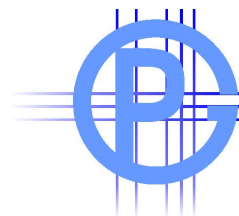


Paul Gothe GmbH

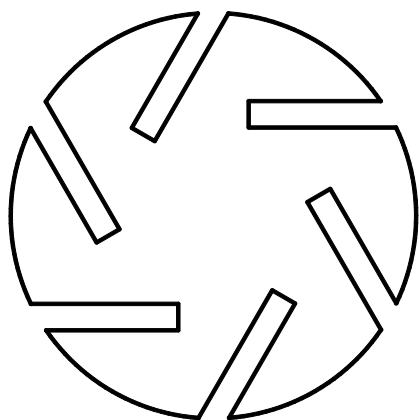


CE

***OPERATING AND MAINTENANCE
INSTRUCTIONS***

(Translation of the original instructions)

OIL FREE VACUUM PUMPS



***17.02-SC5
17.03-SC8
17.04-SB10TV***



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1 INTRODUCTION

1.1 GENERAL INFORMATION

This manual is meant to provide you with important information for the safety of persons involved in pump use and maintenance.

This manual, originally written in ITALIAN, is an integral part of the pump and must be preserved with care for the life of the pump itself. In the event of sale, lease or loaned use of the pump, it must be delivered to the new user along with EC declaration of conformity.

Carrying out any operations on the pump before reading and fully understanding all instructions in this manual is prohibited.

The images contained in this document are examples only and are not binding for the Manufacturer. The Manufacturer reserves the right to make changes to components, product improvement parts and any other without updating this manual, if said components or parts do not alter pump operation and safety.

1.2 MANUFACTURER INFORMATION

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D-44789 Bochum - Germany

Ph +49234 33 51 80

Fx +49234 30 82 17

e-mail: info@paulgothe.de

web site: <http://www.paulgothe.com>

Please always include the following information in all communications regarding the pump:

- pump model and serial number
- year of manufacture
- date of purchase
- detail information regarding problems verified

1.3 METHOD OF CONSULTATION

For improved understanding of the information provided in this manual, warnings or instructions considered critical or hazardous are marked with the following symbols:



HAZARD

Failure to comply with these instructions may cause hazards to persons.



WARNING

Failure to comply with these instructions may cause damage to the pump.

1.4 PERSONNEL QUALIFICATIONS

To ensure that all operations performed on the pump are carried out safely, operators must have the qualifications and requirements to carry out its operations.

Operators are classified as follows:



FIRST LEVEL OPERATOR:

Unqualified personnel, having no specific skills, able to perform simple tasks only.



MECHANICAL MAINTENANCE OPERATOR:

Technician qualified to work on mechanical parts to carry out any necessary adjustments, maintenance or repairs. Not qualified to work on electrical systems in the presence of voltage.



ELECTRICAL MAINTENANCE OPERATOR:

Technician in charge of all operations of an electrical nature. Can operate in the presence of voltage inside cabinets and connector boxes.

1.5 PERSONAL PROTECTION EQUIPMENT

This manual assumes that the pump has been installed in workplaces, which comply with all mandatory safety requirements; in particular, it is mandatory that personnel are equipped with personal protective equipment in relation to the activities that must be performed.



1.6 INFORMATION PLATE

All pumps are equipped with an identification plate that contains the manufacturer's name, address, CE marking and technical data of the pump itself.



WARNING

Removing or tampering with the identification plate is strictly prohibited.

2 SAFETY

2.1 GENERAL WARNINGS

It is important to read this manual before performing any operation on the pump. Compliance with the safety standards of the country in which the pump is installed and requirements of qualified personnel for various maintenance, use, installation, etc. are recommended throughout the life of the pump.

The main rules of conduct to be observed for operation at a suitable level of security are the following:

- Installation, operation, maintenance, etc. operations should always be performed by qualified, trained personnel.
- Without exception, always wear necessary personal protective equipment.
- Always perform all cleaning, adjustment and maintenance operations with all power equipment cut off.
- Do not direct water jets toward electrical parts, even if they are protected by enclosures.
- Do not smoke during work or maintenance, especially where solvents or flammable materials are being used.
- Do not damage symbol plaques or pictograms on the pump. If they should accidentally become damaged, immediately replace them with other identification plaques.

Paul Gothe GmbH disclaims any liability for damage to persons or property resulting from improper use of the pump, from tampering with its safety apparatus or failure to observe operational safety standards.

2.2 RESIDUAL RISKS

HAZARD



This pump has been designed to minimise residual risks to personnel. We urge you, however, to take the utmost care and attention in carrying out maintenance operations. The confidence gained with frequent contact with the pump too often leads users to forget or underestimate risks.

High temperature hazard

Pump surfaces can exceed a temperature of 70°C. Install the pump in a protected area that is accessible only by authorised personnel and only perform operations when the pump is stopped and cooled.

