WIGGENS

THE MAGIC MOTION

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Version-2023

# About WIGGENS

## What Does Wiggens Stand for?

***W**ide Product Range*
***I**nternational Orientation*
***G**reat Quality*
***G**reat Service*
***E**nergetic Team*
***N**ew Technology*
***S**olutions*

WIGGENS
THE MAGIC MOTION

Wiggens was established in 2005 with the goal of delivering the best laboratory equipment and service for reliable results. Since then Wiggens has been producing top-quality general laboratory equipment, analysis apparatus and chemical reaction solutions. Our brand Wiggens stands for high quality, durability and remarkable performance.

Wiggens is your reliable laboratory companion and provides products that can be used in different kinds of laboratory environments. The Wiggens product range includes:

* Rotary Evaporator
* Pump
* Vacuum Filtration Apparatus
* Heating & Mixing unit
* Incubator & Oven
* Analysis Apparatus
* Gas Generator
* Chemical Reactor

ChemVak

ChemVak, the product brand of Wiggens, is specialized in vacuum technology offering an extensive range of vacuum pumps for all applications, including chemical-resistant diaphragm pumps, oil-free pumps and rotary vane vacuum pumps, complemented by vacuum filtration equipment for a wide range of different applications. In addition, solvent recovery systems and bio-suction systems are part of the product range.

ChemTron

ChemTron is our product brand focusing on analysis apparatus, gas generators and chemical reaction solutions, as well as efficient chemical separation tools-rotary evaporator, automatic distillation system, crystalization system etc...



# Thinking the unusual is usual for us.

## Innovation

New concepts and solutions
Customers as generator of ideas
Friendly and modern working atmosphere

## Competence

Specialists in all teams
Expert knowledge and experience

## Quality

Reliability
ISO 9001
Strong After Sales Service
Made in Germany, China, Switzerland & USA

## Flexibility

Special Design, customized products
Constant feedback from subsidiaries and customers





# Vacuum Pump
# Vacuum Solvent Recovery System
# Vacuum Meter and Controller

# Vacuum Pump

## The ability to handle difficult and different vacuum challenges quickly.

Wiggens is your general laboratory companion and provides products that can be used in all kinds of laboratory environments.
ChemVak is a product line in vacuum technology offering an extensive range of vacuum pumps for all applications.
Including :



Chemical resistant diaphragm vacuum pumps which can be used in the chemical, pharmaceutical, petrochemical and other industries

Chemical resistant diaphragm pump
Frequency conversion chemical resistant vacuum pump



Chemical resistant diaphragm pump



Vacuum solvent recovery which can be used to get right vacuum conditions for various application

Vacuum Solvent recovery system



Oil-free piston vacuum pump, no pollution, no need for oil changes

Oil-free piston vacuum pump



Oil-sealed rotary vane vacuum pumps are widely used traditional vacuum pumps in research and production

Rotary vane vacuum pump

# Vacuum pump selection guide

Before selecting a vacuum pump,
please let us introduce a few basic concepts about vacuum.



## Vacuum

The degree of gas content in a vacuum state is usually expressed by the vacuum. The value read from the vacuum gauge is called the degree of vacuum. The vacuum value is the value that indicates that the actual value of the system pressure is lower than the atmospheric pressure. The value shown on the gauge is also called the gauge pressure, usually called the ultimate relative pressure. That is: Vacuum = atmospheric pressure-absolute pressure (atmospheric pressure is generally taken 1013.25mbar, the ultimate vacuum of the oil-free piston pump can reach about 30mbar, the ultimate vacuum of the chemical resistant diaphragm pump can reach 1mbar, and the ultimate vacuum of the rotary vane oil pump is about 0.0004mbar.




## Ultimate relative pressure

The relative pressure is how much lower the measured internal pressure is than the "atmospheric pressure", indicating that the actual value of the system pressure is lower than the value of atmospheric pressure. Since the air inside the container is pumped, the pressure inside the container is always lower than the pressure outside the container. Therefore, when using relative pressure or gauge pressure, the value must be preceded by a negative sign, indicating that the internal pressure of the container is lower than the external pressure.




## Ultimate absolute pressure

Absolute pressure refers to how much higher the measured internal pressure is than "theoretical vacuum (theoretical vacuum pressure value is 0Pa)". The object it compares is the absolute vacuum pressure value of the theoretical state. Due to technological limitations, we cannot pump the internal pressure to the absolute vacuum value of 0Pa in any case. Therefore, the vacuum value drawn by the vacuum pump is higher than the theoretical vacuum value. So when expressed in absolute vacuum, there is no negative sign in front of the value.



