OPERATING MANUAL

English

Chemical Resistant Diaphragm Pump

C300 / C400/ C410 / C510/ C600 / C610



WIGGENS
THE MAGIC MOTION

Room 303, Hall C, Office Building M8, No. 1 Jiuxianqiao East Road, Chaoyang District, Beijing 100015, China
Tel: +86 400-809-2068
Fax: +86 400-809-2068-112
info@ wiggens.com
service@wiggens.com
www.wiggens.com

Congratulations!

You have made an excellent choice.

WIGGENS thanks 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 instruments. For optimal utilization of all functions, we recommend that you thoroughly study this manual prior to beginning operation.

Declaration of conformity EN
We declare under our sole responsibility that this product corresponds to the directives ……. and conforms to the following standards or normative documents: EN ISO ……

The WIGGENS Quality Management System

ISO 9001

Certificate Registration No. 01 100084841

Unpacking and Inspecting

Please unpack the device carefully. Check that the package is right-side-up and then open it. Check that model of the product is one that you ordered. Check that there is no damage. If there is any damage, file a damage claim with the carrier. In the case of any damage a damage report should be requested immediately. 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 China Changes without prior notification reserved

Important: keep operating manual for future use

Content

1. Intended Use 5
2. Operator Responsibility 6
2.1. Disposal 7
2.2 CE Conformity 7
2.3. Technical Specifications 7
3. Safety Instructions 10
3.1. Explanation of Safety Notes 10
3.2. For Your Protection 10
3.3. For protection of the equipment 12
4. Operating Procedures 14
4.1. Environmental Operating Conditions 14
4.2. Design and Function 14
4.3. Installation of the vacuum pump 15
4.4. Operation 16
4.3.1. Operation Controls for C300 16
4.3.2. Operation Controls for C400 and C600 17
4.3.3. Operation Controls for C410 / C510 / C610 18
4.5. Parts List 19
4.5.1. Parts of C300 19
4.5.2. Parts of C400 / C600 20
4.5.3. Parts of C410 / C510 / C610 21
5. Cleaning and Maintenance 22
5.1. Routine Cleaning 22
5.2. Maintenance 23
6. Transport and Storage 23
7. Accessories and Spare Parts 25
7.1. Chemical Resistant Vacuum Regulator / Filter Equipment 25
7.2. Viton tubing 25
8. Service 27
8.1. Trouble-Shooting 27

8.2. Warranty 28
8.3. Contact/Technical Service 28

1. Intended Use

The C-Series Chemical Resistant Diaphragm Pumps are designed for laboratory use only.

All materials of the Chemical Resistant Diaphragm Pumps which have direct contact with gases are made of PTFE. They can be used in the chemical and petrochemical industry, the pharmacy industry and all industries that make use of chemical resistant vacuum processes, such as filtration, vacuum distillation, rotary evaporation, vacuum and centrifugal concentration, solid phase extraction, etc.

The Chemical Resistant Diaphragm Pumps' ultimate vacuum can reach a value as low as 2 mbar. They are working with noise less than 50 dB which is due to the special structure design.

All Chemical Resistant Diaphragm Pumps adopt an overheating protection system, which shuts down the pump when the inner temperature is too hot and automatically starts the pump again when cooled down to a safe temperature. This guarantees stable work of the pump and the safety of use. The Chemical Resistant Diaphragm Pumps can be integrated into vacuum filtration systems a diverse variety of accessories are available. The special design prevents solid impurities from accessing the pump head and thus guarantees the longevity of the pump.

2. Operator Responsibility

The products of WIGGENS ensure safe operation when installed, operated, and maintained according to common safety regulations. This section explains the potential dangers that may arise when operating the instrument and also specifies the most important safety precautions to preclude these dangers as far as possible.

