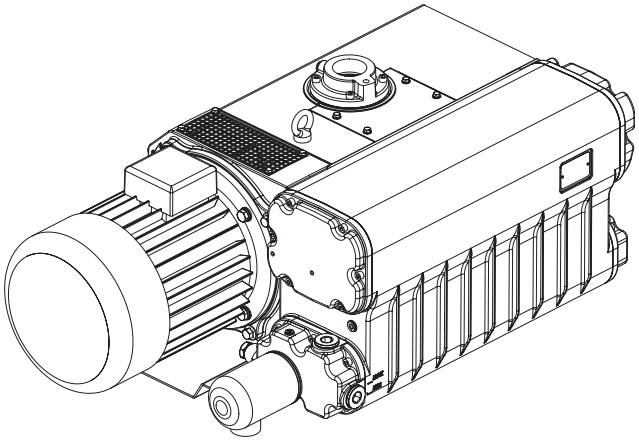
PVR
VACUUMDESIGN

EU 205 - EU 205/B
EU 300 - EU 300/B

Lubricated vane vacuum pump



Operating and maintenance instructions

Publication Number:
LI 1586.03 January 2020

EN
TRANSLATION

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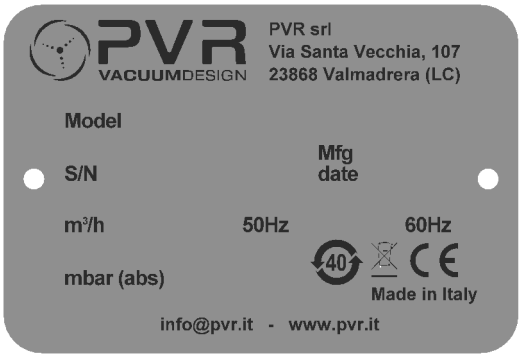
1. General information

This manual contains information necessary for the proper operation of the pump in order to prevent unsuitable use and for the safety of the operators. Do not attempt any other type of operation without having first contacted our **Service Department**. The information provided herewith does not intend to replace, integrate or change any rules, regulations, law by decree, directive or law of specific character in force in the Country where the installation takes place.
The suggestions given to the staff engaged in the installation and servicing assumes that the personnel is expert and prepared in facing any problem of servicing, both mechanical and electrical. For any questions or information not included in this manual, please contact our Service Department, always providing: model (Model), serial number (Serial), year of manufacture, stated on the pump name plate.



Symbols used:

WARNING:
Instructions that, if not followed, could result in serious personal injuries.

NOTE:
Instructions that, if not followed, could result in pump damages.

HOT SURFACES

HARMFUL SUBSTANCES EMISSIONS

DO NOT DISPOSE INTO THE ENVIRONMENT

ELECTRIC SAFETY

FIRE HAZARD

READ THE OPERATING INSTRUCTIONS

INLET PORT

EXHAUST PORT

DISPOSAL

2. Product specifications

2.1 Pump description

EU 205 - EU 300 pumps are single-stage, rotary vane lubricated vacuum pumps, with oil recirculation.

The flanged electric motor is coupled by means of an elastic coupling.

Cooling is achieved by means of an air/oil cooler and a centrifugal fan.

At the pump inlet there is a mesh filter in order to protect it from solid parts having diameter larger than 1.5 mm.

Furthermore, an integrated non-return valve prevents the oil coming back and the return of air in the chamber to be pumped down during the stop phase.

In the tank there is a system of oil smokes separation from the discharged air (maximum residual 2PPM/weight corresponding to 2.4 mg/m^3).

The separated oil is recovered automatically by the pump.

The gas ballast valve prevent condensation inside the pump when pumping down small quantity of vapour.

2.2 Expected use

These vacuum pumps have been designed to handle air and small quantity of water vapour only. They are suitable to evacuate closed systems or to operate at a constant vacuum within the following vacuum range:

EU205 - EU300 from 0.5 to 300 mbar (absolute)
EU205/B - EU300/B from 10 to 850 mbar (absolute)

The ambient temperature and the inlet temperatures must be included between 12° and 40°C.
In case you get temperatures outside this range, please get in touch with us.
Handling of other types of gas or vapours must be declared in advance to PVR that will give the conformity to the specific use.

2.3 Forbidden use

WARNING:
The pump MUST NOT handle:
- **liquids or solid substances;**
- **dangerous, explosive or aggressive gases and vapours;**
- **pure oxygen or air mixtures enriched with oxygen;**

It is forbidden to use the discharge of the pump to create even limited pressures.

WARNING:
It is forbidden to install the pump in a potentially explosive environment.

2.4 Protections

The pump must be protected against suction of dust, solids or liquids.
For those applications where such a protection is not ensured, a vacuum gauge must be installed on the oil tank for a visual check of the exhaust filter clogging.

In order to get an automatic pump stop, a pressure switch set at 0.6 bar can be installed. The pump is supplied without electric control panel. The electric motor must be protected according to the regulations in force.

WARNING:
In case of applications where the pump stop or failure can cause damages to people or things, safety measures for the system must be adopted.

2.5 Accessories

The following accessories useful for the installation and for the control of the operation parameters of the pump are available:
- external inlet filter
- connection fittings
- vacuum meters/ vacuum switches
- pressure meters/ pressure switches
- temperature switch
- low oil level switch

3. Safety rules

WARNING:
Despite of all the precautions adopted when designing the equipment, there are some risk elements that arise during operation and servicing.

HOT SURFACES
The temperature of the pump surfaces may exceed 80°C.
Install the pump in a protected area accessible only by authorized personnel, to prevent possible personal injures due to contact with hot surfaces.
The pump can be placed inside other machines by adopting the necessary safeguards.
Before carrying out any maintenance on the pump, be sure the pump is cold.

HARMFUL SUBSTANCES EMISSIONS
The discharged air contains part of traces of oil mist.
Check the compatibility with the environment.
Make sure a correct air change is allowed otherwise convey the pump discharge outside.
A failure or the seals wear can cause an oil leakage.
Avoid the dispersion to the ground and the pollution of other materials. In case that any air containing dangerous substances must be pumped down (for example, biological or microbiological agents), make sure to adopt filtering systems before introducing air in the work environment.
Used discharged oil from the pump must be disposed in accordance with the regulations in force in the Country of use.

Do not dispose into the environment. 

HAZARD CAUSED BY VACUUM
Any contact with parts under vacuum can cause injuries.
Avoid any contact with the pump inlet port during the pump operation. Introduce air in the inlet circuit before every operation cycle.

HAZARD CAUSED BY PRESSURE
The pump tank is pressurized. Do not open the oil filling and discharge plugs during operation.

FOR A SAFE MAINTENANCE
All maintenance operations must be carried out with the pump idle, disconnected from the electrical supply, with the pump cold, vented to atmospheric pressure. Prevent unexpected start-up (e.g. block the power switch with a personal lock).

ELECTRIC SAFETY

Some components of the electric equipment are electrically charged during operation. Any contact may cause serious injuries to persons or objects.
Connection and control of the electric system must be carried out by skilled personnel only.
The electrical equipment must comply with the EN 60204-1 standard and with any other law in force in the Country of use.
Besides, electrical equipment must comply with EN 61000-6-4 and EN 61000-6-2 standards concerning electromagnetic compatibility and electromagnetic immunity for industrial environment.

FIRE HAZARD

WARNING! The use of the pump in situations unforeseen or not recommended by this manual, as well as lack of correct maintenance, may create high risks for overheating or fire.
In case of a fire do not use water to extinguish but use a powder CO_2 extinguisher or other means compatible with the electrical equipment and lubricating oil.

4. Transport/handling

4.1 Lifting

The orientation of the packed components must correspond to the instructions given by the pictograms on the external covering of the packaging.
For unloading use a lifting equipment suitable for the pump weight.
For lifting the packaging and the pump, please refer to the figures here below.
Pump packaged (Figure 1)
Pump with motor (Figure 2).
Pump without motor (Figure 3).

	L	B	H
Packing size	1140 mm	630 mm	660 mm

EU 205	Pump	Packaged pump
Weight of the pump with motor 50Hz	161 Kg	184 Kg
Weight of the pump with motor 60Hz	188 Kg	211 Kg
Weight of the pump without motor	126 Kg	149 Kg

EU 300	Pump	Packaged pump
Weight of the pump with motor 50Hz	171 Kg	194 Kg
Weight of the pump with motor 60Hz	192 Kg	215 Kg
Weight of the pump without motor	141 Kg	164 Kg

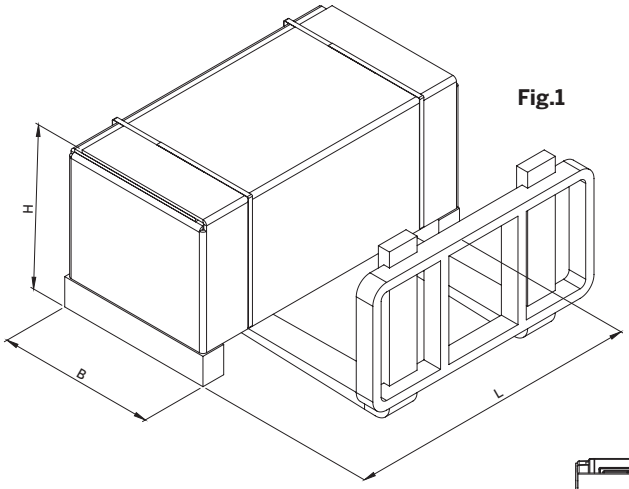


Fig.1

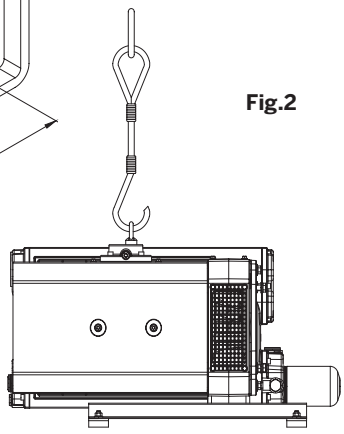


Fig.2

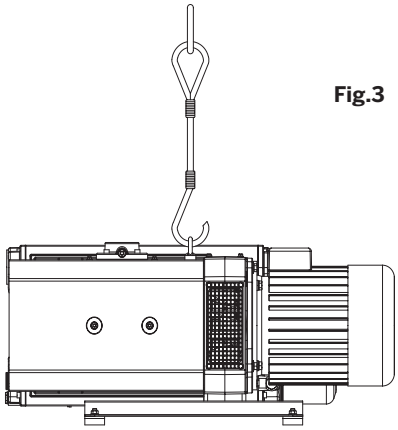


Fig.3

4.2 Unpacking and components control

When receiving the machine, check that the packaging is intact or shows any signs of damages occurred during transportation. If there is no damage, proceed to the unpacking and check the machine further. In case of damages are found, inform immediately PVR and the carrier. A representative will contact you or it may be dispatched to the site to inspect and file full damage report.

4.3 Storage

The pumps must be stored or transported without oil and protected from the atmospheric agents at a temperature between -15°C and 70°C (normal humidity rate max. 95% non condensing).

5. Installation and operation

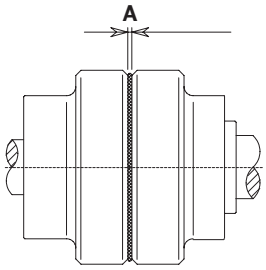
5.1 Assembly

If the pump is supplied without any electric motor, install a motor whose characteristics are the same as stated on the technical sheet, constructive form IM B 5.

WARNING:
- Use lifting equipment suitable for the motor weight (between 30 and 50 Kg depending on the versions)
- To assure the continuity of the equipotential circuit of the pump, clean the contact surfaces very well, by removing any grease or protective painting.

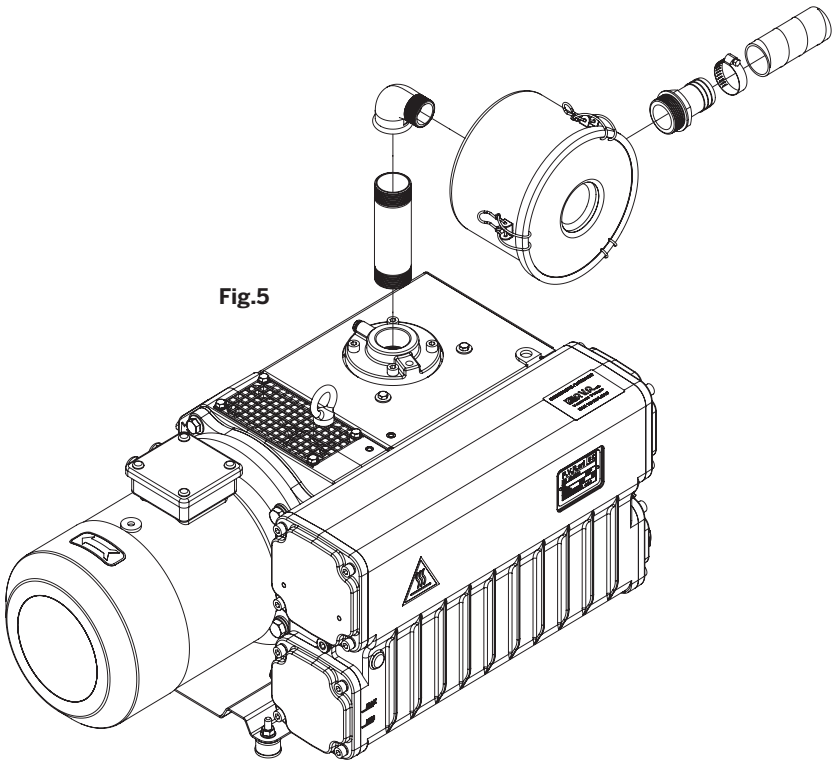
NOTE:
After the assembly, check that the distance between the two coupling halves is 3,5±1 mm (Figure 4)

Fig.4



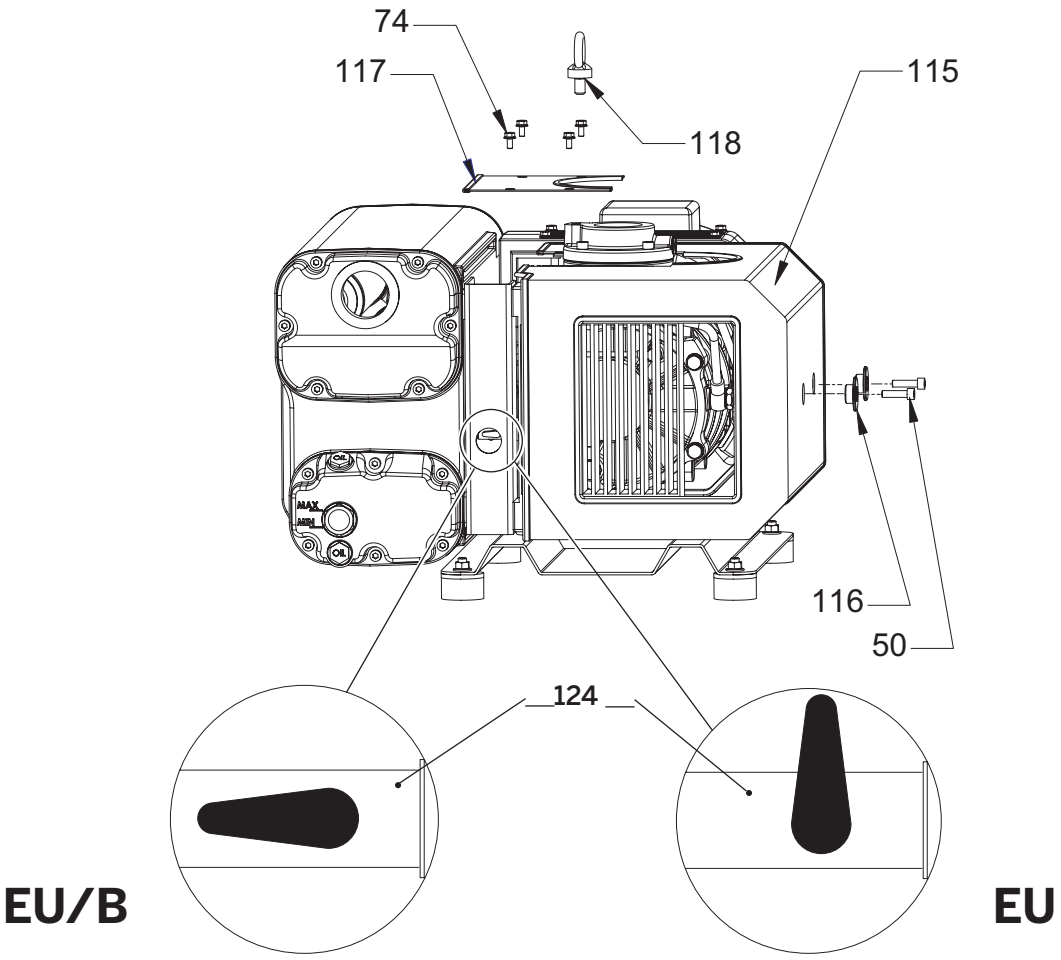
Remove inlet and exhaust plastic caps.
Fit the external filter in horizontal position to prevent dirt coming inside the pump during the cleaning of the cartridge. (Figure.5)

Fig.5



5.2 Operating vacuum range changing

Pumps of EU205 - EU300 series are fitted with a manual selector switch for the choice of the suitable working vacuum range:
· EU from 0.5 to 300 mbar
· EU/B from 10 to 850 mbar
In case the pump working range needs to be changed, please follow the instructions (fig.3). Remove the casing (Pos.115) and its cover (Pos.117) by unscrewing the screws (Pos.50-74-118) until you can see the hole placed on the oil cooler support, from which you can get to the tap (Pos.124).
Position the selector switch vertical for the EU type, position it horizontal for the EU/B one. The predetermined vacuum range is the one stated on the pump name plate.



