

Chemical resistant Vacuum Pumps

C300 / C400 / C410 / C510 / C600 / C610



English Operating Manual

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ChemVak

Chemical Resistant Vacuum Pumps

C300/C400/C410/C600/C510/C610

Congratulations!

You have made an excellent choice.

Wiggins wants to thank you for the trust you have placed in us.

This operating manual has been designed to help you gain an understanding of the operation and possible applications of our C series vacuum pumps. For optimal utilization of all functions, we recommend that you thoroughly study this manual prior to beginning any operation.

The Wiggins Quality Management System



ISO 9001

Certificate Registration No. 01 100084841

Unpacking and Inspection

Unpack the pump and accessories and inspect them for possible transport damage. Damage should be reported to the responsible carrier, railway, or postal authority, and a damage report should be requested. These instructions must be followed fully for us to guarantee our full support of your claim for protecting against loss from concealed damage. The form required for filing such a claim will be provided by the carrier.

Printed in Germany Changes without prior notification reserved

Important: Keep the operating manual for future use

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1. Important Notice

The vacuum pump is designed for laboratory use only. Before the setup and operation of the unit, please read these instructions carefully to get familiar with the entire installation and operation process. Any individual should be well trained either by reading the instructions or by undergoing specific instructions from the authorized distributors' technical staff before operating the unit.

Do not modify or alter the unit in any way. Any modification or alteration will void the warranty and can result in potential hazards.

We cannot be made responsible for any injury or damage caused by using the unit in a way that is not intended by the manufacturer or for modification of the unit by any person who is not authorized.

2. Unpacking

Please make sure that the unit is in good condition. In case of damage or the lack of any part when unpacking the unit, please contact our local distributor or contact us by e-mail under **info@chemvak.com** for immediate assistance.

3. Installation

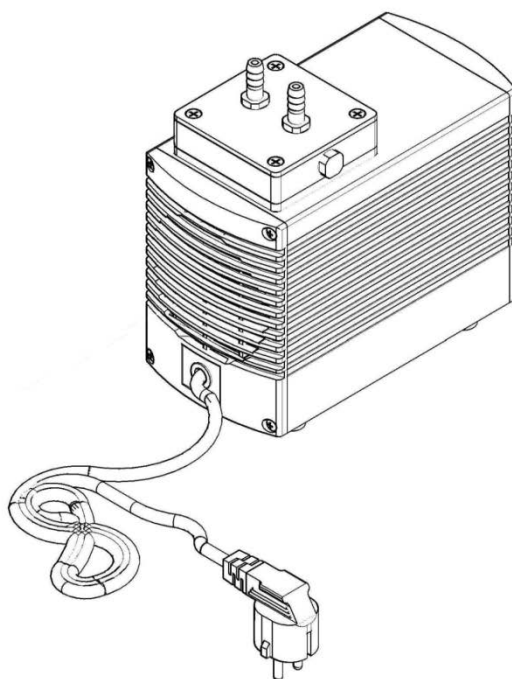
- 1) Check the voltage specified on the nameplate at the bottom of the unit. Make sure that it matches the current requirements in your location.
- 2) Install the unit in a clean, dustless, and ventilated area where the ambient temperature is under 40°C.
- 3) To enable the suction function, connect the inlet of the pump to the outlet of your objective equipment with a high-pressure hose.

4. Warning

- 1) When finished pumping, please do not turn off the pump at once and continue to run the vacuum pump for at least two minutes in order to draw out the mist and tiny liquids to prolong the service life of the pump.
- 2) The filter cartridge (optional) is used to absorb moisture and dust. Please replace it when it is saturated to maintain a high pumping efficiency.
- 3) If the pump does not work when turning on the switch, please release the vacuum and turn it on again. If the pump still fails to start, there may be a problem in the switch or motor. In that case please contact your local distributor for help immediately.
- 4) Never use the pump with any flammable gas or toxic material.
- 5) In case of any damage at the pump, please directly contact your local distributor or the Chemvak service department for help. Do not repair it by yourself to avoid hazard.