- The operator is responsible for the qualification of the personnel operating the instrument.
- The personnel operating the instrument should be regularly instructed about the dangers involved with their job activities as well as measures to avert these dangers.
- Make sure all persons tasked with operating, installing, and maintaining the instrument have read and understand the safety information and operating instructions.
- When using hazardous materials or materials that could become hazardous, the instrument may be operated only by persons who are absolutely familiar with these materials and the instrument. These persons must be fully aware of possible risks.
- Only qualified personnel are authorized to perform configuration, installation, maintenance and repairs of the instrument.
- Routine operation can also be carried out by untrained personnel who should however be instructed by trained personnel.
- The safety of the user cannot be guaranteed if the appliance is operated with accessories that are not supplied or recommended by the manufacturer or if the appliance is operated improperly contrary to the manufacturer’s specifications.

If you have any questions concerning the operation of your instrument or the information in this manual, please contact us!

2.1. Disposal



At the end of its service life the instrument is to be disposed of in accordance with the local regulations specified for the disposal of electronic industry waste in an environmentally friendly manner.

2.2 CE Conformity

The products described in the operating instructions conform to the requirements of the following European guidelines:

Low voltage regulations with respect to legal harmonization of the member countries concerning electric devices for use within certain voltage limits.

EMC guideline with respect to legal harmonization of the member countries concerning electromagnetic compatibility.

2.3. Technical Specifications

Model	C300	C400	C410
Maximum Flow Rate (L/min)	22	34	25
Ultimate Vacuum (mbar)	≤100	≤100	≤13
Outlet (mm)	8	8	8
Maximum Continuous Pressure	1 Bar (14.7 psi)		
Power (W)	95	95	95
Mains (Voltage / Frequency)	220V, 50Hz or 220V, 60Hz or 110V, 60Hz		
Permissible Ambient Temperature	+ 5...+40 °C		
Permissible	+ 5...+40 °C		

Temperature of Pumped Gas			
Weight (kg)	5	7	7
Basic Order Number	169300	169400	169410

Model	**C510**	**C600**	**C610**
Maximum Flow Rate (L/min)	34	60	34
Ultimate Vacuum (mbar)	≤8	≤90	≤2
Outlet (mm)	10	10	10
Maximum Continuous Pressure	1 Bar (14.7 psi)		
Power (W)	245	270	245
Mains (Voltage / Frequency)	220V, 50Hz or 220V, 60Hz or 110V, 60Hz		
Permissible Ambient Temperature	+ 5...+40 °C		
Permissible Temperature of Pumped Gas	+ 5...+40 °C		
Weight (kg)	12.6	12.6	13.4
Basic Order Number	169510	169600	169610

All measurements have been carried out at the stated voltage, frequency, and an ambient temperature of 25°C.

Technical changes without prior notification reserved.

WIGGENS Order Numbers consist of the Basic Order Number (BON) and the Order Number Addition (ONA) which explains different characteristics of the product that can vary from country to country. Order Numbers as stated on the product label and box label are stated as Full Order Numbers (FON), consisting of the BON followed by the ONA. For a full explanation of the ONA of your product, please ask your local

WIGGENS support or refer to the Order Number Guide in the *WIGGENS* General Catalog.

3. Safety Instructions

3.1. Explanation of Safety Notes

In addition to the safety warnings listed, warnings are posted throughout the operating manual. These warnings are designated by an exclamation mark inside an equilateral triangle. “Warning of a dangerous situation (Attention! Please follow the documentation).”

Symbol	Additional term / Description
Warning signs 	The danger is classified using a signal word. Read and follow these important instructions for averting dangers. **Warning!** Describes a **possibly** highly dangerous situation. If these instructions are not followed, serious injury and danger to life could result.
	Caution! Describes a **possibly** dangerous situation. If this is not avoided, slight or minor injuries could result. A warning of possible property damage may also be contained in the text.
	Notice! Describes a **possibly** harmful situation. If this is not avoided, the product or anything in its surroundings can be damaged.
	**Note!** Draws attention to something special.
	**Important!** Indicates usage tips and other useful information.

3.2. For Your Protection

- Make sure you read and understand all instructions and safety precautions listed

in this manual before installing or operating your instrument.