5.3 Location

WARNING:

- The pump must be installed in a protected area (see safety rules).
- It must be fastened with support feet on horizontal surface.
- It must be accessible for correct and easy maintenance, by respecting the minimum distances from possible obstructions (see figure 6).
- It must be accessible to suitable lifting equipment.

NOTE:

- Ensure the air exchange in the room or inside the machine where the pump has been installed.
  To assure a sufficient cooling, avoid exceeding 40°C of ambient temperature.
- The pump must be protected against jets or sprays of water that may penetrate the tank through the exhaust port.
- Whenever the pump is installed outside, it must be protected against atmospheric agents and it must be used with an oil suitable for low temperature.
- Avoid warm air coming from the exhaust or the cooling fans causing discomfort to the personnel.
- Do not install the pump in a dusty area or where other materials may block or cover the cooling surfaces quickly.

A	B	C	D
300 mm	300 mm	100 mm	350 mm

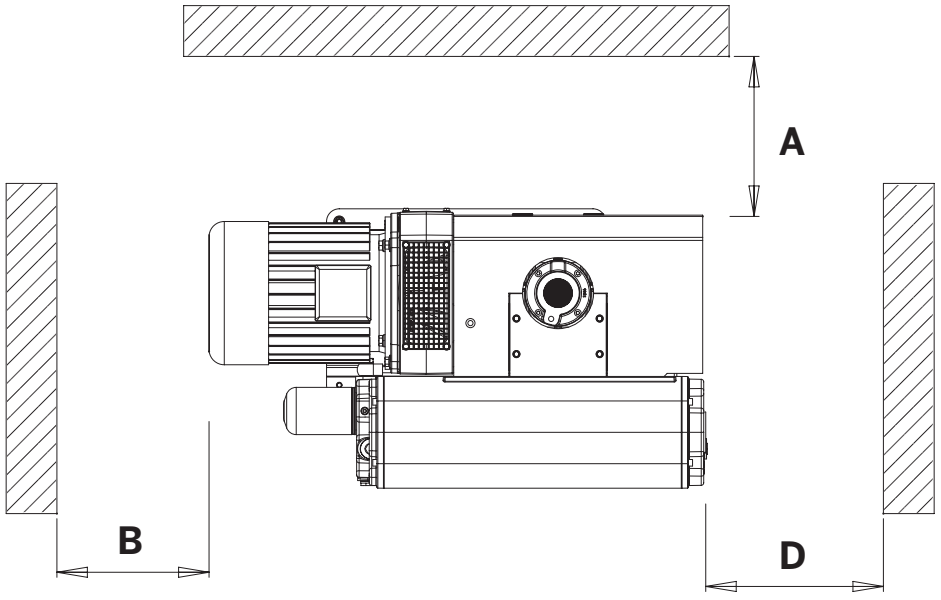


Fig.6

5.4 Connection to the machine

The connection to the chamber to be pumped down must be carried out by means of pipes of the same diameter as the inlet port.
Pipe weights and expansions, if any, must not rest on the pump.
It is advisable to make the final connection to the pump inlet port with flexible pipes or fittings.
It is important that all the pipes and the different fittings are tight.
Very long or small diameter pipes decrease the pump performances.

This symbol identifies the inlet port.

For further information, please refer to the RDT attached herewith.

5.5 Discharge air pipe line installation

- If the pump has been installed in a room with poor air exchange, it is possible to pipe the pump discharge air to other rooms or outside.
- Use pipes with the same diameter as the tank discharge port with a maximum length of 15 m.
  For longer pipes increase pipe diameter. Pipe weights must not rest on the pump.
  In the final length use flexible pipes or pipe fittings.

NOTE:
this pipe must be descending, to avoid the condensate going back to the tank.

WARNING:
do not connect ball valves to this pipeline.

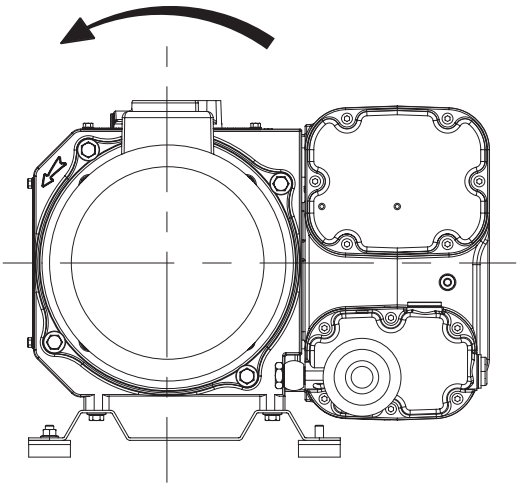
This symbol identifies the exhaust port.

For further information, please refer to the RDT attached herewith.

5.6 Electrical connection

- The control panel and electrical connections must be carried out by skilled personnel and conform to the EN 60204-1 rules or to other local regulations in the Country of use.
- The electrical equipment must comply with EN 61000-6-4 and EN 61000-6-2 standards concerning electromagnetic compatibility, emission standard and immunity for industrial environment.
- Check the main voltage and frequency in use to correspond to the data stamped on the motor name plate.
- The electric motor must be protected against overload. The full load amperage value on the motor name plate must be considered when sizing the electrical components and motor protection against overloading.
- Make sure the grounding is correctly done.
- Carry out the electric connection following the diagram shown on the motor terminal box.
- Check direction of rotation by starting the pump for a short time (2-3 seconds). The correct direction is shown by the arrow on the pump (figure 7). In case of wrong rotation, it is necessary to change the motor rotation by exchanging position of two of the three connections previously connected to the motor terminal box.

Fig.7



5.7 Commissioning

The pump is supplied without lubricating oil.

NOTE:
the operation without oil causes big damages to the pump.

Carry out the first filling up through the plug (E) up to the half of the sight glass (F) and close the plug (E) (Figure 8).
Start the pump and take it to the maximum vacuum level for at least 2 minutes. Stop the pump, check again the oil level and add the lacking oil, if necessary, in order to get the correct oil level.

NOTE:
a quantity of oil greater than necessary may clog the oil separator and damage the pump or the electric motor.

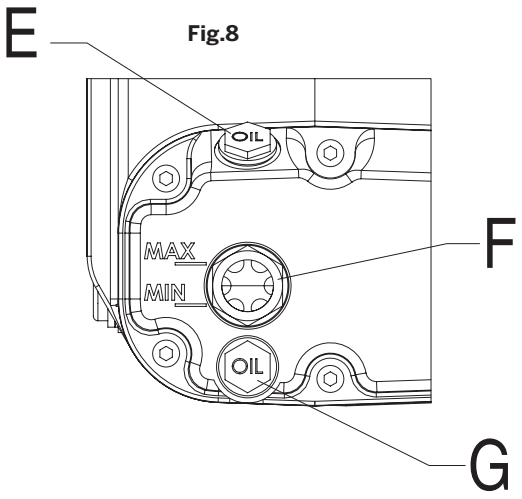


Fig.8

5.8 Tips for using

When the room temperature is lower than 10°C, it is a good practice to let the pump operate at the ultimate pressure (Inlet port closed, without load) for about 15 minutes. During this period the pump may not reach the stated pressure limits.

NOTE:
Avoid operating the pump for long periods with inlet port vented to atmospheric pressure.

Avoid frequent stop-starting, as this will lead to premature wear of the coupling elastic element.

It is recommended not to exceed 10 starting/hour. For more frequent starting, it is recommended to install a soft starter device.

5.9 Water vapour intake

In order to pump down any water vapour, the following operations are recommended:

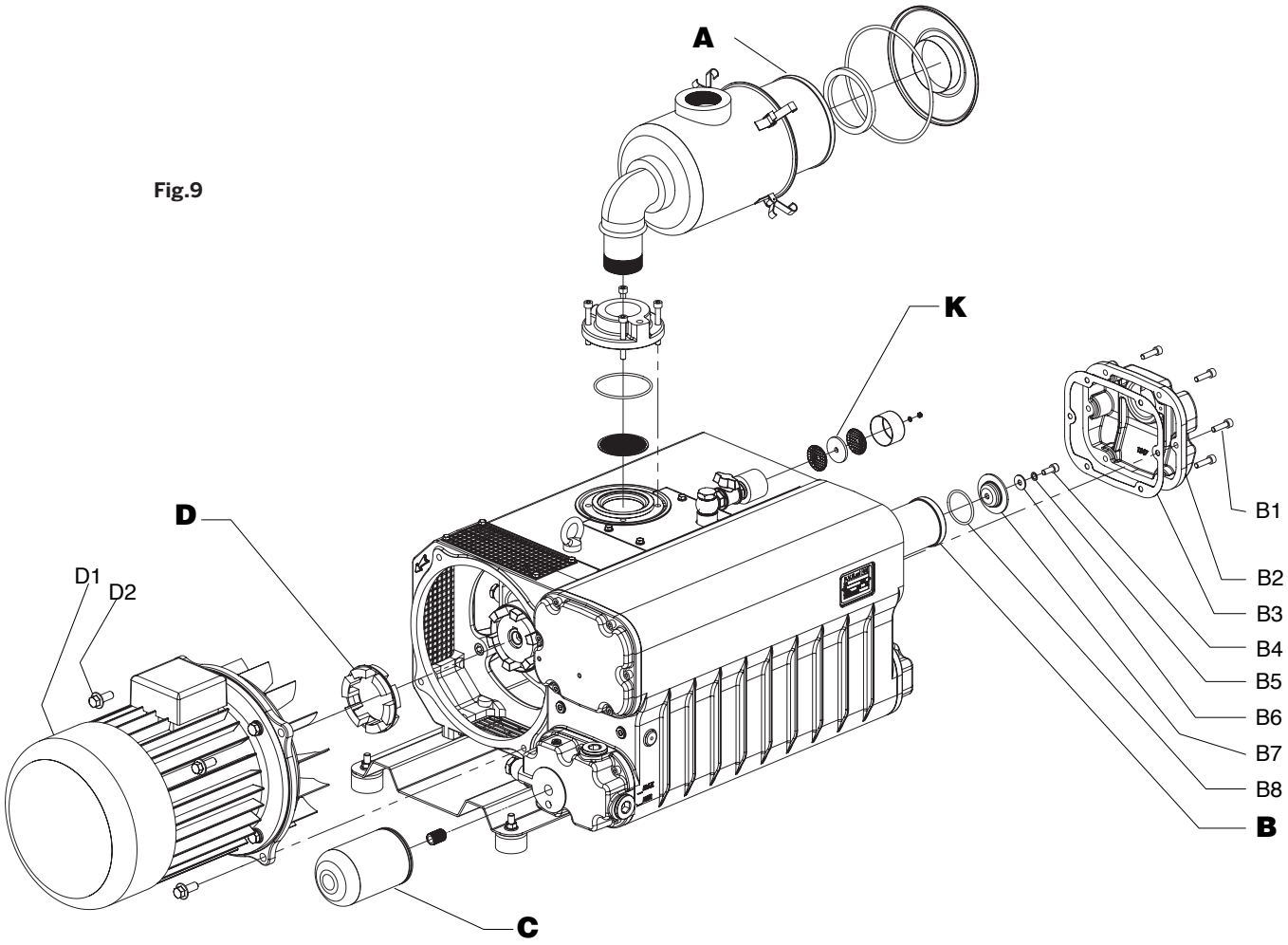
Let the pump run for thirty minutes at the maximum vacuum in order to bring the pump temperature to its operating value.

At the end of the working cycle, in case of further presence of condensate in the oil, let the pump run for at least thirty minutes at the maximum vacuum.

It is advisable to carry out this operation before stopping the pump for a long time. The gas ballast valve will allow the elimination of water condensate from the lubricating oil.

6. Servicing

Fig.9



6.1 General information

In order to keep the pump operating at a high efficiency level, it is mandatory to follow all periodical service points listed in the table below.However, more frequent service operations may be necessary depending on what the pump is used for (suction of condensable vapours, suction of powders or polluting substances).
For such cases, only direct experience can indicate the correct service frequency needed.
The exhausted oil and the replaced spare parts must be considered as special waste products and handled according to the local regulations in the Country of use.

WARNING:

Before every maintenance operation:

- **Always ensure that the pump is insulated from the electrical network so that it can't start automatically.**
- **Wait until the pump gets cool and make sure it has reached a non-dangerous temperature.**
- **Introduce air in the inlet circuit.**

SERVICING FREQUENCY	DESCRIPTION OF THE OPERATION	AUTHORIZED PERSONNEL
24 Hours/every day	Check oil level before starting.	**Operator**
100 Hours/every week	Clean the external inlet element with a blast of air (Figure 9 pos.A).	**Operator**
	Clean the cooling surfaces of the pump, of the oil cooler and of the electric motor with a blast of air.	**Operator**
500/1000* Hours/every 6 months	Change the lubricating oil (Figure 9 pos. C).	**Skilled Worker**
	If the pressure gauge is fitted to the pump, check the oil separator (max 0,6 bar), if necessary, replace it.	**Skilled Worker**
	Replace the gas-ballast felt disk (Figure 9 pos. K).	**Skilled Worker**
2000 Hours/every year	Replace the exhaust filters (Figure 8 pos.B).	**Skilled Worker**
	Check and if necessary replace the coupling elastic insert (Figure 9 pos. D).	**Skilled Worker**
	Check the electrical connections.	**Skilled Worker**
	Check functionality of the float valve and clean it.	**Skilled Worker**
8000 Hours/every 2 years	Grease electric motor bearings (if there is the grease slinger). Please refer to the electric motor name plate and/or motor manual.	**Skilled Worker**
30000 Hours/every 5 years	Pump overhaul.	**Customer Service**

* The first oil change has to be done after 500 hours of operation. If any polluting substances are found in the oil, next oil change could take place within 1000 hours.

6.2 Oil change

For a correct operation, oil change should be performed when the pump is still warm.

WARNING:
Use protective gloves to avoid injury caused by heat.

Please refer to Figure 8, section 5.6.Unscrew the oil filling plug (E) and the discharge plug (G) only after having placed underneath the pump tank a suitable container (proper size and shape) for collecting the total quantity of oil.
Once the oil in tank has completely been discharged from the tank, reassemble both plugs ("E" and "G") and let the pump run under vacuum for about one minute, so that the lubricating/cooling line gets emptied and any oil residual keeps inside the pump. Then remove the plugs and discharge the rest of the oil.
If the oil is polluted or if some water is in the oil, clean the pump by letting it run with a suitable quantity of oil (up to the minimum level shown on the tank) at maximum vacuum level for at least 5 minutes.
Drain the oil again.
Replace the oil filter Figure 9 (pos. C) and follow up to fill with fresh oil (please see "commissioning" and "recommended oil table").

6.3 Coupling elastic element replacement

Please refer to Figure 9.
Remove the motor assembly (pos. D1) unscrewing the screws (pos. D2). Check the elastic element (pos. D) conditions. If necessary, replace it. Reassemble by means of the screws.

WARNING:
please use suitable lifting equipment.
Weight expected for the electric motor between 30 and 50 Kg depending on the versions.

NOTE:
the operation with damaged elastic element causes an anomalous pump noise, especially when starting the pump and may lead to coupling and pump shaft failure.

6.4 Exhaust filters replacement

Very dirty exhaust filters may cause a considerable pump temperature increase and in extreme cases oil lubricant spontaneous ignition.
Maximum allowed pressure in the tank is 0,6 bar measured at the maximum capacity (when the pump is working with the inlet open to atmospheric pressure).
If a pressure gauge has been fitted to the tank, check the exhaust filter blockage with the pump warm.
To replace the filter, remove the cover (pos. B2) by unscrewing its screws (pos. B1).
Unscrew the screw (pos. B4), remove the washers (pos. B5-B6) and then the fixing cartridge disk (pos. B7).
Replace all the exhaust filters (pos. B) and their O Rings (pos. B8). Reassemble the fixing cartridge disk, the washers and tighten the screws.
Reassemble the discharge cover. If necessary, replace the gasket (pos. B3).

6.5 Spares necessary for the normal servicing

The recommended spares are shown in the list of the exploded drawing marked with the letter "R" (see RDT). They are contained in the minor spare parts kit.

6.6 Pump overhaul

For this operation please request the proper instructions and direct any questions to our Customer Service department. The overhaul consists of a complete disassembly, cleaning of all components as well as replacement of parts that are subject to wear (pump and motor bearings, vanes and gaskets).

6.7 How to order spare parts

When ordering spare parts, always state the pump model, serial number, year of production, electric motor characteristics (manufacturer's name, model, kW, V, Hz), position reference on the spare parts list, description and quantity needed.
Different types of maintenance kits are available (ref. RDT attachment).