5. Function and Operation

5.1. C300

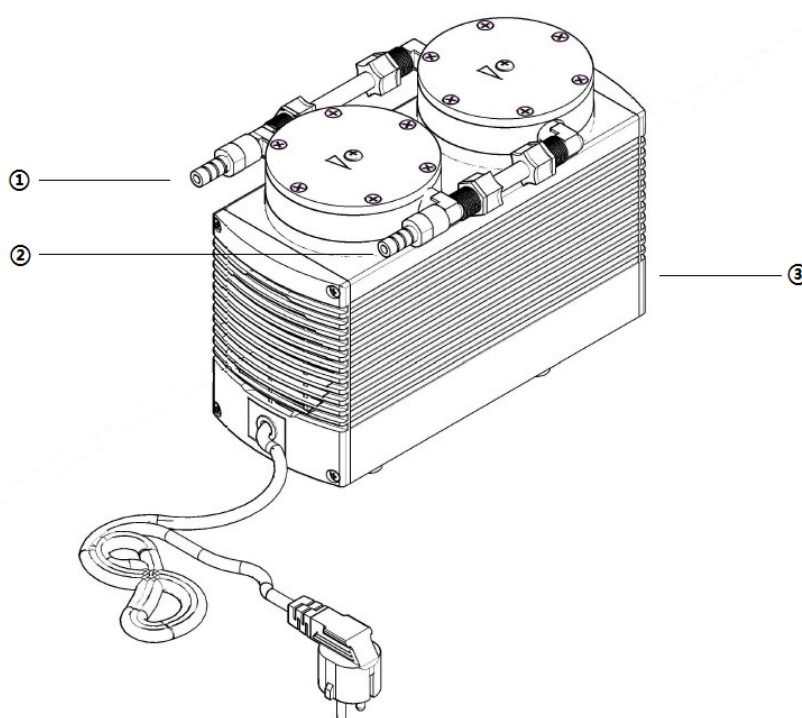


Operating Procedure

- 1) Schematic of the pump system is shown as above.
- 2) When all tubes are connected, the pumping function is activated by pressing the On/Off button.
- 3) For vacuum monitoring and regulation, an optional vacuum regulator / moisture trap is needed.

*** Warning:** *When the pump is used for water filtration never let the liquid level of the flask exceed the safety level. Failure to comply could result in serious damage to the pump and void the warranty.*

5.2. C400

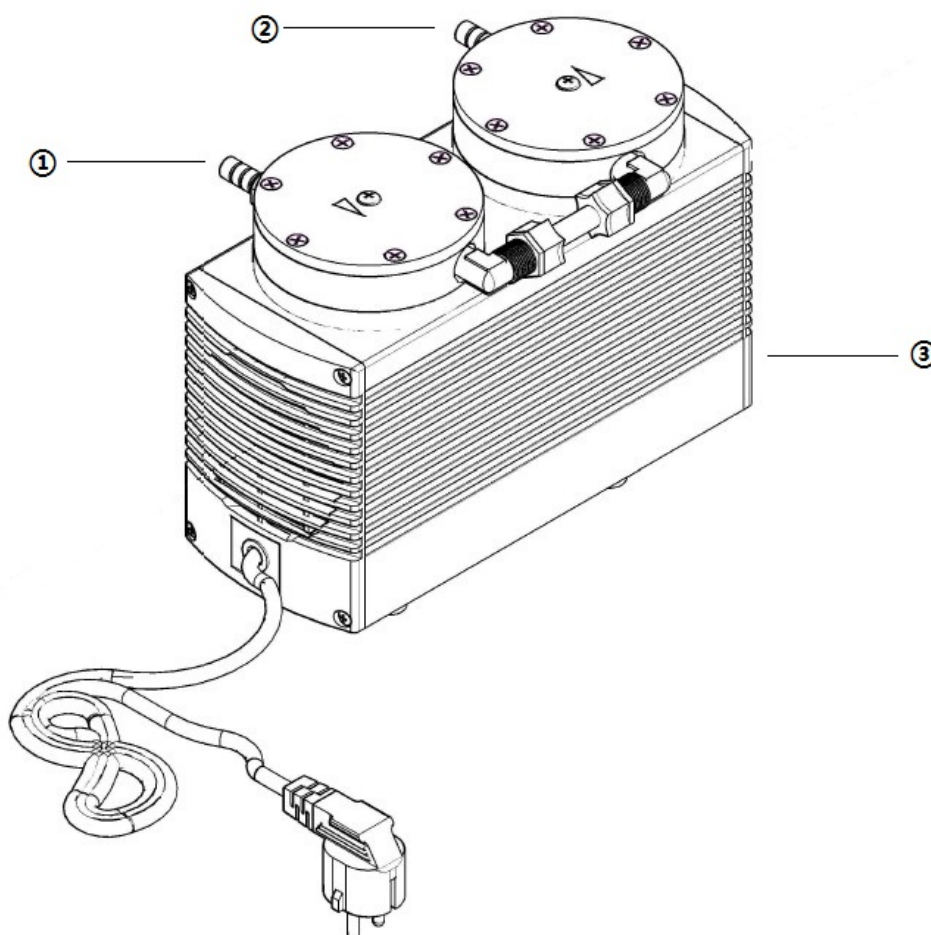


Operating Procedure

- 1) The diagram of the pump system is shown as above.
- 2) When all tubes have been properly connected to the Inlet (1) and Outlet (2), activate the pumping function by pressing On/Off button (3).
- 3) For vacuum monitoring and regulation, an optional vacuum regulator / moisture trap is needed.