Hazard generated by low pressure

Avoid contact with pump intake attachment during operation. Introduce air into the suction circuit before any intervention. Contact with low pressure points can cause accidents.

Danger from the emission of harmful substances

Pump outlet air contains traces of graphite powder due to the wear of the vanes; ensure compatibility with the working environment.

A failure or the wear of the filtering devices located at the pump outlet may cause the emission of graphite powder into the atmosphere; avoid dispersion in the environment and contamination of other materials.

Whenever air containing hazardous substances is sucked in (i.e. biological or microbiological agents), use abatement systems located in front of the vacuum pump.



Electrical hazard

Electrical equipment in the pump includes live parts which, upon contact, can cause serious damage to persons and property. Any kind of intervention on the electrical system must be performed by qualified personnel.

Fire hazard

Use of the pump for any uses not provided for or prohibited by this manual as well as a lack of proper maintenance can cause malfunction with a risk of overheating and fire.

In case of fire, do not use water to extinguish the flames, but use dry chemical or CO₂ or other means compatible with the presence of electrical equipment.

Entanglement hazard

There is a permanent impending hazard of entangling or entrapping hair and clothing in the cooler fan inside the guard near the fan casing on the electric motor. Tie long hair up and do not wear baggy clothing, long laces or other items that could get caught up.

Part projection hazard

Install the pump in order to avoid those in charge of works being directly hit by parts or bits of parts flying through the fan cover casing due to the cooling fan breaking.

2.3 PICTOGRAMS

Pictographs with the warning symbols and safety symbols for operators have been applied to the pump. Read carefully and take note of the symbols and their messages before using the pump.



ELECTRICAL HAZARD

The pump is near electrical connections (protected) but where accidental contact can cause electric shock and death.



HOT SURFACE HAZARD

The pump is close to surfaces with temperatures exceeding 70°C which may lead to burns of medium severity.



DO NOT USE OIL

Warning! This is a dry running pump. Do not use any lubricant or oil.



REFER TO INSTRUCTION MANUAL/BOOKLET

Before use read the instructions in the operating manual.

Paul Gothe GmbH disclaims any liability for damage to persons or property due to non-compliance with instructions indicated in pictograms or their improper preservation.



3 PUMP DESCRIPTION

3.1 INTENDED USE AND CONTRAINDICATIONS

3.1.1 INTENDED USE

The pumps described in this manual are of the oil-free rotary vane type.

These vacuum pumps have been specifically designed to work with dry, clean air and inert gas, the suction temperature of which must be between 0°C and 40°C.

Any other use is prohibited. The Manufacturer is not liable for any damage to persons and/or property caused by improper pump use or not allowed use of the pump.

3.1.2 CONTRAINDICATIONS



Any use other than that for which the pump was constructed is to be considered an abnormal condition and therefore can cause damage to the pump and pose a serious danger to the operator.

Below is a series of operations involving improper use of the pump, which are not permitted under any circumstances.

- Do not use the pump in an explosive or aggressive atmosphere or in an atmosphere with a high concentration of dust or oily substances in the air and do not use the pump to pump explosive, flammable or corrosive gases or gas that form particles. Using the pump in these atmospheres and with these types of gases can cause injury, explosion, fire or serious damage to the pump.
- Do not use non-original spare parts or parts not provided by the manufacturer.
- Do not use the unit to pump solid materials, chemicals, powders, solvents or other substances differing from those permitted. These types of materials may damage the unit, degrade its performance or reduce its life.
- do not expose the pump to rain, steam or excessive humidity.
- Do not place or store near in the proximity of flammable or combustible materials or substances.

3.2 "TV" MANUFACTURE

The models created according to this type, thanks to special manufacturing considerations, the use of FKM gaskets and of specific sealants, ensure a perfect vacuum seal.