## Pumping speed

The pumping speed is a measure of the pumping speed of the vacuum pump. The general unit is expressed in L/min and $m^3/h$. It is a parameter to make up for the air leakage rate. It is not difficult to understand, in theory, when pumping a container of the same volume, why is it easy for a vacuum pump with a large pumping capacity to pump the vacuum we need, while a vacuum pump with a small pumping capacity is so slow or even unable to pump the vacuum we want? Because It is always impossible for the pipeline or container to be absolutely air-free, and the large amount of air extraction makes up for the reduction of the vacuum degree caused by the air leakage, so the air volume can easily be pumped to the ideal vacuum value. It is suggested here that when the theoretical pumping capacity is calculated, we try to choose a vacuum pump with a higher pumping capacity. The specific calculation formula of the pumping volume will be introduced below.

After understanding the basic parameters of vacuum pumps such as vacuum degree, absolute pressure and relative pressure, we can enter the formal selection of vacuum pumps.

## The required vacuum of the experimental process

The working pressure of the vacuum pump should meet the working pressure requirements of the process. The vacuum degree of the chemical resistant diaphragm pump should be half to an order of magnitude higher than the vacuum degree of the vacuum equipment. The vacuum must be at least 50mbar-10mbar), and the rotary vane oil pump must be an order of magnitude higher than the vacuum equipment.

## The required pumping speed of the experimental process

The vacuum pump requires the pumping rate (that is, the ability of the vacuum pump to discharge gas, liquid, and solid under its working pressure), the general unit: $m^3/h$, L/min, L/s, etc. The specific calculation method can refer to the following formula to calculate and select by yourself. Of course, the selection of vacuum pumps is a comprehensive process involving relevant experience and other factors.

$S=(V/t)\times\ln(P1/P2)$

S is the pumping rate of the vacuum pump (L/s)
V is the volume of the vacuum chamber (L)
t is the time required to reach the required vacuum (s)
P1 is the initial pressure (Pa)
P2 is the required pressure (Pa)

## Determine the composition of the gas being pumped

- 1- If the pumped object is gas, liquid or particles, if the pumped gas contains water vapor or a small amount of particles and dust and other impurities, carefully choose the rotary vane vacuum pump. If the vacuum degree is high, a filter device should be added. Only by filtering can the rotary vane vacuum pump be used as the vacuum obtaining equipment.
- 2- Please let us know if the pumped object is corroded (acidic or alkaline, what is the pH value?). If the gas contains acid-base corrosion or organic corrosion, it should be filtered or neutralized to choose the rotary vane vacuum pump. If the vacuum meets the requirements for use, it is recommended to use an anti-corrosion diaphragm pump.
- 3- If the pumped object contaminates rubber or oil? Corresponding vacuum equipment should be selected for different pumped media. If the gas contains a large amount of vapor, particles, and corrosive gas, it should be considered in the intake of the pump. Install the corresponding auxiliary equipment on the pipeline, such as condenser, filter, etc. (contact WIGGENS for details).
- 4- If the noise and vibration of the vacuum pump have any influence.



C300



C400 / C410 / C420



C510 / C520



C600



C610

# Chemical Resistant Diaphragm Pump (C Series)

C series construction with PTFE makes them very resistant to chemical vapors from inlet to exhaust and very tolerant to condensates. Pumping chambers are hermetical ensuring long lifetimes of mechanical parts.
Most importantly, diaphragm pumps are oil-free, with vastly reduced service demands compared with oil sealed pumps. They eliminate the cost of water and its contamination well-known from water-jet aspirators, and the waste-oil disposal of rotary vane pumps.
They are chemical resistant diaphragm vacuum pumps which can be widely used for hard acidic, basic and solvent vapors by utilizing corrosion proof PTFE on all the wetted surfaces. Through innovative mechanical technology and human considerations, we have made C series to be quiet, safe, maintenance-free and cost effective vacuum pumps.

## Features

### High chemical resistant
All wetted parts of C series pump are made of PTFE which is ideal for extremely aggressive / corrosive gases and vapors.

### Long-term durable
Head cover and diaphragm made of PTFE/PTFE-coated with stability core for unsurpassed long-term performance

### No air pollution, maintenance free
Chemvak C series pumps are driven by diaphragm, without the need of lubricant, regular oil changes and maintenance; with no oil pollution.

### Practical
> smooth surfaces for easy cleaning
> sealing system provides reduced leakage rates for improved ultimate vacuum

### Quiet and low vibration
Driven direct by motor with no additional belt-driven transmission; the quality vibration-proof assembly makes Chemvak C series run at the lowest noise level among all other equivalent pumps.

### Thermal protection device
Every motor of Chemvak C series pumps has a built-in thermal protection device to shut off the pump automatically when overheated and then resume working when the temperature cools down.

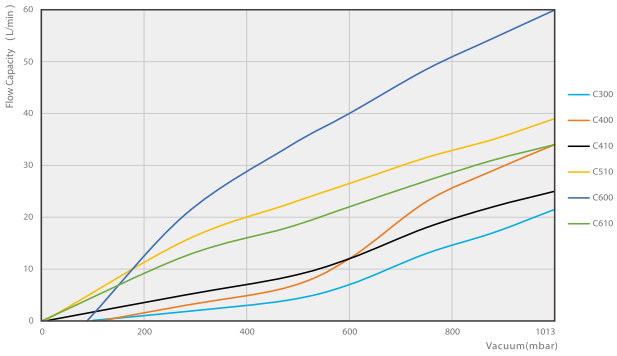
### International safety certification
CE certification

### The stability core principle:
### for unprecedented long-term performance
chemistry diaphragm pumps provide optimum performance and unsurpassed service intervals even in harsh chemical applications. We achieve this unmatched reliability by manufacturing the most highly stressed components – the head cover and clamping disk.
> high quality PTFE coated EPDM provides long term chemical resistance
> this thick-walled, diffusion resistant, molded fluoroplastic is supported by a stable metallic core for durability
> mechanical precision finishing ensures reproducible WIGGENS quality

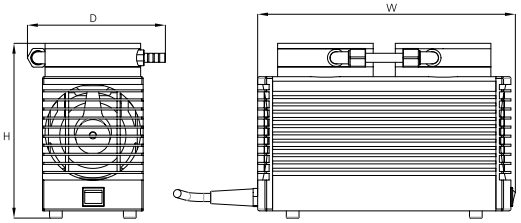
## Application

- Chemical and petrochemical Industry
- Pharma Industry
- Filtration processes
- Vacuum distillation
- Rotary evaporation
- Vacuum and centrifugal concentration
- Solid phase extraction
- Conventional drying and gel drying
- Advanced substitute for water-jet pumps

## Chemical Resistant Diaphragm Pumps Flow curve




Note: Above data is based on the 220V/50Hz instrument




## Vacuum display and control

**Set 1**

Order No. :169311-06
Included vacuum trap, regulator and vacuum gauge



**Set2**

Order No.: 169312-06
Included vacuum trap, regulator and digital meter DVM150C



**Set 3**

Order No. : 900414-1 & 169313-06
Included vacuum trap, regulator, chemical resistantvacuum controller DVR480



| Model / Specifications | C300 | C400 | C410 | C420 NEW! | C510 | C520 NEW! | C600 | C602 NEW! | C610 |
|---|---|---|---|---|---|---|---|---|---|
| Order No. | 169300 | 169400 | 169410 | 169420 | 169510 | 169520 | 169600 | 169602 | 169610 |
| Flow rate [$m^3$/h] at atm. pressure | 1.32 | 2.04 | 1.5 | 1.5 | 2.04 | 3.0 | 3.6 | 4.2 | 2.22 |
| Flow rate [L/min] at atm. pressure | 22 | 34 | 25 | 35 | 34 | 50 | 60 | 70 | 37 |
| Ultimate vacuum [mbar abs.] | 100 | 120 | 13 | 13 | 8 | 8 | 90 | 80 | 2~4 |
| Max. Power P [W] | 60 | 95 | 95 | 95 | 245 | 245 | 270 | 270 | 270 |
| Motor speed [rpm] | 1450 | 1450 | 1450 | 1450 | 1450 | 1450 | 1450 | 1450 | 1450 |
| Pump head | Single stage | Single stage | Double stage | Double stage | Double stage | Double stage | Single stage | Single stage | Double stage |
| Hose connections [mm] | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Noise [dB] | 50 | 50 | 50 | 50 | 60 | 55 | 60 | 55 | 60 |
| Dimensions W x D x H [mm] | 233×110×210 | 294×156×195 | 294×156×195 | 294×156×195 | 380×156×226 | 380×156×226 | 380×162×226 | 380×156×226 | 380×171×226 |
| Weight [kg] | 6 | 8.5 | 8.5 | 8.5 | 13.2 | 14.5 | 13.2 | 14.5 | 13.8 |
| Power supply | 220V/50Hz | 220V/50Hz | 220V/50Hz | 220V/50Hz | 220V/50Hz | 220V/50Hz | 220V/50Hz | 220V/50Hz | 220V/50Hz |