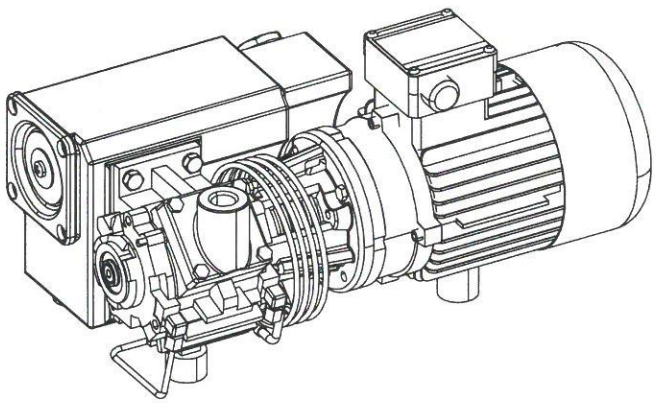
Document Code: *(to request any copies)*	**M000006AG** **OPERATION AND MAINTENANCE BOOK**
Model Machine.	**VACUUM PUMPS** **mod. RVP 21**
Features.	**Single-stage rotary vane vacuum pump** **oil bath lubricated**
Serial number/Year:	33166 2020



"TRANSLATION OF ORIGINAL INSTRUCTIONS"

This manual must be taken as being an integral part of the machine and must always be available to people working with the machine itself. The manual must always stay with the machine, even if it is sold to another user.

Operators are obliged to read this manual and to scrupulously apply the instructions it contains, since the manufacturer does not accept any responsibility for damage caused to people and/ or property, or to the machine itself, if the conditions described below are not met.

The Client is obliged to respect industrial secrecy and so this documentation and its annexes must not be tampered with or changed, reproduced or provided to others without the written consent of the Manufacturer.

CONTENTS AND INDEXES

ANALYTICAL INDEX

- Introduction -

GUARANTEE AND SUPPLY CONDITIONS

The Manufacturer designs and owns the project. The term Manufacturer may also be extended to include their Agent, hereinafter simply referred to as the Manufacturer.
The Client is to be taken as being the end user of the product and as the installator on machines and plants.
The product is to be taken as referring to the machine, quasi-machine, equipment, or technical asset, disciplined in Europe by Directive 2006/42/CE.

The Manufacturer declares under its own responsibility that the machines conforms to the laws in force in the Countries of the Economic European Communion and releases the attached DECLARATION OF CONFORMITY or OF INCORPORATION.

During the warranty period, the Manufacturer shall repair or replace any parts showing material or manufacturing defects, at no charge and as soon as possible.
The product to repair must be sent to the Manufacturer carriage paid; the product may not be replaced during the repair period; the repair does not extend the period of warranty; the redelivery will be ex-works from the Manufacturer's premises.

The Manufacturer is responsible exclusively for the defects arising from the normal usage of the unit.

Warranty exclusions

Consumable and wearable parts are not covered by the warranty as well as the parts the breakage or deterioration of which is shown to be due to improper use of the product. The electrical parts and third party components are also excluded from the warranty.

The Manufacturer shall not be held liable for the loss of production or other damage caused by faults.

The Manufacturer shall NOT be held liable for the disposal of the product; the Client is personally responsible for this in accordance with the current laws and regulations in the country of installation with regard to disposal of the substances that are potentially harmful to the environment.

The Manufacturer shall not be liable for faults or malfunctioning deriving from a failure to observe the instructions; from alterations due to transportation or to particular environmental conditions; from lack of maintenance or improper maintenance, tampering mishandling or temporary repairs; from the use of non-original spare parts; from accessories or functions that are not compatible; from inadequate use or exploitation of the capacities of the product.

If the Client is not up to date with payments, the warranty will automatically expire. In order to request any intervention under warranty, the Client must send the Manufacturer the product, the certificate of warranty completely filled in and a copy of the official document attesting the purchase.
That outlined above is the only valid warranty and supersedes any other warranty outlined by the Law, to all intents and purposes (art. 1490, 1497 and 1512 of the Italian Civil Code).

The warranty is valid for 12 months from the delivery date or for 2000 (two thousand) operating hours if this latter condition can be proved. The warranty only covers the faults and/or manufacturing defects which are promptly communicated in writing, verified and recognized by the Manufacturer.

Certificate of WARRANTY:

Client/Buyer: .....
.....
Address .....
.....
Post Code.....
City .....
Model.....
Serial no. .....
Date of purchase .....
Official purchase document....
.....

DICHIARAZIONE "CE" DI CONFORMITA'

(Direttiva 2006/42, allegato II, lettera A)

DECLARATION OF CONFORMITY "CE"

(Directives 2006/42, annex II, sheet A)

Il Costruttore: .....
The Manufacturer:

VUOTOTECNICA s.r.l.
Via Olgiate Molgora, 27
23883 BEVERATE di BRIVIO (Lecco) Italy
Tel. +39 039.5320561 - Fax +39 039.5320015
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Responsabile Fascicolo Tecnico
Technical file Manager

Fabbroni Eros
Via Olgiate Molgora, 27
23883 BEVERATE di BRIVIO (Lecco) Italy

dichiara sotto la propria esclusiva responsabilità che la/e macchina/e nuova/e o prodotto:
declares under its own responsibility that the new/s machine/s or product:

Modello/model: **POMPA per VUOTO RVP 21**
Pompa per vuoto rotativa a palette monostadio con lubrificazione a bagno d'olio

è/sono conforme/mi a tutte le disposizioni della direttiva 2006/42/CE ed alle seguenti direttive Europee:
conform/s to all relevant provisions of Directive 2006/42/CE and the following European directives:

2014/35/UE - 2004/108/CE: 31-12-2004

è/sono conforme/mi alle seguenti norme armonizzate:
conform/s to the following harmonized norms:

UNI EN ISO 14121-1: 2007 - CEI EN 60204-1: 2006 - UNI EN ISO 11202: 2010

ed inoltre è/sono costruita/e nel rispetto delle seguenti norme tecniche:
and moreover is/are built according to technical norms:

UNI 10893: 2000 - UNI ISO 10015: 2000 - ISO 7000

VUOTOTECNICA s.r.l.
Via Olgiate Molgora, 27
23883 BEVERATE di
BRIVIO (Lecco) Italy

Data
Date .....

Responsabile legale
Legal Officer

Giuliano Bosi

firma
signature

LA PRESENTE DICHIARAZIONE DI CONFORMITÀ HA VALIDITÀ A DECORRERE DALLA DATA DELLA BOLLA DI CONSEGNA.
THE DECLARATION OF CONFORMITY HAS VALIDITY STARTING FROM THE DATE ON THE DELIVERY NOTE

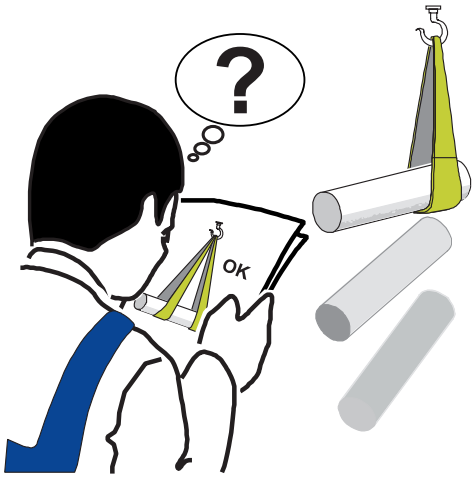
THE DOCUMENT AND INTENDED READERS

This document is intended to be read by professionals whose experience or qualifications allow them to work in conformity with the most common safety standards and specific skills. It is presupposed that each person has the basic knowledge required for their role.

Reading of this manual is obligatory for all the professionals that are involved with the product.

The manual does NOT make up for educational or intellectual gaps that affect the professionals that work with the product.

The product must only be installed or used on machines or plants in a way that is compatible with the product itself and its scope of application.



Scope and structure of the document

This scope of this document is to provide a valid guide that makes it possible to work safely and to carry out the operations that are necessary for maintaining the product well.

This document was originally prepared in ITALIAN and so, if any incongruence or doubt arises ask for the “ORIGINAL INSTRUCTIONS” or further clarification from the manufacturer.

The indications given in this document do not replace the safety regulations and technical data for installation and operation that apply directly to the product, nor the rules dictated by common sense and safety rules in force in the country in which the machine is installed.

