



Vacuum System
Type: VP 10 autovac

INSTRUCTION MANUAL

Translation of the German original manual



VP 10 autovac

European Catalogue Number

ECN: 181-0311 *incl. CEE Euro, UK, CH plug leads*

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Introduction

Thank you for choosing a **VWR Vacuum System VP 10 autovac**.

It will take you very little time to get your new Vacuum System VP 10 autovac installed and running.

This Instruction Manual is designed to guide you quickly through the process.

We recommend that you read it thoroughly before you begin.

Warning

PLEASE READ BEFORE OPERATION!

While reading your manual, please pay close attention to areas labeled: **WARNING AND CAUTION**

The description of each is found below.

WARNING! Warnings are given where failure to observe instruction could result in injury or death to people.

CAUTION! Cautions are found where failure to observe the instruction could result in damage to the equipment, associated equipment and process.

The manual must be kept at the place of use and be available to the personnel when required.

Symbols and conventions

These units conform to the SI International system of units of measurement.

The following symbols (with recommendation of IEC1010) of warning will be found on the pump and/or in this manual.



This symbol alerts you to a wide range of potential dangers.



This symbol advises danger from electricity or electric shock.



This symbol indicates that a hot surface may be present.



This symbol marks information that is particularly important.

Read all instructions pertaining to safety, set-up, operation, and maintenance. Proper operation is the user's responsibility.

Intended Use

The **Vacuum System VP 10 autovac** with an integrated chemical-resistant diaphragm pump is designed for an optimised distillation process. Safe, optimal distillation results can be achieved by complying with the currently valid regulations. These lie in a reduction of the environmental impact and automatic distillation of liquids into the no longer distillable phase.

The design criteria of the Vacuum System VP 10 autovac must be appropriate for the conditions of use. The user bears the sole responsibility for this.

The Vacuum System may only be operated under the conditions stated in the "Specification" chapter, on the type plate and in the technical specification for the order concerned.



WARNING!

- Do not use the pump or any system parts on humans or animals.
- Ensure that individual components are only connected and operated according to their design and as indicated in the instructions for use.
- Comply with all notes on correct vacuum and electrical connections, *see chapter 3.30*.
- Do not use the pump to generate pressure.
- The pumps are designed for ambient temperatures during operation between + 10° and + 40°C. Periodically check maximum temperatures if installing the pump in a cabinet or a housing. Make sure ventilation is adequate to maintain recommended operating temperature. Install an external automatic ventilation system if necessary. If pumping hot process gases, make sure that the maximum permitted gas inlet temperature is not exceeded. The maximum permitted gas inlet temperature depends on several parameters like inlet pressure and ambient temperature.
- Solid particles in the pumping medium impair the pumping action and can lead to damage. Prevent their penetrating into the pump.
- Do not pump liquids.
- For cooling purposes, maintain an air gap of about 5 cm between the pump and surrounding surfaces.



CAUTION!

Ensure that the pump is chemically resistant to the pumped substances prior to operation.



Use equipment only as intended, that is, for generation of vacuum in vessels designed for that purpose. Any other use will automatically invalidate all warranty and liability claims. Remain aware of safety and risks.

Use for an Unauthorized Purpose

It is forbidden to use the pump for applications deviating from the technical data stated on the type plate or the conditions stated in the supply contract, or to operate it with missing or defective protective devices.

Safety Information

Measures such as the following are for the safety of the operating personnel:

- Operating mode S1 (with grounding connector)
- Built-in motor protection
- Ground connection
- Rupture protected glass components
- Warning notes



CAUTION! The Vacuum System VP 10 autovac must not be operated without these elements.



WARNING! Failure to observe the above safety precautions could result in Severe bodily injury, including death in some cases.

1.10 Warning: To Prevent Injury

- Never operate this product if it has a damaged cord or plug.
- Keep the cord away from heated surfaces. All electrical products generate heat. Do not touch the marked areas.
- To ensure proper ventilation, keep unit a minimum of 50 mm (2 inch) from any wall or obstruction.
- Always disconnect power source before servicing and secure against switching on again.
- Do not insert any object into the ventilation slots.
- Do not operate this product where oxygen is being administered.
- Wear safety glasses and goggles when operating this product.
- Use only in well ventilated areas.



WARNING! Do not operate the pumps in an atmosphere containing flammable or explosive gases / vapors.

- The manufacturer or authorized authorised workshops will only service or maintain the hold-back-pump if it is accompanied by a fully completed damage report. Precise information about the contamination (also negative information if necessary) and thorough cleaning of the pump are legally binding parts of the contract.
- Contaminated pumps and their individual parts must be disposed of in accordance with the legal regulations.