7. Lubricants

Oil recommended for generic use		
Mineral oil for compressors according to DIN 51506 group VC-VCL or VDL classification ISO L-DAG.		
Ambient temperature	**Viscosity**	**PVR oil**
12 - 40°C	ISO 100	Rotant VF 204
5 - 30°C	ISO 68	Rotant VF 203

Oil recommended for heavy duty, both for high and low temperatures.		
Synthetic oil on PAO basis (polyalphaolefins).		
Ambient temperature	**Viscosity**	**PVR oil**
5 - 40°C	ISO 100	Rotant VF 304
0 - 30°C	ISO 68	Rotant VF 303

Oil recommended for application in the food industry.		
Synthetic oil lubricant compatible for chance contact with food complying with NSF H1 specifications.		
Ambient temperature	**Viscosity**	**PVR oil**
5 - 40°C	ISO 100	Rotant VF 404 H1
0 - 30°C	ISO 68	Rotant VF 403 H1

For ambient temperature outside the stated range, please get in touch with our Customer Service Department.

8. Decommissioning

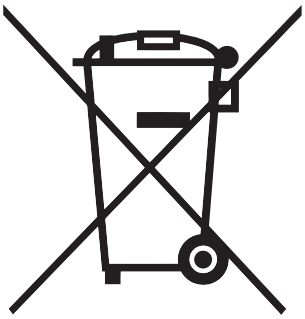
Drain the oil from the pump prior to the removal.
If the oil is polluted, flush the pump with fresh oil (see “oil change”).
Drain the oil from the tank, plug the inlet and the discharge ports and store the pump without oil.

9. Return for repair

In case of pump return for repair to PVR, provide a list of substances which have come in contact with the pump and advise the risks involved in handling, if any. Drain the lubricant from the pump prior to shipping the pump back.

10. Disposal

Meaning of the “WEEE” logo found in labels
The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive.
This symbol (valid only in countries of the European Community) indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste but must be sent to a differentiated waste collection system.
The end user is therefore invited to contact the supplier of the device, whether the Parent Company or a retailer, to initiate the collection and disposal process after checking the contractual terms and conditions of sale.



11. Troubleshooting

TROUBLE	CAUSE	REMEDY
Drop in perfomances	Inlet pipes or machine are leaking	Identify leaking point and seal it
	No lubrication	Check oil level and oil conditions. Fill with oil to the right oil level or change the oil and the oil filter
	Inlet filters are dirty	Clean or replace
	Blocked oil cooler	Clean or replace
Anomalous noise	No lubrication	See previous point
	Coupling element worn	Replace
	Motor or pump bearings damaged	Replace
	Damaged vanes	Replace
	Damaged contact surfaces	Pump overhaul at our workshop
Oil leak	Shaft oil seal rings worn	Replace oil seal rings
	Oil filling/discharge plugs are leaking	Check the plug has been closed / replace the gasket
	Inefficient oil recovery system	Check and clean oil recovery pipe
Motor protection is tripping	Blocked exhaust filters	Replace exhaust filters
	No lubrication	Oil level filling up
	Pump seizure and jam	Pump overhaul
	Broken vane	Replace vanes
Discharge oil mist	Inefficient exhaust filters	Replace exhaust filters
	High temperature due to polluted oil	Oil change
	High operating temperature due to high ambient temperature	Decrease room temperature by allowing a better air exchange
Oil is found in the inlet circuit	Inefficient inlet valve	Check the inlet valve is tight. Clean the valve and change any damaged parts

PVR Srl

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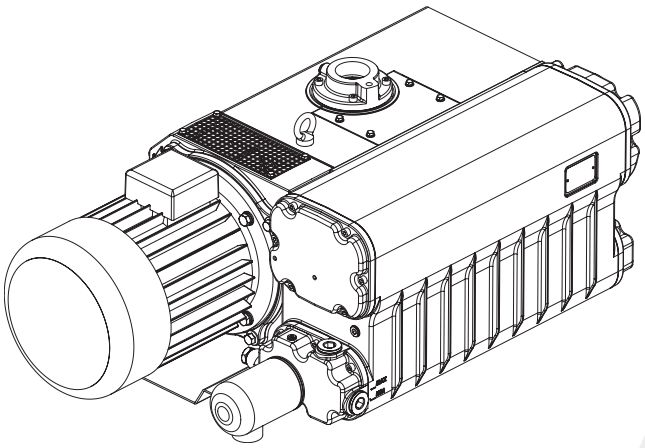
PVR
VACUUMDESIGN

EU 205 - EU 205/B
EU 300 - EU 300/B

Lubricated vane vacuum pump



Technical data and parts lists

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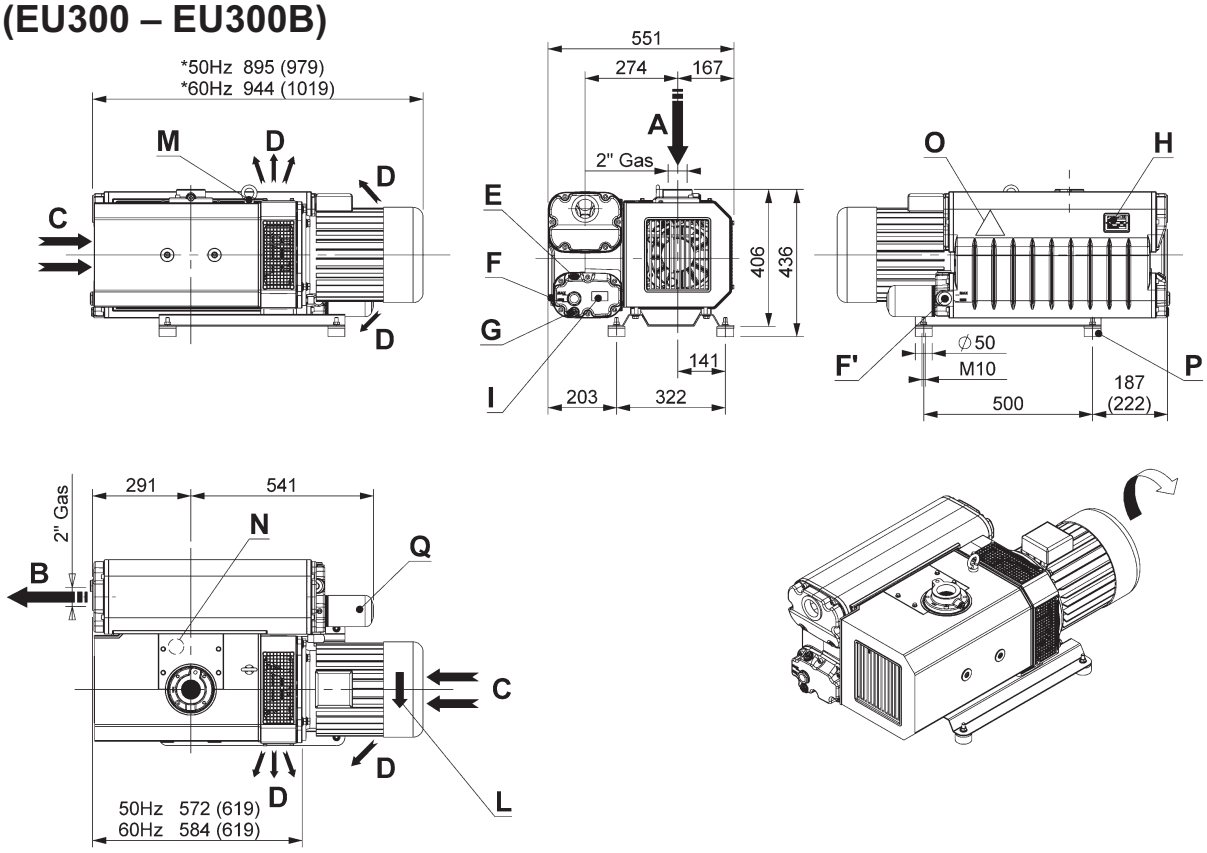
EN
TRANSLATION

EU205 – EU205/B
(EU300 – EU300B)



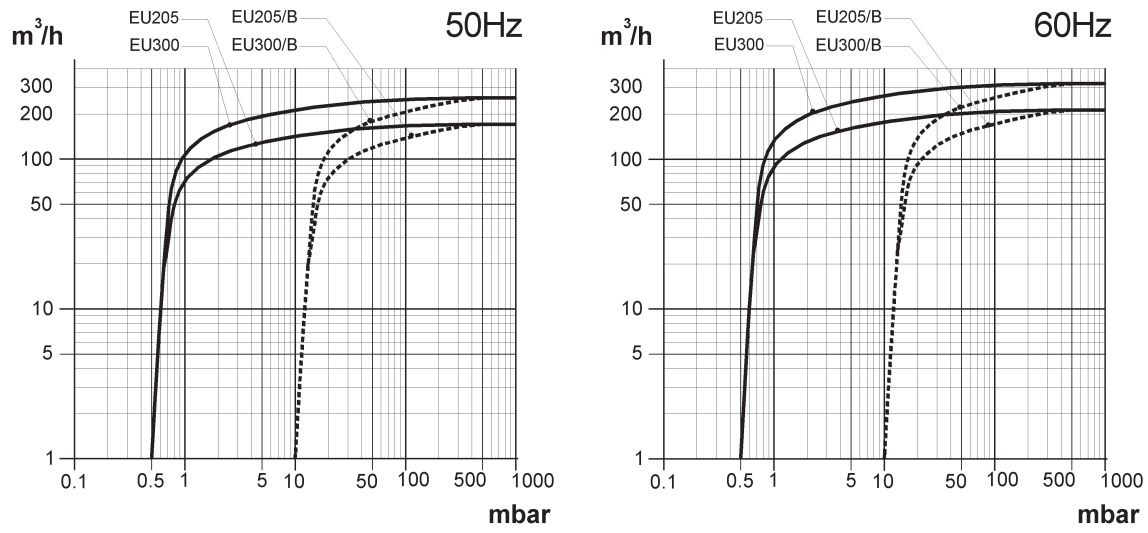
**Misure soggette a variazioni in funzione della marca del motore*
**Dimensions subject to changes depending on the motor brand*
**Données sujettes aux variations en fonction de la marque du moteur*
**Die Maße können aufgrund von Motorzeichen ändern*
**Medidas sujetas a variación en función de la marca del motor*

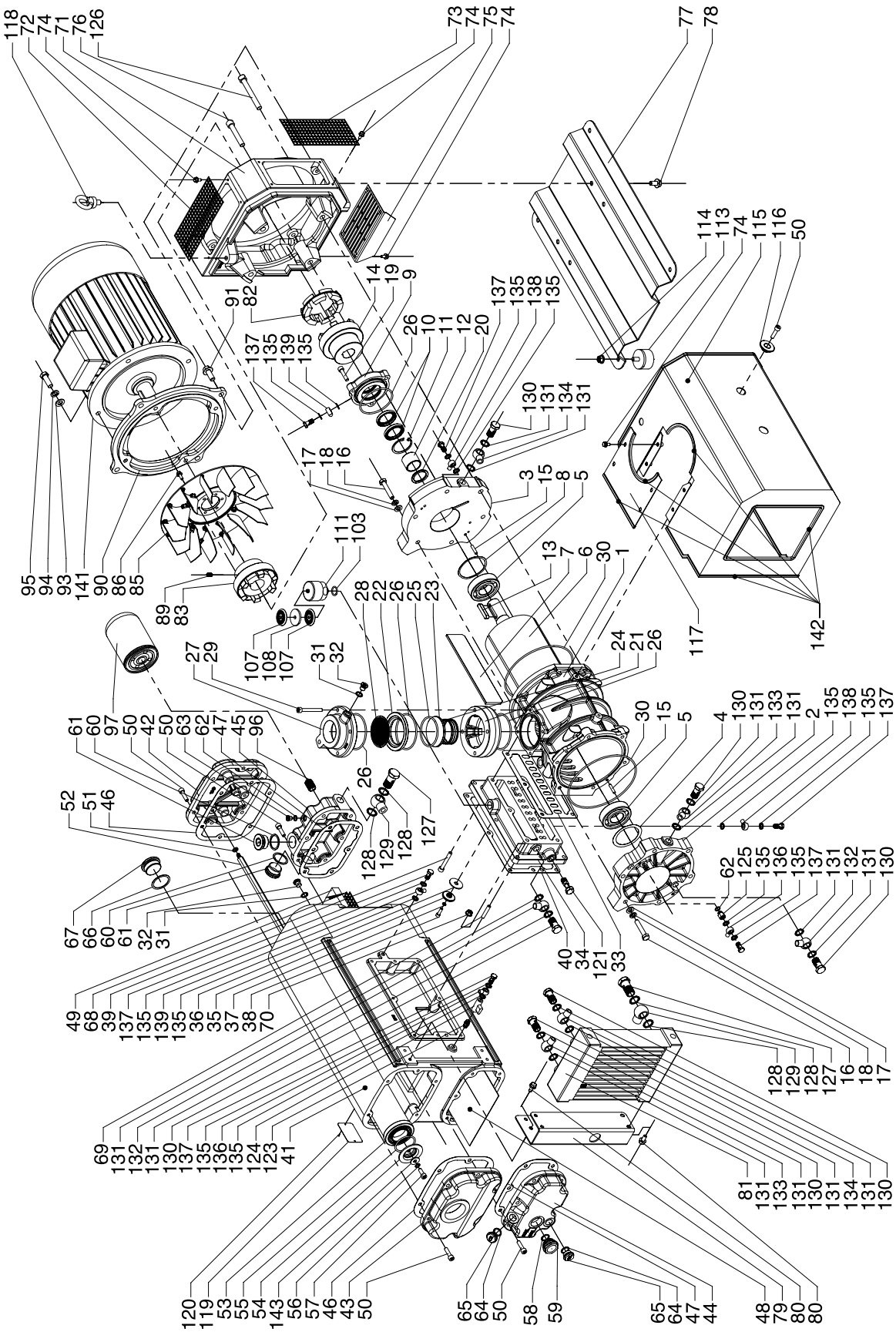
	I	GB	F	D	E
A	Aspirazione	Inlet	Aspiration	Einlass	Aspiración
B	Scarico aria	Exhaust	Sortie de l'air	Luftsauslass	Salida de aire
C	Entrata aria raffreddamento	Cooling air inlet	Entrée air refroidissement	Kühlluftseintritt	Entrada aire refrigeración
D	Uscita aria raffreddamento	Cooling air outlet	Sortie air refroidissement	Kühlluftaustritt	Salida aire refrigeración
E	Tappo carico olio	Oil filling plug	Bouchon remplissage huile	Öleinfüllschraube	Tapón carga de aceite
F-F'	Spia livello olio	Oil level sight glass	Voyant niveau huile	Ölschauglas	Mirilla aceite
G	Tappo scarico olio	Oil drain plug	Bouchon vidange huile	Ölablass-Schraube	Tapón vaciado de aceite
H	Targhetta identificazione	Pump name plate	Plaquette d'identification	Maschinenschild	Placa de identificación
I	Targhetta oli	Oil grade label	Plaquette huiles	Ölempfehlungsschild	Placa tipos de aceites
L	Targhetta rotazione	Rotation plate	Plaquette rotation	Drehungsschild	Placa sentido de giro
M	Golfaro di sollevamento	Lifting eyebolt	Anneau de levage	Aufhebenösenschraube	Gancho de levantamiento
N	Zavorratore	Gas ballast valve	Lest d'air	Gasballastventil	Valvula gas-ballast
O	Targhetta superfici calde	Hot surfaces name plate	Plaquette surfaces chaudes	Typenschild für warme Fläche	Placa superficies calientes
P	Antivibranti	Vibration damper	Pied antivibratoire	Schwingungsdämpfer	Antivibrante
Q	Filtro olio	Oil filter	Filtre huile	Ölfilter	Filtro de aceite