Personnel characteristics

The person responsible for installation and maintenance of the product must be suitably qualified, aware and mature for the tasks described and must be reliable enough to correctly interpret that described in this manual and to ensure safety and thoroughness during the controls.

In order to avoid damage to people or property, we suggest that the Client adequately inform the operators on any RESIDUAL RISKS.

The Client shall be held liable for the qualification and mental or physical state of the professional figures assigned to these tasks.
The Client or employer is legally liable for all and any damage and injury caused or suffered by the personnel authorized by him.

Personnel that work with the machine must always use the personal protective equipment called for in the laws of the country in which it is used and anything else made available by their employer, such as: soundproof headphones, gloves, glasses, etc.

REFERENCE STANDARDS

Below are indicated the International Standards and National Laws complied with in designing and constructing the machine.

Norma/Direttiva/Decreto	Descrizione
2006/42/CE	New machinery directive for the CE mark (ex 98/37/CE ex 89/392/CEE)
2014/35/UE	Low voltage directive
2004/108/CE: 31-12-2004	Electromagnetic compatibility, L. Decree N° 194 of 6/11/2007 (ex 89/336 CE)
D.Lgs. n. 81: 9-4-2008	Implementation of the safety consolidation act (ex L.Decree 626/94 18/9/1994)
UNI EN ISO 14121-1: 2007	Principles for risk assessment
IEC EN 60204-1: 2006	Electrical equipping of machines Part 1: General rules
EN ISO 11202: 2009	Acoustics - Noise emitted by machines and equipment
UNI 10893: 2000	Technical documentation on the product – Operating instructions
UNI - ISO 10015: 2000	Guidelines for training
ISO 7000 - DIN 30600	Graphic symbols and signs for identifying the functions
UNI 11394: 2011	Usability testing of instruction for use of technical goods

RANGE OF USE

The product MUST NOT be used by unskilled personnel or experts that do work that does not comply with the contents of this manual.

Using the machine for a purpose that does not comply with the range of use is completely forbidden as well as dangerous.

Normal use

The product documented in this manual was designed for:

pumping inert gases in the vacuum between the atmospheric pressure and the final vacuum degree of the pump; see plate affixed on the product.

Non-authorized use

This product is NOT suitable for pumping corrosive, flammable or explosive gas, air or inert gases rich in water condensates, oil or dust. If these gases are present contact the Manufacturer.

The installation and use of the product is NOT permitted in environments that are particularly flammable.

Parts of the product can reach high temperatures, it is strictly forbidden to dry rags and clothing by laying them on the product.

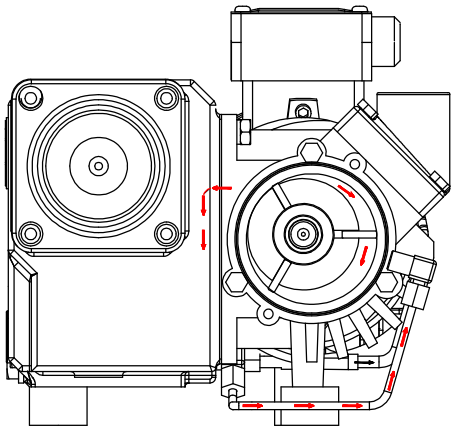
The Manufacturer does not accept any responsibility for any type of damage that may result from incorrect or imprudent operations.

The presence of condensables inside the pump can cause its components to corrode as well as presenting a residual risk for operators.

- Features -

GENERAL DESCRIPTION

The **RVP 21** vacuum pumps have single-stage rotary vanes and are lubricated via oil bath recirculation.
The oil is aspirated via depression into the pump directly from the tank, via a pipe fitted with a calibrated ejector; a second oil recovery pipe has the task of taking in the oil retained by the degreasing cartridge during the discharge phase and circulating it again.
The rotor is supported by bearings installed on both the pump closing flanges.
The pump and electric motor are two independent units coupled between them via an elastic coupling for transmission.
A tank is installed on the pump outlet for the recovery of the oil. It contains a degreasing cartridge that prevents the formation of oil mist and reduces the noise.
Inside the suction hole there is a check valve with a protection filter made of stainless steel mesh. It has the function of ensuring that the vacuum reached in the system is maintained when pump is not running.
The pumps are normally supplied with electric motors with European voltage, 230/400 V - 50/60 Hz, but on request they can be provided with different voltages and frequencies.



Notes on the supply

In order to prevent foreign bodies from entering the pump, the installation of an appropriate filter on the suction line is recommended.

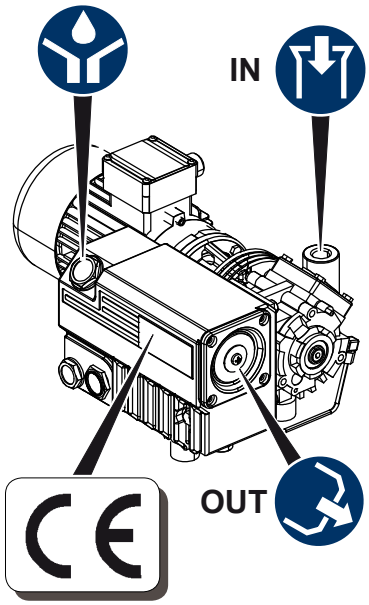
- The pump is supplied without lubrication oil.

Before start up you must supply the pump with the quantity and type of oil outlined for the specific pump model.

- The suction hole **(IN)** is provided with a protection cap made from plastic that should be removed before starting up the pump for the first time.

The outlet hole **(OUT)** is not normally protected; this is to avoid the cap from shooting out on pump start up.

- To order spare parts, always indicate the model of the pump and its serial number.
- The normal maintenance of the pump does not require any particular tools; it only requires the tools normally used in mechanical workshops.



Product identification

The CE plate has the purpose of identifying the product.
The plates affixed on the machine must NOT be removed or damaged and must always be kept clean.
The technical data recorded in this manual do not replace those recorded on the plates on the machine.

TECHNICAL CHARACTERISTICS

Technical data

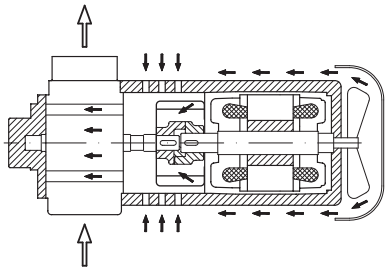
(*) These values are valid at the normal atmospheric pressure of 1013 mbar

Pump model		RVP 21	
Frequency	Hz	50	60
Flow rate *(*)*	m^3/h	21.0	25.0
Final pressure *(*)*	mbar ass	1	
Suction hole attachment **(IN)**	ø gas	1/2”	
Motor execution	V 3~ ± 5%	230/400	275/480
	V 1~ ± 5%	230	275
Motor power	kW 3~	0.75	0.90
	kW 1~		
Motor absorption	A	3,16/1,83	
Motor protection	IP	55	
Rotation speed	g/min	2700	3240
Motor shape		B14	
Motor size		90	
Environmental allowed temperature	°C	10 ÷ 40	
Noise level	dB(A)	64	65
Max weight	kg 3~	18,5	
	kg 1~	19	
Oil charge	lt	0,5	

Lubricant **(OIL)**: Mineral oil ISO 68.

Cooling system

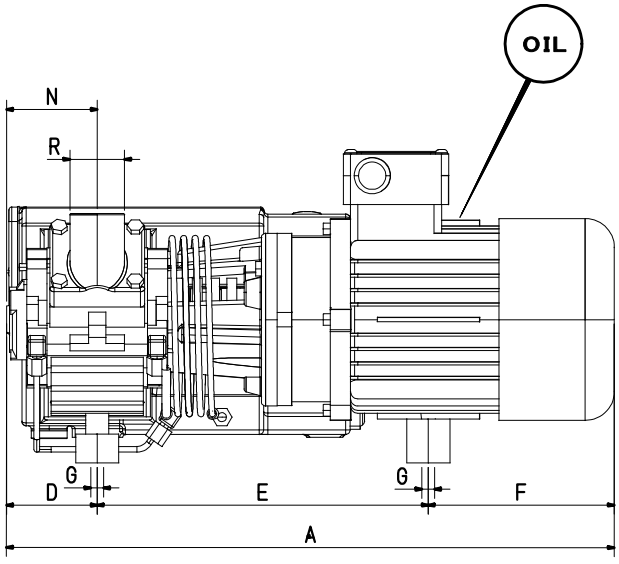
The pump is cooled via heat dissipating surfaces; the heat is dispersed from the external finned surfaces via a centrifugal cooling fan fitted to the shaft of the pump.
Furthermore, the pump is provided with a coil for oil cooling.