Warning: When the pump is used for water filtration never let the liquid level of the flask exceed the safety level. Failure to comply could result in serious damage to the pump and void the warranty.

5.3. C410/C510/C610



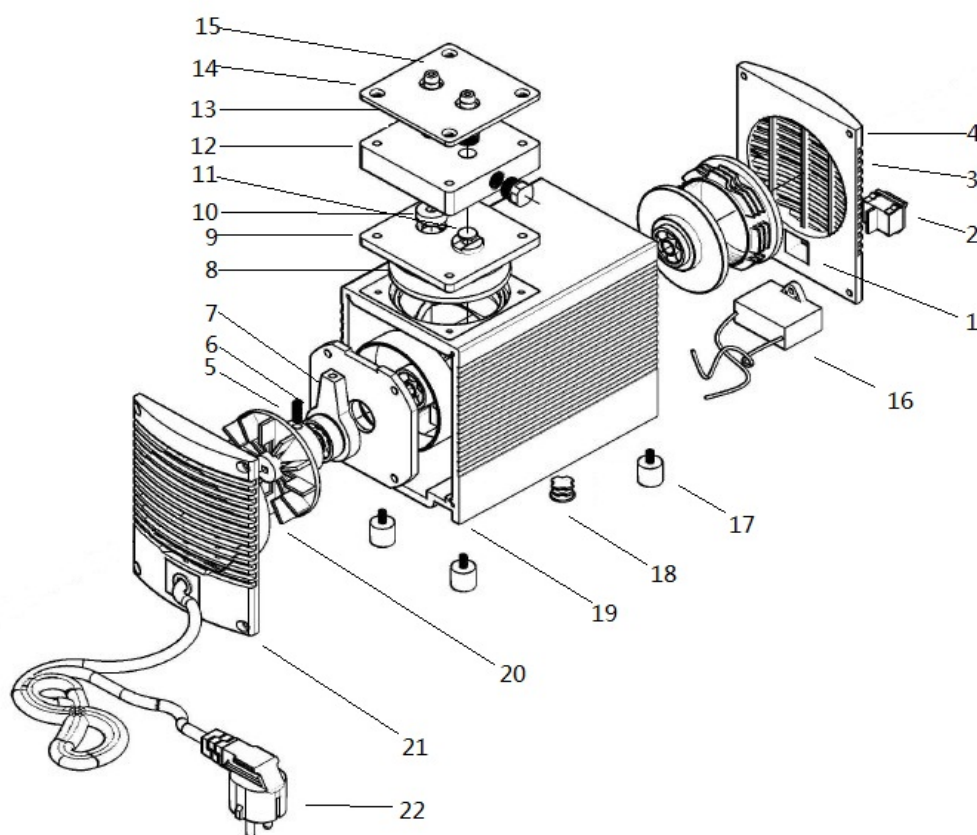
Operating procedure

- 1) The diagram of the pump system is shown as above.
- 2) When all tubes have been properly connected to the Inlet (1) and Outlet (2), activate the pumping function by pressing On/Off button (3).
- 3) For vacuum monitoring and regulation, an optional vacuum regulator / moisture trap is needed.

Warning: When the pump is used for water filtration never let the liquid level of the flask exceed the safety level. Failure to comply could result in serious damage to the pump and void the warranty.

