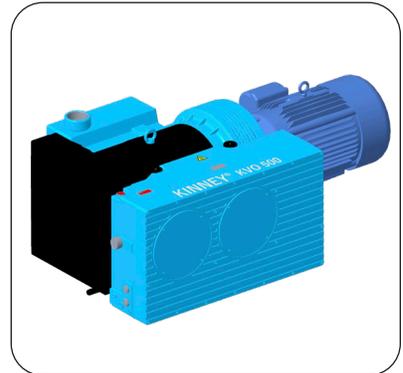


WARNING: Do Not Operate Before Reading Manual

KVO Series OPERATOR'S MANUAL

Models

KVO-50	KVO-75	KVO-150
KVO-200	KVO-300	KVO-400
KVO-500	KVO-700	KVO-900
KVO-1100	KVO-1300	



Disclaimer Statement:

All information, illustrations and specifications in this manual are based on the latest information available at the time of publishing. The illustrations used in this manual are intended as representative reference views only. Products are under a continuous improvement policy. Thus, information, illustrations and/or specifications to explain and or exemplify a product, service or maintenance improvement may be changed at any time without notice.

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Product information and specifications subject to change.

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INTRODUCTION

CONGRATULATIONS on the purchase of a new **Kinney® KVO Series** Oil Sealed Rotary Vane vacuum pump. Please examine the pump for shipping damage, and if any damage is found, report it immediately to the carrier. If the pump is to be installed at a later date, make sure it is stored in a clean, dry location and rotated regularly. Make sure covers are kept on all openings. If pump is stored outdoors, be sure to protect it from weather and corrosion.

This manual applies to Kinney Vacuum models KVO Series. Become thoroughly familiar with these instructions before attempting to install, operate or repair this unit. Consult Kinney when problems arise that cannot be resolved after reading this manual. Always include pump nameplate information when ordering parts or components.

Kinney KVO Series vacuum pumps are built to exacting standards and, if properly installed and maintained, will provide many years of reliable service. Read and follow every step of these instructions when installing and maintaining the pump.

WARNING

Serious injury can result from operating or repairing this machine without first reading the service manual and taking adequate safety precautions.

NOTE: Record the pump model and serial numbers in the **OPERATING DATA** form on the inside back cover of this manual. Use this identification on any replacement part orders, or if service or application assistance is required.

SCOPE OF MANUAL

The scope of this manual includes the KVO Series oil sealed rotary vane vacuum pumps.

02

CONVENTIONS AND DATA PLATE

GRAPHIC CONVENTIONS IN THIS MANUAL

The following are hazard levels referenced within this manual:

 **DANGER**

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 **WARNING**

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 **CAUTION**

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a situation that can cause damage to the engine, personal property, and/or the environment or cause the equipment to operate improperly.

NOTE: Indicates a procedure, practice, or condition that should be followed in

order for the equipment to function in the manner intended.

 **CAUTION**



Read manual before operation or bodily harm may result. Attention should be given to the safety related sections of this manual.

 **WARNING**



Keep body & clothing away from machine. During operation, keep body and clothing away from inlet and outlet of the pump.

 **WARNING**



Do not operate without guards in place. Assure that the guards are in place and secure prior to operation.

**CAUTION**

Hearing protection is required while the pump is in operation. At ultimate pressure noise levels are 80 dBA at 60 Hz, however due to process or installation conditions noise levels may be higher.

**CAUTION**

Do not touch hot surfaces. Do not touch the vacuum pump while it is in operation and assure that the pump is cool before touching, when not in operation.

The following information is contained on the data plate:

- MODEL NUMBER:** The specific model of the pump
- SERIAL NUMBER:** Unique to each pump. Use with any service issues and with any contact with the manufacturer.
- YEAR:** Year of manufacture
- MAX RPM:** Maximum RPM at which the pump can be operated

This manual describes instructions and precautions to be observed in the handling and maintenance of Kinney® KVO Series oil sealed rotary vane vacuum pumps. It is strongly recommended that those who operate or maintain the pump read this manual carefully prior to pump operation, to ensure personal safety and pump life.

KINNEY®	C	€	SN: SC0123456789	
			BJ: 2020	
vacuum pump				
KVO 200 CD	Model	ID: 1027272012		
<hr/>				
0,50 / 0,50 mbar (abs) Ultimate Pressure				
200,0 / 240,0m³/h Maximum Capacity				
EN 60034				
S1	5,50 l	6,50 kW	1445 l 1740 /min	
<small>Kinney, 4840 W Kearney St, Springfield, MO 65803 +1(417)865 8715</small>				

WARNING

The vacuum pump must be handled using an appropriate device such as a fork truck or appropriate lifting device. See *Table 4-1 on page 7* for approximate weights. Care should be taken to assure pump does not over-turn during handling and installation.

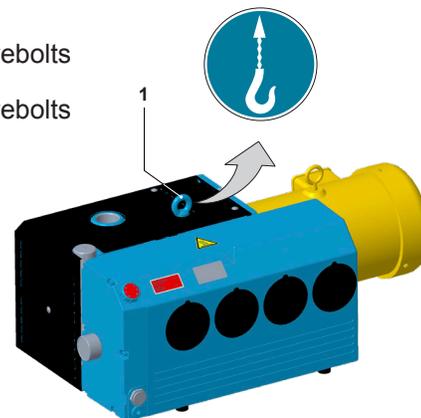
NOTICE

Lift the vacuum pump using eye bolts directly attached to the top of the pump housing, or with both fork truck forks underneath the pump.

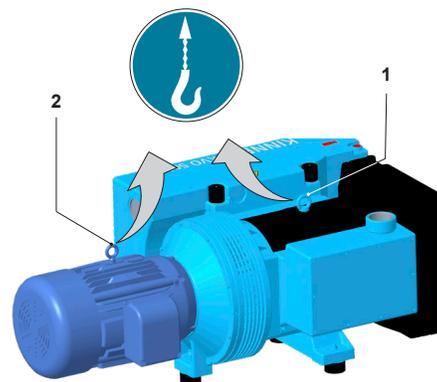
Lifting Configuration

Refer to *Figure 3-1 – Lifting Configuration* for further details on how to properly lift KVO Series vacuum pump.

1. Eyebolts
2. Eyebolts



NOTE: This image applies to models below 400.



NOTE: This image applies to models 400 and above.

Figure 3-1 – Lifting Configuration

04

DESCRIPTION

The KVO vane vacuum pumps are single-stage oil flooded rotary vane vacuum pumps. The rotary vane divides the pump housing into several chambers whose volumes change periodically. The oil ensures for the sealing of the gap, an optimum lubrication and the dissipation of the compression heat.

The pumps have an integrated mesh filter on the suction side and on the outlet side an oil and oil mist separator to return the oil to the oil circulation system. With optimum air routing, a fan and an oil cooler ensure for the cooling of the oil and pump housing. An integrated non-return valve prevents the evacuated system from being ventilated after the pump has stopped. With standstill times longer than two minutes, we recommend venting the connecting lines to atmospheric pressure in order to avoid possible damage.

When the pump is at operating temperature, a standard gas ballast valve prevents the condensation of low quantities of water vapor inside the pump. The water vapor compatibility may vary depending on the pump version.

It is driven via a coupling by a flanged, three-phase standard motor.

DESIGNATED USE

The machine must only be operated in such areas as are described in the operating instructions:

- Only operate in technically perfect condition
- Do not operate the machine when it is only partially assembled
- The machine must only be operated at an ambient temperature and a suction temperature of between 5 and 40°C Please contact us for temperatures outside this range.
- The machine may convey, compress or extract the following media:
 - Air - The air extracted may contain water vapor but no water or other liquids. For water vapor compatibility.
 - All non-explosive, non-inflammable, non-aggressive and non-poisonous dry gases and gas air mixtures

UNACCEPTABLE OPERATING MODES

- Extracting, conveying, and compressing explosive, inflammable, aggressive or poisonous media, e.g. dust as per ATEX zone 20-22, solvents or gaseous oxygen and other oxidants
- Extracting, conveying and compressing explosive, inflammable, aggressive, oxidative or poisonous media, e.g. dust as per ATEX zone 20-22, solvents
- Modifications to the machine and accessories
- Using the machine in non-commercial plants if the necessary precautions and protective measures have not been taken in the plant
- Installing in environments at risk of explosions
- Using the machine in areas with ionizing radiation
- Back pressures on the outlet side of more than +0,1bars

SPECIFICATIONS

	UNIT	KVO-50	KVO-75	KVO-100	KVO-150	KVO-200	KVO-300	KVO-400	KVO-500	KVO-700	KVO-900	KVO-1100	KVO-1300
Nominal Displacement	cfm (m³/h)	35.3 (60)	49.4 (84)	70.6 (120)	106 (180)	141 (240)	212 (360)	283 (480)	388 (660)	494 (840)	586 (995)	777 (1320)	903 (1534)
Motor Power	HP	2	3	5	5	7.5	10	15	20	25	30	40	40
Rotation Speed	RPM	1740	1740	1740	1740	1770	1770	1140	1140	1140	1140	1140	1140
Oil Capacity (Total/Refill)	U.S. gal (L)	.75 (2.8)	.75 (2.8)	.75 (2.8)	.875 (3.3)	1.6 (6)	1.7 (6.5)	3 (11.5)	4.4 (17)	4.4 (17)	5 (19)	6.5 (25)	6.5 (25)
Suction Connection	FNPT	1 1/4" FNPT	1 1/4" FNPT	1 1/2" FNPT	1 1/2" FNPT	2" FNPT	2" FNPT	3" FNPT	3" FNPT	3" FNPT	4" FNPT	4" FNPT	4" FNPT
Discharge Connection	MBSP	1 1/4" FBSP	1 1/4" FBSP	2" FBSP	2" FBSP	2" FBSP	2" FBSP	3" FNPT	3" FNPT	3" FNPT	3" FNPT	3" FNPT	3" FNPT
Height	Inches (mm)	10.51 (267)	10.51 (267)	11.69 (297)	11.69 (297)	15.28 (388)	15.28 (388)	23.15 (588)	23.19 (589)	26.93 (684)	29.02 (737)	29.02 (737)	29.02 (737)
Floor Space Required	Inches (mm)	13.23 × 24.66 (366 × 627)	13.23 × 24.67 (586 × 759)	15.98 × 31.77 (406 × 807)	15.98 × 31.78 (406 × 807)	20.47 × 38.71 (520 × 983)	20.47 × 40.21 (520 × 1021)	36.65 × 57.44 (931 × 1459)	38.82 × 62.79 (986 × 1595)	38.82 × 65.4 (986 × 1661)	42.64 × 64.57 (1083 × 1640)	44.17 × 73.96 (1122 × 1879)	44.17 × 73.96 (1122 × 1879)
Weight	lb (kg)	145 (66)	191 (87)	256 (116)	254 (115)	220 (100)	220 (100)	1250 (567)	1422 (645)	1512 (685)	1723 (782)	2471 (1121)	2486 (1128)
Ultimate Pressure	mbar	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1
Noise Level*	dBA	67	68	69	71	71	72	75	77	80	81	83	84

* Noise level may vary based upon motor selection.