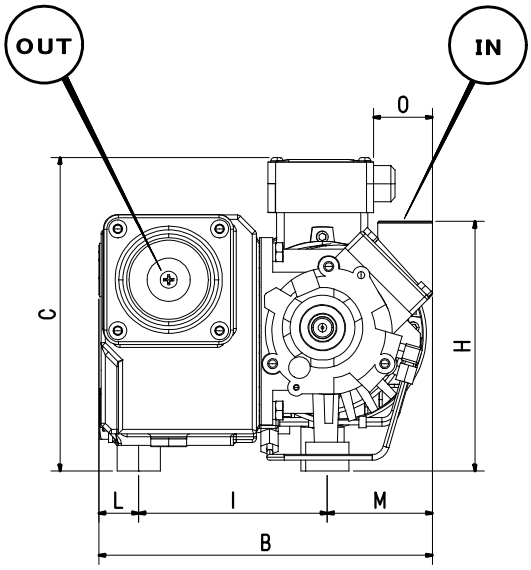


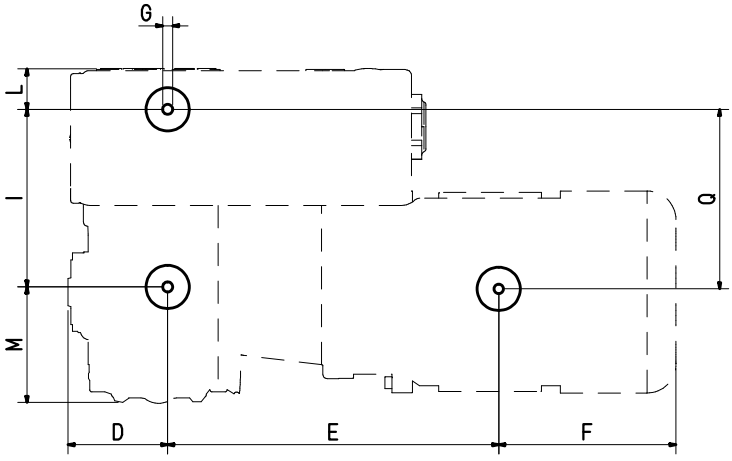
OPTIONAL accessories

The following accessories can be supplied on request:
- suction filter with cartridge made of stainless steel mesh 44 µ **item FB20**
- suction filter with cartridge made of treated paper 5 -7 µ **item FC20**
- oil bath suction filter **item FO20**
- mini vacuum switch **item 120210**
- vacuum gauge Ø63 with 1/4” gas radial attachment **item 090510**

Drawings showing overall dimensions







Dimensions in mm

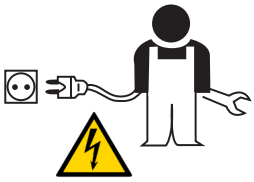
A	=	421
B	=	232
C	=	225
D	=	63
E	=	230
F	=	128
G	=	M8
H	=	173
I	=	131
L	=	28
M	=	73
N	=	62
O	=	41
Q	=	127
R .... **IN (ø)**	=	gas 1/2”

- Accident Prevention and Safety -

GENERAL CONDITIONS

This product is built according to the most severe accident prevention standards and is fitted with proper safety devices.

It is NOT possible to outline the many environments or machines on which the product will be installed; the Client must therefore adequately inform the Manufacturer on the specific installation conditions.



The lifting of single products or of several packages altogether for a weight above 25 Kg should be carried out using suitable means.

Do not use the machine if any operating anomaly is encountered.
Avoid any precarious repairs. Repairs are only to be done using original spare parts.

Specific conditions and RESIDUAL RISKS

This machine must not be installed out in the open or under adverse ambient conditions (sun, rain, wind, etc.). The suction of steam or condensates can cause liquids to escape; suitable means must be provided for collecting these liquids during the installation stage.

The Manufacturer is not responsible for the disposal of the product or the materials necessary for its use or maintenance, i.e. lubrication oil. Carry out the disposal according to the laws and regulations applicable in the country of installation.

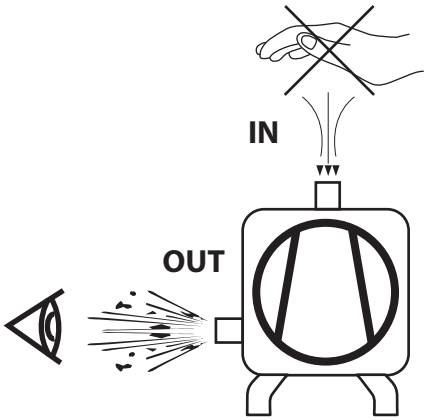
The product's surfaces can overheat and reach temperatures above 80°C, be careful what you touch.

To clean the machine suitable means and adequate detergents must be used that do not damage the components in any way; washing or cleaning the machine with water jets is strictly forbidden.

A correct cleaning of the work environment can avoid incidents or unnecessary risks. Even a small loss of oil can be dangerous.

Do not insert objects, tools, fingers, etc. in the holes arranged on product: suction, discharge outlet, motor grid, terminal block, etc. ...

ATTENTION: The non connection to the outlet hole (OUT) is a source of hazard as the pump could project objects.



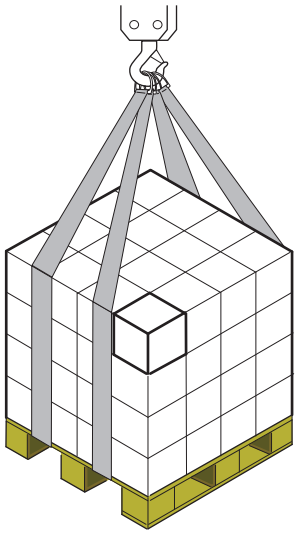
Do not rest objects or parts of the body on the suction hole **(IN)**.

When running at full capacity the product, assessed individually and with a correct maintenance, generates a level of acoustic pressure (noise) below 80 dBA and therefore harmless.
If this value is exceeded the Client should remove the related causes or provide the superator with suitable protection.

In the event of fire use extinguishers with CO2 foam and self-suction systems to fight the fire in closed environments.

- Lifting Transportation and Storage -

Some indications are only valid for products of large sizes or multiple packages of small-sized products.

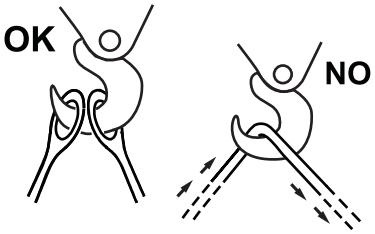


Lifting

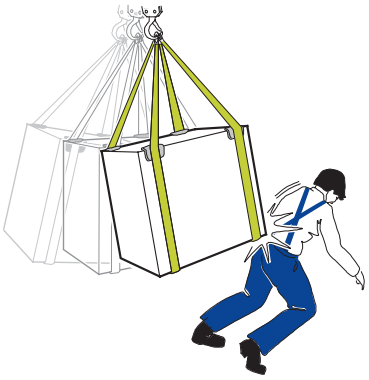
The product is packaged based on its destination in order to ensure protection of the single components, and suitable means (eyebolts, feet, brackets, etc.) are provided for facilitating its transport and subsequent handling.
Where deemed necessary, eyebolts are inserted to which a suitable hook can be directly attached or shackles can be hooked.

Lifting is only to be done by specialist personnel (riggers, crane operators, haulage contractors, etc.).

The lifting means used (cables, polyester straps, chains) must be suitable for supporting the load imposed by the product.
The cables must form an opening angle of less than or equal to 90°.



During handling, check the correct distribution of the load and do not make abrupt movements that could create hazards.



Transportation

The transport should be carried out using means and methods suitable to protect the components from violent impacts, humidity, vibrations, etc.

DO NOT OVERTURN the product or parcel.

Unpacking and Storage

We wish to point out that packaging (wood, nails, cellophane, metal staples, adhesive tape, etc.) can pose a danger.
They must be removed using suitable means and not left within reach of irresponsible people (e.g. children). The same goes for tools used to remove packaging (scissors, hammers, tongs, etc.).

The packaging is to be disposed of in compliance with the standards in force in the country in which the product is installed.