- Keep the operation instructions in a place where they can be accessed by everyone.
- Connect the instrument to a power socket with earthing contact (PE-protective earth)!
- The power supply plug serves as a safe disconnecting device from the line and must always be easily accessible.
- Do not stay in the area below the instrument.
- Make sure the product is checked for proper condition regularly (depending on the conditions of use). Regularly check (at least every 2 months) the proper condition of the mandatory, warning, prohibition and safety labels.
- Never operate damaged equipment.
- Always turn off the instrument and disconnect the mains cable from the power source before performing any service or maintenance procedures, or before moving the instrument.
- Transport the instrument with care.
- Never operate instruments with damaged mains power cables.
- Observe all warning labels.
- Never remove warning labels.
- Repairs are to be carried out only by qualified service personnel
- **Warning!** Never use the pump with any flammable gas or toxic material.
- **Warning!** Before using a medium, check the compatibility of the materials of the pump head, diaphragm and valves with the medium.
- **Warning!** Before using a medium, check whether the medium can be transferred anger-free in the specific application case.
- **Warning!** Ensure that the system is not subject to any risks of explosion, also in extreme operating situations (temperature, pressure) or in case of malfunctions.
- **Warning!** Only transfer gases which remain stable under the pressures and temperatures occurring in the pump.
- Laboratory equipment or additional components connected to a pump have to be

suitable for use with the pneumatic capabilities of the pump

-  **Warning!** Make sure the temperature of the medium is always sufficiently below the ignition temperature of the medium, to avoid ignition or explosion.
- If necessary, consider any external sources of energy, such as radiation, that may add heat to the medium.

3.3. For protection of the equipment

- You have received a product designed for industrial and experimental use. Nevertheless, avoid strikes to the housing, vibrations, damage to the operating-element panel, and contamination.
- Make sure that the mains power supply has low impedance to avoid any negative effects on instruments being operated on the same mains.
- Do not expose the unit to sunlight.
- Sudden drops may cause damage in the interior of the instrument.

- When finished with the pumping operation, do not turn off the pump at once but 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.
- The filter cartridge (optional) is used to absorb moisture and dust. Replace it when it is saturated to maintain a high pumping efficiency.
- Never use the pump with any flammable gas or toxic material.
- Press the power switch to interrupt the pump, rather than disconnect the main power plug directly.
- When in an emergency, disconnect the main power plug.
- Protect the pump from vibrations, jolts and external damage.
- The pump is not suitable for use underground.
- The pump is not suitable for transferring dusts.
- The pump is not suitable for transferring liquids.
-  **Warning!** An overpressure must not be applied to the suction side of the pump.

- The pumps must not be modified. If a wearing part is replaced, the original function of the pump must be checked by reaching the specified ultimate vacuum

4. Operating Procedures

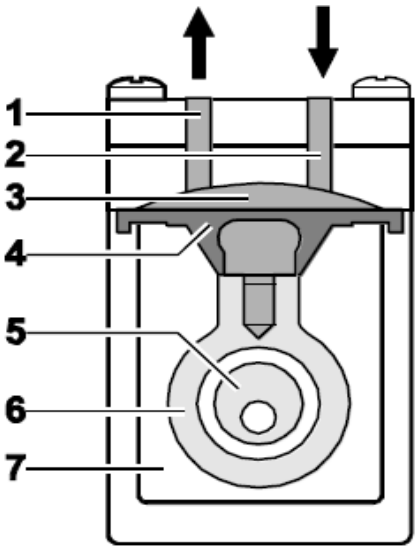
4.1. Environmental Operating Conditions

The pump must operate in the following conditions:

- Indoors
- Altitudes up to 2000 meters
- Temperatures from +5°C to +40°C
- Maximum relative humidity 80% for temperatures up to +31°C, linear decrease down to 50% relative humidity at a temperature of +40°C
- Max. mains fluctuation of ±10 % are permissible
- Protection class according to EN 60 529: IP31
- The unit corresponds to Class I
- Overvoltage category II

4.2. Design and Function

Function Diaphragm pump



Index	Description
1	Outlet valve

2	Inlet valve
3	Transfer chamber
4	Diaphragm
5	Eccentric
6	Connecting rod
7	Pump drive

Diaphragm pumps transfer, compress (depending on pump version) and evacuate gases and vapors.