Table 4-1 – Specifications

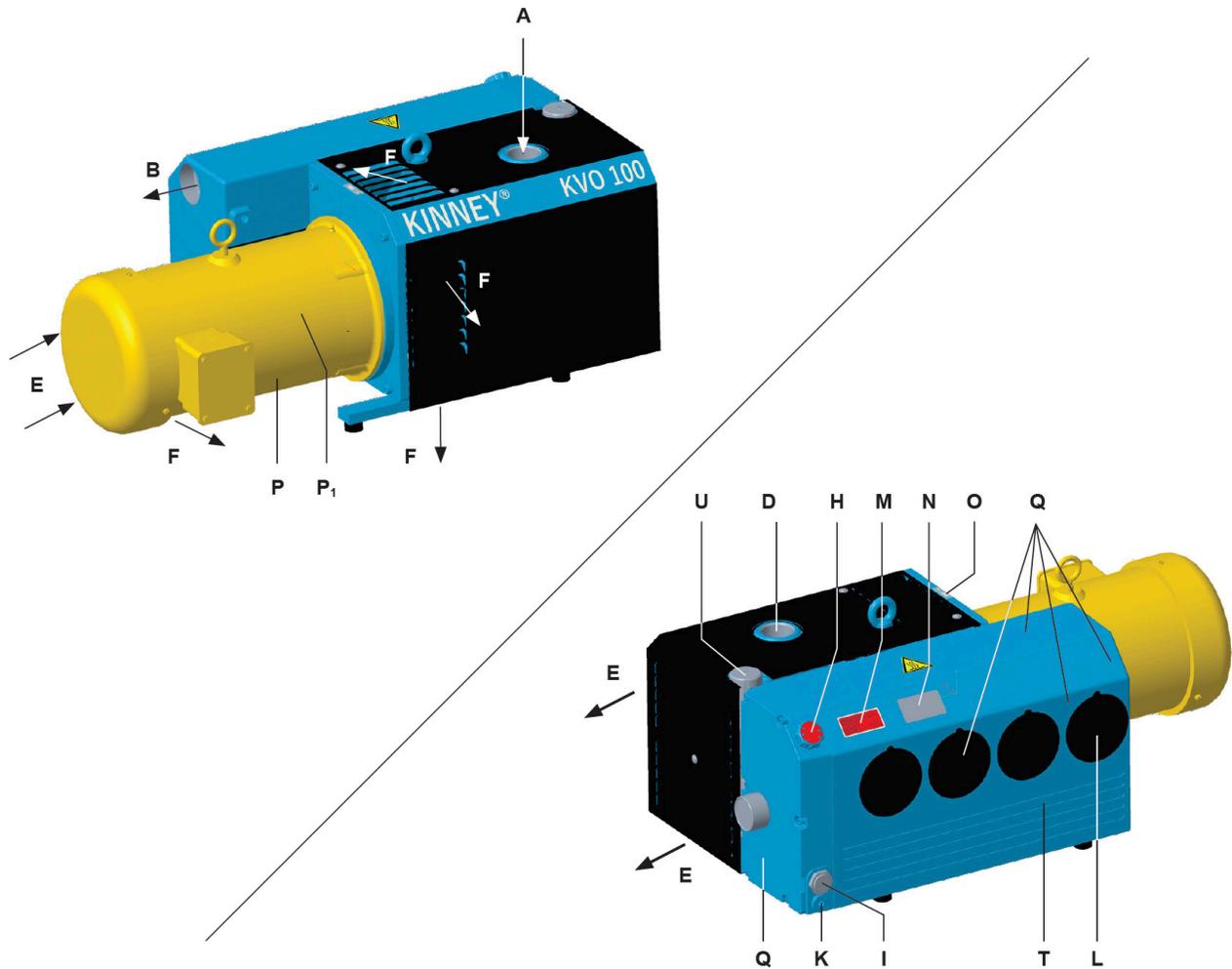
WARNING

Do not exceed maximum rotation speed (RPM) as stated in Table 4-1.

MATERIALS OF CONSTRUCTION

HOUSINGS AND CYLINDER:	Cast iron
ROTORS:	Cast iron
SHAFT:	Carbon Steel
SHAFT SEALS:	Carbon/Viton®
VANES:	Composite Resin KVO-50 – KVO-300
	Aluminum KVO-400 – KVO-1300

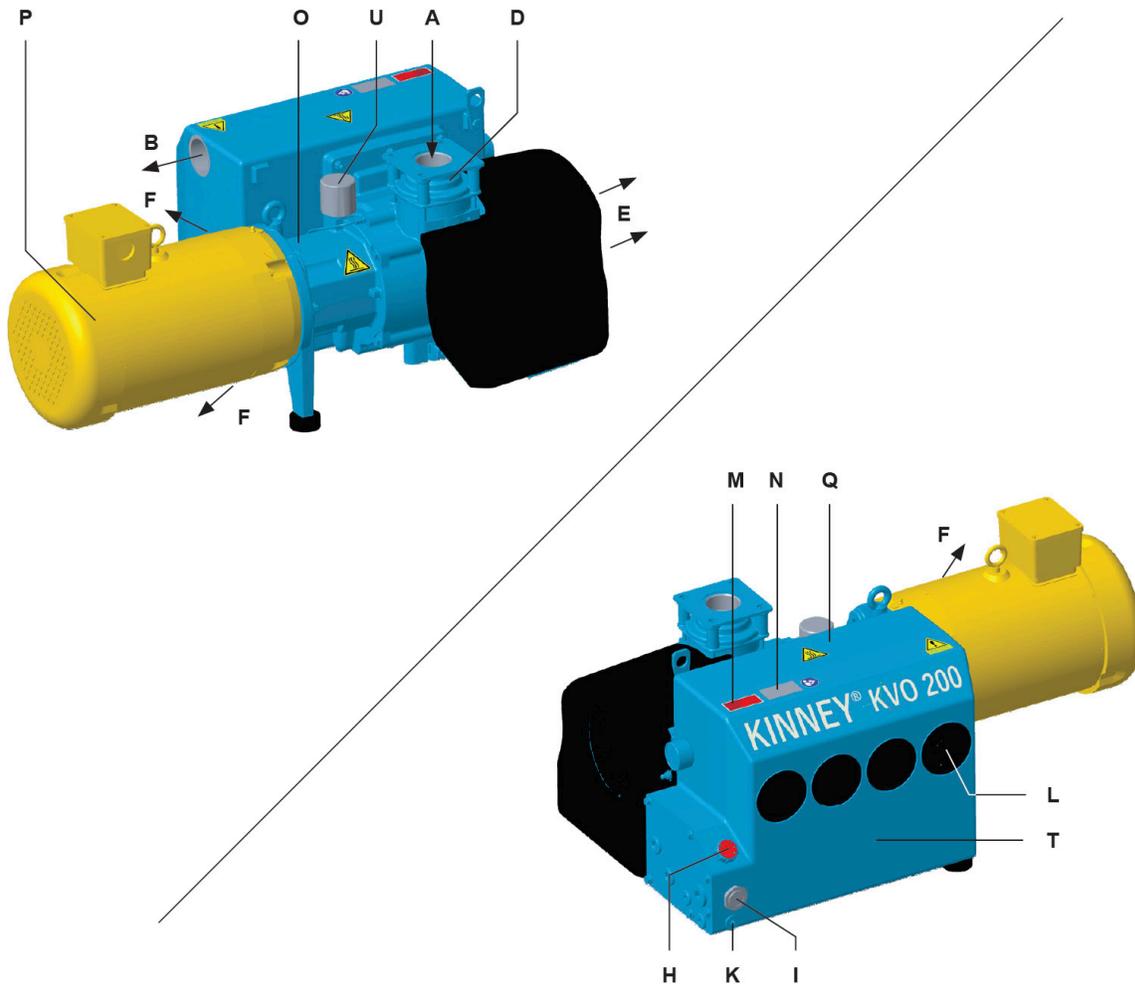
KVO-50 / KVO-75 / KVO-100 / KVO-150 FEATURE SETUP



- A** Vacuum connection
- B** Exhaust air outlet
- D** Suction flange
- E** Cooling air inlet
- F** Cooling air outlet
- H** Oil filling point
- I** Oil sight glass
- K** Oil discharge point
- L** Oil separator element

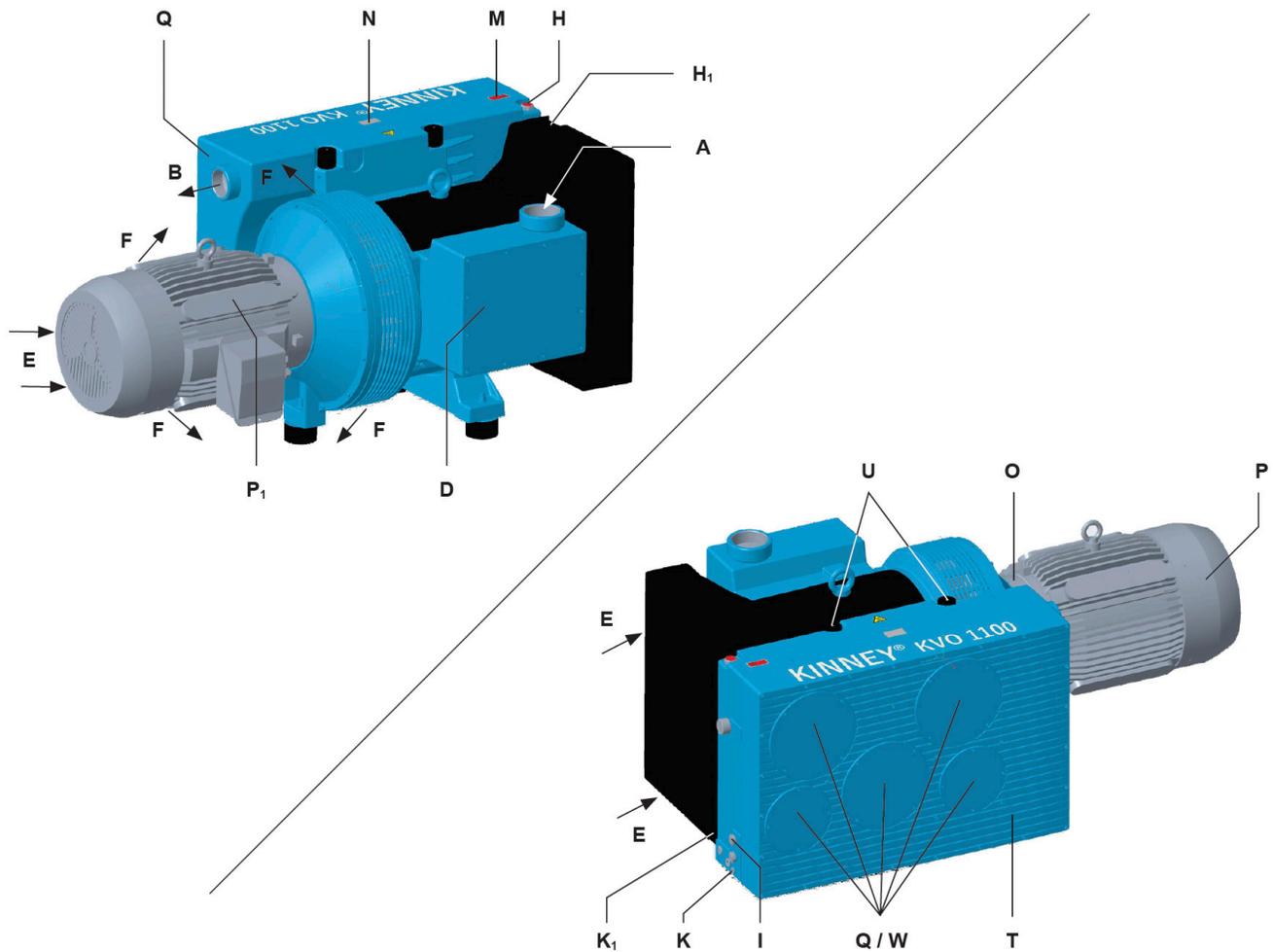
- M** Oil recommendation plate
- N** Data plate
- O** Rotation direction arrow
- P** Drive motor
- P₁** Motor data plate
- Q** Hot surfaces > 70 °C
- T** Oil remover housing
- U** Gas ballast valve