Storage should be carried out in closed but well ventilated places.
Adequately clean the product and protect the non-painted parts from corrosion; if necessary store with dehydrating salts.

If the products are not correctly packaged, they cannot be stacked. Check that the weight is supported by the packaging itself.

- Installation -

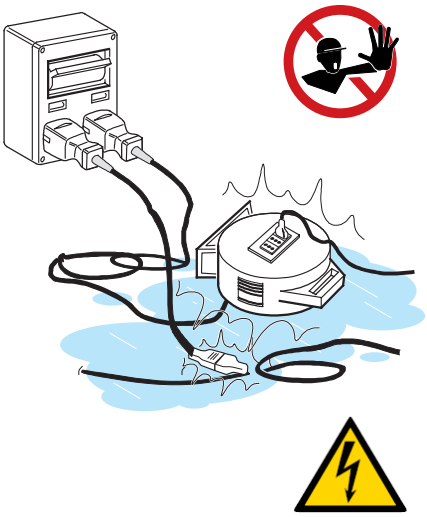
GENERAL TERMS AND CONDITIONS

The installation of the product is carried out according on the Client's needs, the scope of application of the plant and the place in which the product is installed; the Client must therefore provide the Manufacturer with adequate information, giving details of any specific situations (environmental conditions, dimensional restrictions or performances, etc. ...).

The installation must be performed with full awareness and familiarity with the product characteristics and its intended use.

The operation should be carried out by specialized personnel, observing the content of this manual and that which was specified when selecting the product.

The use and maintenance manual CANNOT remedy the technical deficiencies of the installers, users and maintainers.



Preliminary checks

- Check the correct environmental conditions (explosive atmospheres, over-ventilated or high-humidity atmospheres, altitude at which the machine is installed and operates, high temperatures, etc.).
- Check that the product is not exposed to atmospheric agents such as sun, rain, snow, wind etc.;
- The suction of steam or condensates can cause spills of liquids, suitable means for liquid collection must therefore be provided during the installation stage.
- Position the product respecting the safety distances so as to allow the normal installation, work and maintenance operations to be carried out.
- Check that there are no objects on the product.
- Check that the product is positioned stable and level on a surface that is able to support its weight and avoid harmful vibrations or noise.
- Avoid electromagnetic interferences.
- Make sure that the power supply voltage is the same as that indicated on the information plates on the machine or in the manual.
- Check that the motors (if present) rotate in the correct direction.
- Install an adequate system on the electrical line to protect against overloads or short-circuits. We also recommend protection against excessively low voltages.

Always perform the EARTH connection at the closest possible point, even for products not fitted with an electrical system.

During the installation make sure that there is no power in the wires to be connected to the product.

INSTALLATION METHOD

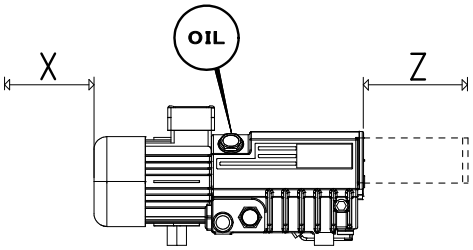
Placement and securing of the pump

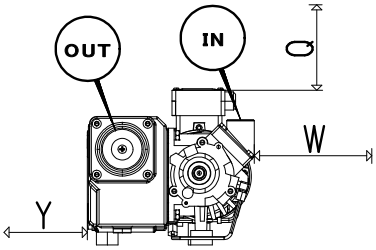
After having positioned the pump on a horizontal platform, depending on the requirements, secure it using the designated threaded holes made in the anti-vibrating feet or on the base plates (see dimensional drawing).

It may NOT be mounted vertically.
Securing the pump on a sloping platform causes the oil level to be read incorrectly.

In order to allow the product to cool adequately and to leave clear space for maintenance work, do not install the product in areas that are too narrow or difficult to access, and respect the following minimum distances:

X	**200 mm**	motor cooling
Z	**200 mm**	degreasing cartridge replacement
Q	**600 mm**	oil refill or replacement
Y	**150 mm**	oil tank cooling
W	**150 mm**	motor/pump cooling





Connection of the systems

SUCTION (IN): Connect the suction pipe to the system using suitable hoses or rigid pipes. In order to not reduce the flow rate, it is important that the diameter of the piping connected to the system is equal or greater than the diameter of the suction hole.
Make sure that the connections are sealed using Teflon tape or commercial sealant (Loctite).
Make sure that the suction line is perfectly sealed to avoid leaks and subsequent reduction of the vacuum degree.

ATTENTION: The inlet pressure (IN) should not be above the atmospheric pressure (1.013 mbar).

OUTLET (OUT): When air or inert gases are aspirated it is not necessary to connect the outlet to the venting system; on the other hand, this connection is necessary for the suction of toxic and harmful gases and fumes.
Any piping attached to the outlet for conveying the aspirated gases should have a diameter equal to or greater than the diameter of the outlet hole; if not, the pump will pressurize and the electrical absorption of the motor will increase. Before start up carefully check the piping in order to exclude any obstructions or constrictions. The maximum backpressure allowed on the outlet is approximately 0.6 bar.

ELECTRICAL SYSTEM: The THREE-PHASE electric motor must be connected according to the voltage available, for example:

230 Volt a Δ (delta) - 400 Volt a Y (star)

- Check the correct oil level and resupply necessary.
- Check that the rotation direction of the pump is the one indicated by the arrow on the motor; if this is not, reverse the polarity.

Prolonged use in the wrong direction of rotation damages the pump.

- Re-check the oil level after around ten minutes of operation.

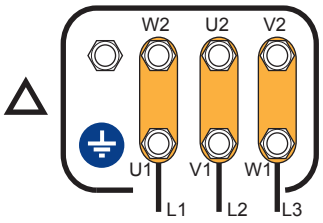
Carry out the earth connection

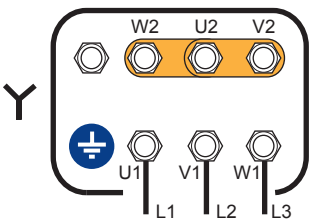
Note: For models equipped with single-phase electric motor, the connection requires no special operations.

However, be careful and follow all safety instructions.

RESUPPLY OF OIL: The pump is normally delivered without lubricating oil. Before start up it is necessary to resupply the pump with the type and quantity of oil indicated in the technical data depending on the model purchased.

The installation of a motor protection (thermal relay, automatic circuit breaker, etc.) is recommended in order to prevent damage to the pump in the event of overheating or overloading .





- Operation -

The oil bath or oil recirculation vacuum pumps can pump both non-condensable and condensable gases.

Suction of condensable gases

In a pump with oil recirculation lubrication, an increase of the oil level in the tank can be a sign of the presence or excess of condensable gases.

The presence of condensables gases inside the pump can cause its components to corrode as well as a residual risk to the operators.

Work cycle

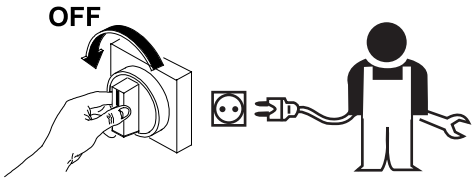
It is recommended not to exceed a maximum of 10 start ups/hour.
In case of heavier work cycles, it is recommended that the pump is left to run continuously and an electrically or pneumatically controlled valve is installed on the suction line.

At the end of the work cycle, it is recommended that you leave the pump to run for around five minutes with the suction hole closed in order to get rid of the condensables in the pump.

- Maintenance -

GENERAL CONDITIONS

The maintenance operations must only be performed by specialized personnel with the power disconnected.



There are two levels of maintenance:
STANDARD MAINTENANCE: it does not require any particular knowledge about the product.
TECHNICAL OPERATIONS: they require a deeper knowledge about the product or similar equipment, knowledge of the scope of application of the system to which the product is connected, ability to interpret technical diagrams and drawings, and tools or equipment that are not normally used in workshops.

The frequency of the described operations is indicative and can be applied to pumps used under normal conditions.

Use the personal protective equipment made available by the employer (gloves, goggles, etc.).
In particular after using the pump for the suction of harmful gases or substances.

If the pump is used for the pumping of gases or corrosive and/or toxic substances, after use wash it immediately to avoid corrosion.

If the pump is sent to the manufacturer for maintenance, indicate any use of harmful gases or substances.

