UN813, UN814, UN815 Single & Multi-Head Diaphragm Vacuum Pumps & Compressors



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid property damage, possible injury or death.

Operating Instructions

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

1. KNF units are all 100% oil-free. No maintenance at all is necessary for the bearings and NO lubrication should be done. All bearings are sealed and permanently lubricated. For repair service, call KNF Customer Service.
2. Be sure that the available electric power matches specifications marked on the motor. Serious damage may occur to the motor if connected to an improper voltage. All AC units should be grounded using the provided brass screw, or a grounded, 3-prong plug. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current.
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 where heat may build up during operation.
4. Standard models are designed to *start against atmospheric pressure only, not under load (Pressure or vacuum)*. Care must be taken to eliminate load when pump is turned off for any reason. Optional modifications for the pump to start under load may be available for certain models.
5. Use this pump only to pump air or gas, not liquids or particulates. *Damage to the pump or loss of performance can occur if quantities of liquids or particulates enter the system.*
6. Always install the pump in such a location that it is protected from direct (or indirect) moisture contact.
7. Avoid operating the pump in very dusty conditions. If necessary, install an inlet filter and change it frequently.
8. If flow is throttled or restricted for any reason, care must be taken to avoid exceeding the maximum continuous operating design pressure of the unit.
9. Be sure that the pump is installed at the highest point within the system to prevent possible liquid condensate from entering the unit.
10. To avoid personal injury, remove any protective plastic plugs supplied prior to applying power to the motor.

11. Run the pump for a few minutes to warm it up before handling saturated or nearly saturated vapors.
12. 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.
13. Do not thread metal fittings into Rytan® (K) pump heads. Use plastic material fittings only.

Troubleshooting

WARNING

AC motors are thermally protected and will automatically restart unexpectedly when the overload device resets. DO NOT pump flammable or explosive gases or operate this pump in an atmosphere containing flammable or explosive gases.

Your KNF 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 and head screws are snug. Do not overtighten screws.
2. Remove the head assembly as described in "Changing the Diaphragm and Valve plate". Look for any foreign matter; usually bits of Teflon® tape or particulates carried into the valve system or crystallized material from previously pumped vapors. All of the above must be cleared out and 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 wetted parts of the pump.

Chemical resistance charts should be consulted if you are in doubt. Generally, replacement of the diaphragm and valve plate will restore the pump to operating specifications if there is no pitting or debris in the valve seat area.

4. Check that power is being supplied to the pump from the power source and the pump switch is in the on position.

Limited Warranty

KNF NEUBERGER, INC. (KNF) 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 KNF. This determination will frequently require the return of the product to KNF. All product returns will be handled in accordance with KNF's product return policy. KNF reserves the right to inspect custom installations and devices that use KNF 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 judgement caused the product failure. KNF 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 KNF 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

KNF 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 KNF 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 KNF 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 our Technical Sales Department for further information.

Return Requests / Inquiries

Direct all warranty and repair requests to KNF Customer Service Department for instructions before returning any unit for repair or evaluation. We will fax you a "Return Instruction Sheet" for guidance on the proper marking, packing and documentation requirements or you can download this form from our website at <http://www.knf.com> by clicking on the Service/Support button. Important information conforming to the "Right To Know" act, such as a Material Safety Data Sheet may be required.

Products shipped to KNF must have a Return Materials Authorization Number (RMA) file number marked on the outside of the package, otherwise they will be refused by our receiving department.

Spare Parts Kits (One kit per head)

For Pump Models AN, KN:

UN84.3/.4	Kit # 073438
UN85	Kit # 072836
UN85.3	Kit # 072840
UN86	Kit # 072838
UN89, UN811	Kit # 076408
UN813	Kit # 073348
UN814	Kit # 074626
UN815	Kit # 073604

For Pump Models AT, KT:

N85	Kit # 072837
UN85.3	Kit # 072841
UN86	Kit # 072839
UN87	Kit # 200133
UN89, UN811	Kit # 073871
UN814	Kit # 074931
UN815	Kit # 073605

Kit consists of:

Qty	ID#	Description
1	F	Diaphragm
2	D	Valve plate
2	E	Seal Ring

Note: If your model number begins with MPU, PU or PJ, contact KNF Customer Service for the proper Parts Kit, as the contents may differ from those kits listed above. Head and Intermediate plate kits also available.

Changing the Diaphragm and Valve Plate

Materials needed:

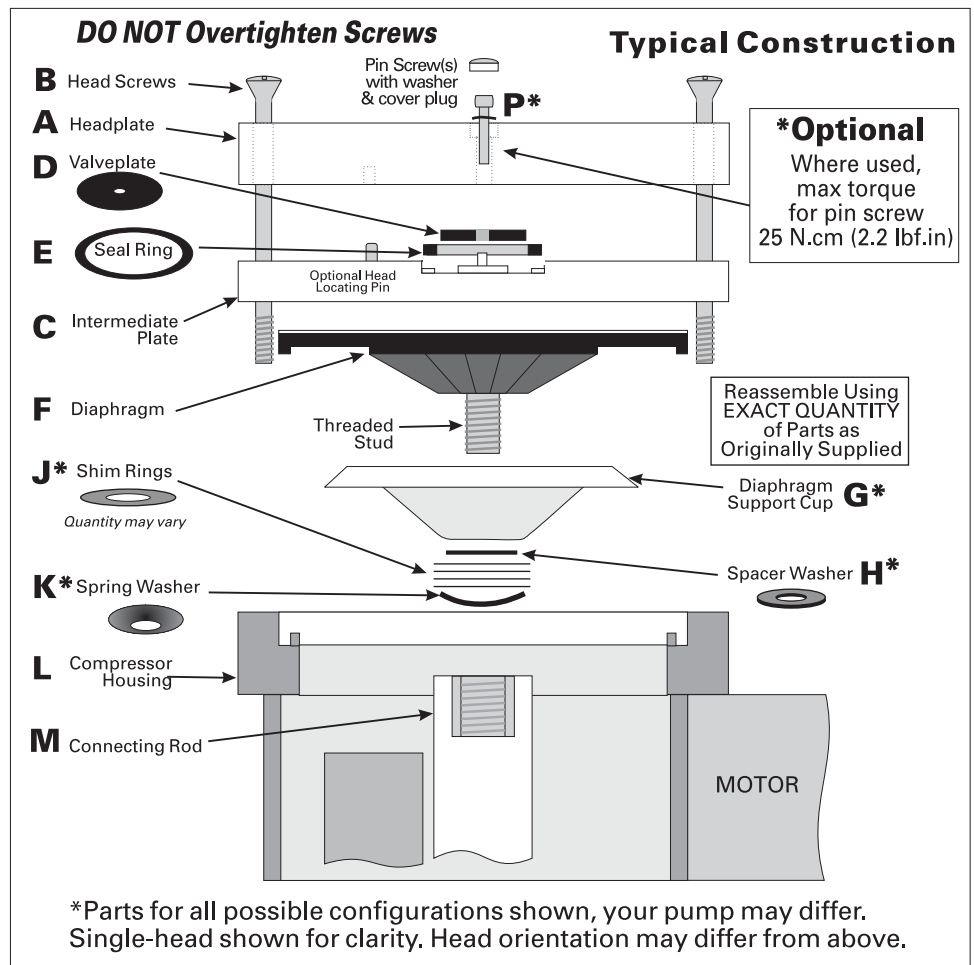
Proper replacement kit, Marking pencil

Tools Required:

2.5 mm Allen wrench
Small slotted-head screwdriver
Small Phillips-head screwdriver

Procedure:

1. Disconnect the pump from electrical power. Make a sketch of the position of any tubes and fittings for ease of reassembly later.
2. Mark the position of the pump headplate **A**, intermediate plate **C** and compressor housing **L** relative to each other by drawing a line on the edges with a pencil or other marker to assure proper reassembly. To access the counterweight, carefully pry off the plastic compressor housing cover, or remove the screws holding the aluminum cover. Re-use any gasketing.
3. Remove the four screws **B** and remove the headplate **A**. Note the positioning of the valve plates **D** and seal rings **E** in relation to the valve ports on the headplate **A** and intermediate plate **C**. Lift off the seal rings and valve plates.
4. Remove the intermediate plate **C**. Carefully clean the head and intermediate plates of any residue using fine steel wool. DO NOT scratch the parts.
5. Unscrew the old diaphragm **F** by turning it counterclockwise using both hands. **DO NOT use tools!** IMPORTANT — Take care not to lose any small parts such as the spacer washer **H**, shim rings **J**, or spring washer **K** positioned between the diaphragm stud and connecting rod, as they must be replaced for proper pump operation. Note: quantity and type of parts may vary among models. Parts removed must be replaced exactly as found.
6. Place the parts removed in step 5 above onto the threaded stud of the new diaphragm. Carefully screw the new diaphragm **F** into the connecting rod **M**. **Tighten firmly using both hands only - DO NOT use tools!**



(TIP: If possible, hold the pump with the motor shaft vertical when starting the threaded diaphragm stud into the connecting rod.)

7. Turn the counterweight **N** until the diaphragm is flat across. Carefully center the diaphragm over the compressor housing **L**, firmly seating the diaphragm edge into the compressor housing groove.
8. Place the clean intermediate plate **C** onto the compressor housing **L**, according to your previously drawn markings, then place the new valve plates **D** and seal rings **E** on top of the intermediate plate. Make sure the seal rings are properly seated in intermediate plate recesses to avoid pinching.
9. Place the clean headplate **A** on top of the intermediate plate **C** according to your previously drawn markings and locating pins. Locating pins are used with Ryton® heads only. Then tighten the four screws **B** in a criss-cross pattern. Replace the pin screw(s) **P** and tighten to 25 N.cm (2.2 lbf.in). **Do not overtighten.** Turn the counterweight or the fan by hand to ensure that pump turns freely.
10. Replace the compressor housing cover. On portable models, replace the cabinet.
11. Remove any old Teflon® tape from all fittings. Carefully apply two layers of Teflon® tape around any fittings before reinstalling into the pump head. Install the tubing and fittings as previously sketched in step 1 above.

Do not apply tape beyond threads, as excess tape may tear off and lodge in the valves. Do not substitute any other type of tape.

Note: Should you need to send a KNF pump to our factory for repairs, please be sure to read the instructions in the Limited Warranty section with regard to obtaining an RMA (Return Materials Authorization) number prior to shipment.

Individual Parts: (per head)

ID#	Description
A	Headplate
B	Head Screws (4 per head)
C	Intermediate Plate
D	Valve Plate (2 per head)
E	Seal Ring (2 per head)
F	Diaphragm
G	Diaphragm Support Cup
H	Spacer Washer
J	Shim Rings
K	Spring Washer

Notes:

1. Drawing is for reference only, and covers a variety of models. Use the same quantity of parts as originally supplied on your pump.
2. Contact KNF Customer Service for ordering information.

For Service or Parts, CONTACT: KNF NEUBERGER, INC.

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