The elastic diaphragm (4) is moved up and down by the eccentric (5) and the connecting rod (6). In the downward stroke it aspirates the gas to be transferred via the inlet valve (2). In the upward stroke, the diaphragm presses the medium out of the pump head via the outlet valve (1). The transfer chamber (3) is hermetically separated from the pump drive (7) by the diaphragm.

4.3. Installation of the vacuum pump

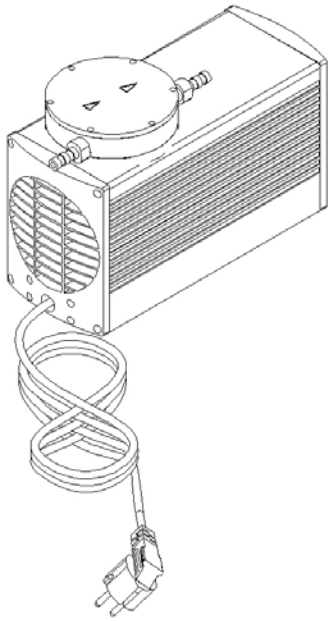
1. Place the vacuum pump on a stable, flat surface and proper environment for operation.
2. Check the voltage specified on the rear label at the bottom of the unit. Make sure that it matches the mains requirements in your country.
3. To enable the suction function, connect the inlet of the pump to the outlet of your objective equipment with high-pressure tubing.

4.4. Operation

Warning:

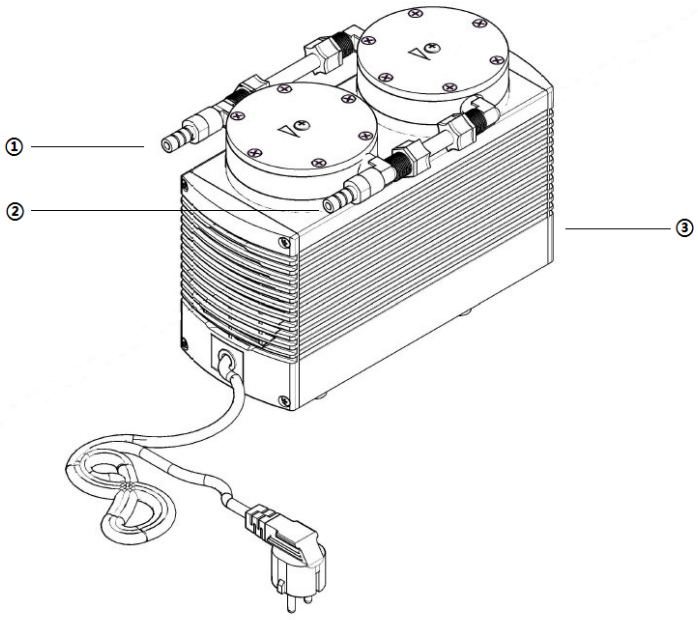
When the pump is used in water filtration, prevent the liquid level in the flask / waste bottle from exceeding the safety level. Failure to comply can result in serious damage to the pump and void the warranty.

4.3.1. Operation Controls for C300



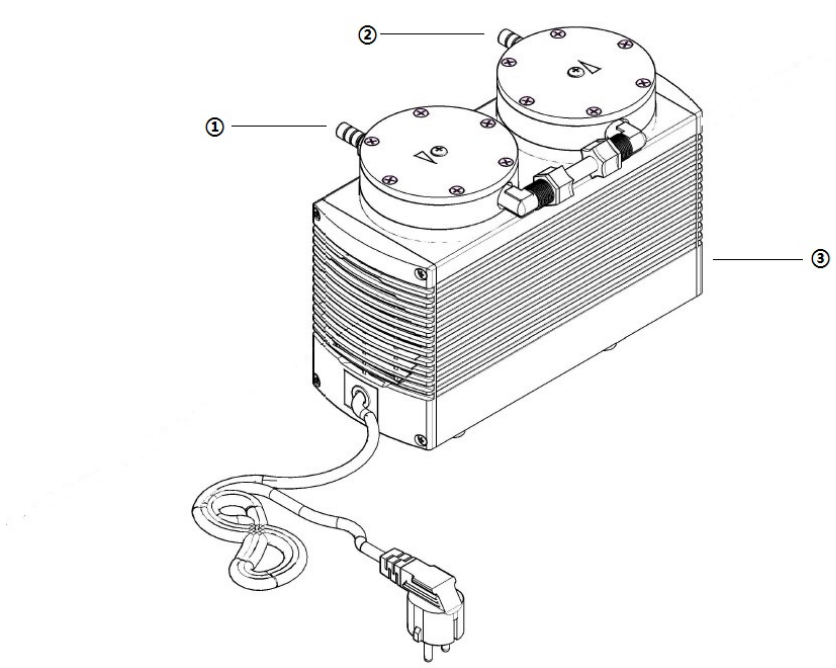
1. The diagram of the pump system is shown above.
2. When all tubes have been properly connected to the Inlet and Outlet, activate the pumping function by pressing the On / Off Button.
3. For vacuum monitoring and regulation, an optional vacuum regulator / moisture trap is needed.