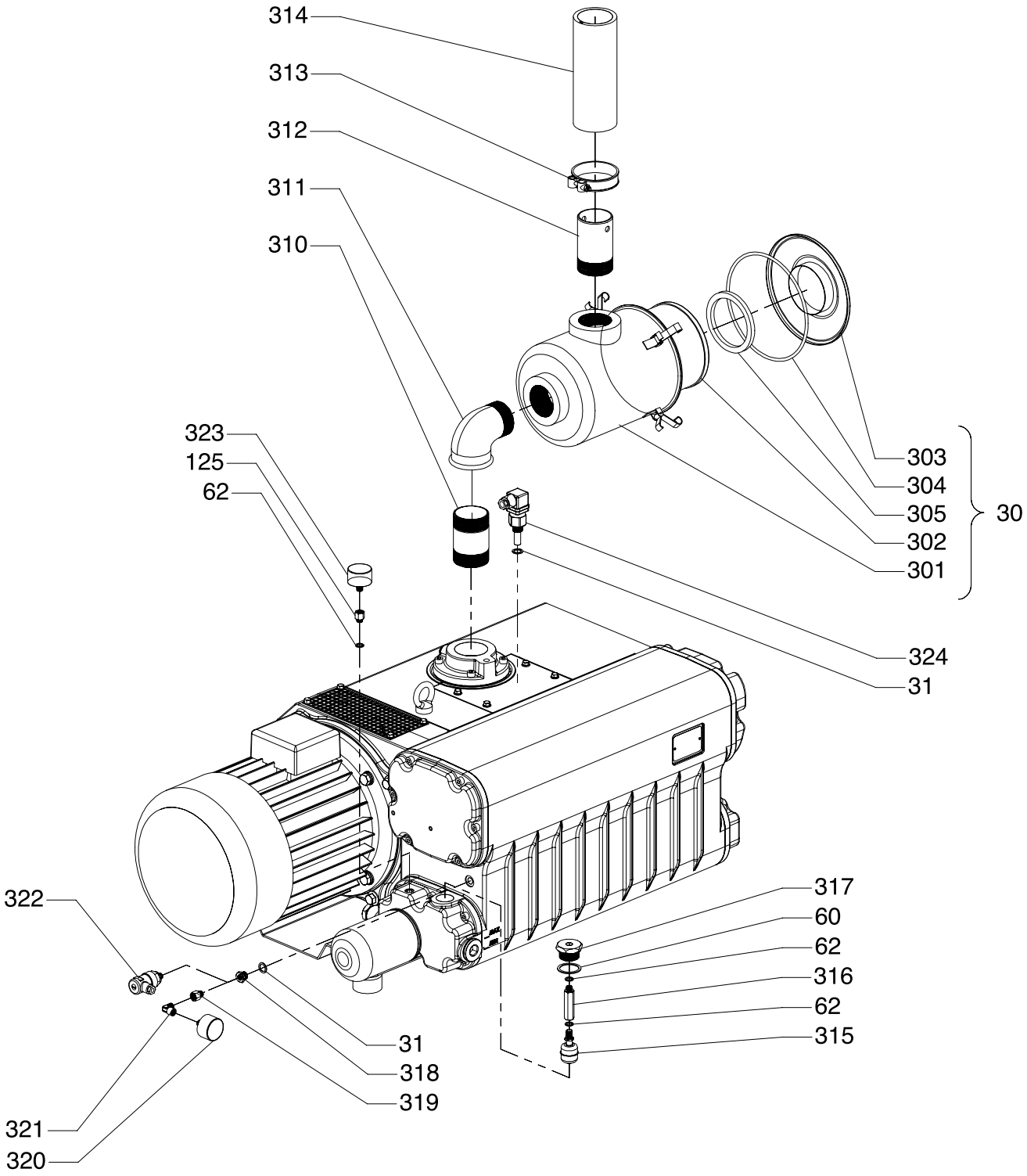
			EU205	EU205/B	EU300	EU300/B
Portata nominale* Nominal speed* Débit nominal* Nennsaugvermögen* Caudal nominal*	m^3/h	50Hz	205		300	
		60Hz	245		360	
Pressione finale*(assoluta) Ultimate pressure* (abs.) Pression limite* (abs.) Enddruck* (abs.) Presión final* (abs.)	mbar		0.5	10	0.5	10
	Pascal		50	1000	50	1000
Potenza motore # / Numero di giri Motor power # / Rotational speed Puissance moteur # / Numéro de révolutions Motorleistung # / Drehzahl Potencia motor # / Velocidad de giro	kW	50Hz ~3	4		5,5	
	min^{-1}	50Hz ~3	1500			
	kW	60Hz ~3	5,5		7,5	
	min^{-1}	60Hz ~3	1800			
Caratteristiche motore elettrico Electric motor characteristics Caractéristiques moteur électrique Motoreigenschaften Características motor eléctrico		50Hz ~3	IM B5 230/400 V±10%		IM B5 400/690 V±10%	
		60Hz ~3	IM B5 275/480 V±10%		IM B5 480/828 V±10%	
Livello di pressione acustica Sound pressure level Niveau de pression acoustique Schalldruckpegel Nivel de presión acústica	dB(A) EN ISO 2151	50Hz	70		71	
		60Hz	72		73	
Pressione max vapore H_2O ammissibile Water vapour tolerance Pression de vapeur d'eau maximale admissible Wasserdampfverträglichkeit Presión máxima de vapor de agua admisible	mbar		30			
Quantità vapore H_2O ammissibile Water vapour pumping capacity Capacité de pompage de la vapeur d'eau Wasserdampfkapazität Cantidad de vapor de agua admisible	kg/h		3,6		5	
Carica olio Oil capacity Charge d'huile Ölfüllmenge Carga de aceite	l		7			
Peso totale / senza motore Total weight / Without motor Poids total / Sans moteur Gesamtgewicht / Gewicht ohne Motor Peso total / Sin motor	kg	50Hz	161 /126		188 / 141	
		60Hz	171 / 126		192 / 141	

**Secondo accordi PNEUROP 6602.*
**According to Pneurop standard 6602.*
**Selon la norme Pneurop 6602*
**Nach der Pneurop Norm 6602..*
**Según la normativa Pneurop 6602.*

#Valido per temperature fino a 40°C e altitudini inferiori a 1000 m.
#Valid for temperatures up to 40°C and altitudes lower than 1000 m.
#Valable pour températures jusqu'à 40°C et pour altitudes inférieurs à 1000 m.
#Gültig für Temperaturen bis 40°C und für Höhen weniger als 1000 m.
#Válido para temperaturas hasta 40°C y altitudes inferiores à 1000 m.



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POS.		DESCRIPTION	Q.TA'	
			EU205	EU300
1		Body of pump	1	
2		External side cover	1	
3		Motor side cover	1	
4		63x80 Space washer	1	
5		6307 Bearing	2	
6		Rotor	1	
7		Vane	3	
8		Shim ring	1	
9		Oil seal ring	1	
10	G	BABSL 40x52x7 Seal ring	2	
11		I53 Seeger	1	
12		IR 35X430X30 Ring	1	
13		10x8x50 Key	1	
14		Pump side coupling half	1	
15		6x30 Pin	4	
16		M10x55 Hex. Screw	11	
17		ø10 Washer	11	
18		ø10 Lock washer	11	
19		M8x35 Hex. Socket head screw	3	
20		ø35/45x3Spacer	1	
21		Inlet valve body	1	
22		Inlet valve disk	1	
23		Inlet valve plate	1	
24		Helicoidal spring	1	
25	G	O Ring 173	1	
26	G	O Ring 4337	4	
27		2"G Inlet flange	1	
28		Inlet filtering baffle	1	
29		M8x65Hex. Socket head screw	4	
30	G	O Ring 4725	2	
31		1/4"G Al washer	2	
32		1/4" Al Hex. Socket head plug	2	
33	G	Body of pump-spacer gasket	1	
34		Pump-tank spacer	1	
35		Support valve disk	4	5
36	G	ø36/10x2 Rubber disk	4	5
37		ø6 Lock washer	4	5
38		M6x20 Hex. Socket head screw	4	5
39		M8x55 Hex. Socket head screw	6	
40	G	Spacer-tank gasket	1	
41		Tank	1	
42		Motor side upper tank cover	1	
43		External side upper tank cover	1	
44		External side lower tank cover	1	
45		Motor side lower tank cover	1	
46	G	Gasket for upper tank covers	2	
47	G	Gasket for lower tank covers	2	
48		Tank micro-stretched sheet	1	
49		192X122X20 tank demister	1	
50		M8x30 Hex. Socket head screw	26	
51		Ø8 Lock washer	2	3
52		Stay bolt for exhaust filter	2	3
53	R	Exhaust filter	2	3
54		Disk for exhaust filter	2	3
55	G	O Ring 4200	4	6
56		ø8.4/13x1 Al washer	2	3
57		M8x20 Hex. Socket head screw	2	3
58		1"G Fibre washer	1	
59		1"G Oil sight glass	1	
60		1"G Al washer	2	
61		1"G Hex. Socket head plug	2	
62		1/8"G Al washer	2	
63		1/8"G Hex. Socket head screw	1	
64		1/2"G Fibre washer	2	
65		1/2"G Filling-discharge plug	2	
66		1" 1/4G Al washer	2	1
67		1" 1/4G Hex. Socket head screw plug	2	1
68		Demister-tank support mesh	1	
69		M8x40 Hex. Socket Stud Bolt	8	
70		M8 Nut (flanged and knurled)	8	
71		Fan cover sleeve	1	
72		Upper safety mesh	1	
73		Frontal safety mesh	1	
74		M6x12 Hex. Screw flanged and knurled	16	
75		Lower safety mesh with air plate	1	
76		M12x70 Hex. Socket head screw	3	
77		Base-plate	1	
78		M10x20 Hex. Screw flanged and knurled	4	
79		Oil cooler support	1	
80		M8x16 Hex. Screw flanged and knurled	8	
81		Air/oil cooler	1	

POS.		DESCRIPTION	Q.TA'	
			EU205	EU300
82	R	Elastic coupling insert	1	
83		Motor side coupling half	1	
85		ø280x73 Fan	1	
86		M6x16 Hex. Screw flanged and knurled	6	
89		M8x16 Hex. Socket Stud Bolt	1	
90		Motor flange	1	
91		M12x30 Hex. Screw flanged and knurled	4	
93		Ø12-24 Washer th.=2.5	4	
94		Ø12 Lock washer	4	
95		M12x35 (M12x30) Hex. Screw	(4)	4
96		UNF 3/4"-16 Nipple	1	
97	R	Oil filter	1	
103	G	O Ring 3075	1	
107		Micro-stretched sheet disk	2	
108	R	ø42/8x4 Felt disk	1	
111		½"G Gas ballast valve	1	
113		ø50x30 M10x27 Vibration-damping foot	4	
114		M10 Nut flanged and knurled	4	
115		Casing	1	
116		Disk (for casing)	2	
117		Casing cover	1	
118		M12 Eyebolt	1	
119		Pump name plate	1	
120		ø1.85x5 Rivet	2	
121		1/4" screw with non return valve	1	
123		A2 M-M 1/8"G ø2 reduced Nipple	1	
124		F-F 1/8"G cock	1	
125		A5/Z M-F 1/8"-1/8" Extension	1	
126		M12x100 Hex. Socket head screw	1	
127		Screw for 1/2"G fittings	2	
128		1/2"G Cu Washer	4	
129		Oil cooler inlet pipe	1	
130		Screw for 3/8"G fittings	6	
131		3/8"G Cu Washer	12	
132		Gas ballast pipe	1	
133		Oil pipe (external side)	1	
134		Oil pipe (motor side)	1	
135		1/8"G Cu Washer	12	
136		Recovery pipe (/B)	1	
137		Screw for 1/8"G fittings	6	
138		Oil recovery pipe (standard)	1	
139		Oil pipe (outlet seal rings)	1	
141		Electric motor	1	
142		Sheath	5	
143		ø8/24 Washer	2	3
		OPTIONALS		
31		1/4"G Al washer	2	
60		1"G Al washer	1	
62		1/8"G Al washer	3	
125		A5/Z M-F 1/8"-1/8" Extension	1	
300		Inlet filter F300	1	
301		Filter housing	1	
302	R	Filter element	1	
303		Filter cover	1	
304	G	O Ring M. ø185 c=5	1	
305	G	V Gasket	2	
310		M M 2"G Pipe fitting	1	
311		A4 2"G Elbow union	1	
312		2"G fitting	1	
313		Collar	1	
314		Flexible pipe	1	
315		Oil level switch	1	
316		Oil level switch extension	1	
317		Oil level switch port	1	
318		A4/Z M-F 1/4"-1/8" Reduction	1	
319		A5 M-F 1/8"-1/8" extension	1	
320		PVR pressure gauge	1	
321		A10 M-F 1/8"-1/8" fitting	1	
322		Adjustable pressure switch	1	
323		Oil filter condition indicator	1	
324		Safety temperature switch	1	

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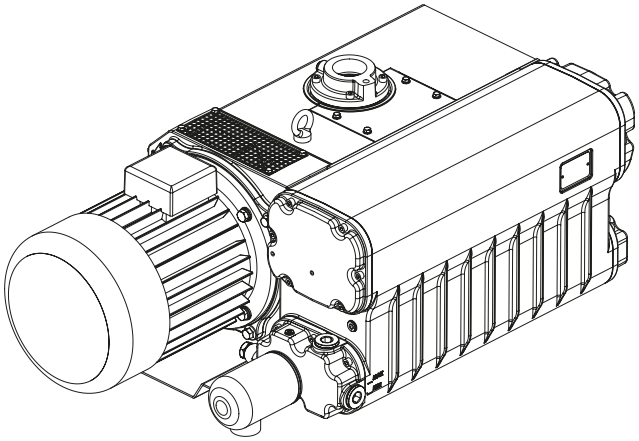
PVR VACUUMDESIGN

EU205F
EU205F HWT
EU300F
EU300F HWT

Lubricated vane vacuum pump



Operating and maintenance instructions

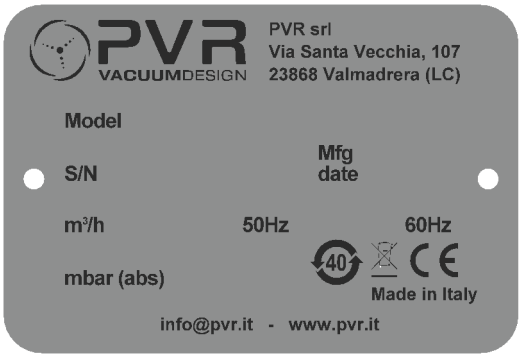
Publication Number:
LI 4431.02 April 2021

EN
TRANSLATION

Index

1. General information

This manual contains information necessary for the proper operation of the pump in order to prevent unsuitable use and for the safety of the operators. Do not attempt any other type of operation without having first contacted our **Service Department**. The information provided herewith does not intend to replace, integrate or change any rules, regulations, law by decree, directive or law of specific character in force in the Country where the installation takes place.
The suggestions given to the staff engaged in the installation and servicing assumes that the personnel is expert and prepared in facing any problem of servicing, both mechanical and electrical. For any questions or information not included in this manual, please contact our Service Department, always providing: model (Model), serial number (Serial), year of manufacture, stated on the pump name plate.



Symbols used:

WARNING:
Instructions that, if not followed, could result in serious personal injuries.

NOTE:
Instructions that, if not followed, could result in pump damages.

HOT SURFACES

HARMFUL SUBSTANCES EMISSIONS

DO NOT DISPOSE INTO THE ENVIRONMENT

ELECTRIC SAFETY

FIRE HAZARD

READ THE OPERATING INSTRUCTIONS

INLET PORT

EXHAUST PORT

DISPOSAL

2. Product specifications

2.1 Pump description

EU300F - EU300F HWT pumps are single-stage, rotary vane lubricated vacuum pumps, with oil recirculation.

The flanged electric motor is coupled by means of an elastic coupling.

Cooling is achieved by means of an air/oil cooler and a centrifugal fan.

At the pump inlet there is a mesh filter in order to protect it from solid parts having diameter larger than 1.5 mm.

Furthermore, an integrated non-return valve prevents the oil coming back and the return of air in the chamber to be pumped down during the stop phase.

In the tank there is a system of oil smokes separation from the discharged air (maximum residual 2PPM/weight corresponding to 2.4 mg/m^3).

The separated oil is recovered automatically by the pump.

Two gas ballast valves prevent condensation inside the pump when pumping down small quantity of vapour.

2.2 Expected use

These vacuum pumps have been designed to handle air and small quantity of water vapour only. They are suitable to evacuate closed systems or to operate at a constant vacuum within the following vacuum range:

0,5 - 850 mbar (abs.)

The ambient temperature and the inlet temperatures must be included between 12° and 40°C.
In case you get temperatures outside this range, please get in touch with us.
Handling of other types of gas or vapours must be declared in advance to PVR that will give the conformity to the specific use.

2.3 Forbidden use

WARNING:
The pump MUST NOT handle:
- **liquids or solid substances;**
- **dangerous, explosive or aggressive gases and vapours;**
- **pure oxygen or air mixtures enriched with oxygen;**

It is forbidden to use the discharge of the pump to create even limited pressures.

WARNING:
It is forbidden to install the pump in a potentially explosive environment.

2.4 Protections

The pump must be protected against suction of dust, solids or liquids.
For those applications where such a protection is not ensured, a vacuum gauge must be installed on the oil tank for a visual check of the exhaust filter clogging.

In order to get an automatic pump stop, a pressure switch set at 0.6 bar can be installed. The pump is supplied without electric control panel. The electric motor must be protected according to the regulations in force.

WARNING:
In case of applications where the pump stop or failure can cause damages to people or things, safety measures for the system must be adopted.

2.5 Accessories

The following accessories useful for the installation and for the control of the operation parameters of the pump are available:
- external inlet filter
- connection fittings
- vacuum meters/ vacuum switches
- pressure meters/ pressure switches
- temperature switch
- low oil level switch

3. Safety rules

WARNING:
Despite of all the precautions adopted when designing the equipment, there are some risk elements that arise during operation and servicing.

HOT SURFACES
The temperature of the pump surfaces may exceed 80°C.
Install the pump in a protected area accessible only by authorized personnel, to prevent possible personal injures due to contact with hot surfaces.
The pump can be placed inside other machines by adopting the necessary safeguards.
Before carrying out any maintenance on the pump, be sure the pump is cold.

HARMFUL SUBSTANCES EMISSIONS
The discharged air contains part of traces of oil mist.
Check the compatibility with the environment.
Make sure a correct air change is allowed otherwise convey the pump discharge outside.
A failure or the seals wear can cause an oil leakage.
Avoid the dispersion to the ground and the pollution of other materials. In case that any air containing dangerous substances must be pumped down (for example, biological or microbiological agents), make sure to adopt filtering systems before introducing air in the work environment.
Used discharged oil from the pump must be disposed in accordance with the regulations in force in the Country of use.

