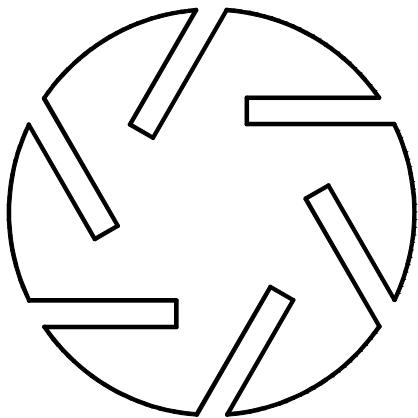


VACUUM ^{CE} **TECHNOLOGY**

OPERATING AND MAINTENANCE INSTRUCTIONS

(Translation of the original instructions)

OIL FREE VANE COMPRESSORS



17.02-SC.5
17.03
17.04

1 INTRODUCTION

1.1 GENERAL INFORMATION

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

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

Carrying out any operations on the compressor before reading and fully understanding all the 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, make product improvements or for any other reason without updating this manual, if said components or parts do not alter the compressor's operation and safety.

1.2 MANUFACTURER INFORMATION

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e-mail: info@paulgothe.de

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

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

- Compressor model and serial number;
- year of manufacture;
- date of purchase;
- detailed information regarding problems occurred.

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 compressor.

1.4 PERSONNEL QUALIFICATIONS

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

Operators are classified as follows:



FIRST LEVEL OPERATOR:

Unqualified personnel, without specific skills and able to perform simple tasks only.



MECHANICAL MAINTENANCE OPERATOR:

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



ELECTRICAL MAINTENANCE OPERATOR:


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


1.5 PERSONAL PROTECTION EQUIPMENT


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

1.6 IDENTIFICATION PLATE

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

TIPO TYPE	<input type="text"/>		
MATRICOLA SERIAL No	<input type="text"/>	PROD.	<input type="text"/> kg <input type="text"/>
PORTATA 50/60 Hz FLOW RATE 50/60 Hz	<input type="text"/>	m ³ /h	
PRESSIONE PRESSURE	<input type="text"/>	bar 10 ⁵ Pa	

TIPO TYPE	<input type="text"/>		
MATRICOLA SERIAL No	<input type="text"/>	PROD.	<input type="text"/> kg <input type="text"/>
	Hz	m ³ /h	P bar
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>
			

TIPO TYPE	<input type="text"/>			
MATRICOLA SERIAL No	<input type="text"/>	PROD.	<input type="text"/> kg <input type="text"/>	
	Hz	m ³ /h	V mbar (Abs.)	P bar
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
				



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 compressor. Compliance with the safety standards of the country in which the compressor is installed and the employment of qualified personnel for maintenance, use, installation, etc. are recommended throughout the life of the compressor.

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

- Installation, use, maintenance, etc. should always be performed by qualified and 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 the warning plates or pictograms on the compressor. If they should accidentally become damaged, immediately replace them with other identical plates.

D.V.P. Vacuum Technology s.p.a. disclaims any liability for damage to persons or property resulting from improper use of the compressor, from tampering with its safety apparatus or failure to observe workplace safety standards.

2.2 RESIDUAL RISKS

HAZARD



The compressor has been designed to minimise residual risks to personnel.

However, we urge you to take the utmost care and attention in carrying out maintenance operations. The confidence obtained with frequent contact with the compressor too often leads users to forget or underestimate risks.

High temperature hazard

The compressor surfaces can exceed a temperature of 70°C. Install the compressor in a protected area that is accessible only by authorised personnel. Perform operations when the compressor is stopped and has cooled.

Hazard generated by low pressure

During operation avoid contact with the compressor intake attachment. Contact with low pressure points can cause accidents.

Hazard generated by pressure

Check that the outlet piping is connected properly before starting the compressor. Discharge the pressure in the circuit before carrying out any work. Contact with pressurised points can cause accidents.

Danger from the emission of harmful substances

Air released from the compressor outlet contains traces of graphite powder due to the wear of the vanes; ensure compatibility with the system and the working environment.