CAUTION! After work has finished, the Vacuum System VP 10 autovac must continue to run for about ten minutes with the suction pipe open in order to clean the valves.

When handling glass vessels, pay attention to:

- Only use glass vessels with a plastic coating for splinter protection.
- Only authorised vessels which are suitable for use with vacuums (e.g. round-bottomed flasks).
We recommend that only glass components supplied by the manufacturer are used.
Do not use Erlenmeyer flasks.
- Before each evacuation, check glass vessels for damage, replace them if any such damage is found.
- Do not heat glass vessels on one side only.
- Retardation of the boiling of the gases to be pumped can lead to a sudden pressure increase. Prevent retardation of boiling by means of suitable measures (e.g. turbulent agitation).
- For your own safety, operate the Vacuum System only in a fume chamber.

1.20 Caution: To Prevent Risk of Electrical Shock

- The Vacuum System is delivered in operating mode S1. Please note that the testing must be repeated in accordance with DIN EN 0105, DIN EN 0702 and BGV A 2 in case of portable devices of operating mode S1.
- Do not disassemble. Disassembly or attempted repairs if accomplished incorrectly can create electrical shock hazard. Refer servicing to qualified service agencies only
- Be sure to connect pump to a properly installed outlet only.
- Do not use this apparatus in areas in which it could come into contact with water.
- Do not reach for this product if it has fallen into liquid. Unplug immediately.
- Never operate this product outdoors in the rain or in a wet area.

1.30 Warning: To Prevent Risk of Explosion or Fire

- The pump may heat up as a result of the temperature of the gas being pumped and through intrinsic heating. Use suitable devices to prevent the maximum permissible temperatures. The limit values are < 40°C for the ambient temperature and < 60°C for the gas to be pumped.
- Do not use this pump in explosive atmospheres.
- Do not use this product near open flames.



WARNING! If aggressive or poisonous gases are used or occur, the user must recognize this state of affairs and compensate for them by taking appropriate measures complying with the relevant, currently valid regulations.

The **Vacuum System VP 10 autovac** conforms to the:

2006 / 95 / EC	Low Voltage Directive
2006 / 42 / EC	Machinery Directive
2004 / 108 / EC	Electromagnetic Compatibility Directive

The CE mark is located on the rating plate.

Observe the binding national and local regulations when fitting the system into installations.

Product Standards, Safety Regulations

The **Vacuum System VP 10 autovac** meet the following product standards:

DIN EN ISO 12100-1:2004	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
DIN EN ISO 12100-2:2004	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles
DIN EN ISO 13857:2008-06	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
DIN EN 1012-2	Compressors and vacuum pumps - Safety requirements - Part 2: Vacuum pumps
DIN EN ISO 2151	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)
DIN EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
DIN EN 61000-6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
DIN EN 61000-6-4	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
DIN EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
DIN EN 50110-1	Operation of electrical installations
Directive 2012/19/CE	Electrical and electronics - old devices (WEEE)
Directive 2011/65/CE	Dangerous materials in electrical and electronics devices (RoHS)
China - RoHS	Environment protection law - China 2007-03

The following additional safety regulations apply in the Germany:

BGV A3	Electrical equipment and operating materials
VBG 5	Power-driven machines
BGR 120	Guidelines for laboratories
BGI 798	Hazard assessment in the laboratory
BGG 919 (VBG 16)	Accident prevention regulations for "compressors"
BGR 189 (BGR 195;192;197)	Use of protective working clothes

Observe the standards and regulations applying in your country when you use the pumps.