The Manufacturer shall not be held liable for the non-respect of the maintenance cycles or for the use of lubricants with characteristics that are not compatible with those recommended.

Avoid any temporary and unstable repairs; all repairs must be carried out using exclusively original spare parts.

Decommissioning, dismantling, or scrapping of the machine

- Disconnect the energy supply lines: electrical, suctioning, ejecting, etc.
- Empty the oil tank of harmful substances.
- Eliminate any stored voltages and/or residual energy.
- Dispose of the various types of materials that make up the parts of the machine via dumpsites that are suitable for this purpose:

The Client shall provide for the disposal of the product and of the material used during its useful life (oil, filtering elements, etc. ...) so as to not generate environmental pollution.

The Manufacturer shall not be held liable for any damage caused to the environment, for the methods used for the disposal of the product and the material used during its life or for any other substance, agent or material to be disposed of according to the laws and regulations in force in the country of destination.

ROUTINE MAINTENANCE

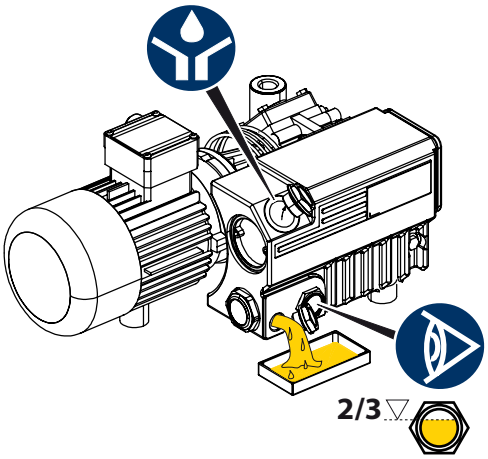
Checking the oil level and/or replacing the oil

The oil level must be checked when the pump is running.
The oil level must reach approximately half of the visual inspection glass. If necessary turn off the pump and refill up to **2/3 of one of the inspection windows**. Too much oil in the tank or too much lubrication to the pump can generate fumes and possible breakage to mechanical parts. Before filling it up, make sure the oil in the tank is transparent and clean; if this is not the case, replace it all.

The oil must be replaced while still hot and the pump is stopped.

Take care! The tank and oil can reach very high and dangerous temperatures.
Always use adequate protection devices and be particularly cautious.

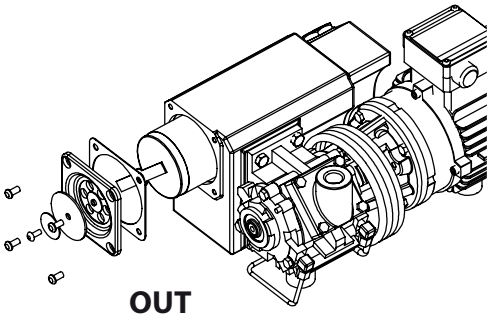
WARNING: Depending on the gas aspirated from the pump some harmful substances can be escape from the pump and/or hot oil.
Take the necessary precautions



- Remove the outlet tank cap and collect the oil in a suitable container.
- After discharging the majority of the exhausted oil, screw the outlet cap back on and start up the pump for approximately ten seconds.
- Empty the tank completely by removing the outlet cap again.
- Screw the outlet cap on and tighten it sufficiently after checking the conditions of its sealing ring and replacing it if necessary.
- Remove the oil loading cap and sufficiently refill the tank according to quantity of oil outlined for Your model; see technical data.

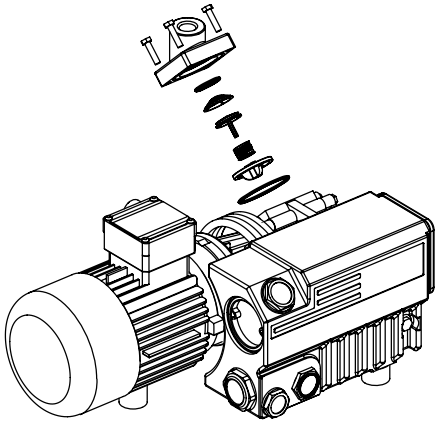
Replacing the degreasing cartridge

- Unscrew the screws and remove the OUTLET **OUT** flange and the relative sealing ring.
- Loosen the screw that holds the degreasing cartridge, remove the spring that holds it into position and extract the cartridge.
- Install the new degreasing cartridge making sure to position it correctly.
- Re-close and secure the OUTLET **OUT** flange paying attention to its sealing ring.



Cleaning or replacing the check valve

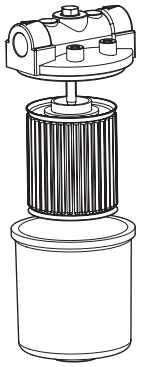
- Remove the screws located near the suction hole in the upper part of the pump.
- Remove the cover that contains the stainless steel mesh filter, which protects the check valve.
- Check the conditions of the gasket below the cover and replace if necessary.
- Remove the rubber membrane of the check valve and the relative spring and clean with a neutral detergent.
- If the membrane shows indentations or tears, replace it.
- Clean the mesh inside the cover with compressed air.
- Reassemble the pump reversing the sequence above.



Cleaning or replacing the suction filter cartridge

- Remove the bowl or cover of the suction filter depending on the model (OPTIONAL).
- Open and clean the filter cartridge or bowl with the compressed air and replace the filter cartridge if necessary.

FB



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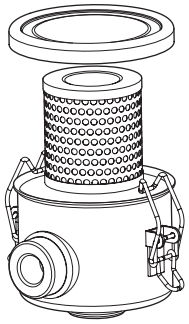


TECHNICAL OPERATIONS

Replacing the vanes

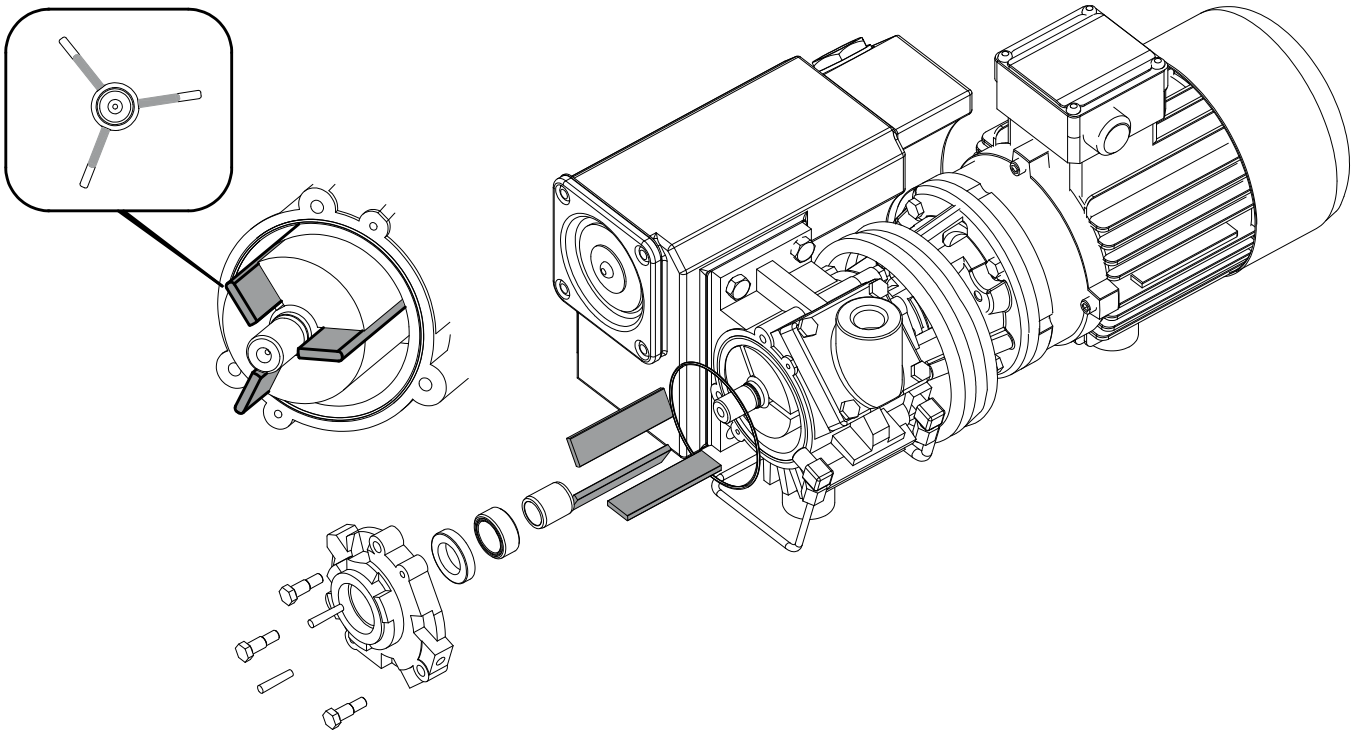
- Loosen the oil recovery pipe on flange side.
- Unscrew the cap and remove it.
- Remove the securing screws of the flange and remove it paying attention to the sealing ring below.
- Remove the rotor bearing.
- Remove the worn vanes paying attention to the direction of the beveling.
- Carefully clean the inside of the stator and the vane slots located in the rotor using solvent, then dry with compressed air.
- Insert the new vanes (equal to the original ones) making sure they slide freely in their slots without excessive backlash; if necessary, grind them gently using abrasive cloth and lubricate with the same type of oil as the pump.
- Reassemble the rotor bearing.
- Re-close the flange previously dismantled on the stator by inserting the sealing ring (if it is still in a good state) between the two contact surfaces . If needed, replacing the ring with a new one.
- Tighten the fixing screws of the flange.
- Reassemble all the components reversing the sequence above.