3.3 NOISE EMISSION

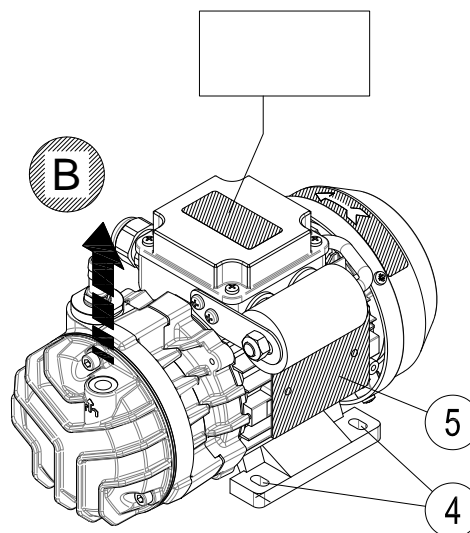
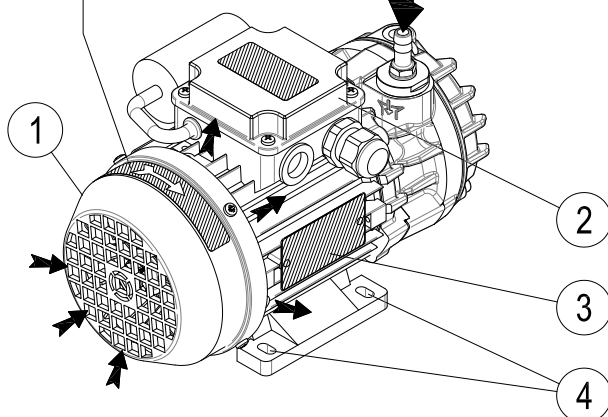
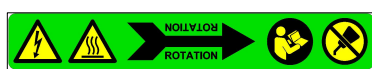
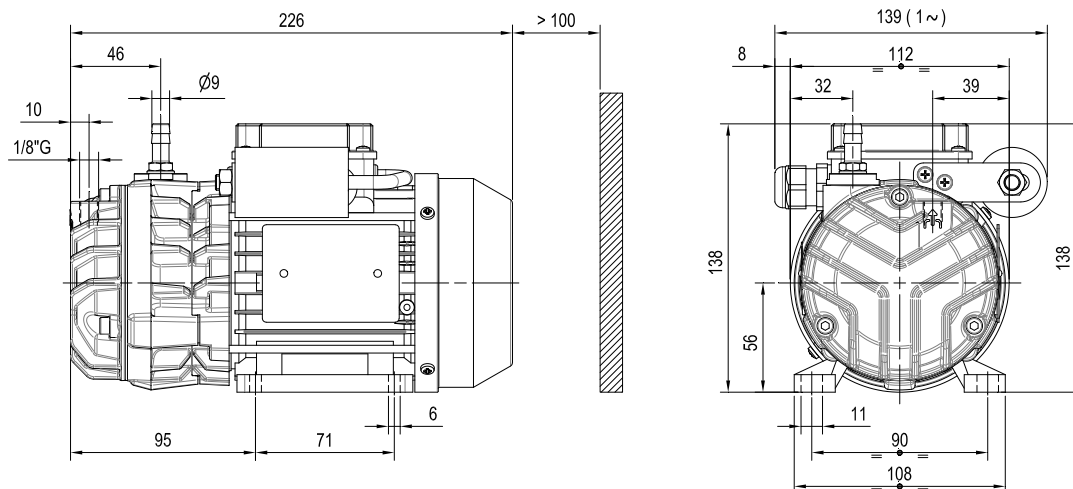
This pump has been designed and constructed to reduce noise at its source.

The sound pressure levels contained in the table of technical specifications were measured at maximum vacuum and outlet conveyed according to UNI EN 2151.