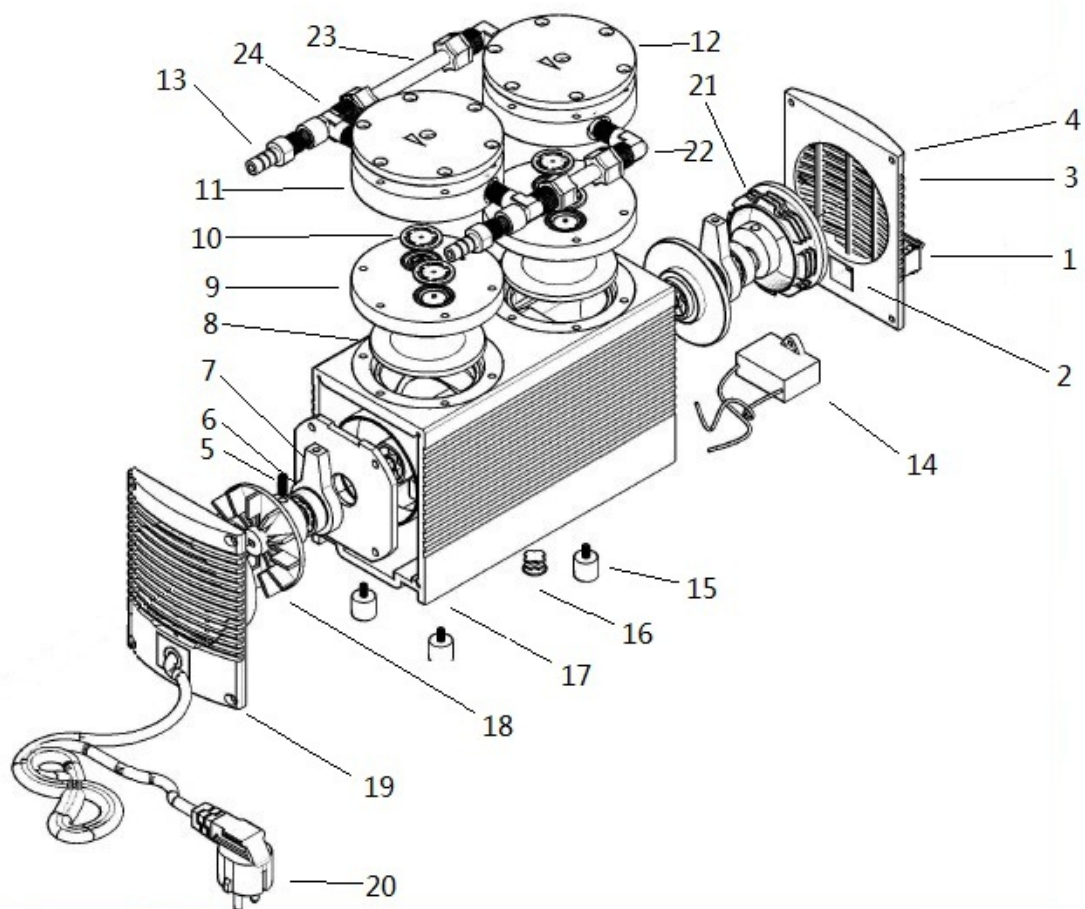
6. Parts List

6.1. C300



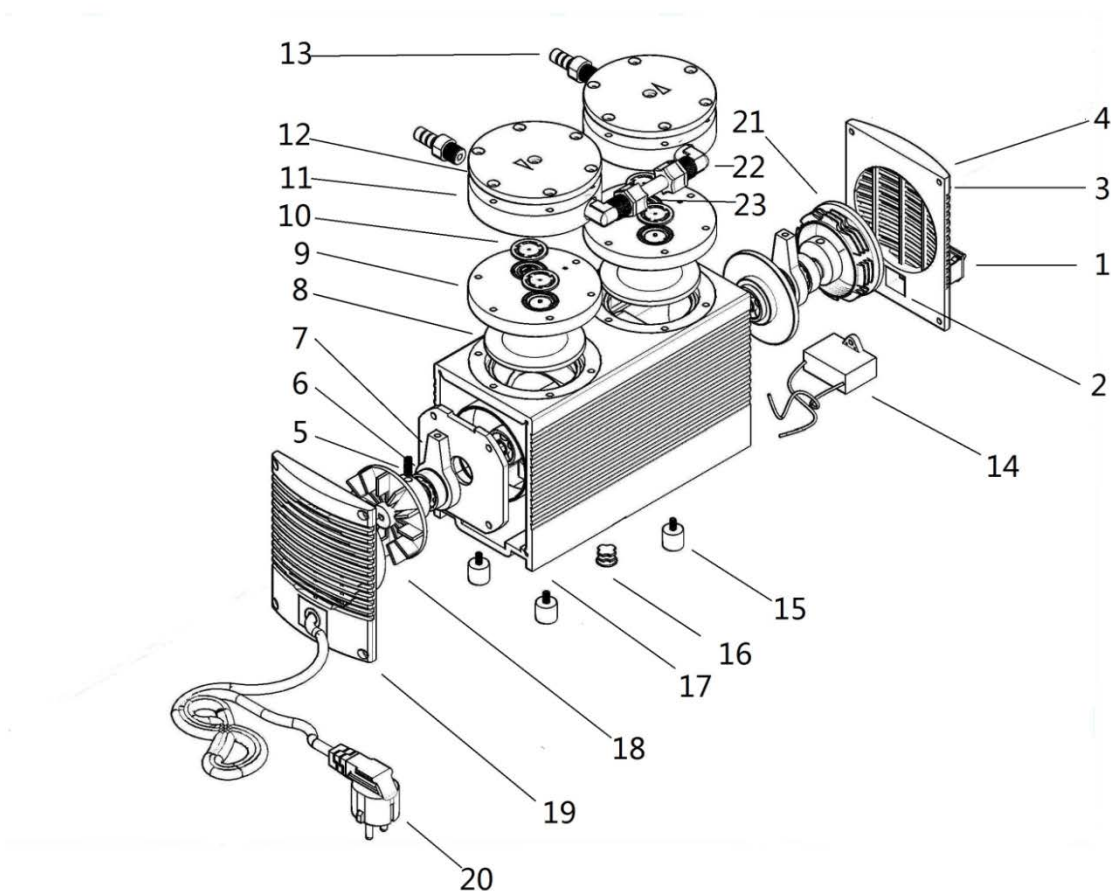
Index	Description	Qty	Index	Description	Qty
1	On/Off Switch Cup	1	13	Stainless Plate	2
2	On/Off Switch	1	14	Setscrew	8
3	Front Body Lid	1	15	Tier Connector	2
4	Set Screw	8	16	Condenser	1
5	Counterweight	2	17	Rubber Stand	4
6	Bearing	2	18	Clog	1
7	Connecting Rod	2	19	Body	1
8	Diaphragm	2	20	Cooling Fan	1
9	Diaphragm block	2	21	Rear Body Lid	1
10	Plug-in Unit	4	22	Plug	1
11	Valve Plate	4			
12	Diaphragm Head	2			