Attention: *when reassembling the vanes you must position them with the bevel in the original direction.*

The pump is now ready to start running again.

ATTENTION: Depending on the aspirated gas, some harmful substances and/or hot oil can escape from the pump. Take the necessary precautions.

ATTENTION:
In order to remove the components only use tools made of brass or aluminium. Do not use screwdrivers or other steel equipment.
When dismantling pay attention to the sequence of components. Some components can slip out and fall if not correctly dismantled, take care not to damage them and always use protective devices



Replacing the pump, coupling or motor

The pump module is always supplied with the relative kit of gaskets that need to be replaced.
After having disconnected the oil recovery pipe and all the other electrical, fluid and mechanical connections, position the pump on an adequate work bench and remove the components as needed:

Pump

- Unscrew the cap and remove it.
- Discharge all the oil from the tank (see relevant chapter).
- Disconnect the oil, injection and recovery pipes.
- Unscrew the screws connecting the pump to the tank, paying attention to the seal between the two elements.
- Unscrew the pump fixing screws and remove it.
- In removing the pump, half of the elastic coupling can remain on the pump shaft. Be careful not to drop it.
- Thoroughly check all the disassembled parts taking particular care over the gaskets and to the elastic transmission coupling. Replace any damaged or worn parts.
- Reassemble the pump reversing the sequence above.
- Reload the oil in the tank, from the cap above (see the relevant chapter).

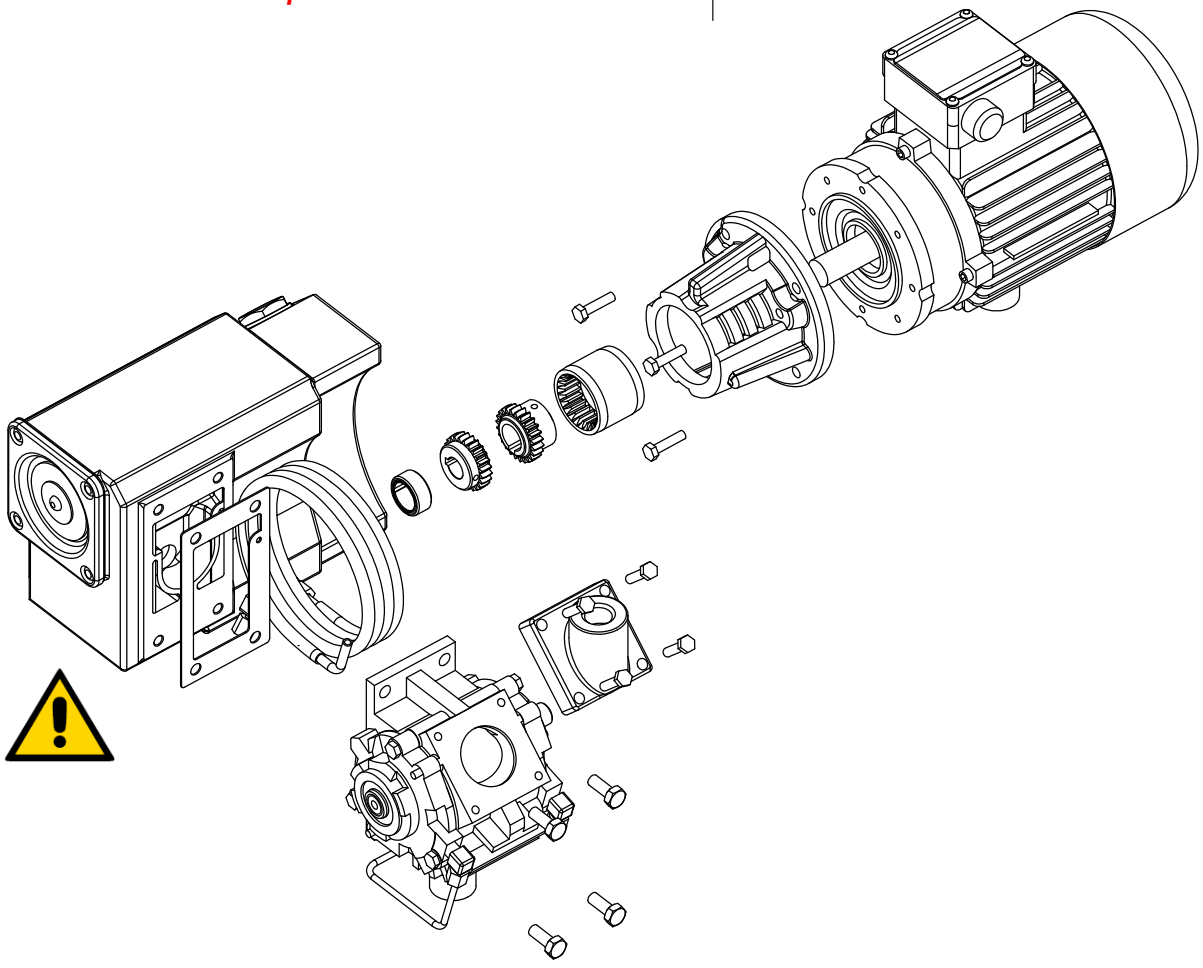
Coupling

- After removing the pump, remove the other half of the elastic coupling and the elastic ring

Motor

- Once removed the pump and the elastic coupling, remove also the motor.
- Unscrew the external motor fixing screws and remove the motor.

Removing these screws the motor is completely free. Be careful not to drop it.