KVO-200 / KVO-300 FEATURE SETUP



- | | | | |
|----------|------------------------------------|----------|------------------------------|
| A | Vacuum connection | L | Air oil removal device |
| B | Exhaust air outlet | M | Oil recommendation plate |
| D | Inlet flange with non-return valve | N | Data plate |
| E | Cooling air inlet | O | Direction of rotation arrow |
| F | Cooling air outlet | P | Drive motor |
| H | Oil filling point | Q | Hot surfaces > 70 °C |
| I | Oil sight glass | T | Oil remover housing |
| K | Oil discharge point | U | Gas ballast valve (standard) |

KVO-400 / KVO-500 / KVO-700 / KVO-900 / KVO-1100 / KVO-1300 FEATURE SETUP



A	Vacuum connection
B	Exhaust air outlet
D	Filter housing
E	Cooling air inlet
F	Cooling air outlet
H, H₁	Oil filling points
I	Oil sight glass
K, K₁	Oil discharge points
M	Oil recommendation plate

N	Data plate
O	Rotation direction plate
P	Drive motor
P₁	Motor data plate
Q	Hot surfaces > 70°C
T	Oil remover housing
U	Gas ballast valve
W	Maintenance cover
X	Adjusting bolt

INSTALLATION

SAFETY

DANGER



Internal and external rotating parts of the pump and driving equipment can produce serious physical injuries. The pump should never be run with the inlet or discharge piping removed. If it becomes necessary to inspect the rotating parts of the pump or to change the belt, be absolutely sure that all power to the motor controls has been shut off, the motor controls are locked out, and properly tagged before proceeding.

WARNING



Vacuum pump housing and associated piping or accessories may become hot enough to cause major skin burns on contact as a result of process conditions.

WARNING

Use lockout / tagout procedures to disable the electrical energy source before any service or work is done on the vacuum pumps.

CAUTION



Avoid extended exposure in close proximity to machinery with high intensity noise levels. Wear adequate ear protection.

CAUTION

Other potential hazards to safety may also be associated with operation of this equipment. All personnel working in or passing through the area should be warned by signs and trained to exercise adequate general safety precautions.

NOTICE

Use proper care and good procedures in handling, lifting, installing, operating, and maintaining the equipment.

⚠ WARNING

Never attempt to change or add lubrication while the pump is running. Failure to heed this warning could result in damage to the equipment or personal injury.

⚠ WARNING

Properly dispose of spent lubricants. Refer to the manufacturer of the lubricant and any applicable regulations to ensure proper and safe disposal.

NOTICE

If the oil level is too low, bearings and seals will be damaged as a result of improper lubrication.

NOTICE

The machine may only be operated when it is set up horizontally.

NOTICE

Material damage resulting from the machine tipping over and falling.

NOTICE

When installed at more than 3280 feet (1000 meters) above sea level a reduction in power is noticeable. In this case we would ask you to contact Kinney directly for guidance.

FILLING THE PUMP WITH OIL

Use oil recommended by Kinney and see the specifications for the quantity of oil required to fill the pump. Remove the oil fill plug at the top of the housing and add oil until the level reaches mid-center of the gauge. With the pump shut off, add or drain oil as necessary to keep the oil level.

⚠ CAUTION

Do not overfill the pump as excess oil will be blown out the discharge during the high pressure operation of the pump.

LOCATION

The pump should be mounted on a flat, level surface. There should be enough space around the pump to allow for safe maintenance work and periodic inspections. This includes, at a minimum, the ability to access oil fill and drain locations, view the oil level glass and the oil temperature and pressure gauges. Allow accessibility to all sides. Do not close cooling air entry and exit.

Foundation

The foundation for the pump assembly should be flat and level, and have adequate load-bearing capacity. The pump and its base frame, peripheral equipment and piping should be installed after the foundation concrete has been cured. It is possible to install the machine on a firm base without anchoring. When installing on a sub-structure Kinney recommends fixing with flexible buffers.

PIPING CONNECTIONS**⚠ WARNING**

Pipe loading on the pump should be negligible as pipe loading can cause distortion of the pump. Use proper supports and pipe hangers to assure that there is no loading.

VACUUM CONNECTION

The pumping capacity of the vacuum pump is reduced if the suction pipe is too narrow and/or long. Discharged air can be blow out through the exhaust silencer conducted away using a hose or a pipe.

Exhaust Air Must Not be Restricted

When the exhaust air pipe is connected it must be checked regularly for impurities.

WARNING

Do not block the exhaust pipe of the pump.

NOTICE

Material damage resulting from the forces and torques of the pipes on the unit being too high. Only screw pipes in by hand.

CONNECTING THE MOTOR

DANGER



Danger of death if the electrical installation is not professionally completed. The electrical installation must be completed by a qualified electrician observing EN 60204. The operating company is required to provide the main switch.

The motor's electrical data is given on the data plate or on the motor data plate. The motors comply with DIN EN 60034 and are in protection class IP55 and insulation class F. The appropriate connection diagram is located in the motor's terminal box (not for the plug connection version). The motor data must be compared with the data of the existing mains network (current type, voltage, network frequency, and permitted current value).

Connect the motor via the plug connection or the motor overload. For safety reasons, a motor overload is required and the connecting cable must be installed via a cable fitting to provide strain relief. Kinney recommends using motor protection switches with delayed switch off, depending on possible excess current. Temporary excess current may occur when the machine is started cold.

Power Supply

The conditions at the installation location must match the information on the motor data plate. Without derating the following is permissible:

- $\pm 5\%$ Voltage deviation
- $\pm 2\%$ Frequency deviation

06

OPERATION

WARNING

Improper use may lead to severe or fatal injuries. Therefore be sure to obey the safety instructions.

CAUTION



Hot surfaces. When the machine is at operating temperature the surface temperature on the components may go above 158°F (70°C). You must avoid touching the hot surfaces. These areas are marked with warning plates.

CAUTION



Noise emission. The highest noise pressure levels measured as per EN ISO 3744. When spending a long time in the vicinity of the running machine use ear protection to avoid permanent damage to your hearing.

NOTICE

Wait until the machine stops. The machine must only be switched on again after it stops.

CHECKING ROTOR ROTATION DIRECTION

Operating in the wrong direction of rotation leads to damage to the machine. Use a phase sequence indicator to check the direction of rotation (clockwise rotating field).

The intended direction of rotation of the drive shaft is shown by the rotary direction arrow on the motor flange. Start the motor briefly (maximum of 2 seconds) to check the direction of rotation. When looking at the motor fan, it must rotate clockwise.

NOTICE

Operating in the wrong direction of rotation leads to damage to the machine. Use a phase sequence indicator to check the direction of rotation (anti-clockwise rotating field).

After correcting the direction of rotation if necessary, start the motor again and stop it again after 2 minutes in order to top missing oil up to the upper edge of the sight glass. This topping up at the filling point must be repeated until all the oil pipes have been filled completely. The filling point must not be open when the pump is running.

ENSURING OPERATIONAL SAFETY

DANGER



Danger of death from touching live parts. Before maintenance work disconnect the machine by pressing the main switch or unplugging it and ensure it cannot be turned on again.

WARNING



Hot surfaces and equipment. During maintenance work there is the danger of getting burnt on hot components and by machine lubricating oil. Allow ample time for the machine to cool down prior to maintenance work.

Regular maintenance work must be carried out in order to ensure operational safety. Maintenance intervals also depend on the operational demands on the machine. Observe the safety instructions described in the section labeled **“Safety” on page 11**. The entire unit should always be kept in a clean condition.

SPECIFICATIONS

INTERVAL	MAINTENANCE TO BE CARRIED OUT
Daily	Check the oil level
Depending on the degree of pollution	Clean vacuum pump
At least 1 x per month	Check the pipes and screws for leaks and ensure their tight fit and if necessary re-seal or re-tighten.
	Check the terminal box and cable inlet holes for leaks and if necessary re-seal.
	Clean the ventilation slots on the machine and the motor cooling ribs.
	Cleaning the oil cooler
Depending on how dirty the sucked in medium is or at least 1 x per month	Clean the mesh filter in the inlet connection
	Clean the filter cartridge in the gas ballast valve
500 hours	First oil change
500 - 2,000 hours	Oil change
2000 hours	Change the air oil removal devices
At least 1 x per year	Check couplings for wear
As per manufacturer's instructions	Motor (maintenance, lubrication and cleaning)

Table 7-1 – Maintenance Interval Schedule

CHANGING THE OIL

The oil level must be checked at least once a day, if necessary top the oil up to the upper edge of the sight glass. First oil change after 500 hours of operation. Subsequent oil changes after 500-2000 hours of operation. Reduce the change intervals accordingly depending on how contaminated the discharged medium is.

Only lubricating oils complying with DIN51506 group. The viscosity of the oil must comply with ISO VG 100 as per DIN51519. KV100M (mineral) and KV100S (synthetic) oils must be used.

OIL REMOVAL

The oil separator elements can become contaminated by dust particles after they have been running for some time (power consumption and pump temperature increase). Replace these components every 2000 operating hours or when the filter resistance is

0.7 bar (see pressure gauge » Accessories, Checking with short term, atmospheric suction) because it is not possible to clean them.

Reduce the change intervals accordingly depending on how contaminated the discharged medium is.

KVO-50 – 300 Oil Removal

Changing: Undo the air oil removers with a ring spanner (spanner width 3/4") rotating counter clockwise. Insert new air oil removers with the open lock symbol with the arrow ▼ on the insert and fix turning clockwise (until it clicks into place).

KVO-400 – 1300 Oil Removal

Changing: Unscrew the maintenance cover. Replace the oil separator elements.

Re-assemble in reverse order. Before fitting the O-ring lightly oil the new oil remover and tighten it to 15 Nm (wrench width 3/4").