6.2. C400



Index	Description	Quan	Index	Description	Quan
1	On/Off Switch Cup	1	14	Condenser	1
2	On/Off Switch	1	15	Rubber Stand	4
3	Front Body Lid	1	16	Clog	1
4	Set Screw	8	17	Body	1
5	Counterweight	2	18	Cooling Fan	1
6	Bearing	2	19	Rear Body Lid	1
7	Connecting Rod	2	20	Plug	1
8	Diaphragm	2	21	PistonsetCover	1
9	Diaphragm Block	2	22	L-Connector	2
10	DiaphragmValve	4	23	Interflow Tube	2
11	Diaphragm Head	2	24	T-Connector	2
12	Stainless Plate	2			
13	Tier Connector	2			


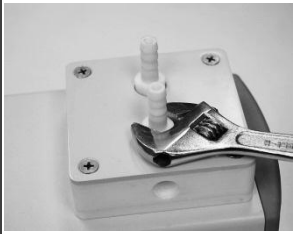
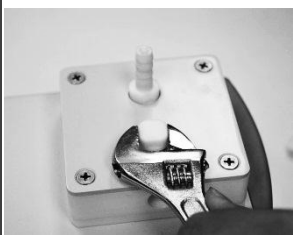
6.3. C410/C510/C610





Index	Description	Quan	Index	Description	Quan
1	On/Off Switch Cup	1	14	Condenser	1
2	On/Off Switch	1	15	Rubber Stand	4
3	Front Body Lid	1	16	Clog	1
4	Set Screw	8	17	Body	1
5	Counterweight	2	18	Cooling Fan	1
6	Bearing	2	19	Rear Body Lid	1
7	Connecting Rod	2	20	Plug	1
8	Diaphragm	2	21	Piston set Cover	1
9	Diaphragm Block	2	22	L-Connector	2
10	Diaphragm Valve	4	23	Interflow Tube	1
11	Diaphragm Head	2			
12	Stainless Plate	2			
13	Tier Connector	2			



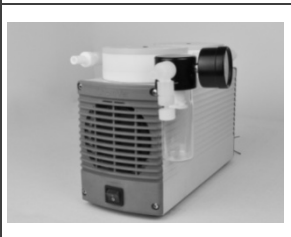
7. Vacuum Regulator / Moisture Trap (Optional)

7.1. Installation of the Vacuum Regulator/ Moisture Trap (C300)




	1. Remove the screw at the side of the cylinder head with a spanner.
	2. Remove the tier connector with a spanner.
	3. Fix the screw removed from step 1 at the location where you removed the tier connector in step 2.