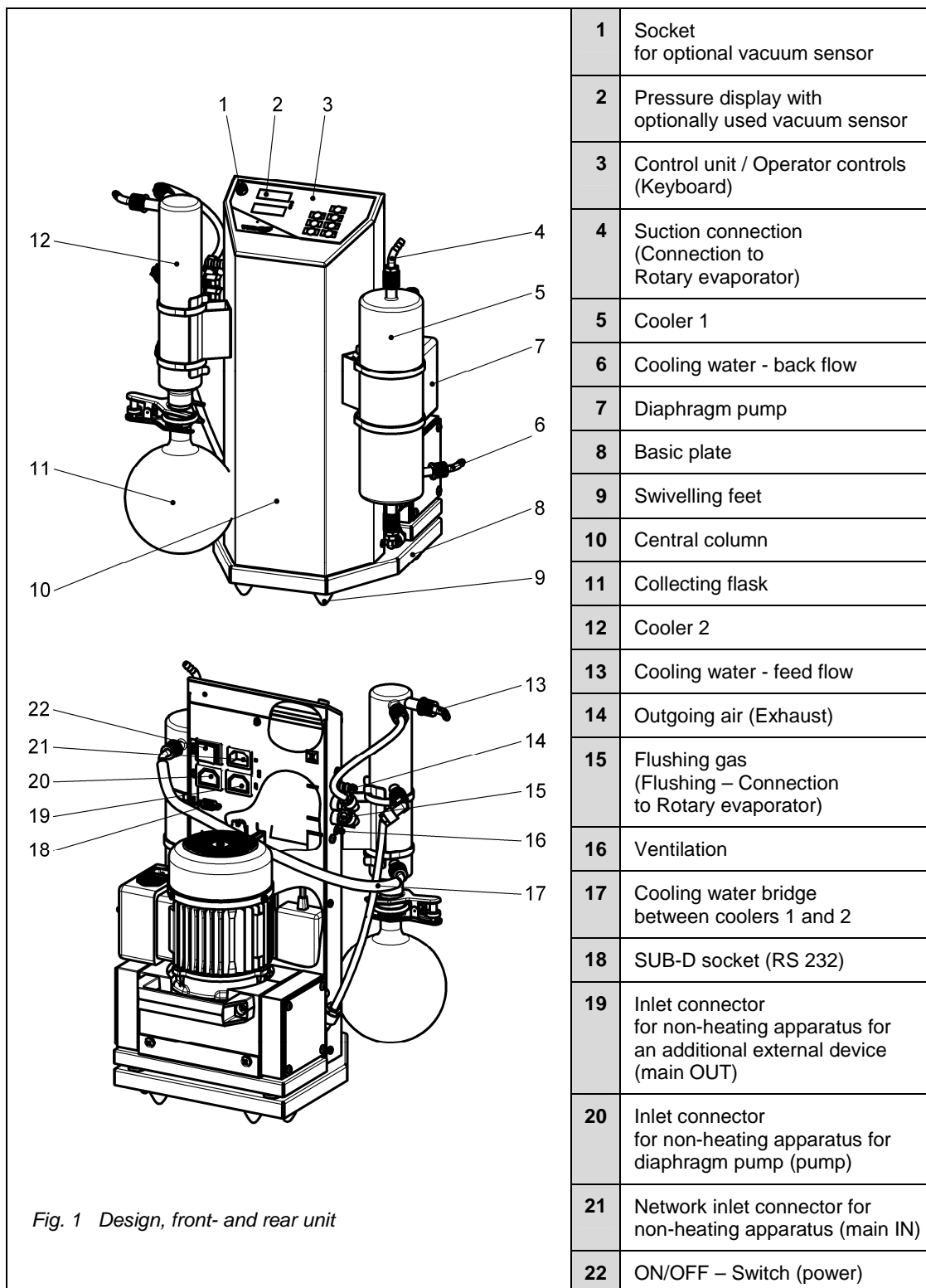
Package Contents

No.	VP 10 autovac	Quantity
1	VP 10 autovac Vacuum System	1
2	CEE Euro Plug	1
3	UK Plug	1
4	CH Plug	1
5	Adapter 50/70 with 3 connections	1
6	Vacuum hose PTFE 8 / 6x1 mm (1 m)	2

Description

2.10 Design

The **Vacuum System VP 10 autovac** is a vacuum pump with upstream condensation of the solvent. It is designed as a closed system.



A chemical-resistant, modified diaphragm pump (7) is used as the vacuum pump. It is complete and is attached as a separate module to the base plate (8), and electrically connected via a connector for non-heating apparatus (21) on the back wall of the central column (10) and the control unit (3).

The operator controls (3) are located on the top surface of the column. The entire control system is fitted in the column.

The distilled-off solvents are collected in the laterally attached 1000 ml round-bottomed flask (11).

The customer has to connect the suction connector (4) and the flushing gas (15) of the Vacuum System to his vaporization appliance. The limit values are < 40°C for the ambient temperature and < 60°C for the gas to be pumped.

The electrical connection to the network is made by plugging a device connecting cable into the socket for non-heating apparatus (21) fitted in the rear wall of the central column. The device switch (22) is located next to the above-mentioned connector.

2.20 Principle of Operation

The boiling temperature of the solvent is attained by increasing the temperature of the solvent or solvent mixture via a vaporization unit, and by the reduced pressure generated by the diaphragm pump (7).

The vaporized solvent is condensed in the cooler 1 (5). The condensate thus created gets into the diaphragm pump, and inevitably leads to minimization of the volume pumped by the diaphragm pump.

A defined quantity of gas is removed via flushing gas valve (15) from the exhaust-side of the closed work circuit of the pump and fed to the suction-side of the diaphragm pump (7) in one set work cycle. This quantity of gas causes a brief increase in pressure. The condensate produced is extracted, and the diaphragm pump is activated. The condensate produced is extracted and collected in a condensate vessel (11). The boiling retardation is corrected at the same time. The procedure described is continued alternately until the pump reaches the ultimate pressure.