NOTICE

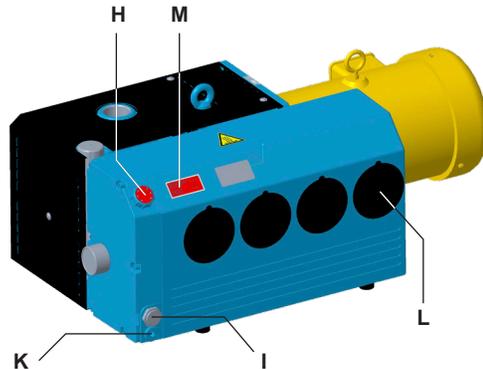
Always change the oil when the machine is at operating temperature and in an atmospherically ventilated area. If it is completely emptied the amount that can be refilled is reduced.

NOTICE

The waste oil must be disposed of in compliance with the local environmental protection regulations. If you are going to use another oil type, empty the oil removing device housing and oil cooler completely.

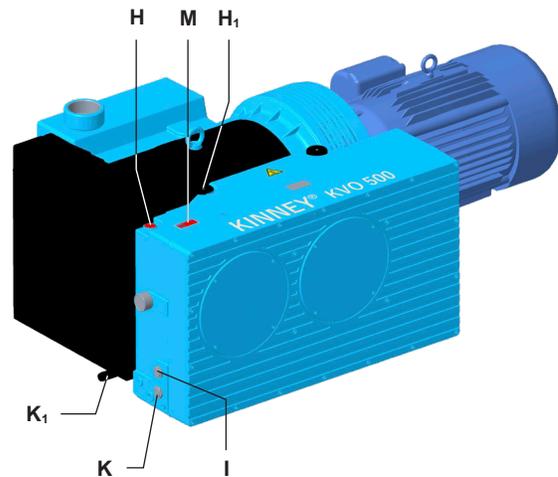
OIL DIAGRAMS

KVO-50 – KVO-300 Oil Diagram



- H Oil filling point
- I Oil sight glass
- K Oil discharge point
- L Air oil remover device
- M Oil recommendation plate

KVO-400 – KVO-1300 Oil Diagram



- H, H₁ Oil filling point
- I Oil sight glass
- K, K₁ Oil discharge point
- M Oil recommendation plate

AIR FILTERING (MODELS KVO-50 – KVO-300)

Intake air filter

The micro filter must be cleaned by rinsing out or purging or replaced more or less often depending on how dirty the discharged medium is. Remove the cover after undoing the screws and remove the suction flange after undoing the screws.

Re-assemble in reverse order. After that check the function of the valve. For this purpose fit a shut-off device (enclosed volume min. 1 liter) on the suction side and starts vacuum pump shortly. Afterwards the vacuum achieved must remain constantly.

NOTICE

Insufficient maintenance on the air filter may cause power of the machine to lessen, which may damage the machine.

NOTICE

Do not damage the filter cartridge when cleaning.

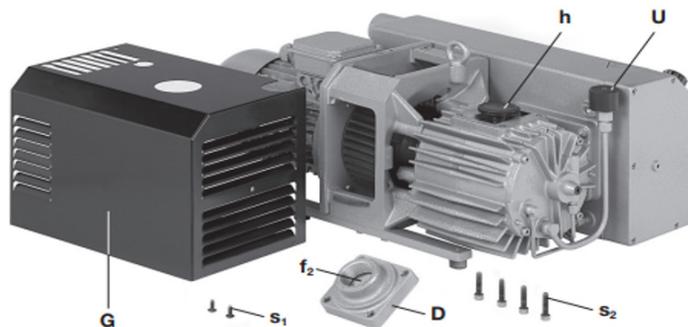


Figure 7-1 – KVO-50 – KVO-300 air filtering.

! WARNING

Danger of injury when dealing with compressed air. When blowing through with compressed air, solid particles may be carried along or powder dust swirling around may cause injury to the eyes. Therefore, when cleaning with compressed air always wear safety goggles and a dusty mask.

GAS BALLAST VALVE FILTER

The pumps work with a gas ballast valve. The inbuilt filter disc and micro filter discs must be cleaned more or less often by purging depending on how dirty the medium flowing through is. By undoing the countersunk screw and removing the plastic cover the filter parts can be removed for cleaning. Re-assemble in reverse order. KVO-400 – KVO-1300 models operate with two gas ballast valves.

To check the coupling sleeve, switch the motor off and ensure that it cannot be switched on again. Undo the screws on the housing flange. Remove the motor axially with half of the coupling on the motor side and suspend with a lifting device. If the sleeve is damaged or worn, then replace the sleeve.

- D** Suction flange
- G** Cover
- U** Gas ballast valve
- f₂** Micro filter
- h** Valve
- s₁** Lens flange screw
- s₂** Screws

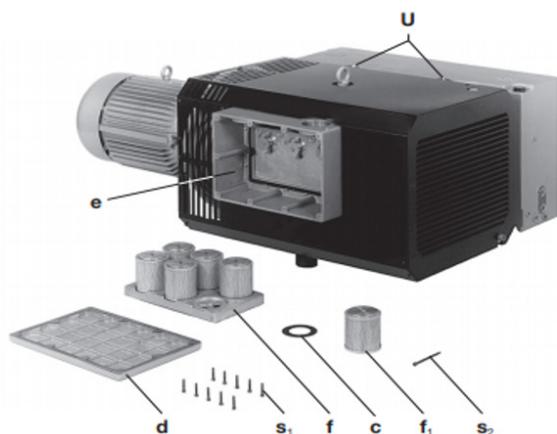


Figure 7-2 – KVO-400 – KVO-1300 air filtering.

- U** Gas ballast valve
- c** Gasket
- d** filter housing cover
- e** Filter housing area
- f** Filter insert
- f₁** Filter cartridge
- s₁** Screw
- s₂** Screw

COUPLING

Models KVO-50 – KVO-300 Coupling

The coupling sprocket is subject to wear and must be checked regularly (at least once a year). When doing this the cooling coil must be cleaned each time by purging.

Models KVO-400 – KVO-1300 Coupling

The coupling rubbers are subject to wear and must be checked regularly (at least once a year). You can tell when the coupling rubbers are worn by a knocking noise when the pump starts up.

CAUTION

A defective coupling sprocket/rubbers may lead to the rotor shaft breaking.

To check the coupling sprocket/rubbers, switch the motor off and ensure that it cannot be switched on again. Undo the screws on the housing flange. Remove the motor axially with half of the coupling on the motor side and suspend with a lifting device. If the sleeve is damaged or worn, then replace the sleeve.

REPLACEMENT PARTS

Replacement parts for the KVO Series rotary vane vacuum pump shown in “**Exploded Views and Parts Lists**” on page 23. Maintenance kits are available for the KVO line of pumps. Contact the factory with serial number information for kit part numbers. Delivery can be provided at that time.

FACTORY SERVICE AND REPAIR

With proper care, Kinney vacuum pumps and systems will provide years of reliable service. Should adjustments or parts replacement eventually be needed, these can often be performed locally as described in this book after obtaining required parts. Personnel should have a good background of mechanical experience and be thoroughly familiar with the procedures outlined in this manual.

For major repairs not covered in this manual, contact the nearest Kinney Authorized Service Center. Pump repair services are also available at our factory in Springfield, MO, or through our international network of Authorized Service Centers. Call (800) 825-6937 for the location nearest you for more information. Units that are still under warranty must be returned to the factory, freight prepaid, for service. Please contact Customer Service or visit us online for additional instructions on how to receive a Return Authorization number.

08

TROUBLESHOOTING

Although Kinney vacuum pumps are well-designed and manufactured, problems may occur due to normal wear and the need for readjustment. The following chart lists symptoms that may occur along with probable causes and remedies.

SYMPTOM	PROBABLE CAUSE	REMEDIES
Machine is switched off by the motor protection switch	Mains voltage/ Frequency does not correspond with the motor data	Check by qualified electrician
	Connection to motor terminal board is not correct	
	Motor protection switch is not set correctly	
	Motor protection switch is triggered too quickly	Use a motor protection switch with an overload-dependent delayed switch off that takes into consideration the short term excess current at start up (version with short circuit and overload trigger as per IEC 60947-4-1)
	Vacuum pump or its oil is too cold	Note the ambient temperature and the intake temperature
	The lubricating oil is too viscous	The oil viscosity must comply with ISO VG 100 as per DIN ISO 3448
	The air oil removers are dirty.	Change the air oil removal devices
	The back pressure in the exhaust line is too high	Check the hose and/or the pipe
	Permanent operation >100 mbar (abs.).	Use next largest motor output
Pumping capacity is insufficient	The inlet pipe is too long or too narrow	Check the hose and/or the pipe
	Leak on the suction side of the vacuum pump or in the system	Check the pipework and screw connections for leaks and check for tight fit
	The intake filter is dirty	Clean or replace the intake filter
Final pressure (max. vacuum) is not reached	Leak on the suction side of the vacuum pump or in the system	Check the pipework and screw connections for leaks and check for tight fit
	Incorrect oil viscosity	The oil viscosity must comply with ISO VG 100 as per DIN ISO 3448

SYMPTOM	PROBABLE CAUSE	REMEDIES
Machine gets too hot	Ambient or inlet temperatures too high	Ensure proper use
	Cooling air supply is obstructed	Check ambient conditions
		Clean ventilation slots
	Soiled oil cooler	Clean the oil cooler and fan, renew the fan if necessary
	The lubricating oil is too viscous	The oil viscosity must comply with ISO VG 100 as per DIN ISO 3448
	The air oil removers are dirty.	Change the air oil removal devices
The back pressure in the exhaust line is too high	Check the hose and/or the pipe	
Exhaust air contains visible oil mist	The air oil remover devices are not inserted correctly or the O rings are missing.	Check that it is correctly seated
	Unsuitable oil is being used	Use suitable types
	The air oil removers are dirty	Change the air oil removal devices
	Ambient or inlet temperatures too high	Ensure proper use
	Cooling air supply is obstructed	Check ambient conditions
Clean ventilation slots		
The machine makes a strange noise (The blades making a hammering noise when starting from cold is normal if it disappears within two minutes as the operating temperature increases)	The pump housing is worn (chatter marks)	Repair by manufacturer or authorized workshop
	The vacuum adjustment valve (if available) is vibrating	Replace the valve
	Blades are damaged	Repair by manufacturer or authorized workshop
	Vacuum pump or its oil is too cold	Note the ambient temperature and the intake temperature
	The lubricating oil is too viscous	The oil viscosity must comply with ISO VG 100 as per DIN ISO 3448
Water in lubricating oil	Pump sucks in water	Install water interceptor upstream of the pump
	The pump sucks in more water vapor than is suitable for its water vapor compatibility	Contact the manufacturer for increased gas ballast
	Pump only works for a short time and therefore does not reach its normal operating temperature	Let the pump continue to run with a closed suction side after extracting the water vapor until the water has evaporated from the oil

PART NUMBER DESIGNATIONS

EXAMPLE: MODEL KVO100CD-DV

Position #:

	1	2	3	4	5
	K	V	O	100	CD
			-	D	V

Position 1

PUMP MODEL NUMBER:

Position 1	
SIZE	KVO50
	KVO75
	KVO100
	KVO150
	KVO200
	KVO300
	KVO400
	KVO500
	KVO700
	KVO900
	KVO1100(F)
	KVO1300(F)

Position 2:

PUMP VERSION

Position 2		
VERSION	CD	Standard duty
	XD	Extreme duty for heavy duty applications

Position 4:

MOTOR HP

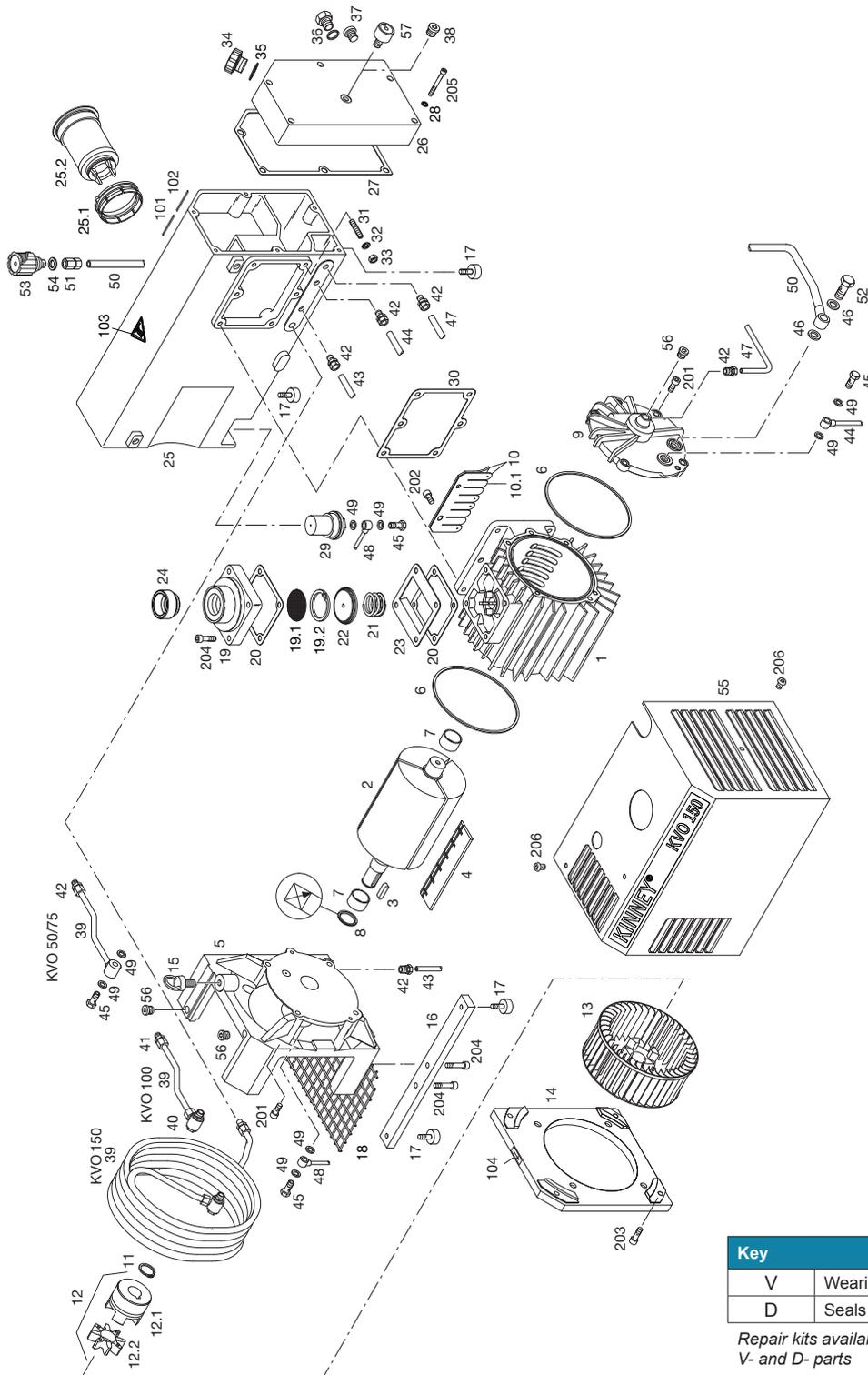
Position 4		
HP	2hp	B
	3hp	C
	5hp	D
	7.5hp	E
	10hp	F
	15hp	G
	20hp	H
	25hp	I
	30hp	J
	40hp	K

Position 5:

MOTOR SUPPLIED

Position 5		
NEMA	xp	VOLTAGES
V		3/50-60/190/380/230/460
	H	3/60/230-460
9		3/60/200
E		3/60/575

KVO-50 / KVO-75 / KVO-100 / KVO-150 SERIES EXPLODED VIEW DRAWING

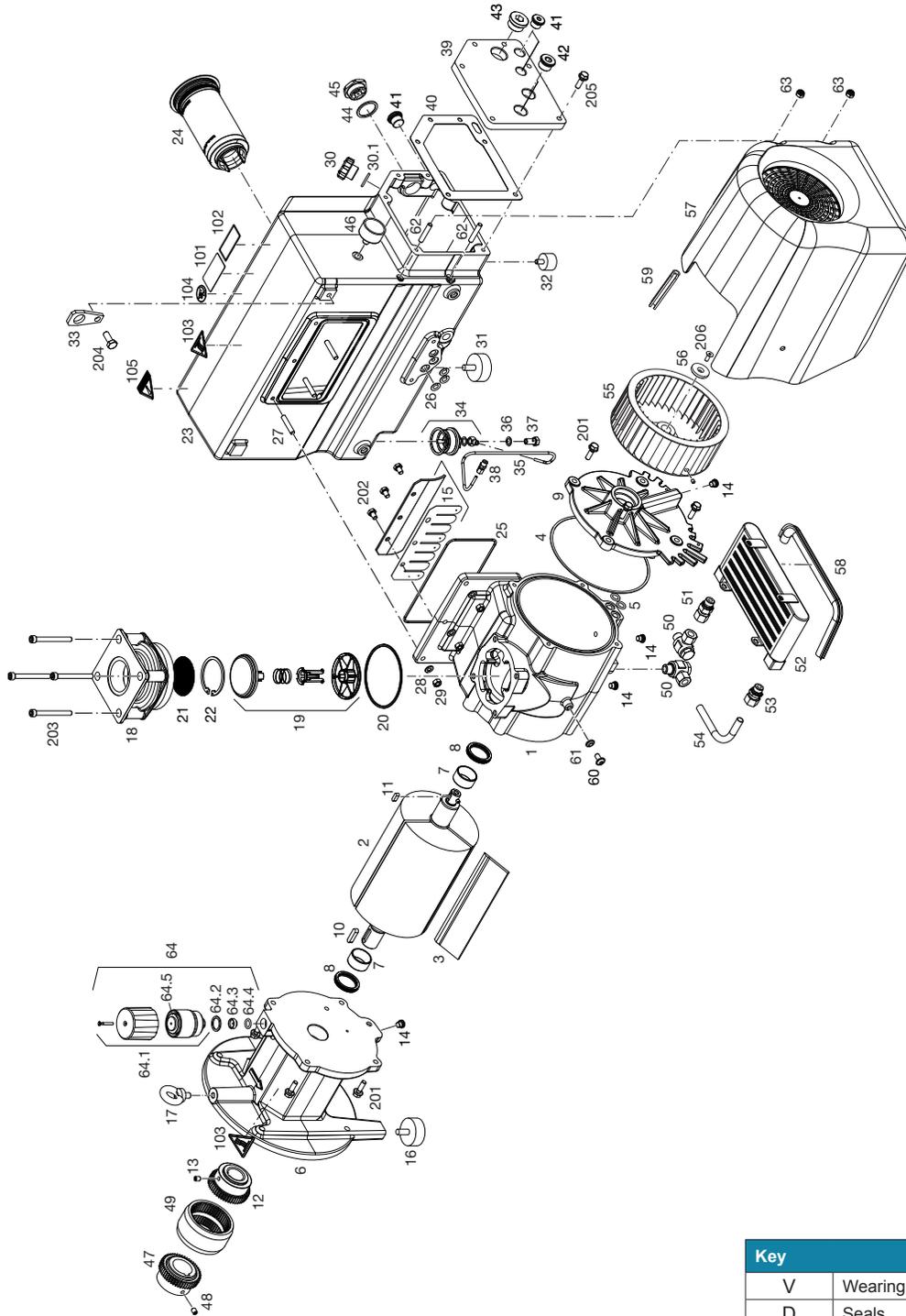


KVO-50 / KVO-75 / KVO-100 / KVO-150 SERIES PARTS LIST

ITEM NO.	PART TYPE	DESCRIPTION	QTY
Basic unit			
1		Housing (KVO 50)	1
2		Rotor	1
3		Key	1
4	V	Blade	3
5		Housing cover A	1
6	D	O-Ring	2
7	V	Sleeve	2
8	D	Shaft seal	1
9		Housing cover B	1
10		Exhaust valve cpl.	1
10.1	V	Valve plate	1
11	V	Circlip	1
12		Coupling driven cpl.	1
12.1		Coupling driven	1
12.2		Coupling spider	1
13		Fan with coupling	1
14		Motor flange	1
15		Eyebolt	1
16		Base feet	1
17		Rubber foot	4
18		Grid	1
19		Suction flange assembly	1
19.1		Mesh disc	1
19.2		Circlip	1
20	D	Gasket	2
21	V	Spring	1
22	D	Valve plate with O-Ring	1
23		Intermediate sheet	1
24		NPT adapter	1
Oil separator side			
25		Oil separator housing	1
25.1	D	Insert with O-Ring (KVO 50/75)	3
		Insert with O-Ring (KVO 100/150)	4
25.2	V	Oil separator element (KVO 50/75)	3
		Oil separator element (KVO 100/150)	4
26		Oil separator cover	1
27	D	Gasket	1
28		Washer	6
29		Float valve assembly	1
30	D	Gasket	1
31		Set screw	6
32		Washer	6
33		Nut	6
34		Oil filler plug	1
35	D	Sealing ring	1
36	V	Oil sight glass with seal	1
37		Threaded plug	1
38	D	Threaded plug with seal	1

ITEM NO.	PART TYPE	DESCRIPTION	QTY
Oil-air-cooling / pipework			
39		Oil cooling line	1
40		Oil line fitting (KVO 100)	1
41		Oil line fitting, straight (KVO 100)	1
42		Fitting, straight (KVO 50/75)	5
		Fitting, straight (KVO 100/150)	4
43		Lubrication line	1
44		Oil line	1
45		Oil passage bolt (KVO 50/75)	4
		Oil passage bolt (KVO 100/150)	3
46	D	Copper washer	2
47		Oil pipe	1
48		Oil line	1
49	D	Washer (KVO 50/75)	8
		Washer (KVO 100/150)	6
50		Pipeline gas ballast valve	1
51		Tube fitting	1
52		Oil passage bolt	1
53	D	Seal ring	1
54		Gas ballast valve	1
Metal cover			
56		Cover, metal	1
57		Blank nut	3
Accessories			
58		Pressure gauge ZDM 8	1
Labels			
101		Data plate	1
102		Oil type plate	1
103		Warning label hot surface	1
104		Arrow label	1
Screws			
201		Allen bolt	8
202		Allen bolt	2
203		Allen bolt	4
204		Allen bolt	6
205		Allen bolt	6
206		Cap screw	3