3.4 DIMENSIONS AND CHARACTERISTICS

3.4.1 Model: 17.02-SC5



A	Intake
B	Air outlet
1	Motor fan guard

2	Terminal board
3	Information plate
4	Attachment point

5	Motor rating plate
----------	--------------------

TECHNICAL SPECIFICATIONS

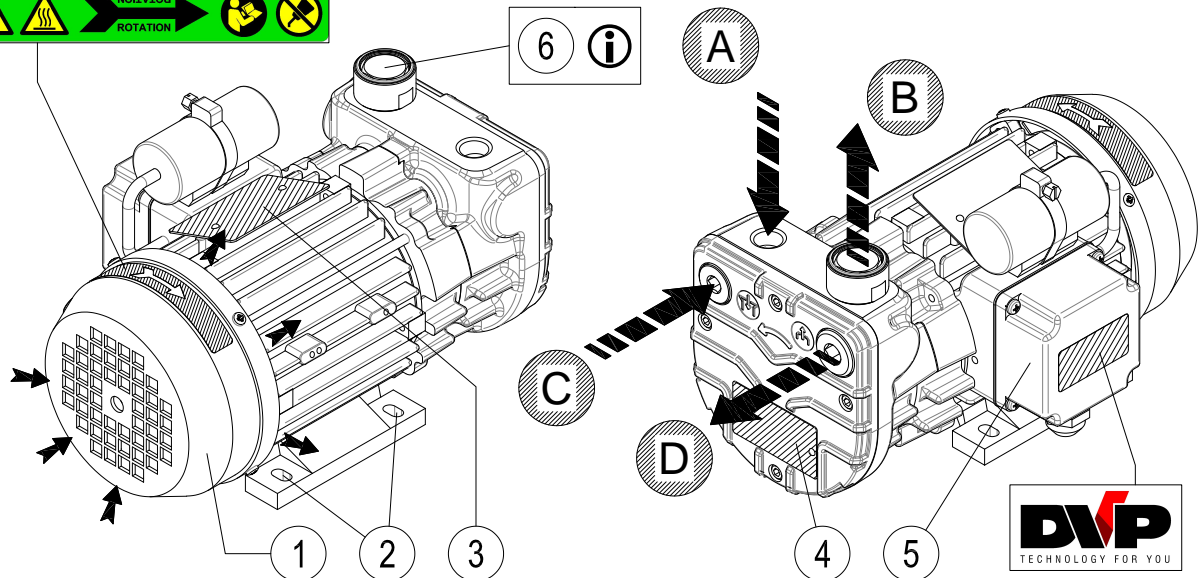
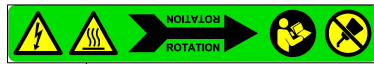
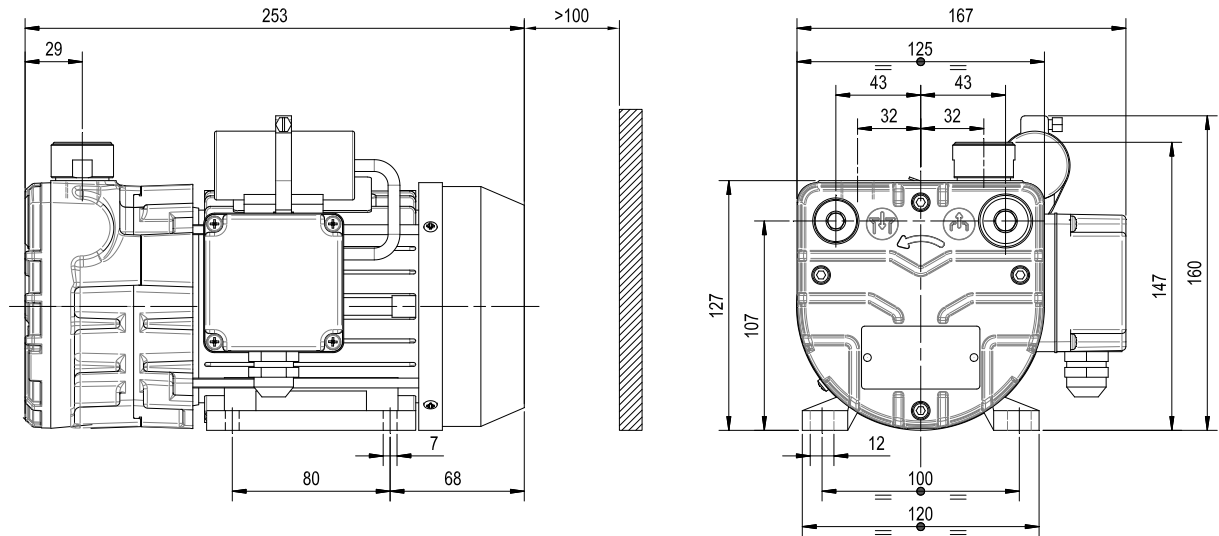
		17.02-SC5	
		50 Hz	60 Hz
Inlet capacity	m ³ /h	5	6
Final pressure (Abs.)	mbar - hPa	120	
Maximum over pressure	bar - 10 ⁵ Pa	0,8 **	
Motor power	kW (1~ / 3~)	0,12 / 0,12	0,15 / 0,15
Nominal r.p.m.	n/min	2800	3300
Noise level (UNI EN ISO 2151) (K 3dB) (Used as a pump)	dB(A)	59	61
Noise level (UNI EN ISO 2151) (K 3dB) (Used as a compressor)	dB(A)	62 **	64 **
Weight	kg (1~ / 3~)	5,4 / 5,4	
Intake pump		Ø9mm (1/8"G)	
Outlet pump		1/8"G	
Operating temperature (room temp. 20°C)	°C	65 ÷ 70	70 ÷ 75
Required room temp. for place of installation	°C	0 ÷ 40	
Ambient temperature for storage/transport	°C	-20 ÷ 50	
MAX humidity / altitude		80% / 1000m a.s.l. *	

(*) Please contact the Manufacturer if environmental conditions are different from those prescribed.

(**) For use as a compressor consult manual code: 8702039.