2.30 Areas of Application

Vacuum System VP 10 autovac have been specially developed for vacuum distillation in the chemical laboratory.

The vacuum system can autonomously separate solvents mixtures from the non-distillable product without a fraction change. This happens continually in the optimal ratio to the information content of the solvent used. The objective is to minimize environmental contamination.

The vacuum system is made of chemically resistant materials (PTFE, PEEK, PVDF, FFKM) appropriate for the range of applications. These materials guarantee a high level of reliability and a long service life.

2.40 Advantages of Use

The main advantages of the device are its compact size, its completely oil-free operation, and automatically, optimal distillation control with the objective of maintaining the lowest emission rates.

Neither a complicated control and regulation unit nor a fraction change is required during the process. This ensures that the product is separated within one vaporization cycle. The vaporization of the solvent thus always takes place at the optimal boiling point. You do not need to precisely calculate the boiling temperature of the solvent or solvent mixture or exactly determine the vacuum of the system for the process.

The product is generated quickly and without losses in a closed circuit without environmental impacts. The process proceeds automatically.

Installation

3.10 Unpacking

Carefully remove the vacuum system from the shipping case. Preserve all paperwork for later use. If damage has occurred from shipment a claim must be filed with the carrier immediately; your VWR dealer or manufacturing firm, be sure to include to order numbers for quick identification.

Do not return the pump to the factory without obtaining returned goods authorization.

3.20 Pump Location



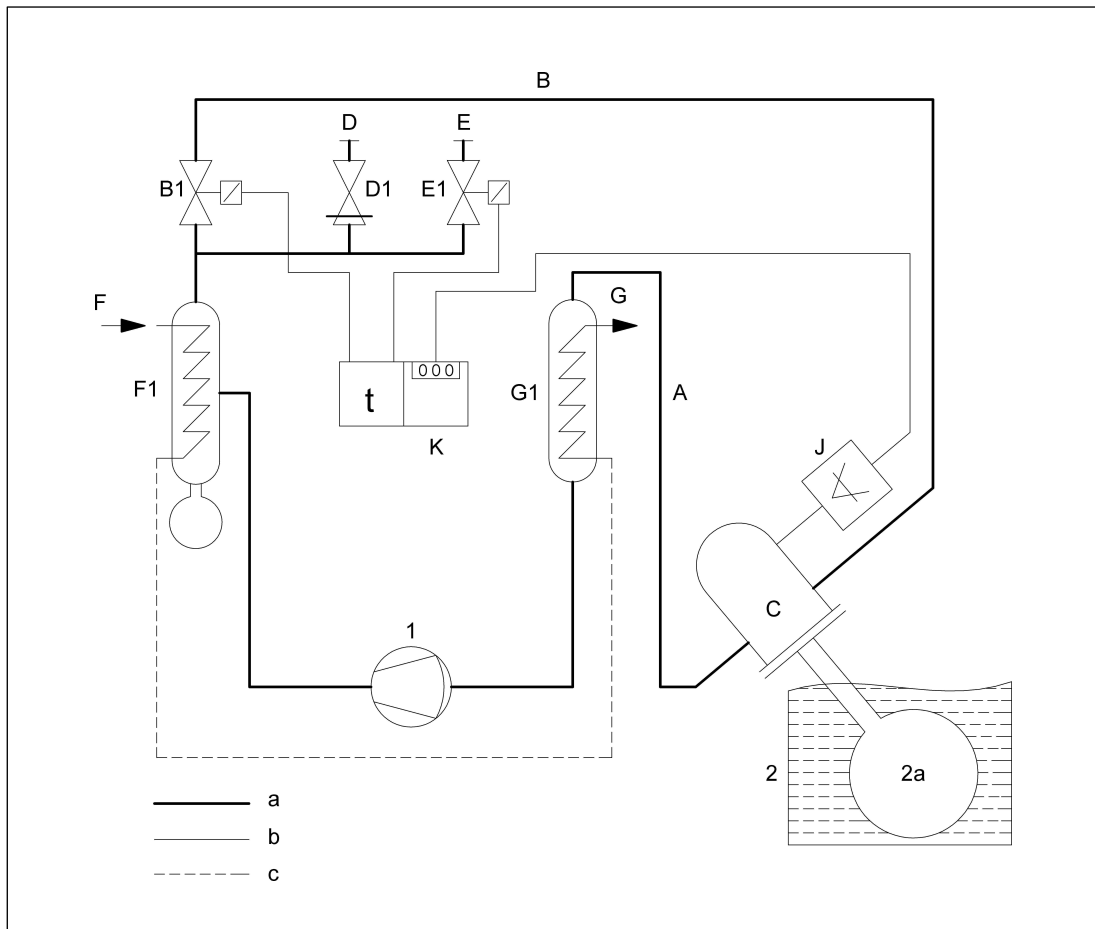
WARNING! Don't operate this pump in an atmosphere containing flammable or explosive gas.