4.3.2. Operation Controls for C400 and C600



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

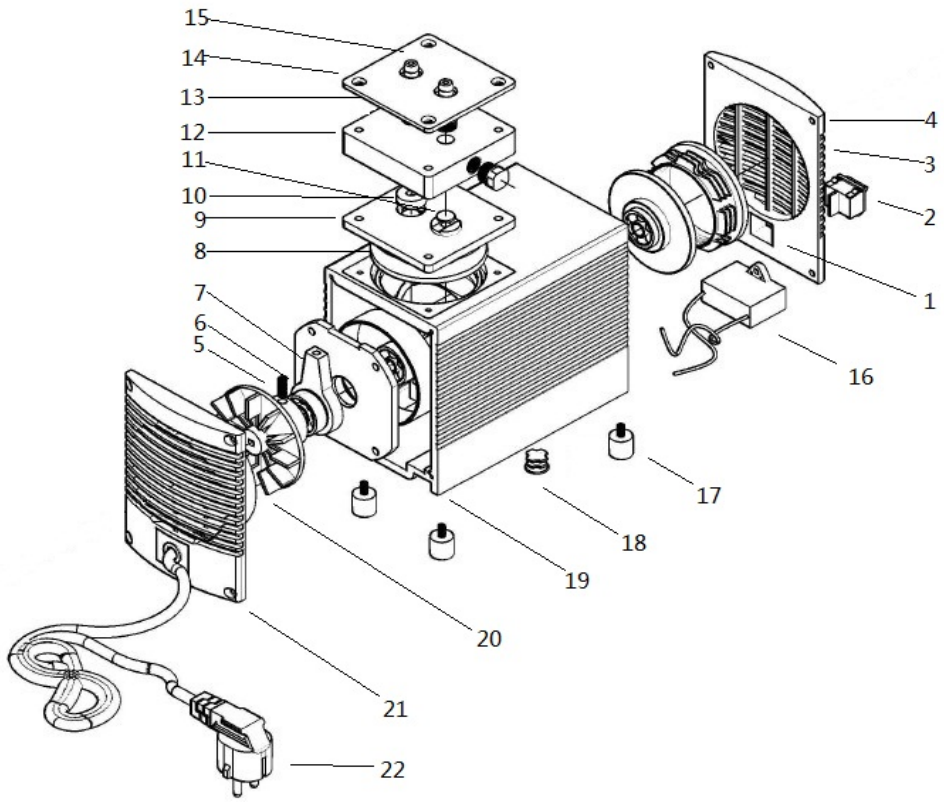
4.3.3. Operation Controls for C410 / C510 / C610