KVO-200 / KVO-300 SERIES EXPLODED VIEW DRAWING



Key	
V	Wearing Parts
D	Seals

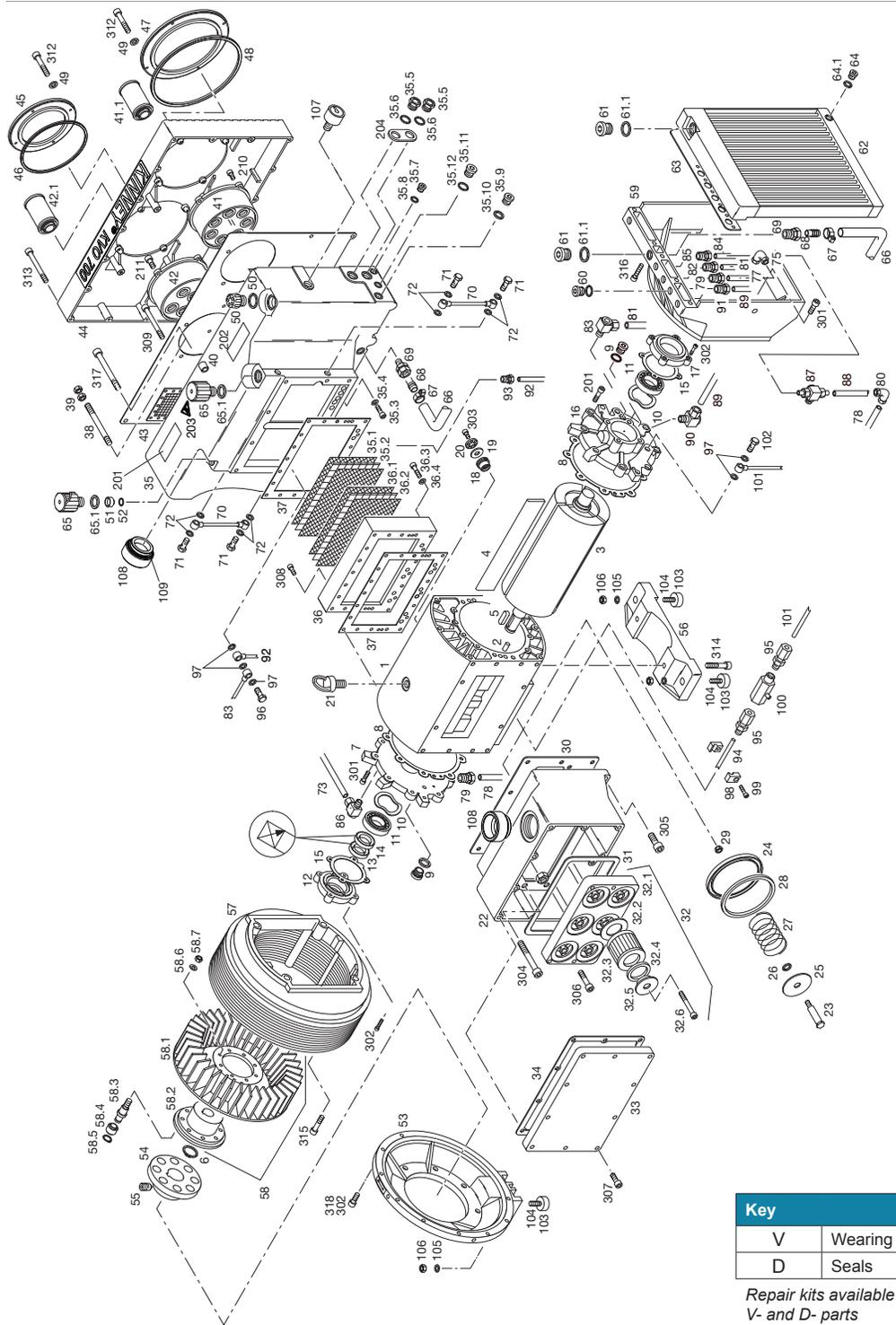
Repair kits available consisting of V- and D- parts

KVO-200 / KVO-300 SERIES PARTS LIST

ITEM NO.	PART TYPE	DESCRIPTION	QTY
Basic unit			
1		Housing (KVO 200)	1
2		Rotor	1
3	V	Blade	3
4	D	O-Ring	2
5	D	O-Ring	4
6		Motor flange	1
7	V	Sleeve	2
8	D	Shaft seal	2
9		Housing cover B	1
10		Key	1
11		Key	1
12		Coupling driven	1
13		Setscrew	1
14	D	Lock plug with sealing ring	4
15	V	Outlet valve cpl.	1
16		Rubber foot	1
17		Eye bolt	1
Suction side			
18		Suction flange NPT	1
19	V	Non-return valve cpl.	1
20	D	O-Ring	1
21	V	Mesh disc	1
22		Lock ring	1
Oil separator side			
23		Oil separator housing	1
24		Oil separator element	4
25		O-Ring	1
26		O-Ring	3
27		Setscrew	5
28		Washer	5
29		Nut	5
30		Oil filler plug	1
30.1		O-Ring	1
31		Rubber foot	1
32		Rubber foot	1
33		Lifting lug	1
34	V	Swimmer complete	1
35		Pipe reduction	1
36		Washer	2
37		Oil passage bolt	1
38		Straight fitting	1
39		Oil separator cover	1
40	D	Gasket	1
41	D	Threaded plug with seal	3
42		Lock plug	2
42.1	D	Sealing ring (KVO 200)	2

ITEM NO.	PART TYPE	DESCRIPTION	QTY
43	D	Threaded plug with seal	1
44	D	Sealing ring	1
45	V	Oil sight glass	1
46		Pressure gauge ZDM 8	1
Drive			
47		Coupling driving	1
48		Setscrew	1
49	V	Coupling Sleeve	1
Oil-air-cooling			
50		Banjo fitting	2
51		Straight screw-type stud	1
52		Oil cooler	1
53		Straight fitting	1
54		Pipe	1
55		Fan	1
56		Disc	1
57		Cover	1
58		Edge protection	1
59		Edge protection	1
60		Cap screw	1
61		Clamp disc	1
62		Setscrew	2
63		Nut	2
Gas ballast valve			
64		Gas ballast valve cpl.	1
64.1		Gas ballast valve	1
64.2		Sealing ring	1
64.3		Nozzle	1
64.4		O-Ring	1
64.5	V	Filter cartridge	1
Labels			
101		Data plate	1
102		Oil type plate	1
103		Warning label hot surface	1
104		Label Manual	1
105		Label Max. back pressure	1
Screws			
201		Hexhead screw with flange	8
202		Hexhead screw	3
203		Allen bolt	4
204		Hexhead screw	1
205		Hexhead screw with flange	6
206		Counter sunk screw	1

KVO-400 / KVO-500 / KVO-700 SERIES EXPLODED VIEW DRAWING



Key	
V	Wearing Parts
D	Seals

Repair kits available consisting of V- and D- parts

KVO-900 / KVO-1100 / KVO-1300 SERIES PARTS LIST

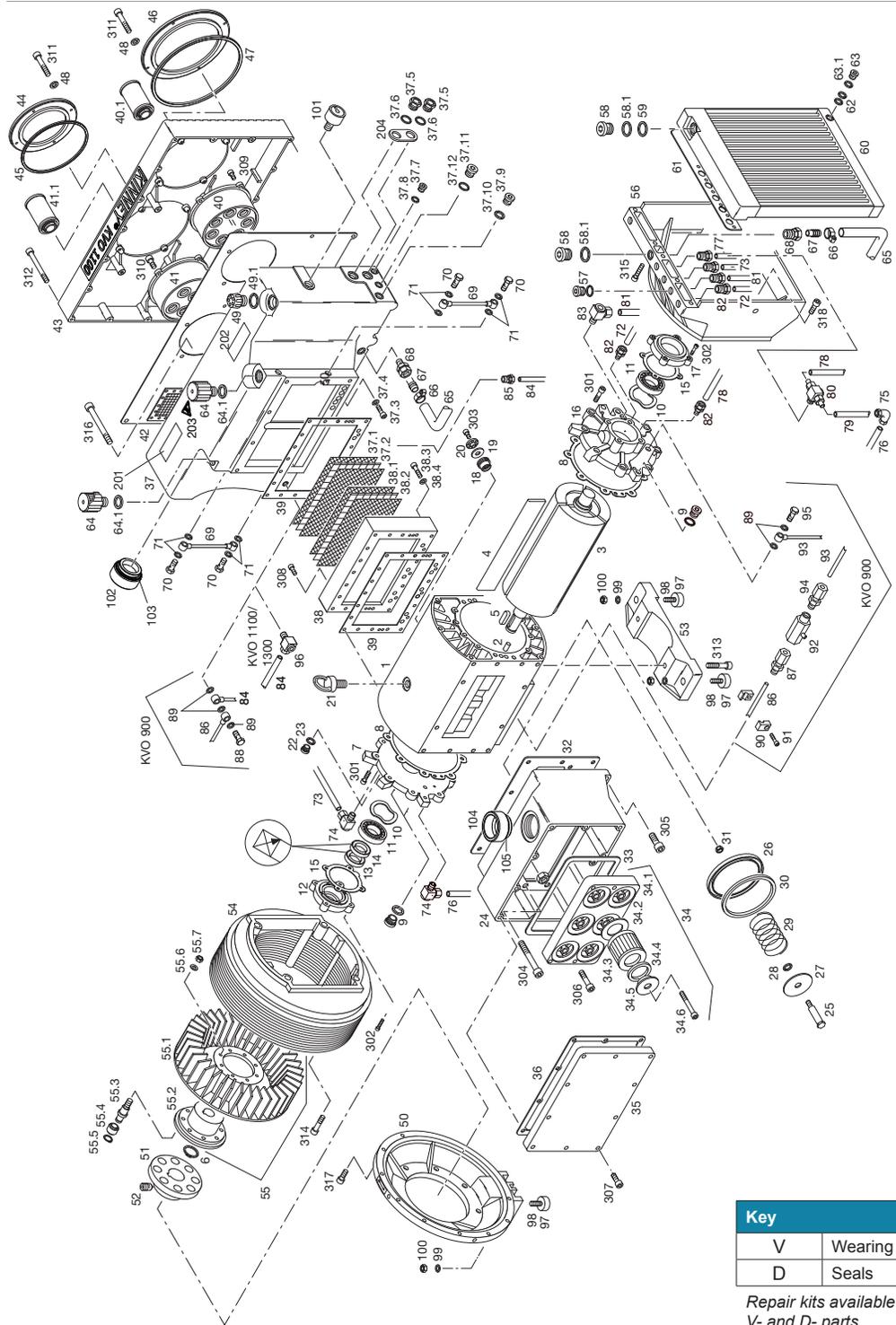
ITEM NO.	PART TYPE	DESCRIPTION	QTY
Basic unit			
1		Housing	1
2		Dowel pin	4
3		Rotor	1
4	V	Blade	3
5		Key	1
6	V	Circlip	1
7		Housing cover A	1
8	D	Gasket, diff. thicknesses	2
9	D	Threaded plug with seal	3
10	V	Ball bearing shim	2
11	V	Cylinder roller bearing	2
12		Bearing cover A	1
13	D	Shaft seal ring	1
14	D	Shaft seal	1
15	D	Gasket	2
16		Housing cover B	1
17		Bearing cover B	1
18		Non return valve insert (KVO 400)	8
		Non return valve insert (KVO 500/700)	12
19	D	Valve disc (KVO 400)	8
		Valve disc (KVO 500/700)	12
20		Valve plate (KVO 400)	8
		Valve plate (KVO 500/700)	12
21		Eye bolt	1
Suction side			
22		Filter Housing	1
23		Bolt (KVO 400)	2
		Bolt (KVO 500/700)	3
24		Valve plate (KVO 400)	2
		Valve plate (KVO 500/700)	3
25		Disc (KVO 400)	2
		Disc (KVO 500/700)	3
26	D	O-Ring (KVO 400)	2
		O-Ring (KVO 500/700)	3
27		Spring (KVO 400)	2
		Spring (KVO 500/700)	3
28	D	O-Ring (KVO 400)	2
		O-Ring (KVO 500/700)	3
29		Nut (KVO 400)	2
		Nut (KVO 500/700)	3
30	D	Gasket	1
31		Gasket	1
32		Filter base assembly	1
32.1		Filter socket	1
32.2	D	Sealing ring (KVO 400)	4
		Sealing ring (KVO 500/700)	6
32.3	V	Filter cartridge (KVO 400)	4
		Filter cartridge (KVO 500/700)	6
32.4	D	Sealing ring (KVO 400)	4
		Sealing ring (KVO 500/700)	6
32.5		Clamping disc (KVO 400)	4
		Clamping disc (KVO 500/700)	6