	<p>4. Fix the moisture trap at the location where you removed the screw in Step 1.</p>
	<p>5. You completed the operation successfully.</p>

7.2. Installation of the Vacuum Regulator/ Moisture Trap (C400/C600)

	<p>1. Remove the Teflon tier connector at the side of the cylinder head with a spanner.</p>
	<p>2. Fix the moisture trap at the location where you removed the Teflon tier connector in Step 1.</p>
	<p>3. You completed the operation successfully.</p>

7.3. Installation of the Vacuum Regulator/ Moisture Trap (C410/510/C610)

	1. Remove the Teflon tier connector at the side of the cylinder head with a spanner.
	2. Fix the moisture trap at the location where you removed the Teflon tier connector in Step 1.
	3. You completed the operation successfully.

7.4. Functions of the Vacuum Regulator/ Moisture Trap

Vacuum regulator/ Moisture Trap is used to filtering possible particles and liquid from coming in the pump, with the vacuum gauge and adjusting valve, a approximate vacuum level can be maintained, however for more accurate vacuum control a precision vacuum controller is needed.



Replacement of the Cartridge:

When the filter cartridge is saturated and the flow rate or vacuum decreases, the filter cartridge should be replaced.

First, remove the moisture trap by rotating the cup counterclockwise. Second, remove the cartridge in the same way and replace it with a new one.

Dispose the water in the moisture trap as described above.

8. Troubleshooting

8.1. Sufficient vacuum is not reached

Possible reasons:

- ① Tube connections are not tight.
- ② Condensate in the pump head(detach the condensate source from the pump).
- ③ Diaphragms and/or valve plates/sealings are worn out(changing diaphragms and valve plates/sealings).
- ④ If this problem occurs after changing of diaphragms and valve plates/sealings.

8.2 . Pump is switched on, but does not run, the on/off-switch on the pump is not lit

Possible reasons:

- ① Pump is not connected with the power source.
- ② No voltage in the power source.

8.3 . Pump is switched on, but does not run, the on/off-switch on the pump is lit

Possible reasons:

The thermal switch has opened due to overheating (disconnect the pump from the power source, let the pump cool down, investigate the reason for the overheating and irradiate it).

9. Changing the Pump Diaphragms and the Valve Plates/Sealings

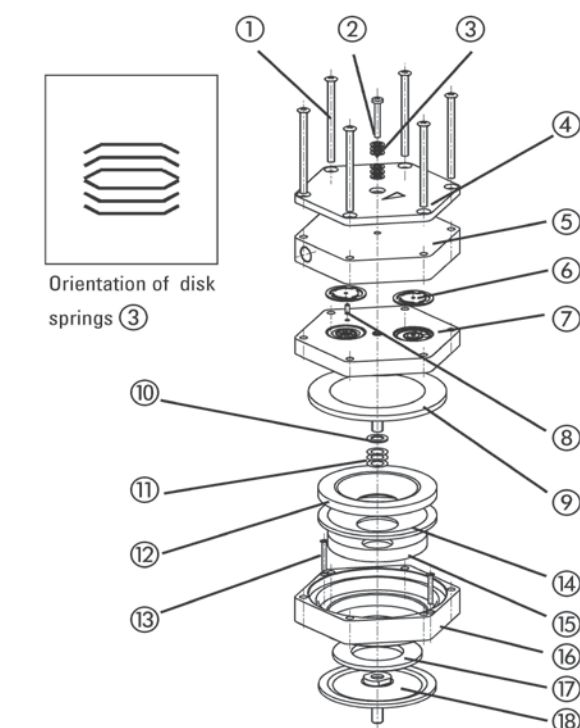
Structured diaphragm and valve plates/sealings are the only parts subject to wear. It is easy to change them.

In the case of two-headed pumps the structured diaphragms in both pump heads should be changed at the same time. When the structured diaphragms are changed, valve plates/sealings should also be replaced. If the structured diaphragms are not changed in both heads at the same time or the structured diaphragms and valve plates/sealings are not changed at the same time the nominal performance of the pump is not guaranteed after the service.

- If a pump has been used for aggressive or toxic substances or other types of substances which are hazardous, hazardous to health, or injurious, the following points must be observed:
 - 1) Clean the pump and its components before servicing.
 - 2) Ensure that the service personnel is not subject to a health hazard. Apply the safety and protection measures that are necessary for the medium that has been handled by the pump (example: the use of protective gloves).
 - 3) Ensure that discarded parts and materials are safely and correctly disposed of. Use only original CHEMVAK replacement parts.

9.1 Pump Head

The position numbers in the following text refer to fig. 4.