3.4.3 Model: 17.03-SC8

**DVP**
TECHNOLOGY FOR YOU

A	Intake
B	Air outlet
C	Optional intake
D	Optional air outlet

1	Motor fan guard
2	Terminal board
3	Information plate
4	Attachment point

5	Motor rating plate
6	Exhaust silencer
i	Only present on SC.8

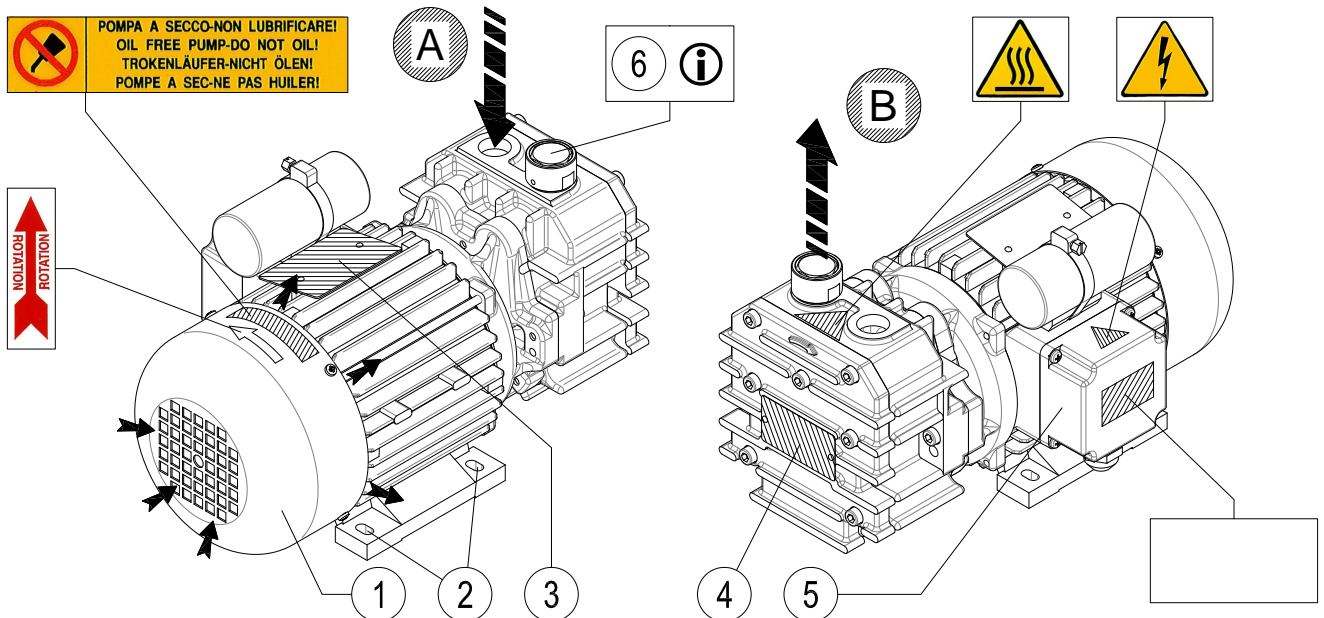
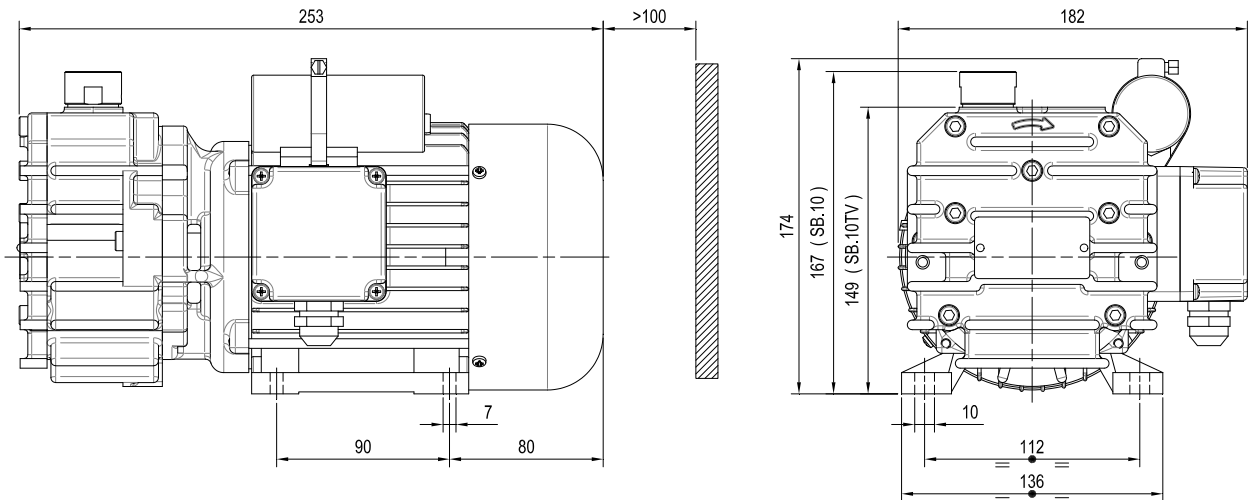
TECHNICAL SPECIFICATIONS

		SC.8TV	
		50 Hz	60 Hz
Inlet capacity	m ³ /h	8	9
Final pressure (Abs.)	mbar - hPa	150	
Maximum over pressure	bar - 10 ⁵ Pa	- - -	
Motor power	kW (1~ / 3~)	0,25 / 0,25	0,30 / 0,30
Nominal r.p.m.	n/min	2800	3300
Noise level (UNI EN ISO 2151) (K 3dB) (Used as a pump)	dB(A)	59	61
Noise level (UNI EN ISO 2151) (K 3dB) (Used as a compressor)	dB(A)	60 **	62 **
Weight	kg (1~ / 3~)	8,5 [83,4] / 8,5 [83,4]	
Intake pump		3/8"G	
Outlet pump		1/2"G	
Operating temperature (room temp. 20°C)	°C	70 ÷ 75	80 ÷ 85
Required room temp. for place of installation	°C	0 ÷ 40	
Ambient temperature for storage/transport	°C	-20 ÷ 50	
MAX humidity / altitude		80% / 1000m a.s.l. *	

(*) Please contact the Manufacturer if environmental conditions are different from those prescribed.