A failure or the wear of the plant circuit connected to the compressor 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 compressor intake.

Electrical hazard

Electrical equipment in the compressor 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 compressor 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 extinguisher 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

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

**ELECTRICAL HAZARD**

The compressor is located near electrical connections (protected), however accidental contact can cause electric shock and death.

**HOT SURFACE HAZARD**

The compressor is located 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 the instructions indicated in pictograms or their improper preservation.

3 COMPRESSOR DESCRIPTION

3.1 INTENDED USE AND CONTRAINDICATIONS

3.1.1 INTENDED USE

The compressor described in this manual is of the oil-free rotary vane type.

This compressor has 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 use or not allowed use of the compressor.

3.1.2 CONTRAINDICATIONS



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

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

- Do not use the compressor 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 compressor to pump explosive, flammable or corrosive gases or gases that form particles. Using the compressor in these atmospheres and with these types of gases can cause injury, explosion, fire or serious damage to the compressor itself.
- 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 working life;
- Do not expose the compressor to rain, steam or excessive humidity;
- Do not place or store near or in proximity of flammable or combustible materials or substances;

3.2 NOISE EMISSIONS

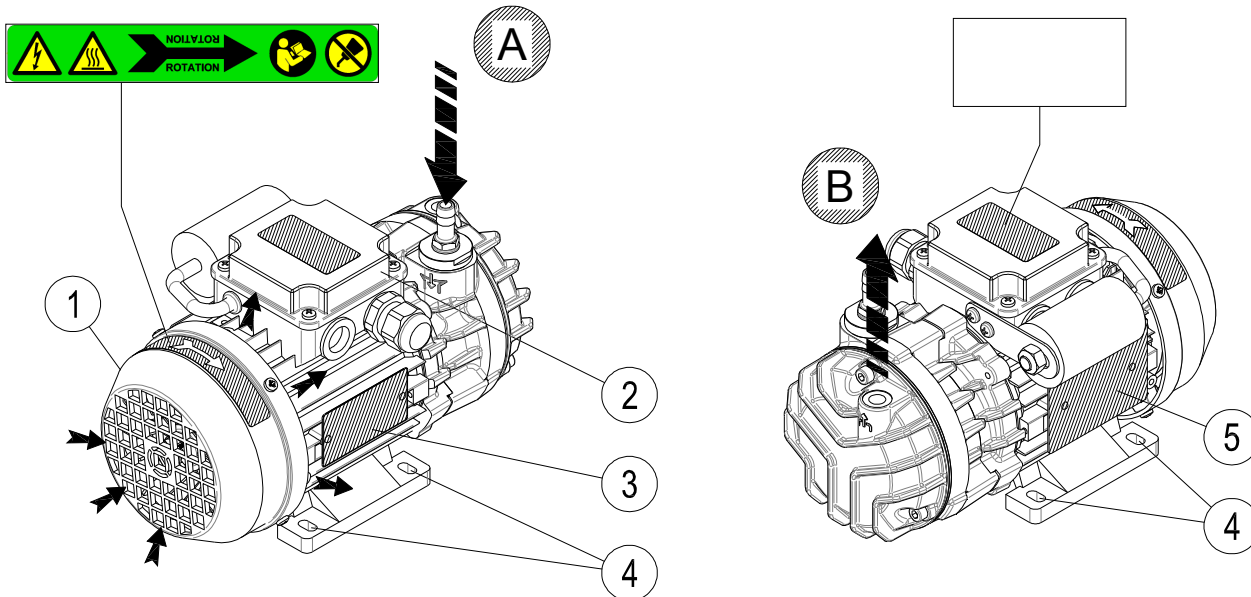
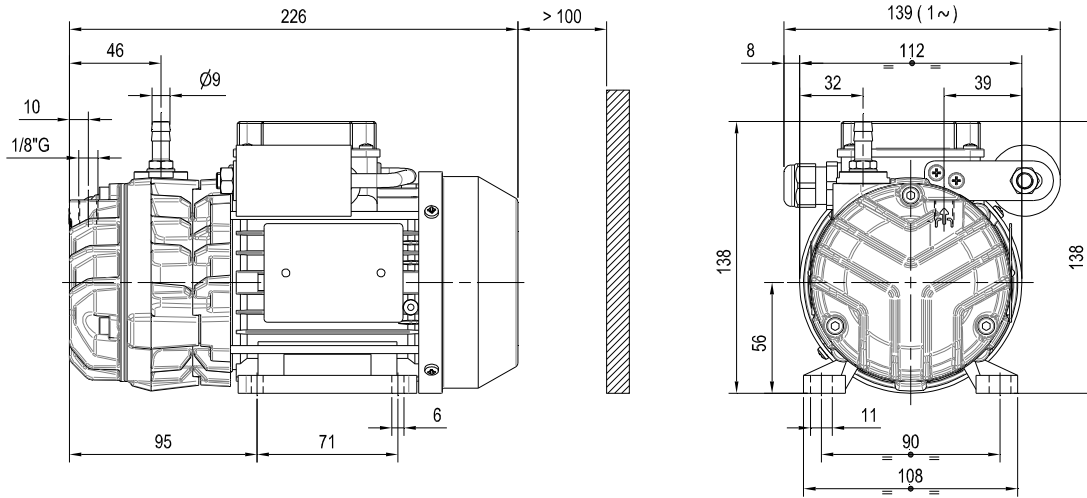
The compressor has been designed and constructed to reduce noise at its source.

The sound pressure values indicated in point 3.3 (Sizes and Specifications) of this manual have been read in compliance with directive UNI EN ISO 2151 making the compressor work at 2/3 of the acceptable maximum pressure with intake and outlet conveyed.

The actual noise emission while operating depends, however, on the installation conditions and position of the compressor on the system.

3.3 DIMENSIONS AND CHARACTERISTICS

3.3.1 Model: 17.02-SC.5



A	Intake
B	Outlet
1	Motor fan guard

2	Terminal board
3	Information plate
4	Attachment point

5	Motor rating plate
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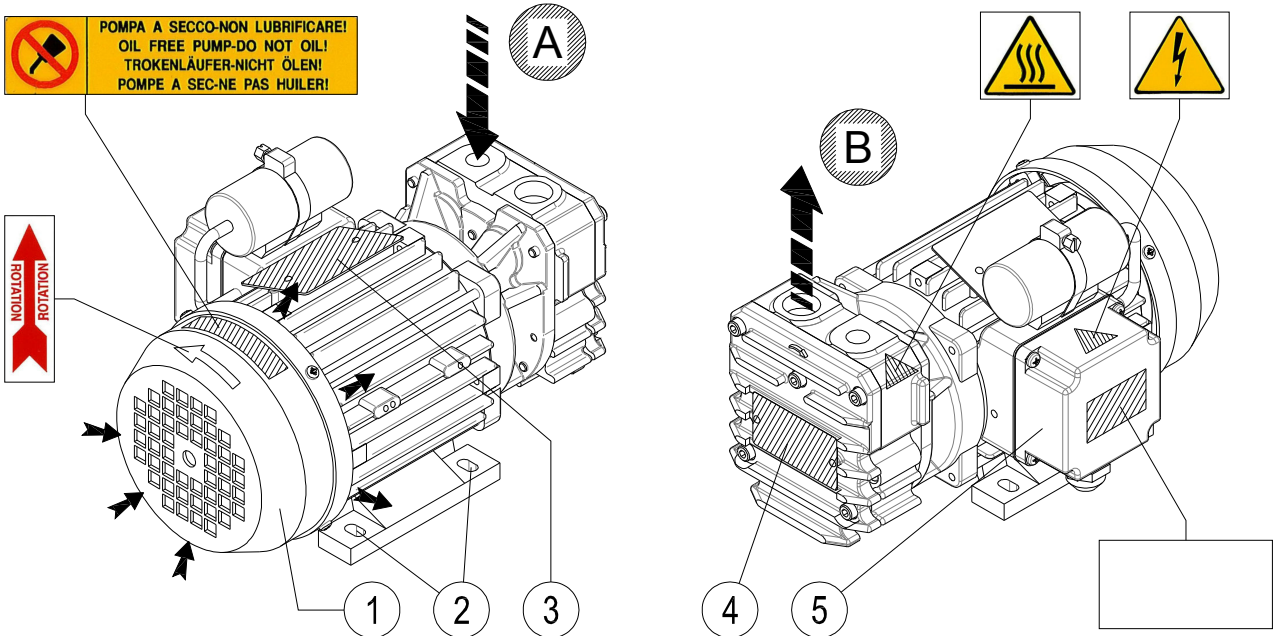
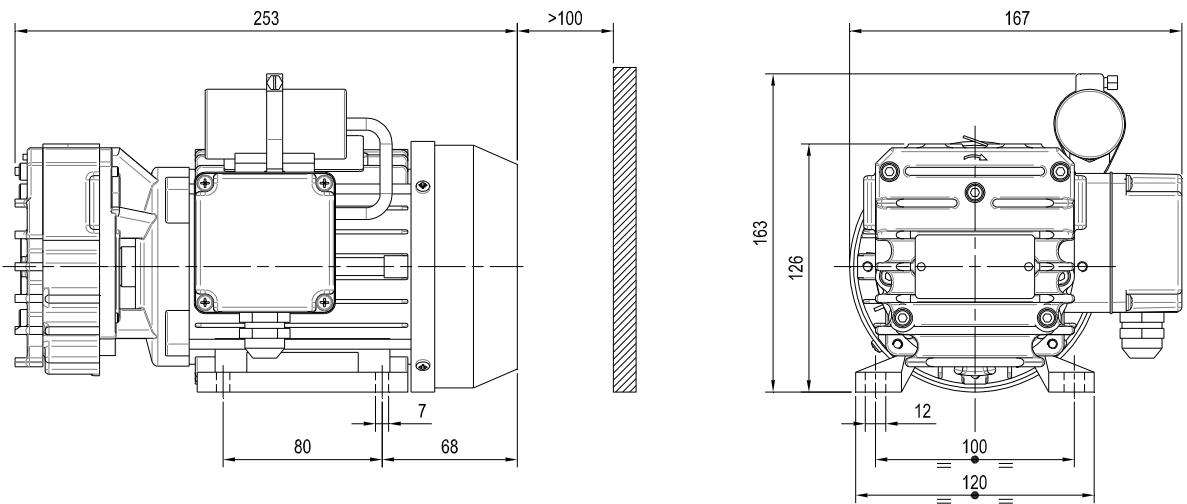
TECHNICAL SPECIFICATIONS

		SC.5	
		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 pump consult manual code: 8702038..

3.3.2 Model: 17.02



A	Intake
B	Outlet
1	Motor fan guard

2	Attachment point
3	Motor rating plate
4	Information plate

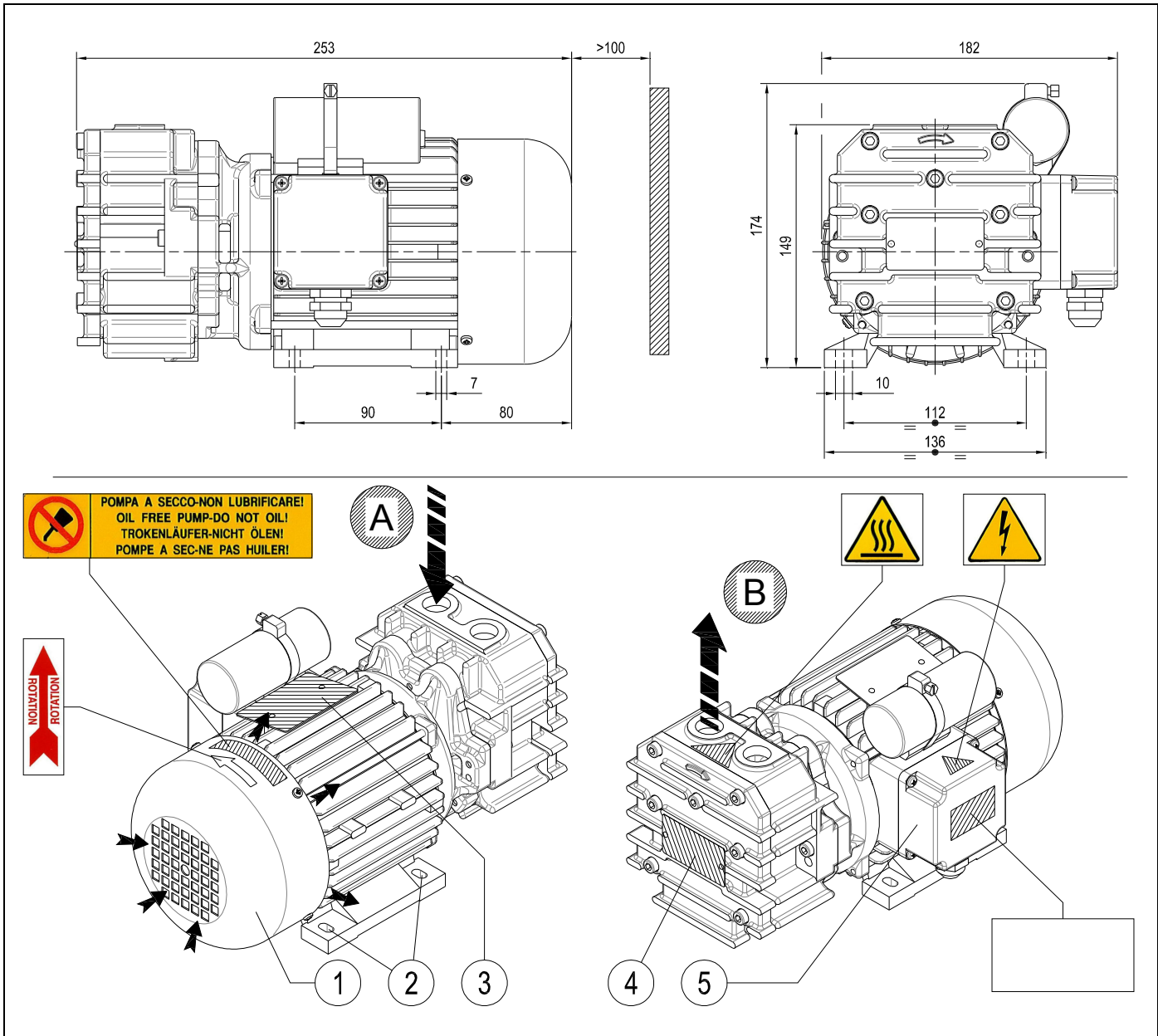
5	Terminal board
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TECHNICAL SPECIFICATIONS

		CB 6	
		50 Hz	60 Hz
Capacity	m ³ /h	6	7
Maximum over pressure	bar - 10 ⁵ Pa	0,8	
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)	dB(A)	60	62
Weight	kg (1~ / 3~)	8,5 / 7,5	
Compressor intake		1/4"G	
Compressor outlet		1/2"G	
Operating temperature (room temp. 20°C)	°C	65 ÷ 70	70 ÷ 75
Required operating room temperature	°C	0 ÷ 40	
Storage/transport room temperature	°C	-20 ÷ 50	
MAX humidity / altitude		80% / 1000m a.s.l. *	

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

3.3.3 Model: 17.04



A	Intake
B	Outlet
1	Motor fan guard

2	Attachment point
3	Motor rating plate
4	Information plate

5	Terminal board
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TECHNICAL SPECIFICATIONS

		CB.10		CB.12	
		50 Hz	60 Hz	50 Hz	60 Hz
Capacity	m ³ /h	10	12	12	14
Maximum over pressure	bar - 10 ⁵ Pa	0,6			
Motor power	kW (1~ / 3~)	0,37 / 0,37	0,45 / 0,45	0,37 / 0,37	--- / 0,45
Nominal r.p.m.	n/min	1400	1700	1400	1700
Noise level (UNI EN ISO 2151) (K 3dB)	dB(A)	64	66	64	66
Weight	kg (1~ / 3~)	15,5 / 14,0		14,5 / 13,5	
Compressor intake		1/2"G			
Compressor outlet		1/2"G			
Operating temperature (room temp. 20°C)	°C	70 ÷ 75	80 ÷ 85	70 ÷ 75	80 ÷ 85
Required operating room temperature	°C	0 ÷ 40			
Storage/transport room temperature	°C	-20 ÷ 50			
MAX humidity / altitude		80% / 1000m a.s.l. *			

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

4.5 ENVIRONMENTAL CONDITIONS

The compressor 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 3.3). 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. The areas must be without shadows, reflections, glare and must not cause any eyestrain.

4.6 COMPRESSOR INSTALLATION



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

- Allow sufficient space on the perimeter sides of the compressor and make sure to keep the motor's and compressor's ventilation side free.
- Make sure the free space adjacent to the compressor allows easy access to components for inspection or maintenance and also allows access for suitable lifting equipment.
- The compressor 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 shock mounts installed at compressor attachment points. Whenever the model has not been equipped, ensure installation of such equipment so as not to transmit vibrations to the compressor.
- Ensure there is ventilation in the room, or inside the machine housing the compressor and prevent air coming in from the cooling fans, which could cause discomfort to personnel.



WARNING

Do not install the compressor in an area with dust or other materials that could clog or quickly cover the cooling surfaces.

4.7 not valid



4.8 USER SYSTEM

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

Make sure that no vibrations or stresses are transmitted to the compressor connection and to the compressor itself.

HAZARD



The compressor is **NOT** fitted with a pressure-reducing valve (available on request as an accessory). The consumer should **NOT** surpass the maximum operating pressure shown in the technical specifications table (chapter 3.3).

WARNING



Fit a retaining valve, on the outlet circuit, between the compressor and system, in order to keep the system under pressure with the compressor off and prevent the pressure being released via the compressor.

4.9 CONNECTION

HAZARD



Mechanical and electrical connections of the compressor should be performed by skilled and trained personnel only.

4.9.1 OUTLET AND INTAKE CONNECTION

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

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

WARNING



When selecting material for the piping bear in mind that the outlet air can reach high temperatures, with respect to the compressor's work pressure (see chapter 3.3).

WARNING



Use an intake filter, especially if the compressor works in dirty or dusty surroundings.

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 connectors or devices into the piping that could block or impede the disposal of the air-flow (Maximum pressure permitted shown in 3.3 – Technical Specifications).

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 compressor (absorption values of the compressor are shown on the motor rating plate) taking into account the environmental conditions of operation.

HAZARD



Always ground the compressor.

Always install a security system between the compressor and the electric power supply. The compressor's absorption values are shown on the motor rating plate.

The compressor 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 of the motor is correct before starting the compressor for the first time or after changing the electrical connections.

The correct direction of rotation is indicated by the arrow on the compressor (see chapter 3.3). Operating the compressor with a rotation direction that is opposite to that indicated can severely damage the compressor itself.

5 OPERATING INSTRUCTIONS

5.1 OPERATION

**HAZARD**

Before start-up make sure there are no pipes or valves blocking the compressor's outlet.

**WARNING**

Only use the compressor at the authorised pressure level (see chapter 3.3 – Technical Specifications) and use a properly gauged pressure-reducing valve (see chapter 6.3 – Spare Parts and Accessories).

5.1.1 START-UP

**HAZARD**

The compressor may reach high temperatures when operating.