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

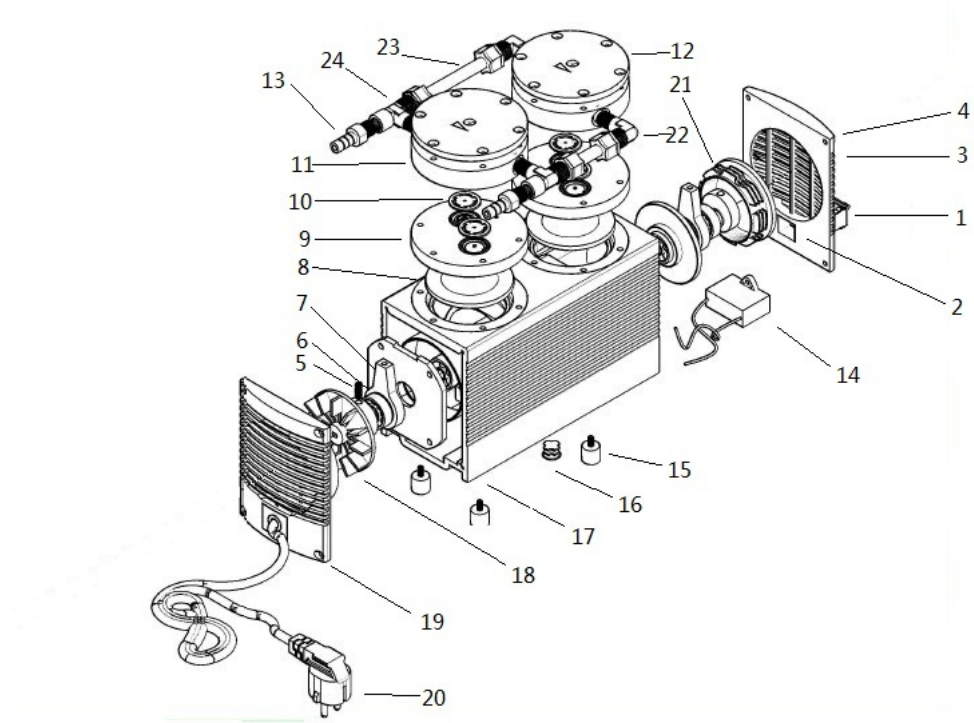
4.5. Parts List

4.5.1. Parts of C300



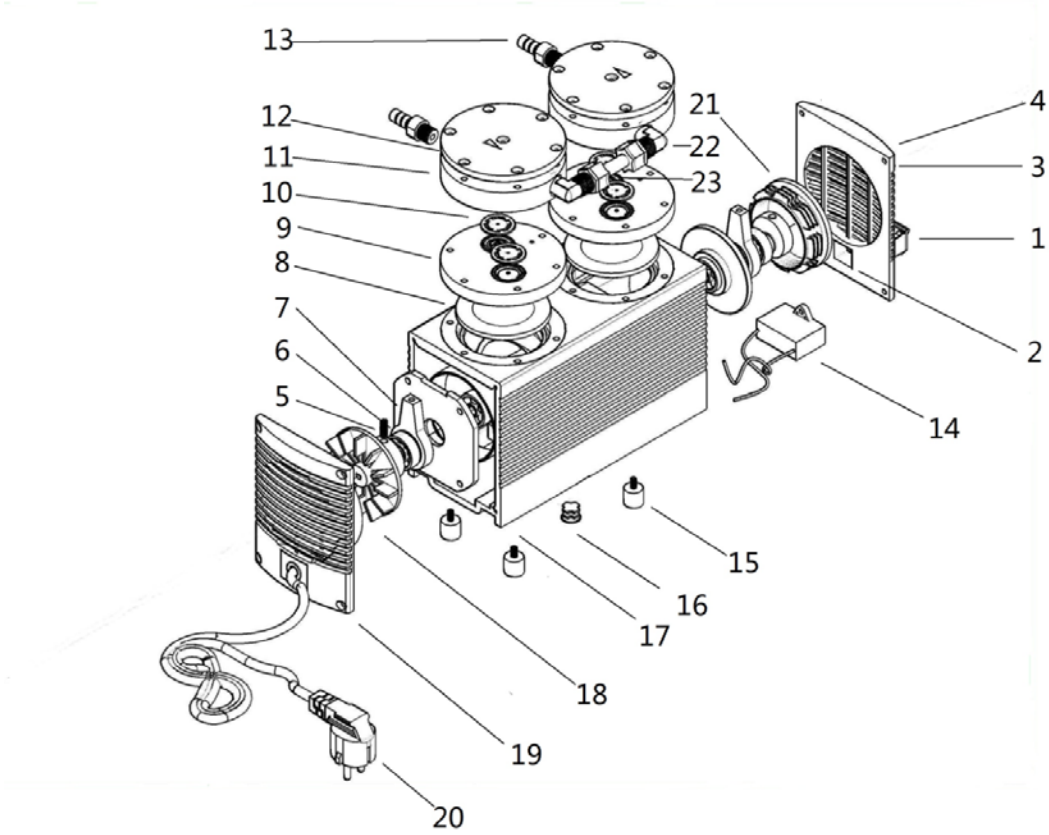
Index	Description	Quantity	Index	Description	Quantity
1	On/Off Switch Cup	1	12	Diaphragm Head	2
2	On/Off Switch	1	13	Stainless Steel Plate	2
3	Front Body Lid	1	14	Setscrew	8
4	Set Screw	8	15	Tier Connector	2
5	Counterweight	2	16	Condenser	1
6	Bearing	2	17	Rubber Stand	4
7	Connecting Rod	2	18	Clog	1
8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