ITEM NO.	PART TYPE	DESCRIPTION	QTY
32.6		Allen screw (KVO 400)	4
		Allen screw (KVO 500/700)	6
33		Filter cover	1
34	D	Gasket	1
Oil separator side			
35		Oil separator housing cpl.	1
35.1		Grid	2
35.2		Mesh	1
35.3		Allen bolt, flat head (KVO 400)	3
		Allen bolt, flat head (KVO 500/700)	4
35.4		Washer (KVO 400)	3
		Washer (KVO 500/700)	4
35.5	V	Oil sight glass with seal	2
35.6	D	Sealing ring	2
35.7		Lock plug	1
35.8	D	Sealing ring	1
35.9		Lock plug	1
35.10	D	Sealing ring	1
35.11		Lock plug	1
35.12	D	Sealing ring	1
36		Intermediate plate cpl.	1
36.1		Grid	2
36.2		Mesh	1
36.3		Allen bolt, flat head (KVO 400)	6
		Allen bolt, flat head (KVO 500/700)	8
36.4		Washer (KVO 400)	6
		Washer (KVO 500/700)	8
37		Gasket	2
38		Stud screw (KVO 400)	8
39		Nut (KVO 400)	8
-		Baffle (not shown)	1
40		Spacer (KVO 400)	5
41		Oil mist filter cpl.	1
41.1	V	Oil separator element	7
42		Oil mist filter cpl. (KVO 400)	1
42.1	V	Oil separator element (KVO 400)	4
		Oil separator element (KVO 500/700)	7
43	D	Gasket with mesh	1
44		Oil separator cover	1
45		Maintenance cover	1
46	D	O-Ring (KVO 400)	1
47		Maintenance cover	1
48	D	O-Ring	1
49		Washer	8
50		Oil filler plug	1
50.1	D	O-Ring	1
51		Nozzle (KVO 400)	1
		Nozzle (KVO 500/700)	2
52	D	O-Ring (KVO 400)	1
		O-Ring (KVO 500/700)	2
Drive			
53		Motor flange	1
54		Coupling half, driving	1

ITEM NO.	PART TYPE	DESCRIPTION	QTY
55		Threaded pin	1
56		Base	1
Oil-air-cooling			
57		Fan housing	1
58		Fan with coupling cpl.	1
58.1		Fan	1
58.2		Coupling half, driven	1
58.3		Coupling bolt	12
58.4	V	Coupling rubber	12
58.5	V	Lock ring	12
58.6		Spring ring	12
58.7		Nut	12
59		Intermediate flange	1
60	D	Threaded plug with seal KVO 400 / 500)	4
		Lock plug (KVO 700)	4
		Sealing ring (KVO 700)	4
61		Lock plug (KVO 400)	3
		Lock plug (KVO 500/700)	2
61.1	D	Sealing ring (KVO 400)	3
		Sealing ring (KVO 500/700)	2
62		Oil cooler	1
63	D	Gasket	1
64		Lock Plug	1
64.1	D	Sealing ring	1
Gas ballast valve			
65		Gas ballast valve cpl. (KVO 400)	1
		Gas ballast valve cpl. (KVO 500/700)	2
65.1	D	O-Ring (KVO 400)	1
		O-Ring (KVO 500/700)	2
Pipework			
66		Hose, oil cooler	1
67		Hose clip	2
68		Hose connection	2
69		Oil line fitting	2
70		Pipe (KVO 400)	1
		Pipe (KVO 500/700)	2
71		Oil passage bolt (KVO 400)	2
		Oil passage bolt (KVO 500/700)	4
72		Washer (KVO 400)	4
		Washer (KVO 500/700)	8
73		Pipe	1
74		Pipe	1
75		Elbow fitting	1
76		Oil line fitting	1
77		Pipe	1
78		Pipe	1
79		Oil line fitting (KVO 400)	2
		Oil line fitting (KVO 500/700)	1
80		Elbow fitting	1
81		Pipe	1
82		Oil line fitting	1
83		Fitting	1
84		Pipe	1
85		Oil line fitting	1
86		Fitting	1
87		T-fitting (KVO 500/700)	1
88		Pipe (KVO 500/700)	1
89		Pipe (KVO 500/700)	1

ITEM NO.	PART TYPE	DESCRIPTION	QTY
90		Fitting (KVO 500/700)	1
91		Oil line fitting (KVO 500/700)	1
92		Pipe	1
93		Oil line fitting	1
94		Pipe	1
95		Oil line fitting	2
96		Oil passage bolt, double	1
97		Washer	5
98		Clamp	1
99		Allen bolt	1
100		Ball cock	1
101		Pipe	1
102		Oil passage bolt	1
Rubber foot			
103		Vibration absorber	3
104		Stud screw	3
105		Washer	3
106		Nut	3
Accessories			
107		Pressure gauge ZDM 8	1
108		NPT adapter	1
109	D	Gasket	1
Labels			
201		Data plate	1
202		Oil type plate	1
203		Warning label hot surface	1
204		Label oil level	1
Screws			
301		Allen bolt	20
302		Allen bolt (KVO 400 / 500)	16
		Allen bolt (KVO 700)	8
303		Allen bolt (KVO 400)	8
		Allen bolt (KVO 500/700)	12
304		Allen bolt (KVO 400)	5
		Allen bolt (KVO 500/700)	6
305		Allen bolt (KVO 400)	3
		Allen bolt (KVO 500/700)	4
306		Allen bolt (KVO 400)	4
		Allen bolt (KVO 500/700)	2
307		Allen bolt (KVO 400)	8
		Allen bolt (KVO 500/700)	11
308		Allen bolt (KVO 400)	7
		Allen bolt (KVO 500/700)	9
309		Allen bolt (KVO 400 / 500)	1
		Allen bolt (KVO 700)	1
310		Allen bolt (KVO 400)	4
		Allen bolt (KVO 500/700)	8
311		Allen bolt (KVO 400 / 500)	4
		Allen bolt (KVO 700)	4
312		Allen bolt, flat head	8
313		Allen bolt (KVO 400 / 500)	18
		Allen bolt (KVO 700)	22
314		Allen bolt	4
315		Allen bolt	4
316		Allen bolt	7
317		Allen bolt (KVO 500/700)	10
318		Allen bolt (KVO 700)	12

KVO-900 / KVO-1100 / KVO-1300 SERIES EXPLODED VIEW DRAWING



Key	
V	Wearing Parts
D	Seals

Repair kits available consisting of V- and D- parts

KVO-900 / KVO-1100 / KVO-1300 SERIES PARTS LIST

ITEM NO.	PART TYPE	DESCRIPTION	QTY
Basic unit			
1		Housing	1
2		Dowel pin	4
3		Rotor	1
4	V	Blade	3
5		Key	1
6	V	Circlip	1
7		Housing cover A	1
8	D	Gasket, diff. thicknesses	2
9	D	Threaded plug with seal	3
10	V	Ball bearing shim	2
11	V	Cylinder roller bearing	2
12		Bearing cover A	1
13	D	Shaft seal ring	1
14	D	Shaft seal	1
15	D	Gasket	2
16		Housing cover B	1
17		Bearing cover B	1
18		Non return valve insert (KVO900)	14
		Non return valve insert (KVO1100 / 1300)	20
19	D	Valve disc (KVO900)	14
		Valve disc (KVO1100 / 1300)	20
20		Valve plate (KVO900)	14
		Valve plate (KVO1100 / 1300)	20
21		Eye bolt	1
22		Threaded Plug	1
23		Washer	1
Suction side			
24		Filter Housing	1
25		Bolt (KVO900)	2
		Bolt (KVO1100 / 1300)	3
26		Valve plate (KVO900)	2
		Valve plate (KVO1100 / 1300)	3
27		Disc (KVO900)	2
		Disc (KVO1100 / 1300)	3
28	D	O-Ring (KVO900)	2
		O-Ring (KVO1100 / 1300)	3
29		Spring (KVO900)	2
		Spring (KVO1100 / 1300)	3
30	D	O-Ring (KVO900)	2
		O-Ring (KVO1100 / 1300)	3
31		Nut (KVO900)	2
		Nut (KVO1100 / 1300)	3
32	D	Gasket	1
33	D	Gasket	1
34		Filter base assembly	1
34.1		Filter socket (KVO900)	1
34.2	D	Sealing ring (KVO900)	5
		Sealing ring (KVO1100 / 1300)	8
34.3	V	Filter cartridge (KVO900)	5
		Filter cartridge (KVO1100 / 1300)	8
34.4	D	Sealing ring (KVO900)	5
		Sealing ring (KVO1100 / 1300)	8
34.5		Clamping disc (KVO900)	5
		Clamping disc (KVO1100 / 1300)	8