Do not dispose into the environment. 

HAZARD CAUSED BY VACUUM
Any contact with parts under vacuum can cause injuries.
Avoid any contact with the pump inlet port during the pump operation. Introduce air in the inlet circuit before every operation cycle.

HAZARD CAUSED BY PRESSURE
The pump tank is pressurized. Do not open the oil filling and discharge plugs during operation.

FOR A SAFE MAINTENANCE
All maintenance operations must be carried out with the pump idle, disconnected from the electrical supply, with the pump cold, vented to atmospheric pressure. Prevent unexpected start-up (e.g. block the power switch with a personal lock).

ELECTRIC SAFETY

Some components of the electric equipment are electrically charged during operation. Any contact may cause serious injuries to persons or objects.
Connection and control of the electric system must be carried out by skilled personnel only.
The electrical equipment must comply with the EN 60204-1 standard and with any other law in force in the Country of use.
Besides, electrical equipment must comply with EN 61000-6-4 and EN 61000-6-2 standards concerning electromagnetic compatibility and electromagnetic immunity for industrial environment.

FIRE HAZARD

WARNING! The use of the pump in situations unforeseen or not recommended by this manual, as well as lack of correct maintenance, may create high risks for overheating or fire.
In case of a fire do not use water to extinguish but use a powder CO_2 extinguisher or other means compatible with the electrical equipment and lubricating oil.

4. Transport/handling

4.1 Lifting

The orientation of the packed components must correspond to the instructions given by the pictograms on the external covering of the packaging.
For unloading use a lifting equipment suitable for the pump weight.
For lifting the packaging and the pump, please refer to the figures here below.
Pump packaged (Figure 1)
Pump with motor (Figure 2).
Pump without motor (Figure 3).

	L	B	H
Packing size	1140 mm	630 mm	660 mm

	Pump	Packaged pump
Weight of the pump with motor 50Hz	188 Kg	194 Kg
Weight of the pump with motor 60Hz	192 Kg	215 Kg
Weight of the pump without motor	141 Kg	164 Kg

Fig.1

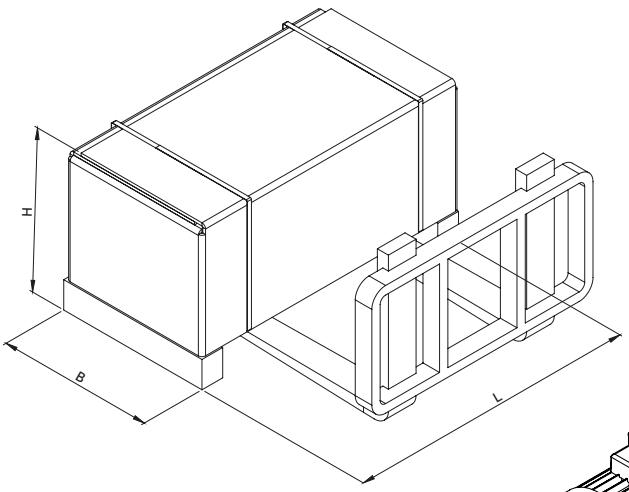


Fig.2

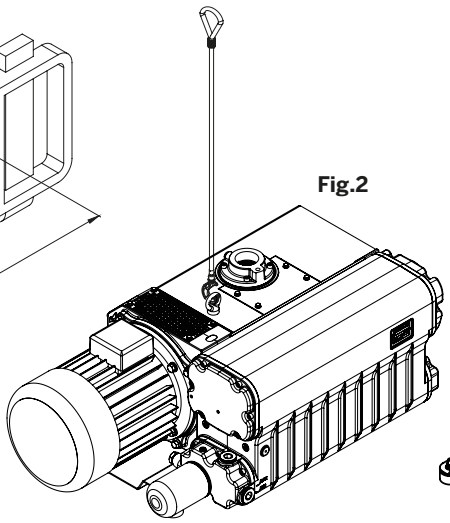
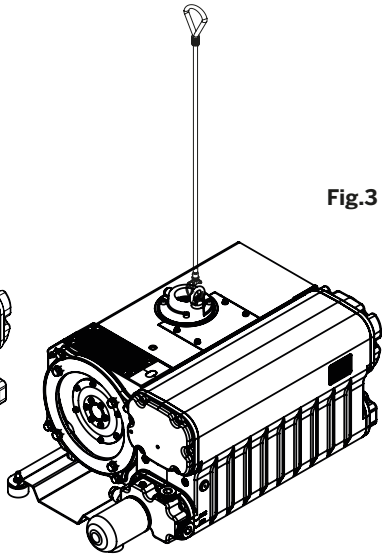


Fig.3



4.2 Unpacking and components control

When receiving the machine, check that the packaging is intact or shows any signs of damages occurred during transportation. If there is no damage, proceed to the unpacking and check the machine further. In case of damages are found, inform immediately PVR and the carrier. A representative will contact you or it may be dispatched to the site to inspect and file full damage report.

4.3 Storage

The pumps must be stored or transported without oil and protected from the atmospheric agents at a temperature between -15°C and 70°C (normal humidity rate max. 95% non condensing).

5. Installation and operation

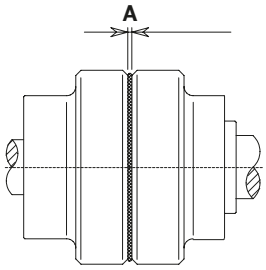
5.1 Assembly

If the pump is supplied without any electric motor, install a motor whose characteristics are the same as stated on the technical sheet, constructive form IM B 5.

WARNING:
- Use lifting equipment suitable for the motor weight (about 45 Kg 50 Hz and about 50 Kg 60 Hz)
- To assure the continuity of the equipotential circuit of the pump, clean the contact surfaces very well, by removing any grease or protective painting.

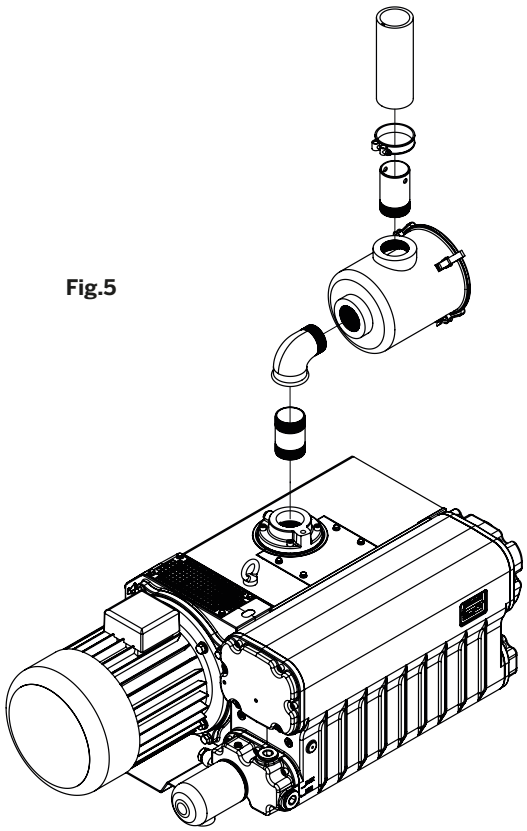
NOTE:
After the assembly, check that the distance between the two coupling halves is $3{,}5^{\pm 1}$ mm (Figure 4)

Fig.4



Remove inlet and exhaust plastic caps.
Fit the external filter in horizontal position to prevent dirt coming inside the pump during the cleaning of the cartridge. (Figure.5)

Fig.5



5.2 Location

WARNING:

- The pump must be installed in a protected area (see safety rules).
- It must be fastened with support feet on horizontal surface.
- It must be accessible for correct and easy maintenance, by respecting the minimum distances from possible obstructions (see figure 6).
- It must be accessible to suitable lifting equipment.

NOTE:

- Ensure the air exchange in the room or inside the machine where the pump has been installed.
  To assure a sufficient cooling, avoid exceeding 40°C of ambient temperature.
- The pump must be protected against jets or sprays of water that may penetrate the tank through the exhaust port.
- Whenever the pump is installed outside, it must be protected against atmospheric agents and it must be used with an oil suitable for low temperature.
- Avoid warm air coming from the exhaust or the cooling fans causing discomfort to the personnel.
- Do not install the pump in a dusty area or where other materials may block or cover the cooling surfaces quickly.

A	B	C	D
300 mm	300 mm	100 mm	350 mm

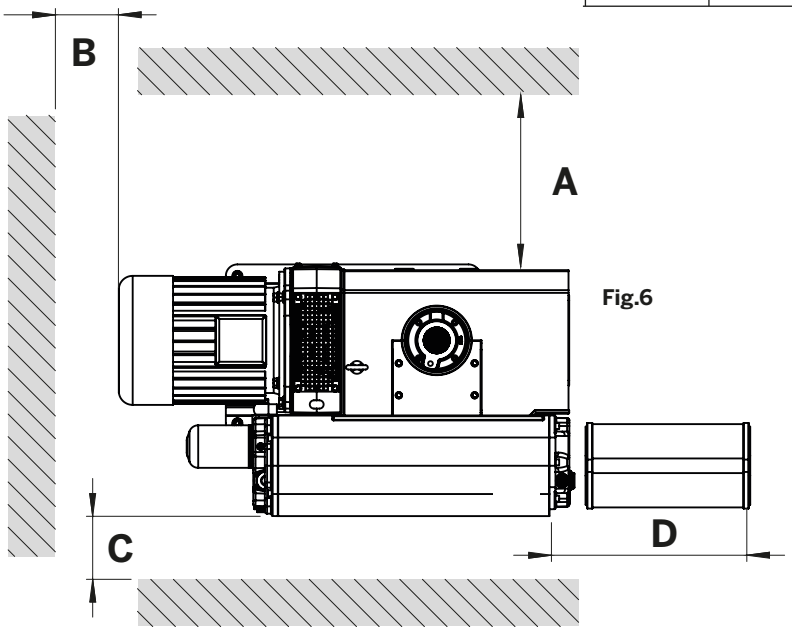


Fig.6

5.3 Connection to the machine

The connection to the chamber to be pumped down must be carried out by means of pipes of the same diameter as the inlet port.
Pipe weights and expansions, if any, must not rest on the pump.
It is advisable to make the final connection to the pump inlet port with flexible pipes or fittings.
It is important that all the pipes and the different fittings are tight.
Very long or small diameter pipes decrease the pump performances.

This symbol identifies the inlet port.

For further information, please refer to the RDT attached herewith.

5.4 Discharge air pipe line installation

- If the pump has been installed in a room with poor air exchange, it is possible to pipe the pump discharge air to other rooms or outside.
- Use pipes with the same diameter as the tank discharge port with a maximum length of 15 m.
  For longer pipes increase pipe diameter. Pipe weights must not rest on the pump.
  In the final length use flexible pipes or pipe fittings.

NOTE:
this pipe must be descending, to avoid the condensate going back to the tank.

WARNING:
do not connect ball valves to this pipeline.

This symbol identifies the exhaust port.

For further information, please refer to the RDT attached herewith.

5.5 Electrical connection

- The control panel and electrical connections must be carried out by skilled personnel and conform to the EN 60204-1 rules or to other local regulations in the Country of use.
- The electrical equipment must comply with EN 61000-6-4 and EN 61000-6-2 standards concerning electromagnetic compatibility, emission standard and immunity for industrial environment.
- Check the main voltage and frequency in use to correspond to the data stamped on the motor name plate.
- The electric motor must be protected against overload. The full load amperage value on the motor name plate must be considered when sizing the electrical components and motor protection against overloading.
- Make sure the grounding is correctly done.
- Carry out the electric connection following the diagram shown on the motor terminal box.
- Check direction of rotation by starting the pump for a short time (2-3 seconds). The correct direction is shown by the arrow on the pump (figure 7). In case of wrong rotation, it is necessary to change the motor rotation by exchanging position of two of the three connections previously connected to the motor terminal box.

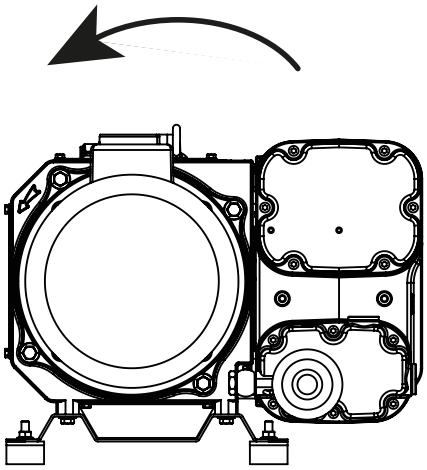


Fig.7

5.6 Commissioning

The pump is supplied without lubricating oil.

NOTE:
the operation without oil causes big damages to the pump.

Carry out the first filling up through the plug (E) up to the half of the sight glass (F) and close the plug (E) (Figure 8).
Start the pump and take it to the maximum vacuum level for at least 2 minutes. Stop the pump, check again the oil level and add the lacking oil, if necessary, in order to get the correct oil level.

NOTE:
a quantity of oil greater than necessary may clog the oil separator and damage the pump or the electric motor.

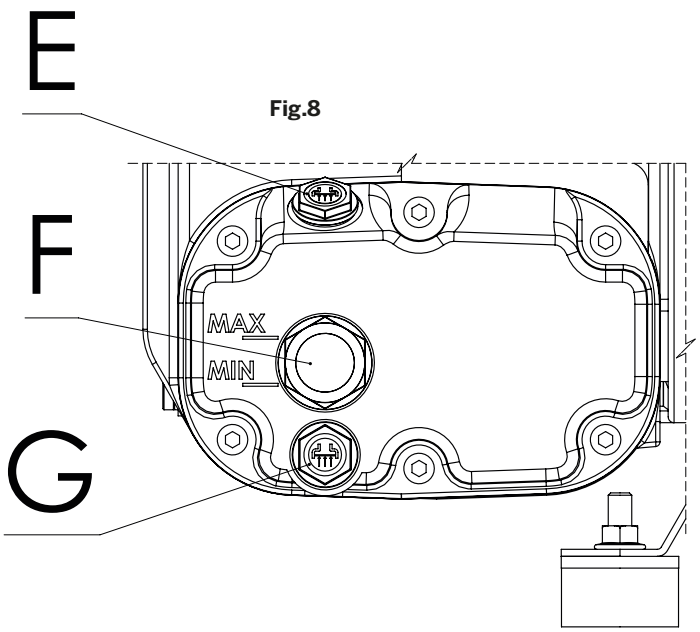


Fig.8

5.7 Tips for using

When the room temperature is lower than 10°C, it is a good practice to let the pump operate at the ultimate pressure (Inlet port closed, without load) for about 15 minutes. During this period the pump may not reach the stated pressure limits.

NOTE:
Avoid operating the pump for long periods with inlet port vented to atmospheric pressure.

Avoid frequent stop-starting, as this will lead to premature wear of the coupling elastic element.

It is recommended not to exceed 10 starting/hour. For more frequent starting, it is recommended to install a soft starter device.

5.8 Water vapour intake

In order to pump down any water vapour, the following operations are recommended:

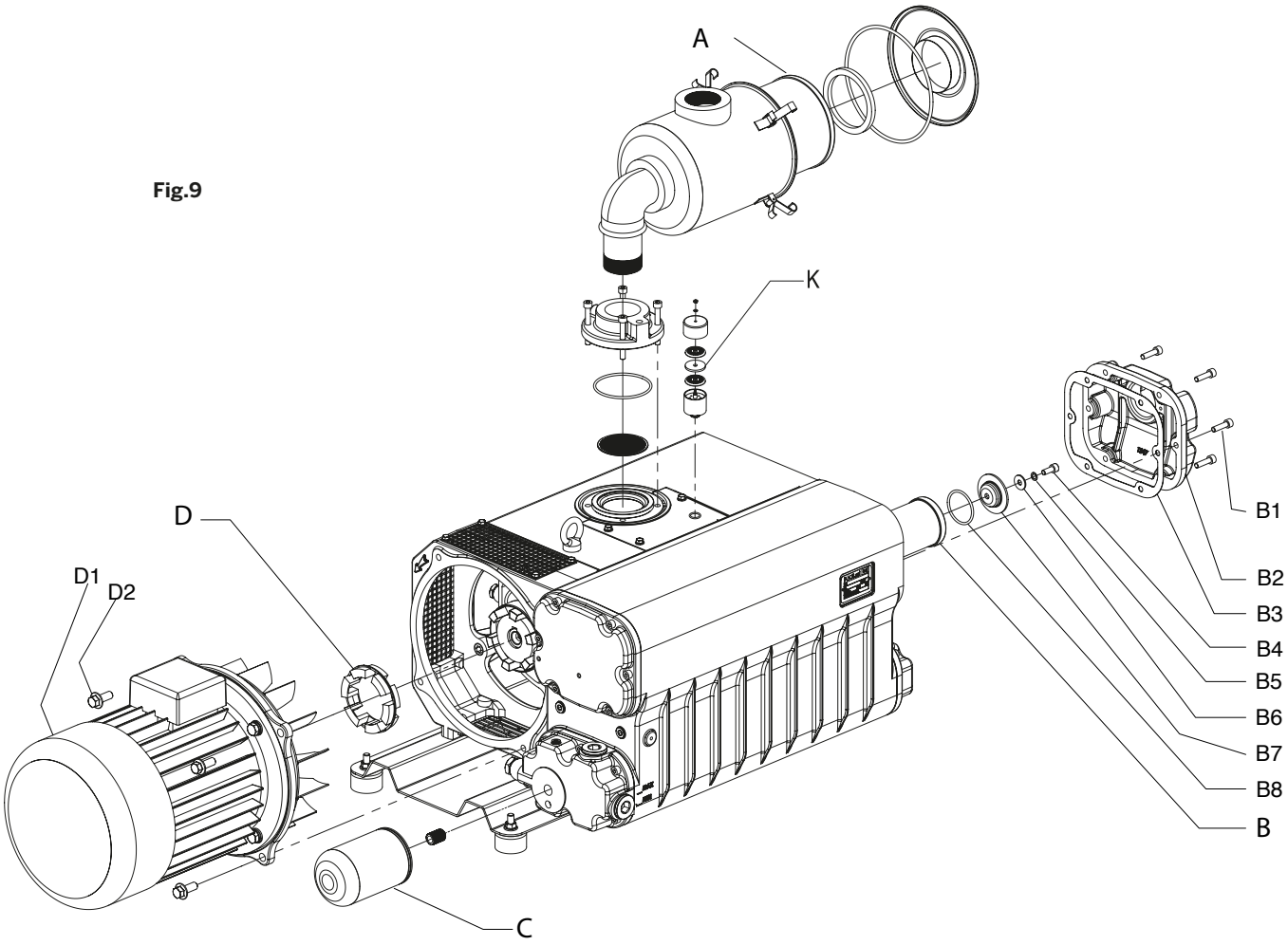
Let the pump run for thirty minutes at the maximum vacuum in order to bring the pump temperature to its operating value.