(**) For use as a compressor consult manual code: 8702039.

3.4.4 Model: 17.04-SB10TV



A	Intake
B	Air outlet
1	Motor fan guard

2	Attachment point
3	Motor rating plate
4	Information plate

5	Terminal board
6	Exhaust silencer
①	Only present on SB.10

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS		SB.10TV	
		50 Hz	60 Hz
Inlet capacity	m³/h	10	12
Final pressure (Abs.)	mbar - hPa	120	
Motor power	kW (1~ / 3~)	0,37 / 0,37	0,45 / 0,45
Nominal r.p.m.	n/min	1400	1700
Noise level (UNI EN ISO 2151) (K 3dB)	dB(A)	64	66
Weight	kg (1~ / 3~)	15,5 / 14,0	
Intake pump		1/2"G	
Outlet pump		1/2"G	
Operating temperature (room temp. 20°C)	°C	70 ÷ 75	80 ÷ 85
Required room temp. for place of installation	°C	0 ÷ 40	
Ambient temperature for storage/transport	°C	-20 ÷ 50	
MAX humidity / altitude		80% / 1000m a.s.l. *	

(*) Please contact the Manufacturer if environmental conditions are different from those prescribed.



4 INSTALLATION

4.1 RECEIPT AND CONTENT VERIFICATION

Upon receipt of the pump, verify that the packaging is intact. If everything is intact, unpack the contents and check the pump. If packaging shows signs of damage due to transport or storage conditions, immediately notify the shipping agent and the manufacturer.

It is always necessary to check that the material received corresponds to its accompanying document.

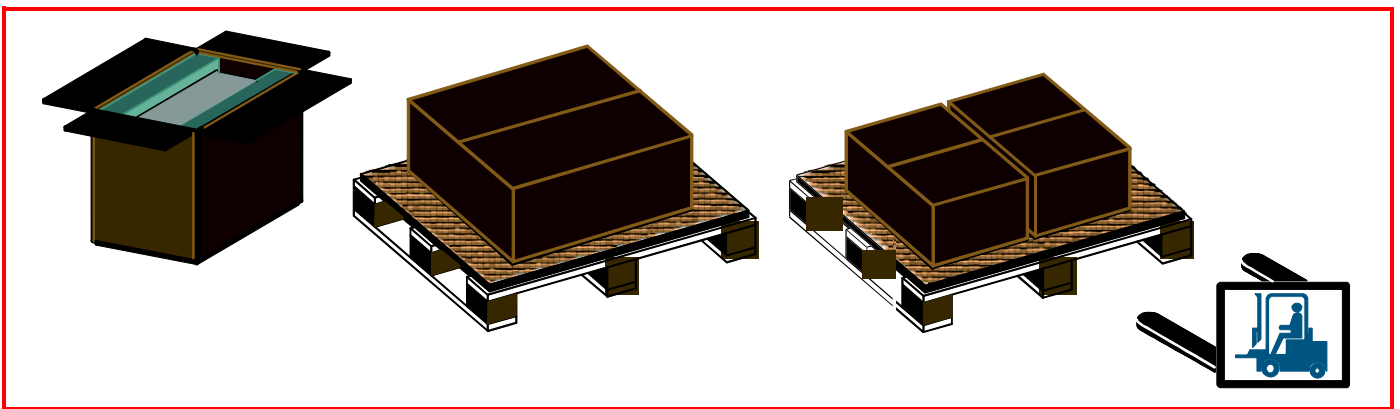
Packages should be opened taking all precautions to avoid harm to people and the contents thereof.

4.2 PACKAGING

Depending on the size and based on the mode of transport, the pump is packaged in the following ways:

- single box with infill material;
- on wooden pallets with cardboard covers;
- in single boxes positioned on pallets with protective film.

The pallet wood can be reused or recycled in accordance with applicable laws in the country of pump installation. Other materials such as cardboard, plastic or protective film must be disposed of in accordance with local regulations. Do not burn or disperse package components in the environment.



4.3 TRANSPORT AND HANDLING



HAZARD

All transportation, lifting and handling operation must be performed by qualified and experienced personnel.

The pump can be lifted and moved with forklifts or with lifting equipment (ropes, hooks, etc.) that are appropriate to the weight indicated in the table of technical data and on the identification plate. Manual handling and transportation are permitted only in accordance with local regulations.



WARNING

Prepare the pump as detailed in the next chapter for transport.

4.4 STORAGE

Close the intake and outlet with the appropriate protections. The pumps are to be stored in their packaging and stored in covered, dry, protected places that are not exposed to bright sunlight, with temperatures in the range indicated in the table of technical specifications.