(1) Screw	(10) Spacer (thick)
(2) Screw	(11) Spacer(thin)
(3) Disk spring	(12) Dampening ring A
(4) Top plate	(13) Screw
(5) Head plate	(14) Dampening felt
(6) Valve plate/sealing	(15) Dampening ring B
(7) intermediate plate	(16) Adapter
(8) Guide pin	(17) Dampening ring C
(9) Structured diaphragm	(18) Dampening diaphragm

9.2 Two-headed pumps

Required tools and material:

Change the structured diaphragms and valve plates/sealings in the following sequence:

- a) Preparatory steps
- b) Remove pump heads
- c) Change structured diaphragms
- d) Change valve plates/sealings
- e) Refit pump heads
- f) Final steps

Detail description for the procedures:

- a) Preparatory Steps
 - ① Shut down system including disconnecting the pump from the power source (pull out plug of electrical supply unit or of socket).
 - ② Remove tubing from the inlet and outlet connectors of the pump.
 - ③ If the pump is integrated in a vacuum system: Remove pump from the Baseplate.
- b) Removing the pump heads
 - ① On the pneumatic head connections, loosen one of the union nuts by hand. Then slightly loosen the angle-fitting in the pump head by turning it anticlockwise, so that the connecting tube can be pulled out.
 - ② Loosen the outer screws (1) on each pump head.
 - ③ Carefully remove both pump heads(top plate (4) , head plate (5) and intermediate plat (6) .
- c) Change structured diaphragms
 - ① Push down one structured diaphragm(9)until other structured diaphragm is pushed upwards to its highest position.
 - ② Carefully unscrew the higher structured diaphragm anti-clock- wise using both hands.
 - ③ Replace all spacers (10) / (11) onto the screw thread of the new structured

diaphragm (same number and order)

- ④ Screw in the new structured diaphragm (9) and tighten it by hand; you do not need any tool.
- ⑤ Change the second structured diaphragm as described above (step (1) to (4)) for the first.

■ Changing the two structured diaphragms one after the other ensures that the same number of diaphragm spacers are refitted as were removed. This is essential to maintain the pneumatic performance of the pump.

d) Change valve plates/sealings

- ① For one pump head: Unscrew the single screw (2)
4 (C510: three screws) in the top plate (4) .
- ② Carefully remove top plate (5) and head plate (5) from intermediate plate (7) ; exposing the valve plates/sealings (6)
- ③ Remove old valve plate/sealings (6) .
- ④ If there should be deposits in the recesses in the intermediate plate (7) clean them until the deposits have been completely removed.
- ⑤ Insert new valve plates/sealings (6) in the recesses in the intermediate plate (7) (upper and lower sides of the valve plates/sealings are identical)
- ⑥ Carry out the steps (1) to (5) for the second pump head.

e) Refitting the pump heads

For one pump head

- ① Press the lip on the edge of the structured diaphragm (9) into the groove in the housing.
- ② Place the intermediate plate (7) , with the valve plates/sealings on the adapter (16) , in the position indicated by the guide pin (8) .
- ③ Place the head plate (5) on the intermediate plate (7) in the position indicated by the guide pin (8) .
- ④ Place the top plate (4) on the head plate in the right position.

- ⑤ Gently tighten screws (1) in diagonal order.
- ⑥ Screw in the single screw (2) (C510: three screws) in the centre of the pump top plate (4) until it is flush with the top plate(they are flush with the top plate) ,
- ⑦ Then screw one final half turn to tighten.

■ For orientation of disk springs (3) see fig.4.

Carry out steps (1) to (6) for the second pump head.

Refit the pneumatic head connection:

Place tube onto the connecting part of the angle fitting, turn angle fitting to a straight position and tighten the union nut.

f) Final steps

- ① Remount the pump to the baseplate.
- ② Reconnect system tubing.
- ③ Reconnect the pump to the electricity supply.

If the pump does not reach the desired vacuum after changing diaphragms and valve plates:/sealings:

- ① Check whether the spacers have been replaced onto the structured diaphragm screw thread.
 - ② Check the interconnecting pipe- work connection between both pump heads as well as the tubing for leaks.
 - ③ Possibly the screws on one of the pump heads (or both heads) are insufficiently tightened (carefully tighten them again crosswise).
- If you have any questions about servicing call our technical adviser(see last page for contact telephone number).

10.Specifications

C300	
Maximum capacity	22 L/min
Ultimate vacuum	≤100mbar abs
Maximum continuous pressure	1 bar (14.7 psi)
Weight of pump	5.0 kg
Permissible ambient temperature	+5...+40°C
Permissible temperature of gas to be pumped	+5...+40°C
Mains(Voltage/Frequency)	230V/50Hz; 110V/60Hz
Power Consumption Power	95W
C400	
Maximum capacity	34 L/min
Ultimate vacuum	≤120mbar abs
Maximum continuous pressure	1 bar (14.7 psi)
Weight of pump	7.0kg
Permissible ambient temperature	+5...+40°C
Permissible temperature of gas to be pumped	+5...+40°C
Mains(Voltage/Frequency)	230V/50Hz; 110V/60Hz
Power Consumption Power	95W
C410	
Maximum capacity	25 L/min
Ultimate vacuum	≤13mbar abs
Maximum continuous pressure	1 bar (14.7 psi)
Weight of pump	7.0 kg
Permissible ambient temperature	+5...+40°C
Permissible temperature of gas to be pumped	+5...+40°C
Mains(Voltage/Frequency)	230V/50Hz; 110V/60Hz
Power Consumption Power	95W

C510	
Maximum capacity	34l/min
Ultimate vacuum	≤8mbar abs
Maximum continuous pressure	1 bar (14.7 psi)
Weight of pump	12.6 kg
Permissible ambient temperature	+5...+40°C
Permissible temperature of gas to be pumped	+5...+40°C
Mains(Voltage/Frequency)	230V/50Hz; 110V/60Hz
Power Consumption Power	245W
C600	
Maximum capacity	60 L/min
Ultimate vacuum	≤90mbar abs
Maximum continuous pressure	1 bar (14.7 psi)
Weight of pump	12.6 kg
Permissible ambient temperature	+5...+40°C
Permissible temperature of gas to be pumped	+5...+40°C
Mains(Voltage/Frequency)	230V/50Hz; 110V/60Hz
Power Consumption Power	270W
C610	
Maximum capacity	34 L/min
Ultimate vacuum	≤2mbar abs
Maximum continuous pressure	1 bar(14.7 psi)
Weight of pump	13.4 kg
Permissible ambient temperature	+5...+40°C
Permissible temperature of gas to be pumped	+5...+40°C
Mains(Voltage/Frequency)	230V/50Hz; 110V/60Hz
Power Consumption Power	245W

11.Ordering Information

C300	
169300-22	C300 Vacuum Pump, AC230V/50Hz
169300-11	C300 Vacuum Pump, AC110V/60Hz
167300-06	Vacuum Regulator/ Moisture Trap
169300-07	Filter Cartridge
167300-08	Magnetic Suction Flask Set (167300-13 with Bottom Plate)
167100-18	Gelman 4242 Funnel
167100-41	Stainless Steel Funnel (100ml)
167100-20	Gelman A/E#61631 Fiberglass Filter, φ 47mm
C400	
169400-22	C400 Vacuum Pump, AC230V/50Hz
169400-11	C400 Vacuum Pump, AC110V/60Hz
169300-06	Vacuum Regulator/ Moisture Trap
167300-07	Filter Cartridge
169400-60	C400/410 Repair Kit
C410	
169410-22	C410 Vacuum Pump, AC230V/50Hz
169410-11	C410 Vacuum Pump, AC110V/60Hz
169300-06	Vacuum Regulator/ Moisture Trap
167300-07	Filter Cartridge
169400-60	C400/410 Repair Kit
C510	
169510-22	C510 Vacuum Pump, AC230V/50Hz
169510-11	C510 Vacuum Pump, AC110V/60Hz
169300-06	Vacuum Regulator/ Moisture Trap
167300-07	Filter Cartridge
169600-60	C510/600 Repair Kit

C600	
169600-22	C600 Vacuum Pump, AC230V/50Hz
169600-11	C600 Vacuum Pump, AC110V/60Hz
169300-06	Vacuum Regulator/ Moisture Trap
167300-07	Filter Cartridge
169600-60	C510/600 Repair Kit
C610	
169610-22	C610 Vacuum Pump, AC230V/50Hz
169610-11	C610 Vacuum Pump, AC110V/60Hz
169300-06	Vacuum Regulator/ Moisture Trap
167300-07	Filter Cartridge
169610-60	C610 Repair Kit

12.Warranty

We guarantee the perfect functioning of this instrument against defects in material, design, and workmanship, when use under appropriate conditions and in accordance with the instruction manual for a period of **TWO YEARS** from the date of initial shipment.

This warranty covers all parts and components of the instrument except those normally requiring frequent replacement, such as tubing, gasket, O-rings, etc. We will not be liable for any personal injury, improper maintenance, or negligence of accident.

13.Product Liability

Under no circumstances shall Chemvak be liable for indirect, consequential or otherwise special or unrelated damages of any kind.

Chemvak reserves the right to make technical changes without prior notice.

Email: info@chemvak.com

Web Site: www.chemvak.com