3.30 Setting up and Connection (*Pos. see fig. 2*)

1. Set the **Vacuum System VP 10 autovac (1)** with rotary evaporator **(2)** on a flat and horizontal surface.
2. Remove the protective caps on the connections and check that the all connections are properly seated.
3. Attach the adapter **(C)** on the rotary evaporator **(2)** union nut and tension spring.
4. Connect the intake connection **(A)** to the vaporization appliance **(2)** via adapter **(C)** with a hose. (A connection option is shown *in fig. 2 and 3.*)
Fasten the suction hose **(C1)** to the bottom port of the adapter **(C)**.
5. Connect the flushing gas line **"Flushing" (B)** to the vaporization appliance **(2)** as shown *in the vacuum schematic fig. 2* via - middle connection - adapter **(C)**.
6. Connect the **"Exhaust"** pump exhaust air duct to the central exhaust air duct of the laboratory by the hose nozzle DN 8 **(D)**.
7. Check the hose connections and glass component connections of the apparatus for leaks!
8. Connect the cooling water feed flow **(F)** and back flow **(G)** lines via hose nozzle DN 8.
 - The cooling water back flow **(G)** must be unpressurized.
 - The flow temperature of the cooling water should be at least 5 °C.
 - The user must provide the essential hose locking devices.
 - The user is to determine the required flow rate of cooling water and set.
9. Connect the vacuum system to the power supply now.
10. For possible necessary **"Ventilation"** with inert gas, this is to realize via the hose nozzle DN 4 **(E)**.
11. Connect the optional vacuum sensor **(J)** via adapter **(C)**. The electrical connection of the vacuum sensor is via the coupling on the display **(K)**.
 - If the sensor is not used, the appropriate port on your adapter is so blind to close.
 - Because the vacuum sensor not for the function is necessary, this is only optional of fered, see *chapter 6.60*.

(Hose PTFE 8 / 6x1 and fittings are included in the scope of delivery.)

3.31 Vacuum schematic



1	Vacuum system	F	Cooling water – feed flow
2	Rotary evaporator with	F1	- Cooler 2
2a	evaporator piston (<i>user side</i>)	G	Cooling water - back flow
A	Suction line	G1	- Cooler 1
B	Flushing gas line (<i>Flushing</i>)	J	Vacuum sensor with pressure indicator and connection (<i>option</i>)
B1	- Flushing gas valve	K	Control unit (internal) with display
C	Adapter 50/70 with 3 connections		
D	Hose nozzle DN 8 (<i>Exhaust</i>)		
D1	- Relief valve	a	<i>Vacuum line</i>
E	Hose nozzle DN 4 (<i>Ventilation</i>)	b	<i>Electrical line</i>
E1	- Ventilation valve	c	<i>Cooling water</i>

Fig. 2 Vacuum schematic - VP10 autovac

3.32 Assembly of the screw connection for the suction connection

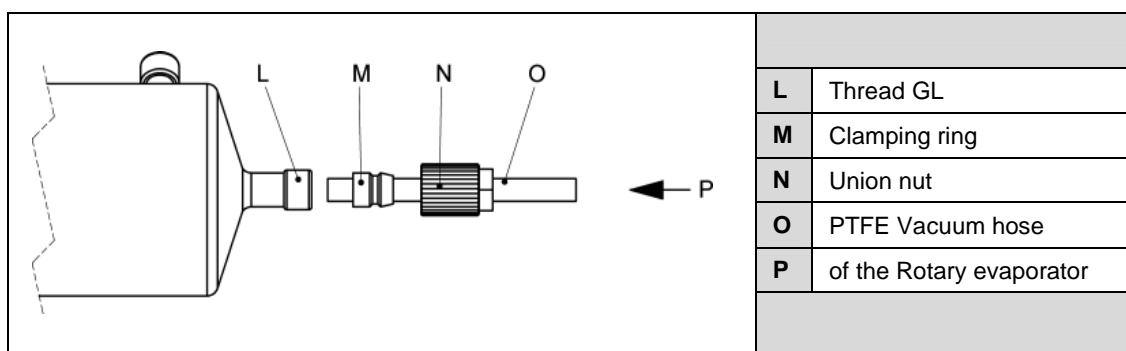


Fig. 3 Instruction for assembly of the screw connection for the suction connection

3.40 Electrical Connection

The vacuum system is supplied with complete electrical wiring.

The electrical connection is made by plugging an appliance connection cable into the socket on the rear side of the appliance. The pump is connected via the marked device socket on the rear panel. The device's main switch is also located on the back panel (see fig. 1).

3.50 Storage

The pumps are to be stored in a low-dust, interior room within the temperature range from + 5 to + 40°C and at a relative air humidity < 90%.

Leave the protective elements on the suction and pressure ports. Another equally good protection may be used.

Operation

4.10 Preparation

The process may be initiated after the vacuum and electrical systems of the hold-back-pumps have been installed (see fig. 2), and after completing the preparatory chemical work for the vacuum distillation. It must be ensured that the vaporizing flask is only to max 50% full at the start, and that the total amount it contains does not exceed the volume of the collecting flask.

To do this, first switch on the main power supply switch on the back of the device and turn on the cold water flow. The flow temperature of the cooling water should be < 5 °C in order to achieve optimum results.

The operating keyboard is located on the top of the column.

The function of the rotary evaporator is explained in the manufacturer's operating manual.



CAUTION! The coolant temperature must be lower than the condensation point of the current solvent in the available vacuum.

It is not necessary to preselect a precise bath temperature of customer's vaporization appliance as the system finds the boiling point of the solvent itself. However, it should not be higher than the boiling point of the solvent at standard pressure.

4.20 Process Start

The process is started by pressing the **START** button on the display and it runs until the technically determined minimum under pressure has been attained.

Description of the automatic expiration:

- The pressure is automatically lowered until, in each case, the first boiling point is reached and controlled according to the solvents used. This means that all the solvents in the evaporating flask are extracted one after the other, and the product, which is not to be distilled, remains behind in the flask.
- An automatic control set for this procedure prevents frothing over in the evaporating flask. The substance or substances to be distilled off are collected on the pressure-side in the round-bottomed flask attached to the column.
- A fraction change is no longer needed even when using solvent mixtures.
- If the vacuum system is fitted with a vacuum sensor (optional), the adjacent pressure is displayed. If that is not the case, the display shows 0 = no pressure; AP = active control program.

The "vaporization-distillation" process has finished when no more solvent is extracted. The process is ended with the **STOP** key on the display and the complete system is automatically vented. An inert gas can be introduced into the system via the DN 4 "Ventilation" hose nozzle in order to protect the product.

Stop	stops the process
Start	starts the process
on / off	switches the control and the indicator on of off



WARNING! The pump must not be operated without suitable protective devices, please refer to Safety Information.

4.30 Intervention Options during the Process

If with sensitive substances the in-built protection against frothing over is inadequate at the start of the process, or if the process is to be accelerated, it is possible to intervene manually by using the keys on the user interface.

Break	In there is frothing, the sensitivity of the system is reduced by one step and the system carries on working in this setting.
P min	Accelerating the distillation by actuating longer evacuating times.
AIR	Option of a brief manual venting or feeding inert gas during the distillation.
RESET	Resetting all settings. The distillation process starts from the beginning without automatic venting.

4.40 Vacuum Sensor, optional

If you would like a visual indication of the pressure during the operation of your vacuum system, then a vacuum sensor can be purchased as an option (*see chapter 6.60*) and fitted later (*see figure 2, pos. 4*).

4.41 Assembly

- Insert the vacuum connector of the vacuum sensor into a given GL14 port and secure with the screw cap (*see figure 3*).
- Lay the cable to the display (*fig. 1, pos. 3*), insert the miniature plug into the socket and lock it in position.
- The pressure is indicated directly.

Specification

5.10 Technical Data

Parameter	Unit	Data
Pumping speed 50/60 Hz DIN 28432	m ³ /h (l/min)	2.3 / 2.5 (38 / 41)
Ultimate pressure (self regulating)	mbar (Torr)	10 (7.6)
Max. Continuous pressure	PSIG (Pascal)	0.145
Overpressure	bar	1
Sound pressure level	dB (A)	45
IN - Hose connector (intake)	-	GL 14 screw connection (Hose dimensions 8 / 6x1mm)
EX - Hose connector (exhaust)		Hose nozzle DN 8
Cooling water connection		for hose – inside diameter 8 mm
Round bottom flask, pressure side	ml	1000
Solvent recovery	%	100
Cold water flow	°C	< 5
Motor Voltage	V	230
Motor Frequency	Hz	50/60
Power consumption	W	180
Operating mode	-	S 1
Type of protection DIN EN 60529		IP 42
Fuse	A	Thermal contact / electrical fuse
Dimensions (W/D/H)	mm	310 / 270 / 490
Weight	kg	18.8
Order No. <i>inclusive mains connection cable IEC with plug CEE, UK, CH</i>	ECN	181-0311