In case of long periods of stop inside the warehouse or out of production with storage, the location should meet the specifications described in Chapter 3 (Pump description). In order to keep rubber parts and lip seals efficient and properly working, we recommend to operate the pump for at least 30 minutes every 6 months with the intake closed, following the instructions and provisions described in this manual, paying particular attention to those in Chapter 5 (Use instructions).



4.5 ENVIRONMENTAL CONDITIONS

The pump must be installed and used in a covered and adequately lit location. The installation area must meet all requirements of height, air circulation and meet the requirements imposed by existing legislation.

Temperature, Humidity and altitude

The corresponding limit values are shown in the table of the technical specifications (chapter 3.4). Please contact the Manufacturer if environmental conditions are different from those prescribed.

Lighting

All areas must be illuminated evenly and sufficiently to ensure all operations included in this manual and must be without shadows, reflections, glare or eyestrain.

4.6 PUMP INSTALLATION



To ensure perfect pump operation, house and place it according to the following conditions:

- Allow sufficient space on the perimeter sides of the pump and make sure to keep the motor ventilation side free.
- Make sure the free space adjacent to the pump allows easy access to components for inspection or maintenance and also allows access for suitable lifting equipment.
- The pump is equipped with mounting points. It is necessary to ensure it locks onto a perfectly horizontal plane in order to avoid tilting in case of transportation by the system user.
- Some models are already equipped with rubber vibration dampers installed at pump attachment points. Whenever the model has not been equipped, ensure installation of such equipment so as not to transmit vibration to the pump.
- Ensure there is ventilation in the room, or inside the machine housing the pump and prevent air coming in from the outlet or cooling fans, which could cause discomfort to personnel.



WARNING

Do not install the pump in any area with dust or other materials that could clog or rapidly cover cooling surfaces of the heat exchanger (where installed).

4.7 MOTOR INSTALLATION



It is possible to install any type of electric or hydraulic motor that has the features described in the table of technical data, with flange and shaft corresponding to:

M90/4 - B14 size as per standard IEC-72 ;

M100/4 - B14 size as per standard IEC-72 ;

M112/4 - B14 size as per standard IEC-72 .



WARNING

Install fan/coupling assembly on the motor following these instructions:

- Fit the assembly on the motor shaft up to reaching the stated measure,
- Tighten screw "A" to firmly fix the assembly to the shaft.



4.8 USER SYSTEM

Make sure that no harmful substances contaminate the user system during installation.

If you wish the system to maintain vacuum even when pump is stopped, install a cutoff valve between pump and system.

Make sure that no vibrations or stresses are transmitted to the pump connection.

4.9 CONNECTION



HAZARD

Pump connections should be performed by skilled and trained personnel only.

4.9.1 INTAKE AND OUTLET CONNECTIONS



User system connections (both intake and outlet) must be performed with pipes with a diameter equal to or greater than the pump suction inlet. The weight of pipes or any expansions must not burden the pump.

It is advisable to make the final connection to the pump using flexible pipe or fittings. It is important to tighten all pipes and couplings. Very long pipes or pipes with a diameter that is too small diminish pump performance.



HAZARD

Make sure that discharged gases are let out of the workplace.



WARNING

Always install an intake filter, especially if the pump is to work with air that might contain foreign matters.

Pump outlet gases must be treated in such a way that they do not contaminate the working environment and the surrounding atmosphere.

Never use friction hoses with hose diameters smaller than the intake diameter. Avoid exceeding hose lengths, tight bends or bends spaced too closely together.



WARNING

Do not insert outlet fitting pipes or devices that block or impede the disposal of outlet gases.

4.9.2 WIRING



WARNING

Check that network voltage and frequency correspond to values contained on the motor rating plate.

The connection cable must be adequate for the power absorbed by the pump (absorption values are shown on the pump motor rating plate) taking into account the environmental conditions of operation.



HAZARD

Always ground the pump.

Always install a security system between the pump and the electric power supply. Pump absorption values are shown on the motor rating plate.

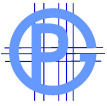
The pump is normally supplied without an electrical cable and switch. For electrical connection, see the diagram contained within the terminal board or on the motor rating plate.

WARNING



Check that the direction of rotation is correct before starting the pump for the first time or after changing the electrical connections.

The correct direction of rotation is indicated by the arrow on the pump (see ch. 3.4). Pump operation with a rotation direction that is opposite to that indicated can severely damage the pump itself.



5 OPERATING INSTRUCTIONS

5.1 OPERATION

**HAZARD**

Prior to start up ensure that the pump outlet is not obstructed by fittings.

5.1.1 START-UP

**HAZARD**

The pump may reach high temperatures when operating.

After start-up, the pump may run slower than the regular rpm if room temperature is lower than allowed as seen on the technical data table. It may also run lower if the supply voltage is lower than the required voltage as indicated on the motor rating plate. If nominal rpm is not reached within a few seconds, the thermal switch fitted to protect the pump must trip (installation required in paragraph "Wiring").

**WARNING**

It is advisable not to start the pump more than 12 times per hour to avoid excessive energy consumption and damage to the pump.

**HAZARD**

Full r.p.m. pump operation must be without vibration or unusual noise. If these are present, stop the pump immediately, search for the cause and eliminate it.

5.1.2 STOP

The pump must be stopped by cutting off the power supply.

If the pump is to be powered off, let it run with open intake, isolated from the user system, for about 30 minutes first. This will eliminate any moisture inside the intake chamber and avoid rotor oxidation of the internal parts.

6 MAINTENANCE

6.1 GENERAL WARNINGS

For good maintenance:

- Immediately verify the causes of any malfunctions (excessive noise, overheating, etc.);
- Pay particular attention to safety devices;
- Make use of all documentation provided by the manufacturer (instruction manuals, wiring diagrams, etc.);
- Use only appropriate tools and original spare parts.

In the event of a failure to understand the information or procedures contained in this chapter, contact Paul Gothe GmbH for clarification before proceeding.

**HAZARD**

Do not perform any type of operation, modification and/or repair of any kind, except for those listed in this manual.



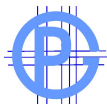
Only trained or authorised personnel have the necessary expertise to perform tasks with the technique appropriate for intervention.

**HAZARD**

All maintenance operations must be carried out with the pump disconnected from any power sources. Do not operate the pump until it has reached a temperature that is not dangerous for the operator.




**HAZARD**

If pump maintenance has been performed in a manner inconsistent with instructions, with non-original spare parts or otherwise so as to impair its integrity or modify its characteristics, Paul Gothe GmbH will be released from any liability relating to the safety of persons and malfunction of the pump.



6.2 MAINTENANCE TABLE

The following table shows all required periodic operations to maintain pump efficiency.

OPERATION TYPE	FREQUENCY	OPERATOR QUALIFICATION
Clean motor fan guard and clean the pump	1000 h	
Change the intake filter (depending on model)	3000 h	
Change vanes	6000 h	

Shorter maintenance intervals may be required according to operating conditions (high temperature of intake gases, intake gases containing condensable vapours, etc.).

6.2.1 CLEAN MOTOR FAN GUARD AND CLEAN THE PUMP

Radiator, motor fan guard and the pump should be cleaned to remove any dust deposits.

This can be done using compressed air and a dry cloth.

Do not use fluids or substances other than those indicated.



HAZARD

Wear appropriate personal protection equipment to perform said operations.

6.2.2 CHANGE THE INTAKE FILTER

The instructions for replacing the inlet filter are available upon request.

6.2.3 CHANGE VANES

The instructions for replacing vanes are available upon request.

6.3 MAINTENANCE OF “TV” MANUFACTURE TYPE PRODUCTS

For the maintenance of “TV” manufacture type products, Paul Gothe GmbH recommends using a “**Long-life silicone grease for high temperatures OKS 1110**” or other equivalent sealants.

Evenly apply a thin film of sealant over all the mating surfaces of the pump body/motor flange and cover/pump body, taking care that it does not enter the pumping chamber.

6.4 SPARE PARTS

Use **Original Spare Parts** to replace pump parts.

When purchasing spare parts, always quote the serial number and model of the pump (these can be found on the identification plate) as well as the spare part purchase number.

Paul Gothe GmbH disclaims all responsibility for any deterioration of pump performance or for damages caused due to use of non-original spare parts.



7 HOW TO RETURN THE PUMP

The product may only be returned after prior agreement with the supplier, who will provide the authorisation number that must accompany the material delivered and should be duly complete in its entirety.

8 DISMANTLING

Demolition of the pump must be performed by authorised technicians.

Metal parts can be disposed of as scrap metal.

All materials deriving from demolition must be disposed of according to regulations in the country where the pump will be demolished.



HAZARD

Disposal operations involve risks of cutting, shavings protection, entanglement, contact with moving parts and contact with chemicals. Operators should use the appropriate personal protective equipment.



9 TROUBLESHOOTING

DAMAGE	CAUSE	REMEDY
(A) The pump does not run	No voltage	Provide power supply
	Thermal switch has tripped	Identify reason and activate switch
	Room temperature is too low	Restore room temperature to allowed range
	Motor wiring damaged	Contact Service Department
	Suction of unpermitted substances	Contact Service Department
(B) The pump cannot reach stated vacuum	Intake filter obstructed (were present)	Replace the filter cartridge
	Wrong power supply to motor	Check power supply
	Discharge clogged	Check couplings at outlet
	Vanes worn out	Contact Service Department
(C) Pump is noisy	Motor coupling damaged (where present)	Contact Service Department
	Bearings damaged	Contact Service Department
	Vanes worn out	Contact Service Department
	Discharge clogged	Check couplings at outlet
	Motor fan guard damaged	Contact Service Department
(D) Pump runs hot	Motor fan guard clogged	See point 6.2.1
	Poor room ventilation	Install an auxiliary ventilator
	Motor fan broken	Contact Service Department
	Wrong power supply to motor	Check power supply
	Discharge clogged	Check couplings at outlet