4.5.2. Parts of C400 / C600



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

4.5.3. Parts of C410 / C510 / C610



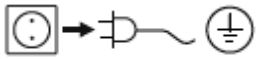
Index	Description	Quantity	Index	Description	Quantity
1	On/Off Switch Cup	1	13	Tier Connector	2
2	On/Off Switch	1	14	Condenser	1
3	Front Body Lid	1	15	Rubber Stand	4
4	Set Screw	8	16	Clog	1
5	Counterweight	2	17	Body	1
6	Bearing	2	18	Cooling Fan	1
7	Connecting Rod	2	19	Rear Body Lid	1
8	Diaphragm	2	20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

5. Cleaning and Maintenance

5.1. Routine Cleaning

The device is maintenance-free.

Cleaning

 For cleaning disconnect the main plug.

Before switching off the pump, flush it with air (if necessary for safety reasons: with an inert gas) for about five minutes under atmospheric conditions (ambient pressure).

Only use solvents for cleaning if the head materials cannot be attacked (check the resistance of the material!).

If compressed air is available, blow out the components.

Only use cleansing agents which have been recommended by WIGGENS

Use to remove:

Dyes	isopropyl alcohol
Construction materials	isopropyl alcohol/water containing surfactant
Cosmetics	isopropyl alcohol/water containing surfactant
Foodstuffs	water containing surfactant
Fuels	water containing surfactant

- Do not allow moisture to get into the appliance when cleaning.
- Wear protective gloves when cleaning the devices.
-Before using another than the recommended method for cleaning or decontamination, the user must ascertain with WIGGENS that this method does not destroy the instrument



Note:

- Do not use chlorine bleach, chlorine-based cleanser, abrasives, ammonia, steel wool or scouring pads with metal content or similar harsh solvents or abrasives. These may damage the surface of the instrument.
- When cleaning, make sure that no liquids enter the inside of the housing.

5.2. Maintenance

Do not attempt to service or repair a WIGGENS overhead stirrer. If the overhead stirrer housing is opened the warranty becomes void. Contact WIGGENS for return authorization and return instructions.

Ordering spare parts

When ordering spare parts, please give:

- Machine type
- Manufacturing number, see type plate
- Item number and designation of the spare part.

Repair

Please only send devices in for repair that have been cleaned and are free of materials which might present health hazards. For this, use the “certificate of compliance” form which you can obtain from WIGGENS. If your appliance requires repair, return it in its original packaging. Storage packaging is not sufficient when sending the device - also use appropriate transport packaging.

6. Transport and Storage

- Clean the pump so that it is free from any materials which may be harmful to the health. Provide a material safety data sheet where appropriate.
- Place the pump unit and its parts into the original packing or a container with necessary protection to prevent damage during transport. Seal the original

packing or container with packing tape.

- Store the packed unit in a dry place.



CAUTION!

Failure to clean, maintenance, and handle the pump as outlined can lead to damages or be harmful to the health.