5.20 Dimensions

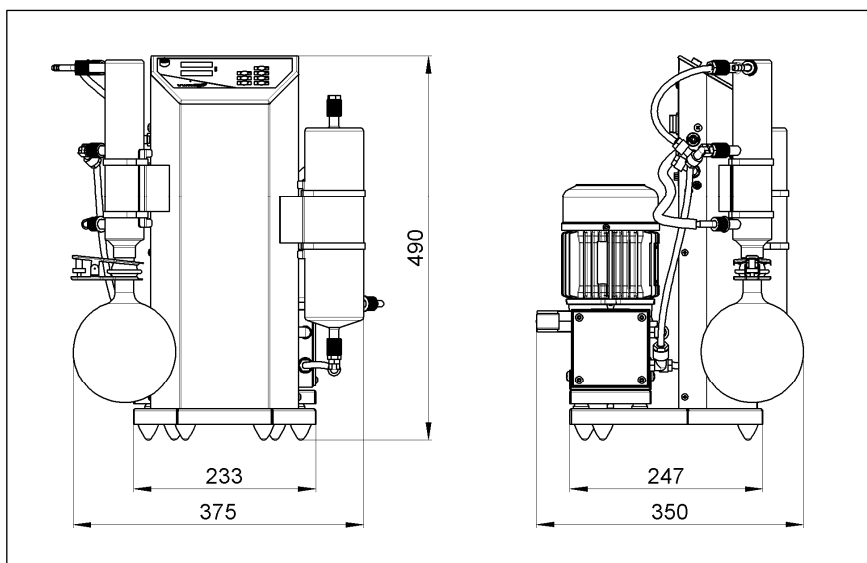


Fig. 4 Dimensions

Maintenance

6.10 General Requirements

Vacuum unit is 100% oil-free. The pump uses a pure PTFE diaphragm.

All bearings are sealed and permanently lubricated. Lubrication should not be attempted.

In the case of award of repair orders, the information about the contamination or thorough cleaning are legally binding parts of the contract.



WARNING! When repairing contaminated units, be sure to observe the applicable user specifications regarding decontamination as required. Provide full information about the type of contamination and the used materials and clean the pump thoroughly before handing it over to third parties.

6.20 Maintenance Performed by the User

6.21 Maintenance of the Diaphragm Pump

At the end of the working day, run the device in cleaning mode for about 10 minutes with the gas ballast valve open. When necessary, flush the pump with a suitable solvent-air-mixture via the intake connection.

Maintenance operations of the diaphragm pump must be performed at regular intervals, the length of which will depend upon the medium pumped. The maintenance intervals must be set specifically for the substances being used. We recommend a period of 1,000 hours. This maintenance must be performed as described *in chapter 6.20*.

6.22 Scope of permissible Work

- Open the pump heads.
- Inspect the pump chambers, diaphragms and valves.
- Clean the interior of the pump, change the diaphragms and valves.



CAUTION! Renew defective parts, if necessary! Wear protective gloves! Parts must be renewed at the intervals stated in this Operating Manual or as specified by the user internally! Do not clean with compressed air!

6.23 Disassembly of the Diaphragm Pump

1. Disconnect the power supply and secure against switching on again.
2. Disconnect the suction and pressure-side media lines and the electrical connection (plug).
3. Use an open spanner (size 10) to unscrew and remove the fixing nuts of the pump underneath the mounting plate.
4. Open the screw clamps (9) of the hoses (10) on the pump body with the SW 14 open spanner.
5. Remove four machine screws (1) from each pump head with an allen key, size 4.
6. Lift off the pressure plate (2), the connection head (3) and the pump head (6). The o-rings (4), valves (5) and diaphragm (8) are now freely exposed.
7. Loosen if necessary the diaphragm (8) at the strain washer (7) by turning the size 3 pin type face wrench anticlockwise.
8. Clean the valves (5) and the diaphragm (8) with a soft cloth and acetone.
9. Check that the drive is in good working order.

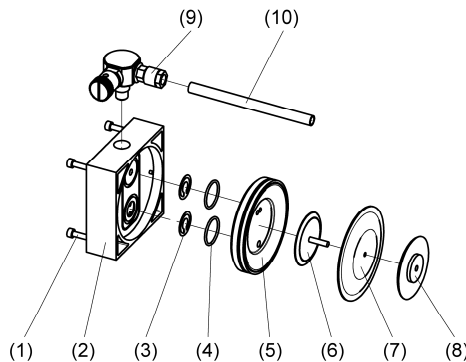


Fig. 5 Disassembly, assembly

6.24 Assembly of the Diaphragm Pump


1. Place the pump so that the diaphragm is lying in a horizontal position.
2. Use the size 3 pin-type face wrench to tighten the pressure disc (9), the diaphragm (8) and the strain washer (7) with the correct torque of 6 - 7 Nm.
3. Bring the diaphragm (8) into the central position.
4. Put on the pump head (6) and align it according to the types of valves.
5. Insert the valves (5) and the o-rings (4).
Ensure that they are lying completely flat. Do not insert the burred side facing the sealing surface.
6. Put on the connecting head (3) and align it with the locating pin.
7. Put the pressure plate (2) onto the connecting head and tighten the 4 machine screws with a torque of 4 - 5 Nm in diagonal order.
8. Reattach the hose (10) connections with clamping ring screw fittings (9).
9. Put the pump on the mounting plate, secure it, and restore connections.

6.25 Test

- Connect the pump to the electrical supply.
- Connect a vacuum measuring device to the suction connector and measure the ultimate pressure.
If the device is working properly, then the figure stated in the technical data must be attained within a maximum of one minute.
- The pump must not make any abnormal noises.
- Moving parts must not touch each other.


6.30 Regular Maintenance of other Components

- Check all glass components regularly for integrity, clean and replace them as and when necessary.
- Empty the round-bottomed collection flask in good time (comply with the disposal regulations).
- Check screw connections for tightness and tightened when necessary.
- Check vacuum hoses for leaks and, if necessary, replace them.
- Check the running noises of the vacuum pump regularly.
- Check the electrical supply lines for any damage.

	<p>CAUTION! Only perform the work that is described here, and that which is permitted to be done by the user. All other maintenance and service work may only be performed by the manufacturer or a dealer authorized by him.</p> <p>Beware of the device parts being possibly contaminated by hazardous substances. Please observe the applicable disposal regulations! Wear protective clothing!</p>
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6.40 Maintenance by the Manufacturer


Repairs and maintenance going beyond the extent of the work described in chapter 6.20 or re-conditioning or modification may only be performed by the manufacturer or authorized work-shops.

	<p>WARNING! The user shall be liable for the consequences of an incorrect damage report or a contaminated pump. The statements in the damage report are legally binding.</p>
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6.50 Service Kit

Designation	Order No.	consists of:	Qty.
Service Kit	181-0315	- O-ring ø 25 x 2	4
		- O-ring ø 3 x 1.5	4
		- Valve	4
		- Diaphragm	2

6.60 Accessories

Illustration	Order No.	Description
	181-0316	<p><u>Vacuum Sensor</u></p> <p>For measurement of process vacuum level.</p> <p>Vacuum connection: Screw connection GI 14</p> <p>Output signal: 0.5 – 4.5 V</p>

Troubleshooting

Review the information in the table below to troubleshoot operating problems.

Trouble	Cause	Remedy	
		by:	with:
Vacuum pump does not start	No power supply	Qualified electrician	Check electrical installation
	Motor defective	Service workshop	Exchange
	Pump body defective		Repair and/or exchange
Vacuum pump does not generate a vacuum or only an inadequate one	Connected apparatus and/or connecting elements leaking	User or Service workshop	Identify and seal the leak, replace the seals and hoses if necessary.
	Vacuum pump leaking		Check the hose connections between the pump heads, replace the hoses and fittings if necessary.
	Pump head leaking	Service workshop	Repair and/or exchange
	Diaphragm defective	User or Service workshop	Exchange of the diaphragm (see operation manual, chapter 6.20)
	Valve defective		Exchange of the valve (see operation manual, chapter 6.20)
	Vacuum pump dirty		General maintenance / cleaning
	Valves dirty		Cleaning condensates and foreign objects out of the valves.
Running noise	Vacuum pump dirty	User or Service workshop	General maintenance / cleaning
Glass components	defective and/or leaking	User	Exchange of the glass parts or seals
Cable(s)	defective and/or brittle	Qualified electrician	Exchange of the cable(s)

Technical Service

Web Resources

Visit the VWR's website at www.vwr.com for:

- Complete technical service contact information
- Access to VWR's Online Catalogue, and information about accessories and related products
- Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. www.vwr.com

Warranty

VWR International warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of purchase. If a defect is present, VWR will, at its option, repair, replace, or refund the purchase price of this product at no charge to you, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear.

For your protection, items being returned must be insured against possible damage or loss. This warranty shall be limited to the replacement of defective products. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

Equipment Disposal (WEEE)



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.

Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment. For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

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TRIBUTOR**