At the end of the working cycle, in case of further presence of condensate in the oil, let the pump run for at least thirty minutes at the maximum vacuum.

It is advisable to carry out this operation before stopping the pump for a long time. The gas ballast valve will allow the elimination of water condensate from the lubricating oil.

6. Servicing

Fig.9



6.1 General information

In order to keep the pump operating at a high efficiency level, it is mandatory to follow all periodical service points listed in the table below.However, more frequent service operations may be necessary depending on what the pump is used for (suction of condensable vapours, suction of powders or polluting substances).
For such cases, only direct experience can indicate the correct service frequency needed.
The exhausted oil and the replaced spare parts must be considered as special waste products and handled according to the local regulations in the Country of use.

WARNING:

Before every maintenance operation:

- **Always ensure that the pump is insulated from the electrical network so that it can't start automatically.**
- **Wait until the pump gets cool and make sure it has reached a non-dangerous temperature.**
- **Introduce air in the inlet circuit.**

SERVICING FREQUENCY	DESCRIPTION OF THE OPERATION	AUTHORIZED PERSONNEL
24 Hours/every day	Check oil level before starting.	**Operator**
100 Hours/every week	Clean the external inlet element with a blast of air (Figure 9 pos.A).	**Operator**
	Clean the cooling surfaces of the pump, of the oil cooler and of the electric motor with a blast of air.	**Operator**
500/1000* Hours/every 6 months	Change the lubricating oil (Figure 9 pos. C).	**Skilled Worker**
	If the pressure gauge is fitted to the pump, check the oil separator (max 0,6 bar), if necessary, replace it.	**Skilled Worker**
	Replace the gas-ballast felt disk (Figure 9 pos. K).	**Skilled Worker**
2000 Hours/every year	Replace the exhaust filters (Figure 8 pos.B).	**Skilled Worker**
	Check and if necessary replace the coupling elastic insert (Figure 9 pos. D).	**Skilled Worker**
	Check the electrical connections.	**Skilled Worker**
	Check functionality of the float valve and clean it.	**Skilled Worker**
30000 Hours/every 5 years	Pump overhaul.	**Customer Service**

* The first oil change has to be done after 500 hours of operation. If any polluting substances are found in the oil, next oil change could take place within 1000 hours.

6.2 Oil change

For a correct operation, oil change should be performed when the pump is still warm.

WARNING:
Use protective gloves to avoid injury caused by heat.

Please refer to Figure 8, section 5.6. Unscrew the oil filling plug (E) and the discharge plug (G) only after having placed underneath the pump tank a suitable container (proper size and shape) for collecting the total quantity of oil.
Once the oil in tank has completely been discharged from the tank, reassemble both plugs ("E" and "G") and let the pump run under vacuum for about one minute, so that the lubricating/cooling line gets emptied and any oil residual keeps inside the pump. Then remove the plugs and discharge the rest of the oil.
If the oil is polluted or if some water is in the oil, clean the pump by letting it run with a suitable quantity of oil (up to the minimum level shown on the tank) at maximum vacuum level for at least 5 minutes.
Drain the oil again.
Replace the oil filter Figure 9 (pos. C) and follow up to fill with fresh oil (please see "commissioning" and "recommended oil table").

6.3 Coupling elastic element replacement

Please refer to Figure 9.
Remove the motor assembly (pos. D1) unscrewing the screws (pos. D2). Check the elastic element (pos. D) conditions. If necessary, replace it. Reassemble by means of the screws.

WARNING:
please use suitable lifting equipment.
Motor weight
EU300F - EU300F HWT - 5,5 kW approx. 45 Kg (50Hz)
EU300F - EU300F HWT - 7,5 kW approx. 50 Kg (60Hz)

NOTE:
the operation with damaged elastic element causes an anomalous pump noise, especially when starting the pump and may lead to coupling and pump shaft failure.

6.4 Exhaust filters replacement

Very dirty exhaust filters may cause a considerable pump temperature increase and in extreme cases oil lubricant spontaneous ignition.
Maximum allowed pressure in the tank is 0,6 bar measured at the maximum capacity (when the pump is working with the inlet open to atmospheric pressure).
If a pressure gauge has been fitted to the tank, check the exhaust filter blockage with the pump warm.
To replace the filter, remove the cover (pos. B2) by unscrewing its screws (pos. B1).
Unscrew the screw (pos. B4), remove the washers (pos. B5-B6) and then the fixing cartridge disk (pos. B7).
Replace all the exhaust filters (pos. B) and their O Rings (pos. B8). Reassemble the fixing cartridge disk, the washers and tighten the screws.
Reassemble the discharge cover. If necessary, replace the gasket (pos. B3).

6.5 Float valve

If the float valve doesn't operate well, you may notice:
- the oil carry out from the discharge port
- pump performance loss.

The reasons could be as follows:
- oil recovery line is blocked or the float valve mechanism got blocked due to dirties or sludges.
- oil recovery line doesn't close perfectly due to dirties or because the seal is worn.

In this case, the float valve must be disassembled, cleaned and then its good operation must be checked.
Remove the cover Fig. 9 (pos. B2) unscrewing its screws (pos. B1). Remove the float valve (pos. Z) from its housing after having unscrewed its grub-screw (pos. Z1). Clean the float valve and its internal reduction fitting, with compressed air by blowing the opposite direction with respect to the normal oil flow. Fit the float valve in its housing. Check the float valve good operation before closing the cover (pos. B2).
- Switch the pump on without having any oil deposit and check if it achieves the limit pressure.
- Fill with oil until the valve opens. Wait until it closes, while checking if the pump keeps its ultimate pressure constant.
If not, the float valve must be replaced completely.

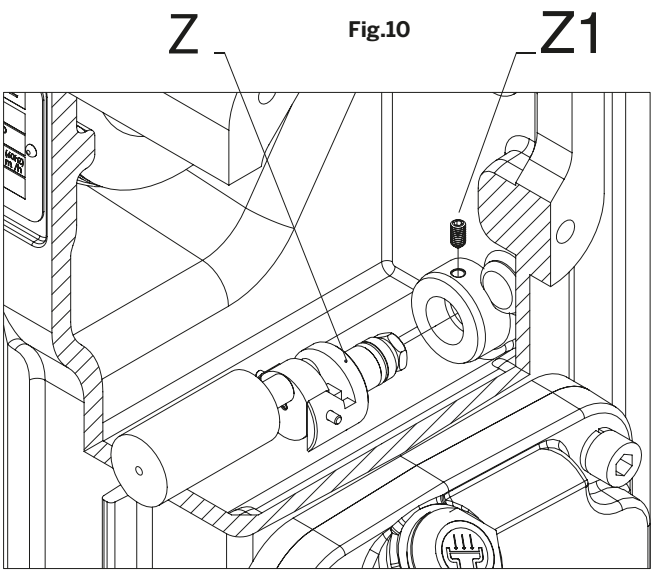


Fig.10

6.6 Spares necessary for the normal servicing

The recommended spares are shown in the list of the exploded drawing marked with the letter "R" (see RDT). They are contained in the minor spare parts kit.

6.7 Pump overhaul

For this operation please request the proper instructions and direct any questions to our Customer Service department. The overhaul consists of a complete disassembly, cleaning of all components as well as replacement of parts that are subject to wear (pump and motor bearings, vanes and gaskets).

6.8 How to order spare parts

When ordering spare parts, always state the pump model, serial number, year of production, electric motor characteristics (manufacturer's name, model, kW, V, Hz), position reference on the spare parts list, description and quantity needed.
Different types of maintenance kits are available (ref. RDT attachment).

7. Lubricants

Oil recommended for generic use

Mineral oil for compressors according to DIN 51506 group VC-VCL or VDL classification ISO L-DAG.

Ambient temperature	Viscosity	PVR oil
10 - 40°C	ISO 100	Rotant VF 204
5 - 15°C	ISO 68	Rotant VF 203

Oil recommended for heavy duty, both for high and low temperatures.

Synthetic oil on PAO basis (polyalphaolefins).

Ambient temperature	Viscosity	PVR oil
5 - 40°C	ISO 100	Rotant VF 304
5 - 20°C	ISO 68	Rotant VF 303

Oil recommended for application in the food industry.

Synthetic oil lubricant compatible for chance contact with food complying with NSF USDA H1 specifications.

Ambient temperature	Viscosity	PVR oil
5 - 40°C	ISO 100	Rotant VF 404 H1
5 - 20°C	ISO 68	Rotant VF 403 H1

For ambient temperature outside the stated range, please get in touch with our Customer Service Department.

8. Decommissioning

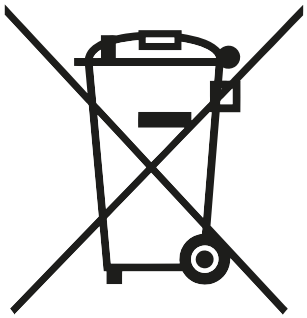
Drain the oil from the pump prior to the removal.
If the oil is polluted, flush the pump with fresh oil (see “oil change”).
Drain the oil from the tank, plug the inlet and the discharge ports and store the pump without oil.

9. Return for repair

In case of pump return for repair to PVR, provide a list of substances which have come in contact with the pump and advise the risks involved in handling, if any. Drain the lubricant from the pump prior to shipping the pump back.

10. Disposal

Meaning of the “WEEE” logo found in labels
The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive.
This symbol (valid only in countries of the European Community) indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste but must be sent to a differentiated waste collection system.
The end user is therefore invited to contact the supplier of the device, whether the Parent Company or a retailer, to initiate the collection and disposal process after checking the contractual terms and conditions of sale.



11. Troubleshooting

TROUBLE	CAUSE	REMEDY
Drop in perfomances	Inlet pipes or machine are leaking	Identify leaking point and seal it
	No lubrication	Check oil level and oil conditions. Fill with oil to the right oil level or change the oil and the oil filter
	Inlet filters are dirty	Clean or replace
	Blocked oil cooler	Clean or replace
Anomalous noise	No lubrication	See previous point
	Coupling element worn	Replace
	Motor or pump bearings damaged	Replace
	Damaged vanes	Replace
	Damaged contact surfaces	Pump overhaul at our workshop
Oil leak	Shaft oil seal rings worn	Replace oil seal rings
	Oil filling/discharge plugs are leaking	Check the plug has been closed / replace the gasket
	Inefficient oil recovery system	Check and clean oil recovery pipe
Motor protection is tripping	Blocked exhaust filters	Replace exhaust filters
	No lubrication	Oil level filling up
	Pump seizure and jam	Pump overhaul
	Broken vane	Replace vanes
Discharge oil mist	Inefficient exhaust filters	Replace exhaust filters
	High temperature due to polluted oil	Oil change
	High operating temperature due to high ambient temperature	Decrease room temperature by allowing a better air exchange
Oil is found in the inlet circuit	Inefficient inlet valve	Check the inlet valve is tight. Clean the valve and change any damaged parts

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info@pvr.it - www.pvr.it

LOCAL UNIT:
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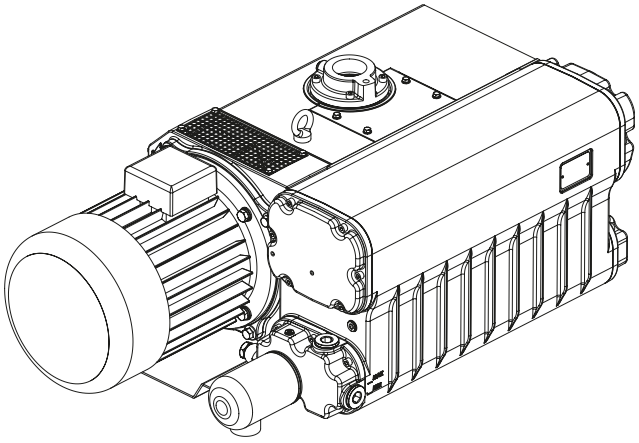
23868 Valmadrera (LC), Italy

PVR
VACUUMDESIGN

EU205F HWT
EU300F HWT

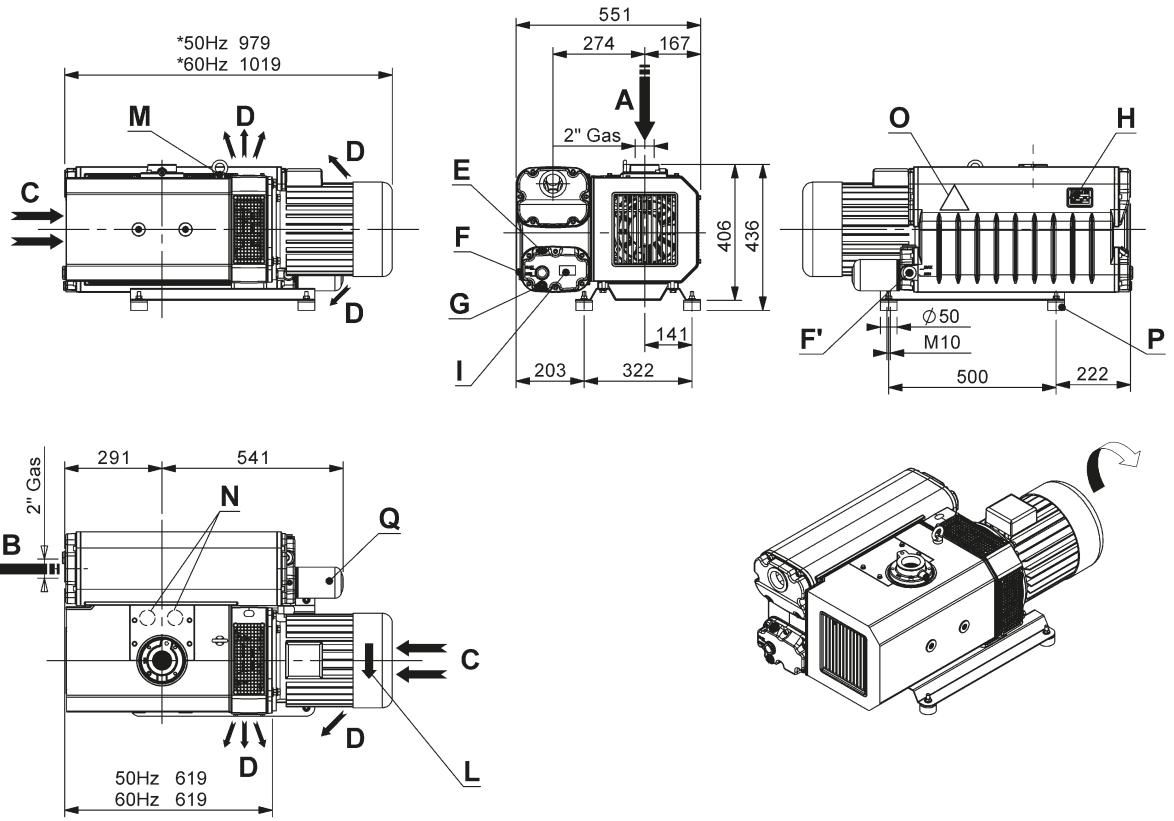
Lubricated vane vacuum pump



Technical data and parts lists

Publication Number:
RDT 4429.01 April 2021

EN
TRANSLATION



Versione ZZ ottimizzata per aspirazione vapori di H_2O
ZZ version optimized for pumping H_2O vapour
Version ZZ optimisé pour l'aspiration de vapeur H_2O
ZZ-Version optimiert für H_2O Dampfabsaugung
Versión ZZ optimizado para la aspiración de vapor H_2O

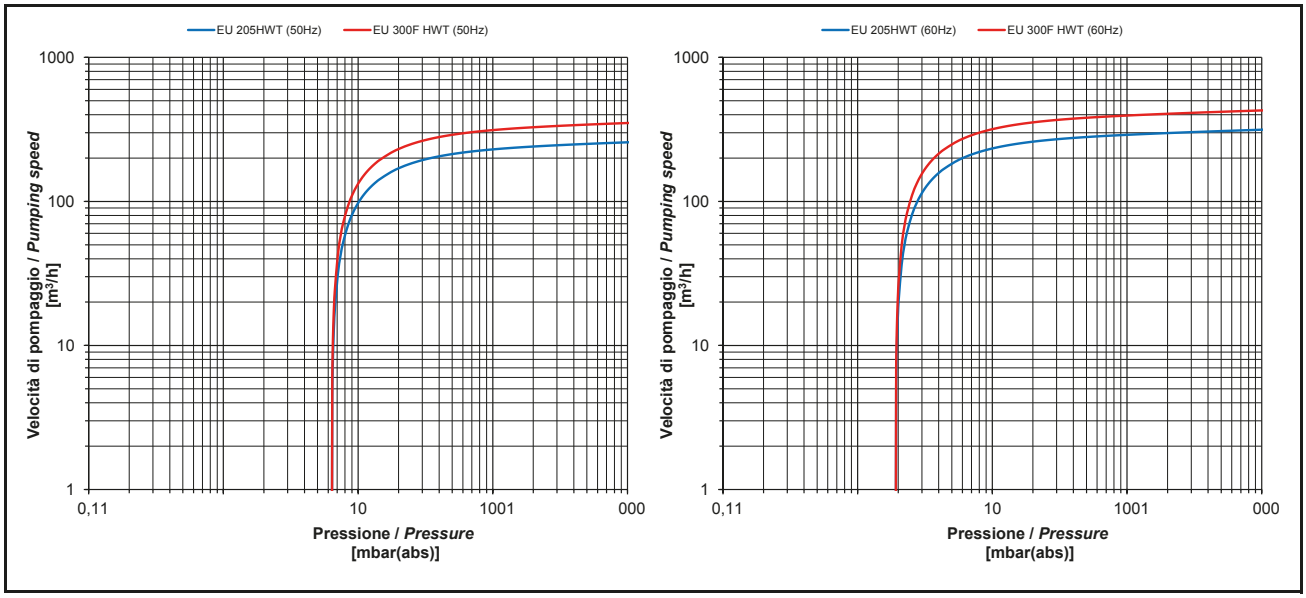
**Misure soggette a variazioni in funzione della marca del motore*
**Dimensions subject to changes depending on the motor brand*
**Données sujettes aux variations en fonction de la marque du moteur*
**Die Maße können aufgrund von Motorzeichen ändern*
**Medidas sujetas a variación en función de la marca del motor*

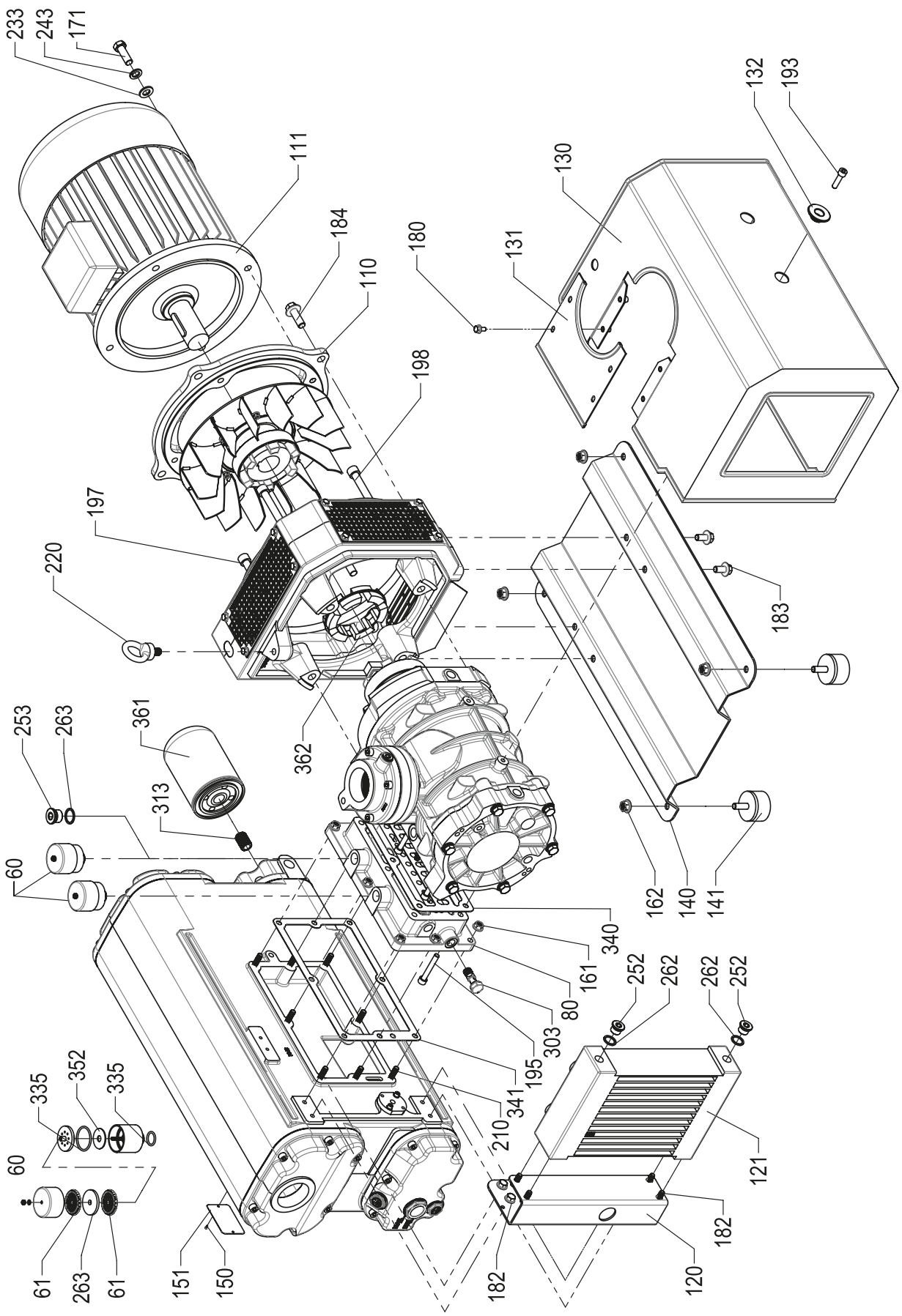
	I	GB	F	D	E
A	Aspirazione	Inlet	Aspiration	Einlass	Aspiración
B	Scarico aria	Exhaust	Sortie de l'air	Luftsauslass	Salida de aire
C	Entrata aria raffreddamento	Cooling air inlet	Entrée air refroidissement	Kühlluftseintritt	Entrada aire refrigeración
D	Uscita aria raffreddamento	Cooling air outlet	Sortie air refroidissement	Kühlluftsaustritt	Salida aire refrigeración
E	Tappo carico olio	Oil filling plug	Bouchon remplissage huile	Öleinfüllschraube	Tapón carga de aceite
F-F'	Spia livello olio	Oil level sight glass	Voyant niveau huile	Ölschauglas	Mirilla aceite
G	Tappo scarico olio	Oil drain plug	Bouchon vidange huile	Ölablass-Schraube	Tapón vaciado de aceite
H	Targhetta identificazione	Pump name plate	Plaquette d'identification	Maschinenschild	Placa de identificación
I	Targhetta oli	Oil grade label	Plaquette huiles	Ölempfehlungsschild	Placa tipos de aceites
L	Targhetta rotazione	Rotation plate	Plaquette rotation	Drehungsschild	Placa sentido de giro
M	Golfaro di sollevamento	Lifting eyebolt	Anneau de levage	Aufhebenösenschraube	Gancho de levantamiento
N	Zavorratore (2xHWT)	Gas ballast valve (2xHWT)	Lest d'air (2xHWT)	Gasballastventil (2xHWT)	Valvula gas-ballast (2xHWT)
O	Targhetta superfici calde	Hot surfaces name plate	Plaquette surfaces chaudes	Typenschild für warme Fläche	Placa superficies calientes
P	Antivibranti	Vibration damper	Pied antivibratoire	Schwingungsdämpfer	Antivibrante
Q	Filtro olio	Oil filter	Filtre huile	Ölfilter	Filtro de aceite

			EU 205F - HWT	EU300F HWT
Portata nominale* Nominal speed* Débit nominal* Nennsaugvermögen* Caudal nominal*	m^3/h	50Hz	205	300
		60Hz	245	360
Pressione finale*(assoluta) Ultimate pressure* (abs.) Pression limite* (abs.) Enddruck* (abs.) Presión final* (abs.)	mbar	≤ 0,8		
	Pascal	≤ 80		
Potenza motore # / Numero di giri Motor power # / Rotational speed Puissance moteur # / Numéro de révolutions Motorleistung # / Drehzahl Potencia motor # / Velocidad de giro	kW	50Hz ~3	4	5,5
	min^{-1}		1500	1500
	kW	60Hz ~3	5,5	7,5
	min^{-1}		1800	1800
Caratteristiche motore elettrico Electric motor characteristics Caractéristiques moteur électrique Motoreigenschaften Características motor eléctrico		50Hz ~3	IM B5 Δ 230 / Y 400 V	IM B5 Δ 400 V / Y 690 V
		60Hz ~3	IM B5 Δ 460 V	IM B5 Δ 460 V
Livello di pressione acustica Sound pressure level Niveau de pression acoustique Schalldruckpegel Nivel de presión acústica	dB(A) EN ISO 2151	50Hz	70	71
		60Hz	72	73
Pressione max vapore H_2O ammissibile Water vapour tolerance Pression de vapeur d'eau maximale admissible Wasserdampfverträglichkeit Presión máxima de vapor de agua admisible	mbar	80		
Quantità vapore H_2O ammissibile Water vapour pumping capacity Capacité de pompage de la vapeur d'eau Wasserdampfkapazität Cantidad de vapor de agua admisible	kg/h	9,8		13,5
Carica olio Oil capacity Charge d'huile Ölfüllmenge Carga de aceite	l	7		
Peso totale / senza motore Total weight / Without motor Poids total / Sans moteur Gesamtgewicht / Gewicht ohne Motor Peso total / Sin motor	kg	50Hz	161 /126	188 / 141
		60Hz	171 / 126	192 / 141

*Secondo accordi PNEUROP 6602.
*According to Pneurop standard 6602.
*Selon la norme Pneurop 6602
*Nach der Pneurop Norm 6602..
*Según la normativa Pneurop 6602.

#Valido per temperature fino a 40°C e altitudini inferiori a 1000 m.
#Valid for temperatures up to 40°C and altitudes lower than 1000 m.
#Valable pour températures jusqu'à 40°C et pour altitudes inférieurs à 1000 m.
#Gültig für Temperaturen bis 40°C und für Höhen weniger als 1000 m.
#Válido para temperaturas hasta 40°C y altitudes inferiores à 1000 m.

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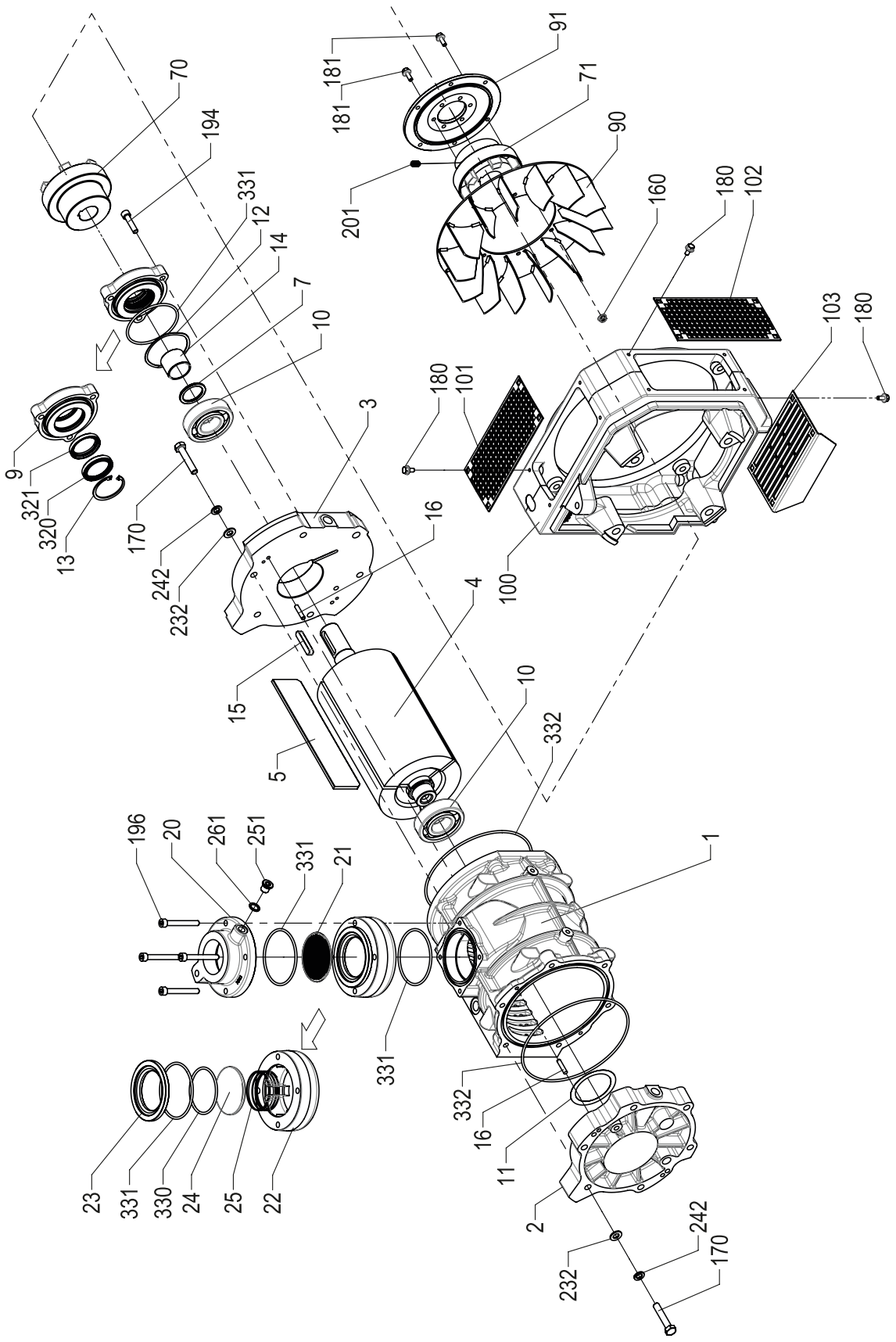
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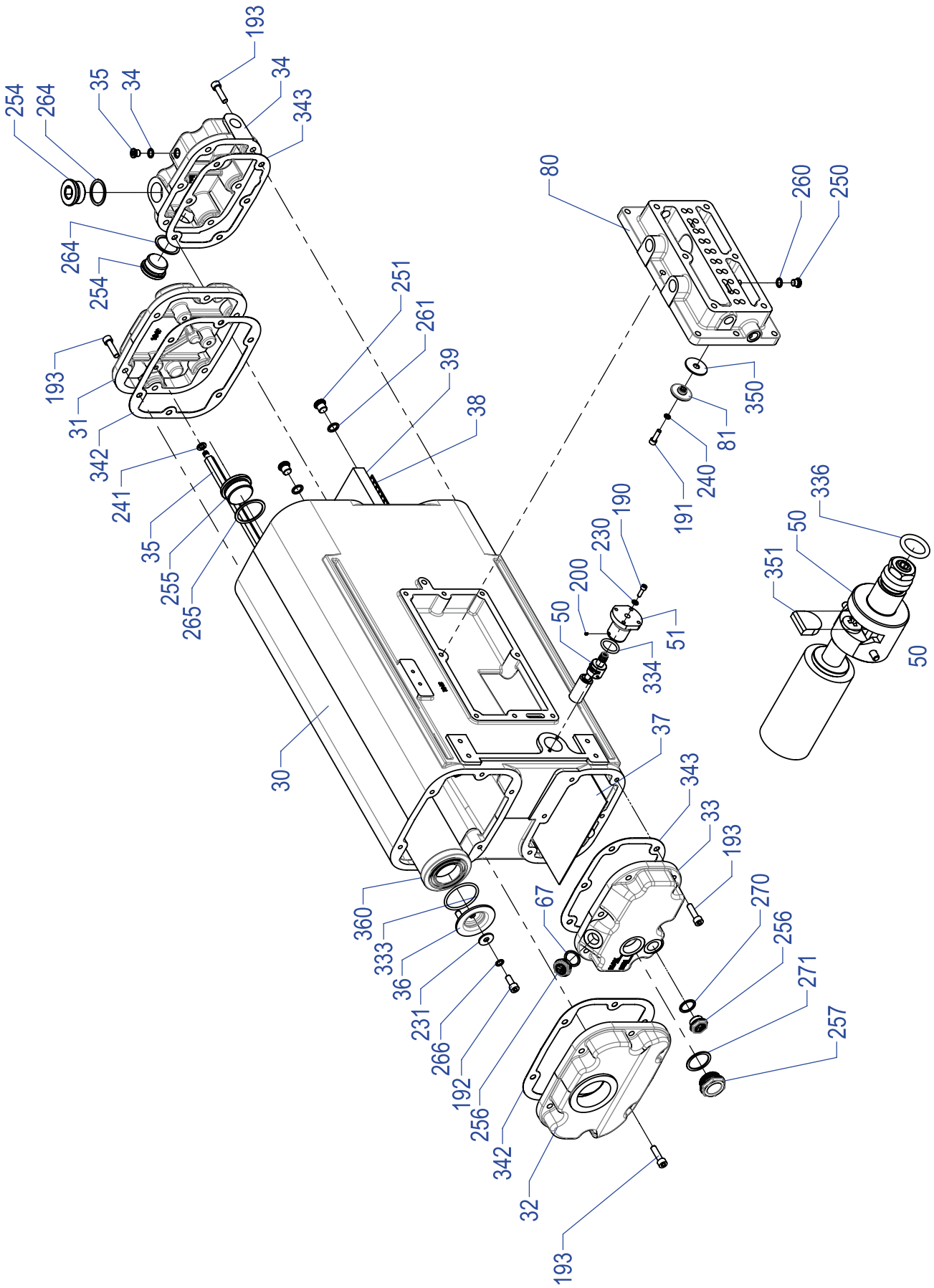
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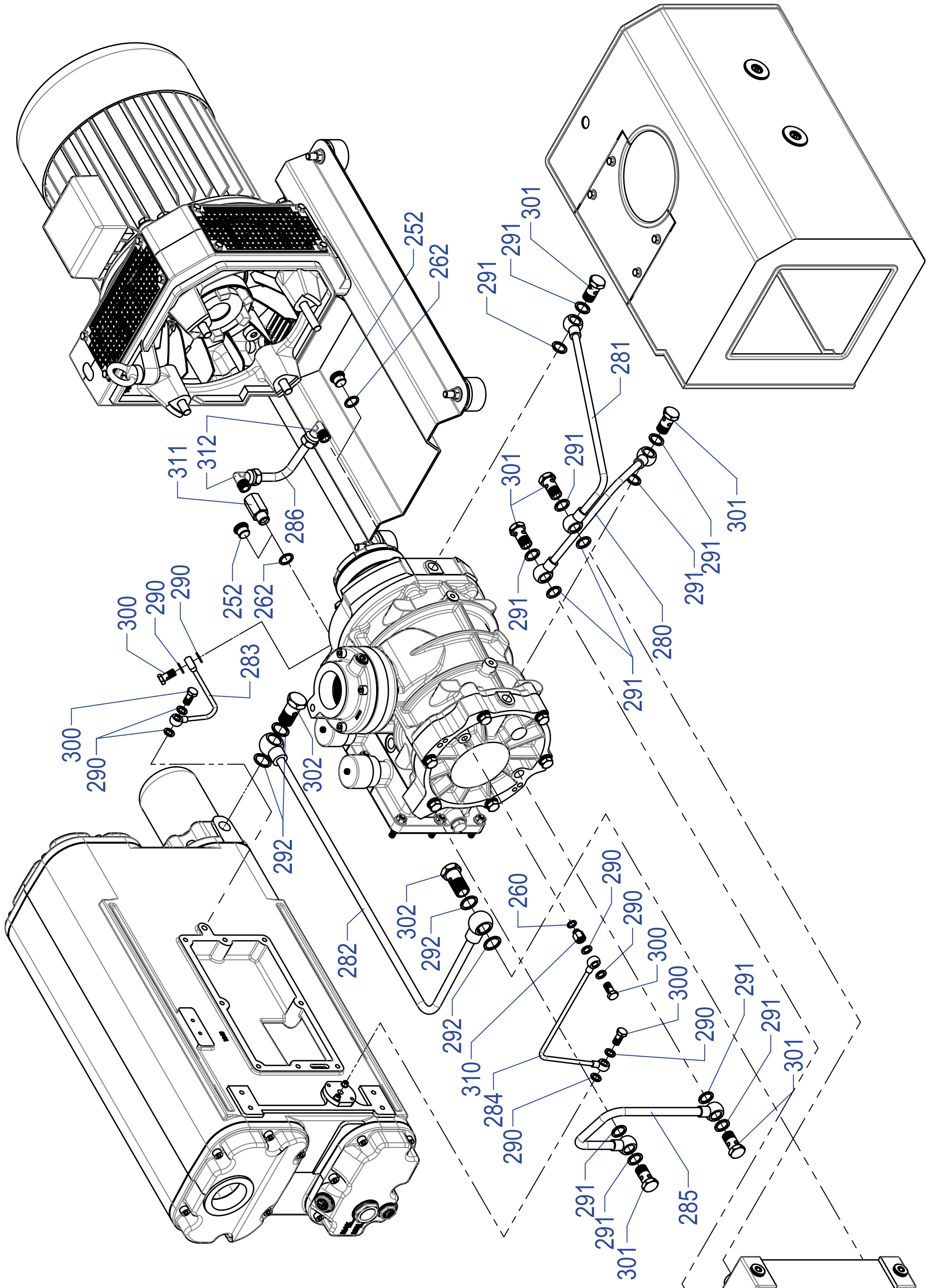
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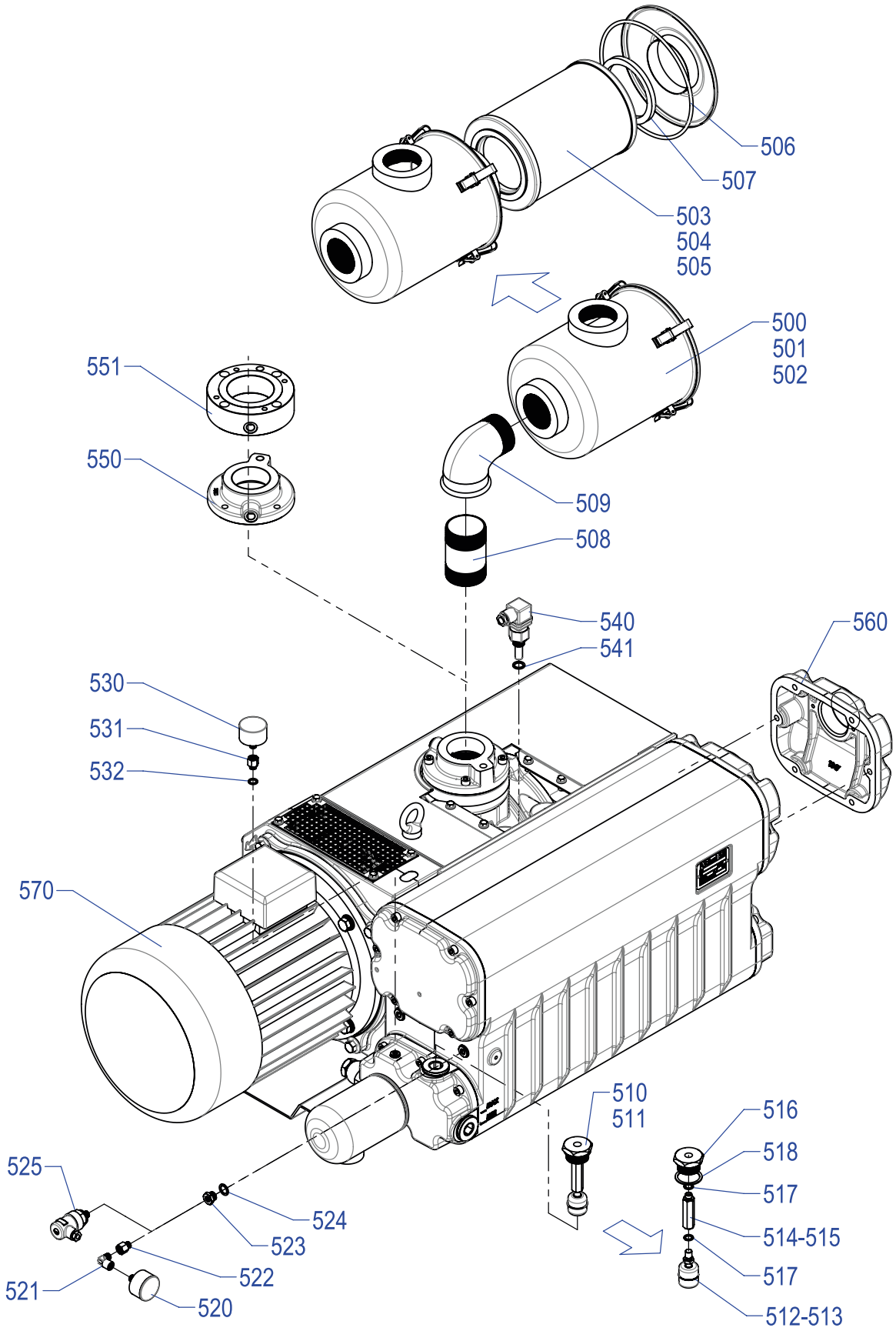
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POS.		DESCRIPTION	EU205F HWT	EU205F HWT
1		Body of pump	1	
2		External side cover	1	
3		Motor side cover	1	
4		Rotor	1	
5	S	Vane	3	
6		Oil seal ring cover	1	
7		Ø35/45x3 Spacer	1	
10	S	6307 Bearing	2	
11		63x80 Space washer	1	
12		Shim ring	1	
13		I53 Seeger	1	
14	S	IR 35X43X30 Ring	1	
15		10x8x50 Key	1	
16		Ø6x30 Pin	4	
20		2"G Inlet flange	1	
21		Inlet filtering baffle	1	
22		Inlet valve body	1	
23		Inlet valve disk	1	
24		Inlet valve plate	1	
25		Helicoidal spring	1	
30		Tank	1	
31		Motor side upper tank cover	1	
32		2"G Discharge tank cover	1	
33		External side lower tank cover	1	
34		Motor side lower tank cover	1	
35		Stay bolt for exhaust filter	3	
36		Disk for exhaust filter	2	3
37		Tank micro-stretched sheet	1	
38		Demister-tank support mesh	1	
39		192X122X20 tank demister	1	
50		Float (oil recovery)	1	
51		Float port	1	
60		1/2"G Gas ballast valve	2	
61		Micro-stretched sheet disk	4	
70		Pump side coupling half	1	
71		Motor side coupling half	1	
80		Pump-tank spacer	1	
81		Support valve disk	5	
90		Ø280x73 Fan	1	
91		Fan hub	1	
100		Fan cover sleeve	1	
101		Upper safety mesh	1	
102		Frontal safety mesh	1	
103		Lower safety mesh with air plate	1	
110		Motor flange	1	
111		Electric motor	1	
120		Oil cooler support	1	
121		Air/oil cooler	1	
130		Casing	1	
131		Casing cover	1	
132		Disk (for casing)	2	
140		Base-plate	1	
141		Ø50x30 – M10x27 Vibration-damping foot	4	
150		Ø1.85x5 Rivet	2	
151		Pump name plate	1	
160		M6 Nut (flanged and knurled)	6	
161		M8 Nut (flanged and knurled)	8	

POS.		DESCRIPTION	EU205F HWT	EU205F HWT
162		M10 Nut (flanged and knurled)	4	
170		M10x55 Partially threaded Hex. Screw	11	
171		M12x35 Hex. Screw	4	
180		M6x12 Hex. (Screw flanged and knurled)	16	
181		M6x16 Hex. Screw (flanged and knurled)	12	
182		M8x16 Hex. Screw (flanged and knurled)	8	
183		M10x20 Hex. Screw (flanged and knurled)	4	
184		M12x35 Hex. Screw flanged and knurled	4	
190		M5x16 Hex. Socket head screw	2	
191		M6x20 Hex. Socket head screw	5	
192		M8x20 Hex. Socket head screw	2	3
193		M8x30 Hex. Socket head screw	26	
194		M8x35 Hex. Socket head screw	3	
195		M8x55 Hex. Socket head screw	6	
196		M8x65 Hex. Socket head screw	4	
197		M12x70 Hex. Socket head screw	3	
198		M12x100 Hex. Socket head screw	1	
200		M4x8 Hex. Socket Stud Bolt	1	
201		M8x16 Hex. Socket Stud Bolt	1	
210		M8x30 Stud bolt	8	
220		M12 Eyebolt	1	
230		Ø5 Washer	2	
231		Ø8/24 Washer	2	3
232		Ø10 Washer	11	
233		Ø12 Washer	4	
240		Ø6 Lock washer	5	
241		Ø8 Lock washer	3	
242		Ø10 Lock washer	11	
243		Ø12 Lock washer	4	
250		1/8"G Hex. Socket head plug	2	
251		1/4"G Al Hex. Socket head plug	3	
252		3/8"G Hex. Socket head plug	2	
253		1/2"G Al Hex. Socket head plug	0	
254		1"G Hex. Socket head plug	2	
255		1" 1/4G Hex. Socket head plug	1	
256		1/2"G Filling-discharge plug	2	
257	R	1"G Oil sight glass	1	
260		1/8"G Al washer	3	
261		1/4"G Al washer	3	
262		3/8"G Al washer	2	
263		1/2"G Al washer	0	
264		1"G Al washer	2	
265		1" 1/4G Al washer	1	
266		Ø8.4/13x1 Al washer	2	3
270		1/2"G Fibre washer	2	
271	R	1"G Fibre washer	1	
280		Oil pipe (external side)	1	
281		Oil pipe (motor side)	1	
282		Oil cooler inlet pipe	1	
283		Oil pipe (outlet seal rings)	1	
284		Oil recovery pipe (H-series)	1	
285		Gas ballast pipe (External side)	1	
286		Gas ballast pipe (Motor side)	1	
290		1/8"G Cu Washer	8	
291		3/8"G Cu Washer	16	
292		1/2"G Cu Washer	4	
300		Screw for 1/8"G fittings	4	

POS.		DESCRIPTION	EU205F HWT	EU205F HWT
301		Screw for 3/8"G fittings	8	
302		Screw for 1/2"G fittings	2	
303		1/4"G Screw with plug	1	
310		A5/Z M-F 1/8"-1/8"G Extension	1	
311		M-F 3/8"-3/8"G L=40 Extension	1	
313		UNF 3/4"-16 Nipple	1	
320	G1	BABSL 40x52x7 Seal ring	1	
321	G1	A-P 40x52x7 Seal ring	1	
330	G1	O Ring 173	1	
331	G1	O Ring 4337	4	
332	G1	O Ring 4725	2	
333	G1	O Ring 4200	4	6
334	G1	O Ring 4093	1	
335	G1	O Ring 3075	2	
336	G1	O Ring 108	1	
337	G1	O Ring 3143	2	
340	G2	Body of pump-spacer gasket	1	
341	G2	Spacer-tank gasket	1	
342	G2	Gasket for upper tank covers	2	
343	G2	Gasket for lower tank covers	2	
350	G1	Ø36/10x2 Rubber disk	5	
351	G1	Rubber seal for Float (oil recovery)	1	
352	G1	Ø34/10x2 Rubber disk	2	
360	R	Exhaust filter	2	3
361	R	Oil filter	1	
362	R	Elastic coupling insert	1	
363	R G1	Ø42/8x4 Felt disk	2	
		OPTIONALS		
500		Complete Inlet filter F300 (paper element)	1	
501		Complete Inlet filter F300 (polyester element)	1	
502		Complete Inlet filter F300 (s/s element)	1	
503	Rx	Paper filter element	1	
504	Rx	Polyester filter element	1	
505	Rx	S/S filter element	1	
506	Gx	O Ring M. Ø185 c=5	1	
507	Gx	V Gasket	2	
508		M-M 2"G Pipe fitting	1	
509		A4 2"G Elbow union	1	
510		Minimum Oil level switch (complete)	1	
511		Max. Oil level switch (complete)	1	
512		Oil level switch	1	
513		Max. Oil level switch	1	
514		Min. oil level switch extension	1	
515		Max. oil level switch extension	1	
516		1"G Oil level switch port	1	
517		1/8"G Al washer	2	
518		1"G Al washer	1	
520		PVR pressure gauge	1	
521		A10 M-F 1/8"-1/8"G fitting	1	
522		A5 M-F 1/8"-1/8"G extension	1	
523		A4/Z M-F 1/4"-1/8"G Adapter	1	
524		1/4"G Al washer	1	
525		Adjustable pressure switch	1	
530		Oil filter condition indicator	1	
531		A5/Z M-F 1/8"-1/8"G Extension	1	
532		1/8"G Al washer	1	

POS.		DESCRIPTION	EU205F HWT	EU205F HWT
540		Safety temperature switch	1	
541		1/4"G Al washer	1	
550		2"NPT Inlet flange	1	
551		ISO-K63 Inlet flange	1	
560		2"NPT Discharge tank cover	1	
570		Oversized electric motor	1	
MAINTENANCE KIT				
600	R	Minor maintenance kit	1	
601	S	Major maintenance kit (R+G1+G2)	1	
602	G1	Viton sealing kit	1	
603	G2	Machined gasket kit	1	

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