ITEM NO.	PART TYPE	DESCRIPTION	QTY
34.6		Allen screw (KVO900)	5
		Allen screw (KVO1100 / 1300)	8
35		Filter cover	1
36	D	Gasket	1
Oil separator side			
37		Oil separator housing cpl.	1
37.1		Grid	2
37.2		Mesh	1
37.3		Allen bolt	4
37.4		Washer	4
37.5	V	Oil sight glass with seal	2
37.6	D	Sealing ring	2
37.7		Lock plug	1
37.8	D	Sealing ring	1
37.9		Lock plug	1
37.10	D	Sealing ring	1
37.11		Lock plug	1
37.12	D	Sealing ring	1
38		Intermediate plate cpl.	1
38.1		Grid	2
38.2		Mesh	1
38.3		Allen bolt, flat head (KVO900)	6
		Allen bolt, flat head (KVO1100 / 1300)	8
38.4		Washer (KVO900)	6
		Washer (KVO1100 / 1300)	8
39	D	Gasket	2
40		Oil mist filter cpl. (KVO900)	2
		Oil mist filter cpl. (KVO1100 / 1300)	3
40.1	V	Oil separator element (KVO900)	14
		Oil separator element (KVO1100 / 1300)	21
41		Oil mist filter cpl.	2
41.1	D	Oil separator element	8
42	D	Gasket with mesh	1
43		Oil separator cover	1
44		Maintenance cover	2
45	D	O-Ring	2
46		Maintenance cover (KVO900)	2
		Maintenance cover (KVO1100 / 1300)	3
47	D	O-Ring (KVO900)	2
		O-Ring (KVO1100 / 1300)	3
48		Washer (KVO900)	16
		Washer (KVO1100 / 1300)	20
49		Oil filler plug	1
49.1	D	O-Ring	1
Drive			
50		Motor flange	1
51		Coupling half, driving	1
52		Threaded pin	1
53		Base	1
Oil-air-cooling			
54		Fan housing	1
55		Fan with coupling cpl.	1
55.1		Fan	1
55.2		Coupling half, driven	1
55.3		Coupling bolt	12

ITEM NO.	PART TYPE	DESCRIPTION	QTY
55.4	V	Coupling rubber	12
55.5	V	Lock ring	12
55.6		Spring ring	12
55.7		Nut	12
56		Intermediate flange	1
57		Lock plug	4
57.1	D	Sealing ring	4
58		Lock plug	2
58.1	D	Sealing ring	2
59		Seal ring	1
60		Oil cooler	1
61	D	Gasket	1
62	D	Seal ring	2
63		Lock Plug	1
63.1	D	Sealing ring	1
Gas ballast valve			
64		Gas ballast valve cpl.	2
64.1	D	O-Ring	2
Pipework			
65		Hose, oil cooler	1
66		Hose clip	2
67		Hose connection	2
68		Oil line fitting	2
69		Pipe	2
70		Oil passage bolt (KVO900)	2
		Oil passage bolt (KVO1100 / 1300)	4
71		Washer	8
72		Pipe	1
73		Pipe	1
74		Fitting	2
75		Elbow fitting	1
76		Pipe	1
77		Pipe	1
78		Pipe	1
79		Pipe	1
80		T-fitting	1
81		Pipe	1
82		Straight fitting	6
83		Fitting	1
84		Pipe	1
85		Oil line fitting	1
86		Pipe (KVO900)	1
87		Oil line fitting (KVO900)	1
88		Oil passage bolt, double (KVO900)	1
89		Washer (KVO900)	5
90		Clamp (KVO900)	1
91		Allen bolt (KVO900)	1
92		Ball cock (KVO900)	1
93		Pipe (KVO900)	1
94		Oil line fitting (KVO900)	1
95		Oil passage bolt (KVO900)	1
96		Fitting (KVO1100 / 1300)	1
97		Vibration absorber	3
98		Stud screw	3
99		Washer	3
100		Nut	3

ITEM NO.	PART TYPE	DESCRIPTION	QTY
Accessories			
101		Pressure gauge ZDM 8	1
102		NPT adapter	1
103	D	Gasket	1
104		BSP-NPT Thread adapter	1
105	D	Gasket	1
Labels			
201		Data plate	1
202		Oil type plate	1
203		Warning label hot surface	1
204		Label oil level	1
Screws			
301		Allen bolt	24
302		Allen bolt (KVO900)	16
		Allen bolt (KVO1100 / 1300)	8
303		Allen bolt (KVO900)	14
		Allen bolt (KVO1100 / 1300)	20
304		Allen bolt (KVO900)	7
		Allen bolt (KVO1100 / 1300)	8
305		Allen bolt (KVO900)	3
		Allen bolt (KVO1100 / 1300)	4
306		Allen bolt (KVO900)	2
		Allen bolt (KVO1100 / 1300)	6
307		Allen bolt (KVO900)	10
		Allen bolt (KVO1100 / 1300)	12
308		Allen bolt (KVO900)	8
		Allen bolt (KVO1100 / 1300)	10
309		Allen bolt (KVO900)	9
		Allen bolt (KVO1100 / 1300)	12
310		Allen bolt	8
311		Allen bolt, flat head (KVO900)	16
		Allen bolt, flat head (KVO1100 / 1300)	20
312		Allen bolt (KVO900)	26
		Allen bolt (KVO1100 / 1300)	31
313		Allen bolt	4
314		Allen bolt	6
315		Allen bolt	7
316		Allen bolt (KVO900)	10
		Allen bolt (KVO1100 / 1300)	12
317		Allen bolt	12
318		Allen bolt	4

REPLACEMENT KITS

AVAILABLE AFTERMARKET	PART NUMBER
OIL, VANE, KV 100M, QUART	203103 0000
OIL, VANE, KV 100M, 5 GALLON	203105 0000
OIL, VANE, KV 100S, QUART	203106 0000
OIL, VANE, KV 100S, 5 GALLON	203108 0000
OIL, VANE, KV 100FG, QUART	203109 0000
OIL, VANE, KV 100FG, 5 GALLON	203111 0000
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REBUILD KIT, KVO50	084001 0050
REBUILD KIT, KVO75	084001 0075
REBUILD KIT, KVO100	084001 0100
REBUILD KIT, KVO150	084001 0150
REBUILD KIT, KVO200/300	084001 0200
REBUILD KIT, KVO400	084001 0400
REBUILD KIT, KVO500/700	084001 0500
REBUILD KIT, KVO900	084001 0900
REBUILD KIT, KVO1100/1300	084001 1100
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INLET FILTER KIT, KVO200/300	084002 0200
INLET FILTER KIT, KVO400	084002 0400
INLET FILTER KIT, KVO500/700	084002 0500
INLET FILTER KIT, KVO900	084002 0900
INLET FILTER KIT, KVO1100/1300	084002 1100
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EXHAUST FILTER KIT, KVO50/75	084003 0050
EXHAUST FILTER KIT, KVO100/150	084003 0100
EXHAUST FILTER KIT, KVO400	084003 0400
EXHAUST FILTER KIT, KVO500/700	084003 0500
EXHAUST FILTER KIT, KVO900	084003 0900
EXHAUST FILTER KIT, FINE, KVO1100/1300	084003 1100
EXHAUST FILTER KIT, COURSE, KVO1100/1300	084003 1101

WARRANTY – VACUUM PRODUCTS

Subject to the terms and conditions hereinafter set forth and set forth in General Terms of Sale, Kinney (the Seller) warrants products and parts of its manufacture, when shipped, and its work (including installation and start-up) when performed, will be of good quality and will be free from defects in material and workmanship. This warranty applies only to Seller's equipment, under use and service in accordance with Seller's written instructions, recommendations and ratings for installation, operating, maintenance and service of products, for a period as stated in the table below. Because of varying conditions of installation and operation, all guarantees of performance are subject to plus or minus 5% variation. (Non-standard materials and KVO Claw pumps are subject to a plus or minus 10% variation).

PRODUCT TYPE	WARRANTY DURATION
New (Non-Piston Pumps)	15 months after date of shipment or 12 months after initial startup date, whichever occurs first
New (Piston Pumps)	30 months after date of shipment, on all units sold after June 1, 2014.
KVC Claw Pumps	24 months after date of shipment.
Repair	6 months after date of shipment or remaining warranty period, whichever is greater
Remanufactured	9 months after date of shipment or 6 months after initial startup date, whichever occurs first

THIS WARRANTY EXTENDS ONLY TO BUYER AND/OR ORIGINAL END USER, AND IN NO EVENT SHALL THE SELLER BE LIABLE FOR PROPERTY DAMAGE SUSTAINED BY A PERSON DESIGNATED BY THE LAW OF ANY JURISDICTION AS A THIRD PARTY BENEFICIARY OF THIS WARRANTY OR ANY OTHER WARRANTY HELD TO SURVIVE SELLER'S DISCLAIMER.

All accessories furnished by Seller but manufactured by others bear only that manufacturer's standard warranty.

All claims for defective products, parts, or work under this warranty must be made in writing immediately upon discovery and, in any event within one (1) year from date of shipment of the applicable item and all claims for defective work must be made in writing immediately upon discovery and in any event within one (1) year from date of completion thereof by Seller. Unless done with prior written consent of Seller, any repairs, alterations or disassembly of Seller's equipment shall void warranty. Installation and transportation costs are not included and defective items must be held for Seller's inspection and returned to Seller's Ex-works point upon request.

THERE ARE NO WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE.

After Buyer's submission of a claim as provided above and its approval, Seller shall at its option either repair or replace its product, part, or work at the original Ex-works point of shipment, or refund an equitable portion of the purchase price.

The products and parts sold hereunder are not warranted for operation with erosive or corrosive material or those which may lead to build up of material within the product supplied, nor those which are incompatible with the materials of construction. The Buyer shall have no claim whatsoever and no product or part shall be deemed to be defective by reason of failure to resist erosive or corrosive action nor for problems resulting from build-up of material within the unit nor for problems due to incompatibility with the materials of construction.

Any improper use, operation beyond capacity, substitution of parts not approved by Seller, or any alteration or repair by others in such manner as in Seller's judgment affects the product materially and adversely shall void this warranty.

No employee or representative of Seller other than an Officer of the Company is authorized to change this warranty in any way or grant any other warranty. Any such change by an Officer of the Company must be in writing.

The foregoing is Seller's only obligation and Buyer's only remedy for breach of warranty, and except for gross negligence, willful misconduct and remedies permitted under the General Terms of Sale in the sections on CONTRACT PERFORMANCE, INSPECTION AND ACCEPTANCE and the PATENTS Clause hereof, the foregoing is BUYER'S ONLY REMEDY HEREUNDER BY WAY OF BREACH OF CONTRACT, TORT OR OTHERWISE, WITHOUT REGARD TO WHETHER ANY DEFECT WAS DISCOVERED OR LATENT AT THE TIME OF DELIVERY OF THE PRODUCT OR WORK. In no event shall Buyer be entitled to incidental or consequential damages. Any action for breach of this agreement must commence within one (1) year after the cause of action has occurred.

June, 2014

OPERATING DATA FORM / PRODUCT REGISTRATION

It is to the user's advantage to have the requested data filled in below and available in the event a problem should develop in the vacuum booster, vacuum pump or the system. This information is also helpful when ordering spare parts.

Model No.	_____	Serial No.	_____
Startup Date	_____	Type of Lubrication	_____
Pump RPM	_____	Operating Vacuum	_____
Pump Sheave Diameter	_____	Any other Special Accessories Supplied or in use:	_____
Motor RPM	_____	HP	_____

NOTES:

IMPORTANT

All vacuum boosters and vacuum pumps manufactured by Kinney are date coded at time of shipment. In order to assure you of the full benefits of the product warranty, please complete, tear out and return the product registration card. You may also register your product online at www.kinneyvacuum.com or contact Customer Service.

KINNEY®

**For Service & Repair, Technical
Support, or Product Sales contact:**

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Manual 1867 Rev A p/n 1867

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