7. Accessories and Spare Parts

7.1. Chemical Resistant Vacuum Regulator / Filter Equipment

Model	Description	Order No.
 Chemical Resistant Vacuum Regulator	Set 1 (includes vacuum trap and regulator)	169311-06
	Set 2 (includes vacuum trap only)	169312-06
	Set 3 (neither include vacuum trap nor regulator)	169313-06

7.2. Viton tubing

Model	description	Order No.
 Viton tubing	Outer Diamete：12 mm Inner Diameter:6mm Thickness:3mm Length:1m	168000-01
	Outer Diamete：14mm Inner Diameter:8mm Thickness:3mm Length:1m	168001-01
	Outer Diamete：16mm Inner Diameter:10mm	168002-01

	Thickness:3mm Length:1m	



Note: Length upon request (min. 1 m)



Note!

For more information about Accessories please contact your local supplier



CAUTION !

For safety and guarantee reasons only original accessory parts are to be used!

8. Service

8.1. Trouble-Shooting

Cause	Remedy
The pump does not react after turning on the On / Off Switch	1. Ensure that the mains electricity plug is plugged into a working socket outlet and check if the On / Off Switch is in the “on” position. 2. If the On / Off Switch is in the “on” position, release the vacuum, disconnect the pump from the power source and let the pump cool down, and investigate the reason for overheating 3. After cooling down, connect the pump to the power source and try again 4. If there is no reaction after several attempts, please contact the WIGGENS support.
The pump does not reach the designated ultimate vacuum	1. Check if all tubing is tight and if there is a leakage at any point 2. Disconnect the pump from all other sources, connect it directly to a vacuum controller / vacuum gauge, and block the gas intake 3. If the pump still does not reach the designated ultimate vacuum, please contact the WIGGENS support. Diaphragms, valve plates, or seal rings might be worn out.



WIGGENS reserves the right to carry out technical modifications with repairs for providing improved performance of the instrument.

8.2. Warranty

In accordance with *WIGGENS* warranty conditions, the warranty period is 24 months. For claims under the warranty please contact your local dealer. You may also send the machine direct to our works, enclosing the delivery invoice and giving reasons for the claim. You will be liable for freight costs. The warranty does not cover wearing parts, nor does it apply to faults resulting from improper use or insufficient care and maintenance contrary to the instructions in this operating manual.

WIGGENS reserves the right to decide the validity of any warranty claim. In case of faults arising either due to faulty materials or workmanship, parts will be repaired or replaced free of charge.

Any other compensation claims, such as consumables, damages caused by corrosion or accidental breakage, are excluded from this guarantee.

This warranty may only be altered by a specifically published amendment. No individual has authorization to alter the provisions of this warranty policy or its amendments.

8.3. Contact/Technical Service

If your device is not working properly:

- ⇨ Please inform *WIGGENS* Instruments by using our contact information.
  You have contacted *WIGGENS* Instruments?
- ⇨ Copy and complete the Conformation of condition of unit from these operating instructions.
- ⇨ Please repack the device appropriately for transport and send to *WIGGENS* Instruments together with the Confirmation of condition of unit.

Our contact details

Room 303, Hall C, Office Building M8, No.1 Jiuxianqiao East Road, Chaoyang District, Beijing 100015, China
Tel: +86 400-809-2068
Fax: +86 400-809-2068-112
info@ wiggens.com
service@wiggens.com
www.wiggens.com

Confirmation of condition of unit

In the case of repair, copy and complete the Conformation of condition of unit and send it to *WIGGENS* Instruments.

1. **Details about the unit**

   Product number _____

   Serial number _____

   Reason for repair _____

   _____

2. **Has the device been cleaned, decontaminated/sterilized?**

   Yes No

3. **Is the unit in a condition which does not represent any health threats for the staff of our service department?**

   Yes No

   If not, which substances has the unit come into contact with?

   _____

   _____

4. **Legally binding declaration**

   The customer is aware of being legally liable to *WIGGENS* Instruments for any damages arising from incomplete and incorrect information.

Date Signature

Company stamp _____

Please note The shipper is responsible for the return of the goods in well-packed condition, suitable for the mode of transport.

Sender information

Name, first name _____
Company _____
Department, research group Street _____
Zip code, city _____
Country _____
Phone _____

E-mail _____