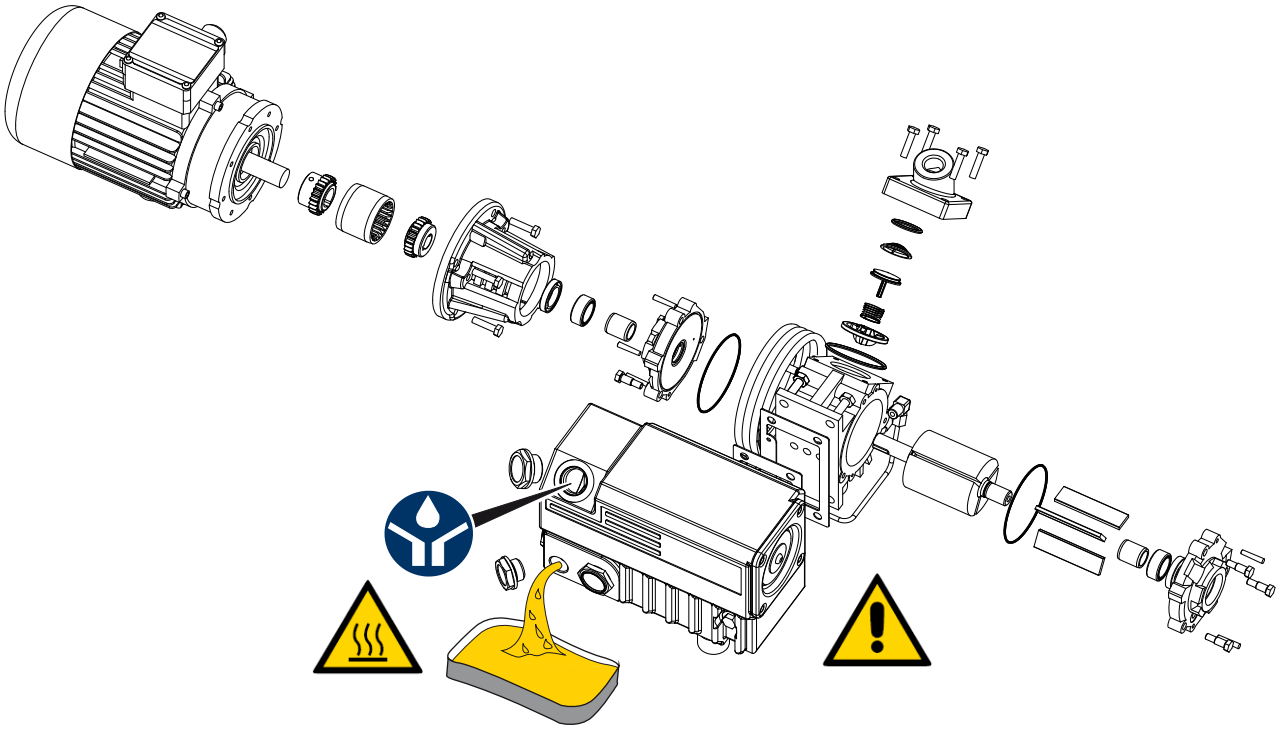
Replace the internal parts of the pump

The operations described below require the following spare part kits:
- Sealing kit;
- Vane kit;

After removing the pump from the body and from the oil tank as described in the paragraph **Replacing the pump, coupling or motor**, remove the key and the half coupling attached to the pump.
- Remove both the front and back closing flanges.
- Get rid of the two sealing rings and of the gasket for the connection to the tank, that you will then replace.
- Extract the rotor from the stator and remove the worn vanes.
- From the front and back closing flanges, extract the sealing rings and bearings.
- Check that the steel or spacer rings located on the rotor shaft are not worn in correspondence with the work area of the bearings and that there are no indentations in the sealing area of the gaskets.

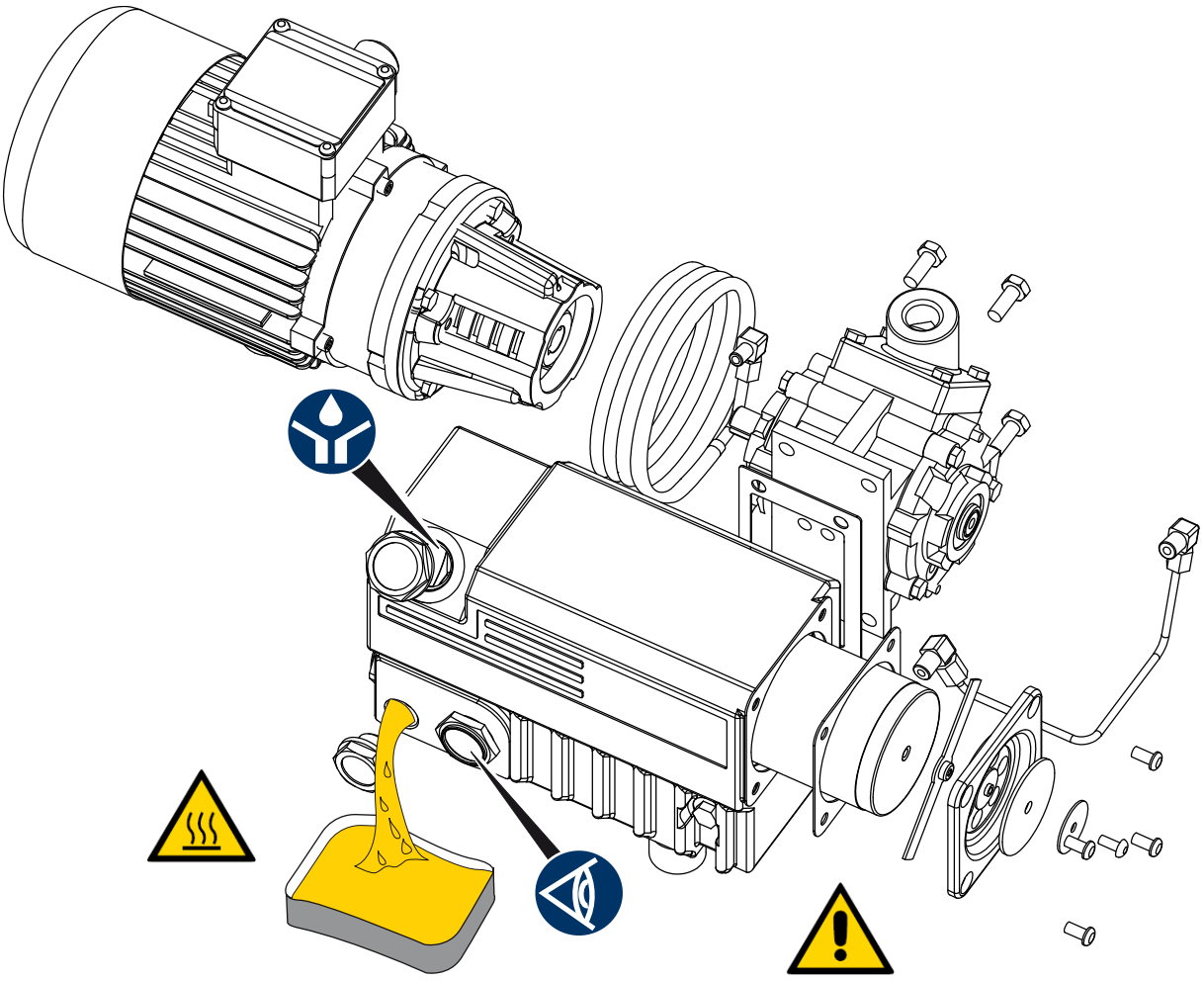
In case of such damages, replace the rotor, because the replacement of the rings is not recommended.

- Remove the cover containing the stainless steel mesh filter that protects the check valve, as described in the paragraph **Cleaning or replacing the check valve**.
- Carefully clean the disassembled parts with suitable solvents, dry with compressed air and lubricate.
- Carefully check the conditions of all the components and in case of evident signs of wear or indentation, replace the stator and the closure flanges.
- Reassemble the pump reversing the sequence above.



Cleaning the tank and oil recovery piping

- Completely drain the oil contained in the tank as described in the paragraph **Checking the oil level and/or replacing the oil**.
- Remove the degreasing cartridge as described in the paragraph **Replacing the degreasing cartridge**.
- Disconnect the oil recovery pipe and the other connections.
- Remove the pump from the tank, acting on the fixing screws.
- Clean inside the tank with adequate solvent.
- Reassemble the tank with the pump after having checked that the relative gasket is integral (replace it if needed).
- Reassemble everything reversing the sequence above.



PLANNED MAINTENANCE

Maintenance check or technical intervention		Frequency in operating hours (h)
Check of oil level	◉	**24 h**
First oil replacement	◉	**150 h** dopo l'avviamento
Standard replacement of oil	◉	**200 h ÷ 1.000 h**
Replacement of degreasing cartridge		**200 h ÷ 2.000 h**
Oil tank cleaning		**200 h ÷ 2.000 h**
Cleaning of check valve		**600 h**
Cleaning of suction filter (if installed)		**40 h**
Replacement of suction filter cartridge (if installed)		
in treated paper		**2.000 h**
in stainless steel mesh		**4.000 h**
Replacement of the rotor vanes		**10.000 h ÷ 12.000 h**
General review of the pump		**15.000 h ÷ 20.000 h**

The frequencies depend on the type of use of the pump. For heavy operating conditions or in dusty atmospheres, aspirating air rich in polluting substances or gases, the maintenance intervals must be shorter; when aspirating dry and clean air use, maintenance intervals can be longer.

Type of lubricant

◉ Lubricant oil for air compressors formulated with paraffin bases.