After start-up, the compressor may run slower than the regular rpm if room temperature is lower than the one indicated on the technical data table. It may also run lower if the supply voltage is lower than the required voltage indicated on the motor rating plate.

If nominal rpm is not reached within a few seconds, the thermal switch fitted to protect the compressor must trip (installation described in paragraph 4.9.2 - Wiring).

**WARNING**

It is advisable not to start the compressor more than 12 times per hour to avoid excessive energy consumption and damage to the compressor, especially for models CC.60-1, CC.80-1, CC.100-1, CC.140-1.

**HAZARD**

Operation of the compressor at full r.p.m. must occur without vibrations or unusual noise. If these are present, stop the compressor immediately, search for the cause and eliminate it.

5.1.2 STOP

The compressor must be stopped by cutting off the power supply to the motor.

**WARNING**

Make sure that the retaining valve whose installation is set out in chapter 4.8, does not allow the pressure generated by the compressor to be released through it.

6 MAINTENANCE

6.1 GENERAL WARNINGS

For good maintenance it is essential to:

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

If failing to understand fully the information or procedures contained in this chapter, contact D.V.P. Vacuum Technology s.p.a. 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 skills appropriate for intervention.



HAZARD

All maintenance operations must be carried out with the compressor disconnected from any power sources.

Do not operate the compressor until it has reached a temperature that is not dangerous for the operator.






HAZARD

If compressor maintenance has been performed in a manner non-compliant with instructions, using non-original spare parts or otherwise so as to impair its integrity or modify its characteristics, D.V.P. Vacuum Technology s.p.a. will be released from any liability relating to the safety of persons and malfunction of the compressor.

6.2 MAINTENANCE TABLE

The following table shows all required periodic operations to maintain the compressor efficient.

OPERATION TYPE	FREQUENCY	OPERATOR QUALIFICATION
Clean motor fan guard and clean the compressor	1000 h	
Change the intake filter (only CB.16, CB.16-1, CB.25, CB.40, CC.60-1, CC.80-1, CC.100-1, CC.140-1)	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 CLEANING THE MOTOR FAN GUARD AND COMPRESSOR

The motor fan guard and the compressor 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 REPLACING THE INTAKE FILTER

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

6.2.3 REPLACING THE VANES

The instructions for replacing vanes are available upon request.

6.3 SPARE PARTS AND ACCESSORIES

We recommend the use of **Original Spare Parts and Accessories** to replace compressor parts and fit accessories.

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

DESCRIPTION	17.02-SC.5	17.03	17.04
Maintenance kit	K9801031	K9701023	K9701028
Pressure reducing valve	9012010	9012011	9012012

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

9 TROUBLESHOOTING

DAMAGE	CAUSE	REMEDY
(A) The compressor does not start	No voltage	Connect the power supply
	Thermal switch has tripped	Identify the cause and activate the switch
	Room temperature is too low	Restore room temperature to the allowed range
	Motor wiring damaged	Contact Technical Assistance
	Suction of unpermitted substances	Contact Technical Assistance
(B) The compressor does not reach the stated pressure	Intake filter obstructed (where present)	Replace the intake filter
	Wrong power supply to motor	Check power supply
	Outlet blocked	Check the outlet connectors
	Vanes worn out	Contact Technical Assistance
(C) The compressor is noisy	Motor coupling damaged (where present)	Contact Technical Assistance
	Bearings damaged	Contact Technical Assistance
	Vanes worn out	Contact Technical Assistance
	Outlet blocked	Check the outlet connectors
	Casing of the motor fan guard damaged	Contact Technical Assistance
(D) Compressor temperature too high	Casing of the motor fan guard clogged	See point 6.2.1
	Poor room ventilation	Install an auxiliary ventilator
	Motor fan broken	Contact Technical Assistance
	Wrong power supply to motor	Check power supply
	Outlet blocked	Check the outlet connectors
	Use at higher pressure levels than those authorised	Use according to the limitations out in point 3.3