Mineral oil ISO 68

DIAGNOSIS

Problem	Cause	Remedy
Failed start up	No voltage	Check the power cutoff switch and the connections
	Electrical connection incorrect	Connect correctly
	Motor protection not adjusted or inadequate	Adjust or replace the thermal relay
	Inadequate voltage	Replace the motor
	Transmission elastic coupling broken	Replace elastic coupling
	Clogging of the outlet filter (degreasing filter) or of piping	Replace the degreasing cartridge, the filter and clean the piping
	Burnt motor	Replace the motor
	Pump jamming	Repair the pump
Vacuum degree too low	Piping for connection to the system damaged or not correctly tightened and/or clogged	Control the system, the suction and outlet hole
	Clogged filters or cartridges	Clean or replace the filters or cartridges
The period to reach vacuum has been too long	Obstruction of the suction filter	Clean the filter
	Dirty or damaged check valve	Clean or replace the check valve
	Clogged outlet filter	Replace the degreasing cartridge
	Inadequate or long connection lines	Use suitable piping
Reduction of the value of the vacuum while the pump is stopped	Leak in the system	Control the piping
	Check clogged or damaged valve	Check the check valve
Pump at temperatures above 90 °C and system not consuming	Installation of the pump inadequate	Check the position of the pump
	Fan protective casing obstructed	Clean the casing
	High ambient temperature	Check the operation data
	Aspirated gas too hot	Check the operation data
	Oil level low	Check the level
	Oil unsuitable	Replace the oil
	Oil feed piping clogged	Clean the piping and/or the tank
	Outlet filter clogged (degreasing cartridge)	Replace the degreasing cartridge
	Pump jammed	Repair the pump
Oil in the vacuum system	Dirty or damaged check valve	Clean or replace the check valve
	Oil level too high	Check the oil level
Turbid oil	Presence of foreign liquids in the oil	Degas the oil
Noisy pump	Low oil level	Check the level
	Worn vanes	Replace the vanes
	Cooling fan damaged	Replace the cooling fan
	Elastic insert of the transmission coupling worn	Replace elastic insert
	Excessive wear of the bearings	Replace the bearings
Noise due to inadequate lubrication	Oil not suitable or contaminated	Replace the oil and degas it if necessary
	Feed piping oil obstructed	Clean the piping and the tank
Expel the fumes and oil from the outlet	Nozzle or oil recovery piping clogged	Clean the oil recovery pipe
	Oil too fluid	Replace the oil
	Outlet filter clogged (degreasing cartridge)	Replace the degreasing cartridge

Spare parts request form

To request spare parts please mention:
- Type of machine
- Serial number
- Document, page and number of spare part **(*)**
- Item description
- Quantity
- For the electric material mention moreover:
  the voltage (Volt) and the frequency (Hz)

Use only original spare parts to benefit from the guarantee.

Customer data:
Company: .....
.....
Address: .....
.....
Person in charge: .....
Telephone/Fax: .....
E-mail: .....

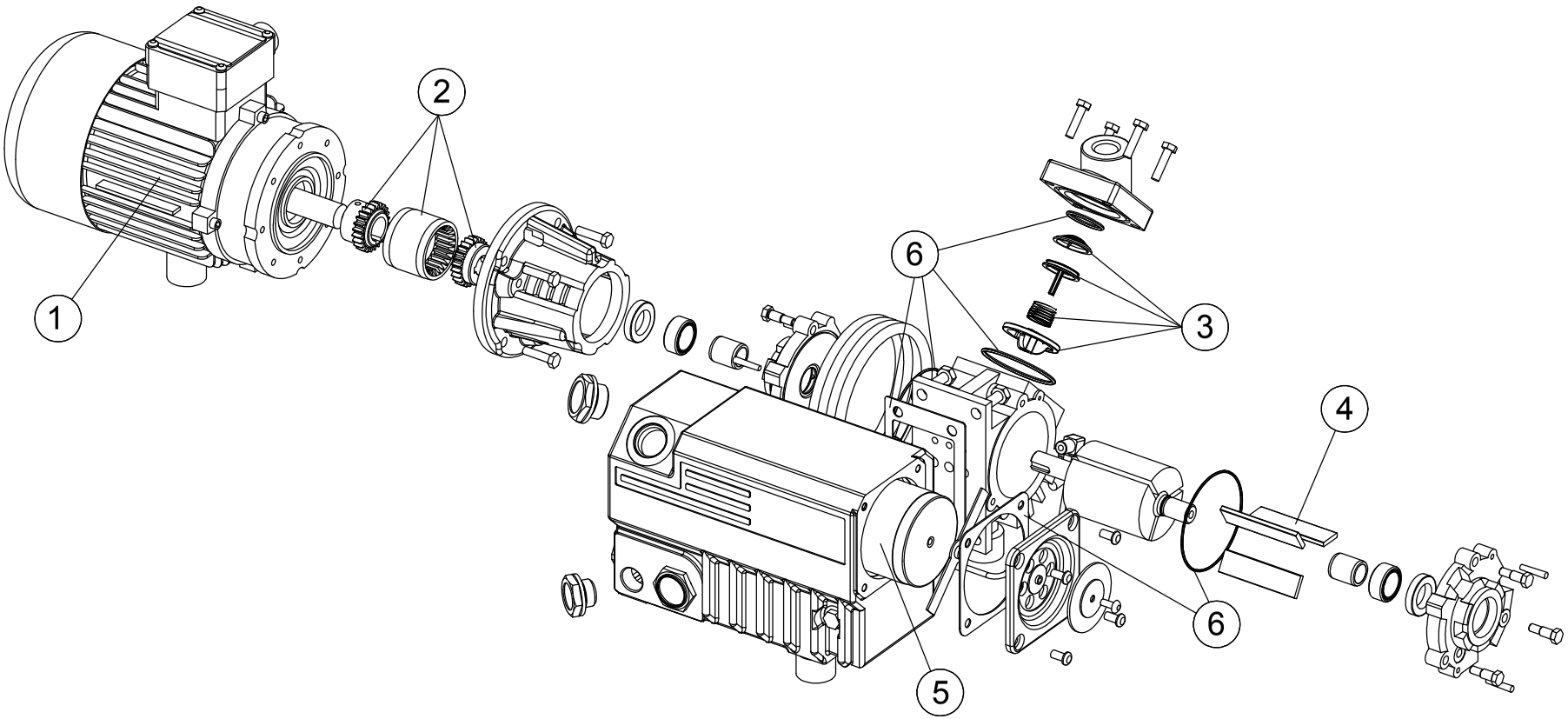
Type of machine:

Serial number:

Voltage: **Frequency:**

Item references (*)	Item description	Quantity

Components drawing



Components list

Pos.	Cod.	Descrizione/ Type	Q.tà	Description	Designation	Benennung	Denominacion
01	00 RVP 21 01	MOTORE ELETTRICO	1	ELECTRIC MOTOR	MOTEUR ELECTRIQUE	ELEKTROMOTOR	MOTOR ELECTRICO
02	00 RVP 21 02	GIUNTO	1	COUPLING	JOINT	KUPPLUNG	EMPALME
03	00 RVP 21 03	VALVOLA DI RITEGNO	1	CHECK VALVE	SOUPAPE DE RETENUE	ABSPERRVENTIL	VALVULA DE RETENCION
04	00 RVP 21 04	PALETTA IN FIBRA	3	FIBER PALLET	PALETTE DE FIBRE	FLÜGELFIBER	PALETA DE FIBRA
05	00 RVP 21 05	CARTUCCIA DISOLEATRICE	1	DEOILING CARTRIDGE	CARTOUCHE DE DÉSHUILAGE	ENTÖLUNG PATRONE	CARTUCHO DE DESACEITACIÓN
06	00 RVP 21 06	GUARNIZIONE - KIT -	1	SEAL	JOINT	DICHTUNG	JUNTA

MACHINE/MANUAL ACCEPTANCE REPORT

Operators are required to read and correctly interpret all the informations in the instructions or Operation and Maintenance Book.

With this report the Customer accepts the machine and the manual and declares as clear and comprehensive the informations received, for every operation phase and any residual risks.

Machine/Type:

Serial Number:

Performed activity description	Operator signature	Date

LIABILITY DISCLAIMER

The Customer can NOT request waiver of liability in the following cases: the request violates security rules; in case of negligence or willful default; in case of serious fault of the operator.
Any waiver of liability resulting from misinterpretation or negligence in accordance with the given instructions is NOT allowed.
If for any reason, logical and legitimate, one or more operators do not want to take over the responsibilities arising out from the safe use of the machine, they must not to use the machine and must contact the manufacturer for any questions and where possible remedies to problems or safety.
The manufacturer does not accept any indemnity or exemption from liability by the Customer unless fully justified and motivated.

Division Manager Signature:

Professional Assignment:

Manufacturer Personnel: