Vacuum Pumps America Inc.

VPA-R/Ex Explosion Proof Double Stage Rotary Vane Vacuum Pumps

Features of VPA-R/Ex Double Stage Rotary Vane Vacuum Pumps with Explosion Proof motors

- Supreme quality product by using high quality materials and excellent design. Chemically protected against corrosion.
- Excellent ultimate vacuum and pumping speed.
- Large Oil Sight Glass for better monitoring of oil color, quality and vacuum pump performance.
- Advanced Oil Filtration System available upon request.
- Advanced design anti suck back valve protects the vacuum system against oil back streaming in the event of sudden shut down or power failure.
- Exclusive Optional adjustable gas ballast valves available upon request depending on applications: Ball valve, Needle Valve, Fine Leak Valve, Solenoid Valve or ATEX Solenoid Valve, Explosion Proof Solenoid Valve .
- Inert Gas Bubbler and Inert Gas Injection system combined with all above valve assemblies available for Explosion Proof VPA-R/Ex series to dilute explosive or flamable gases in the oil box.
- Considerably vibration free and extremely quiet.
- Easy maintenance and oil change with low cost of ownership without using any special tools.
- Competitive and affordable prices.
- Internal Modular Design makes complete overhaul and easy repair in less than one hour for VPA-R6/Ex, VPA-R12/Ex, VPA-R24/Ex, VPA-R36/Ex, VPA-R60/Ex and VPA-R90/Ex.
- 3 phase ATEX motors at different voltages like: 380V, 208V, 230V, 460V, 575V, 50/60Hz are available with CE approvals compatible for all VPA-R/Ex Explosion Proof Dual Stage Rotary Vane Vacuum Pumps upon request.
- Explosion Proof VPA-R/Ex series double stage vacuum pumps can be prepared with different fluids for diffenert applications in hazardous areas upon request
- PFPE prepared VPA-R/Ex/PFPE series are available upon request for Oxygen, Hydrogen and other explosive gas pumping and chemical applications in hazardous areas

ATEX and Explosion Proof Zone classifications

European and IEC Classification	Definition of zone or division	North American Classification
Zone 0 (gases / Vapors)	**An area in which an explosive mixture is continuously present or present for long periods**	**Class I Division 1 (gases)**
Zone 1 (gases / Vapors)	**An area in which an explosive mixture is likely to occur in normal operation**	**Class I Division 1 (gases)**
Zone 2 (gases / Vapors)	**An area in which an explosive mixture is not likely to occur in normal operation and if it occurs it will exist only for a short time.**	**Class I Division 2 (gases)**
Zone 20 (dusts)	**An area in which an explosive mixture is continuously present or present for long periods**	**Class II Division 1 (dusts)**
Zone 21 (dusts)	**An area in which an explosive mixture is likely to occur in normal operation**	**Class II Division 1 (dusts)**
Zone 22 (dusts)	**An area in which an explosive mixture is not likely to occur in normal operation and if it occurs it will exist only for a short time.**	**Class II Division 2 (dusts)**

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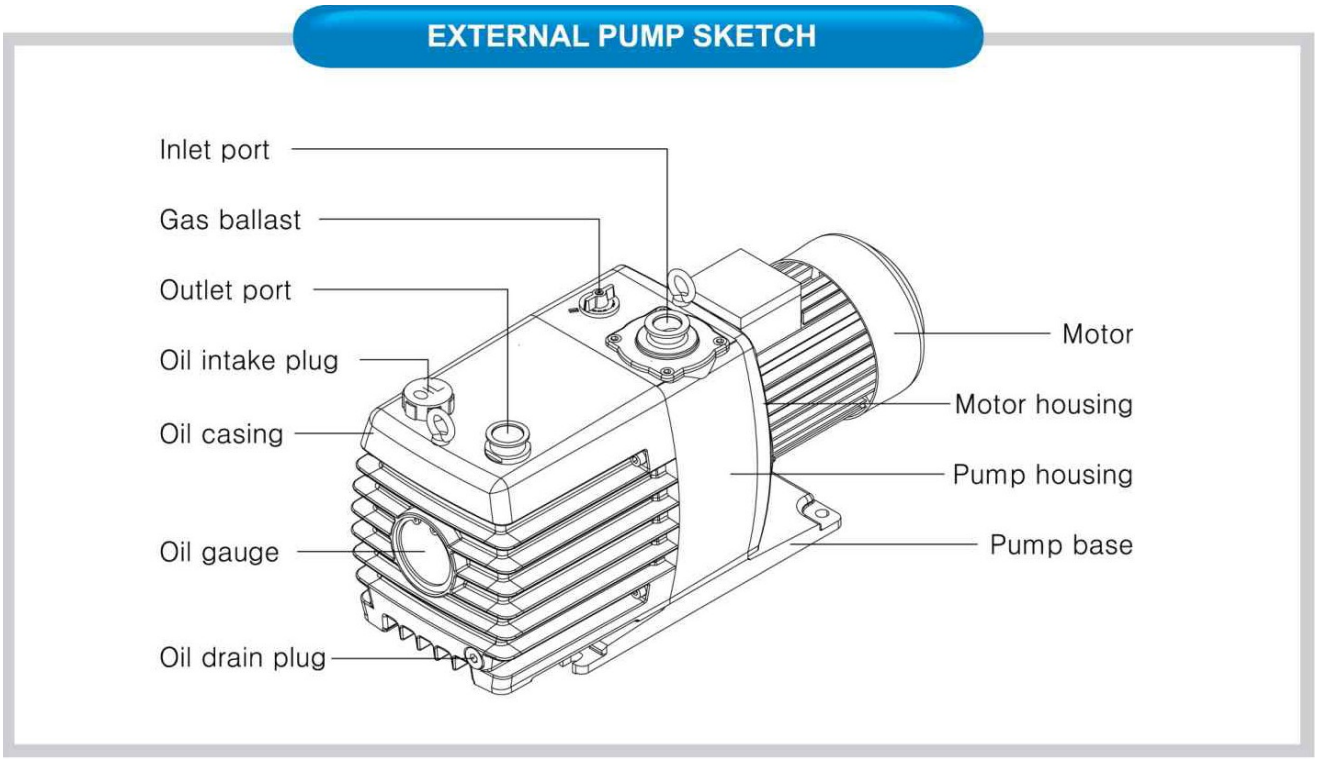
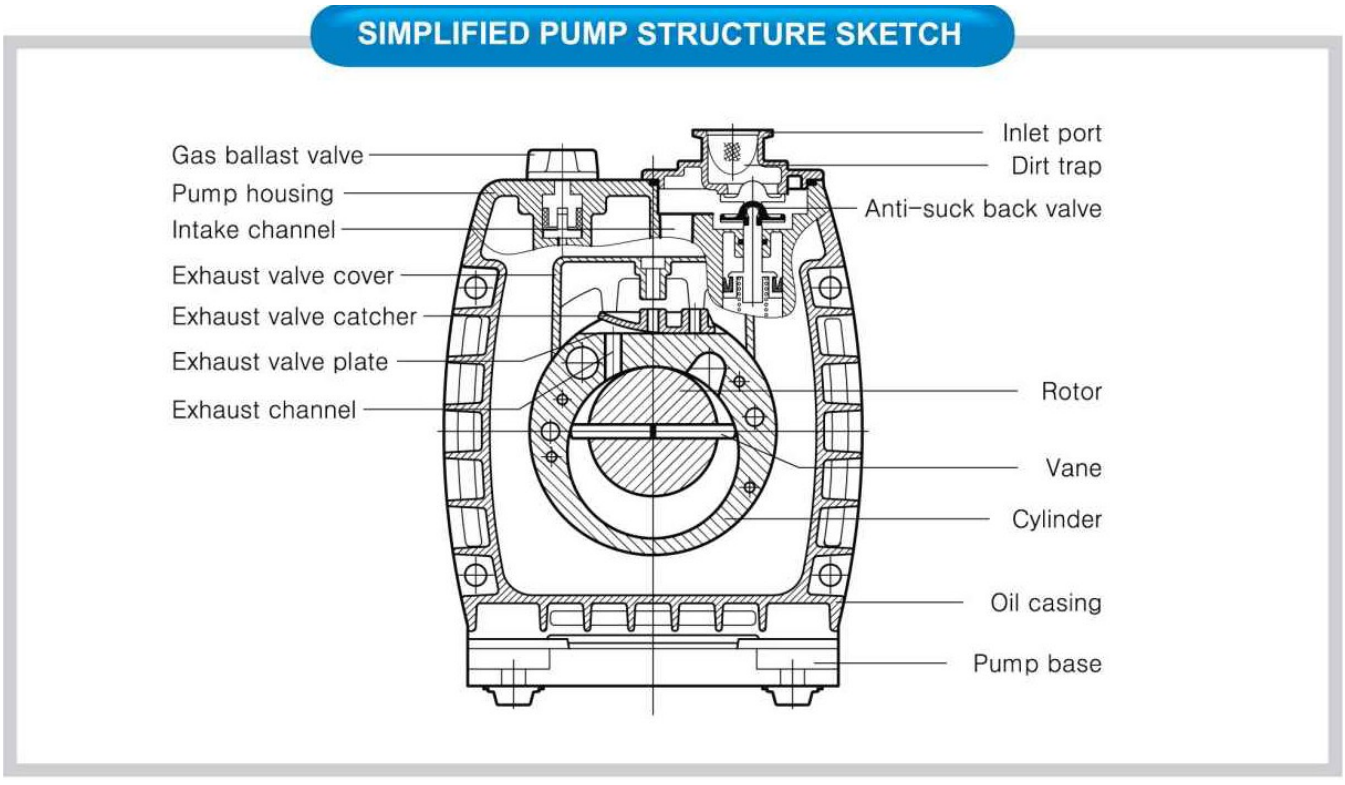
Design Features of VPA-R/Ex Double Stage Rotary Vane Vacuum Pumps



VPA-R6/Ex to VPA-R90/Ex General Drawing



VPA-R6/Ex to VPA-R90/Ex Cross Sectional Drawing

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Advanced design of VPA-R/Ex makes repair very easy as follows

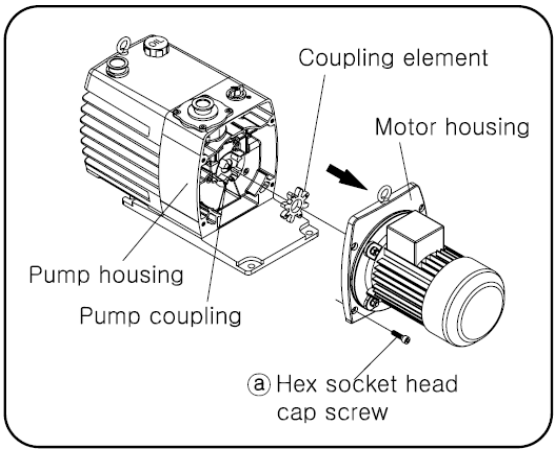

Figure 1

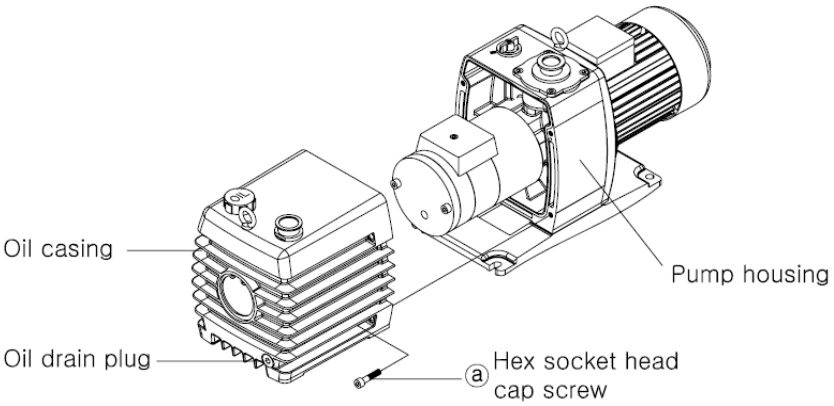

Figure 2

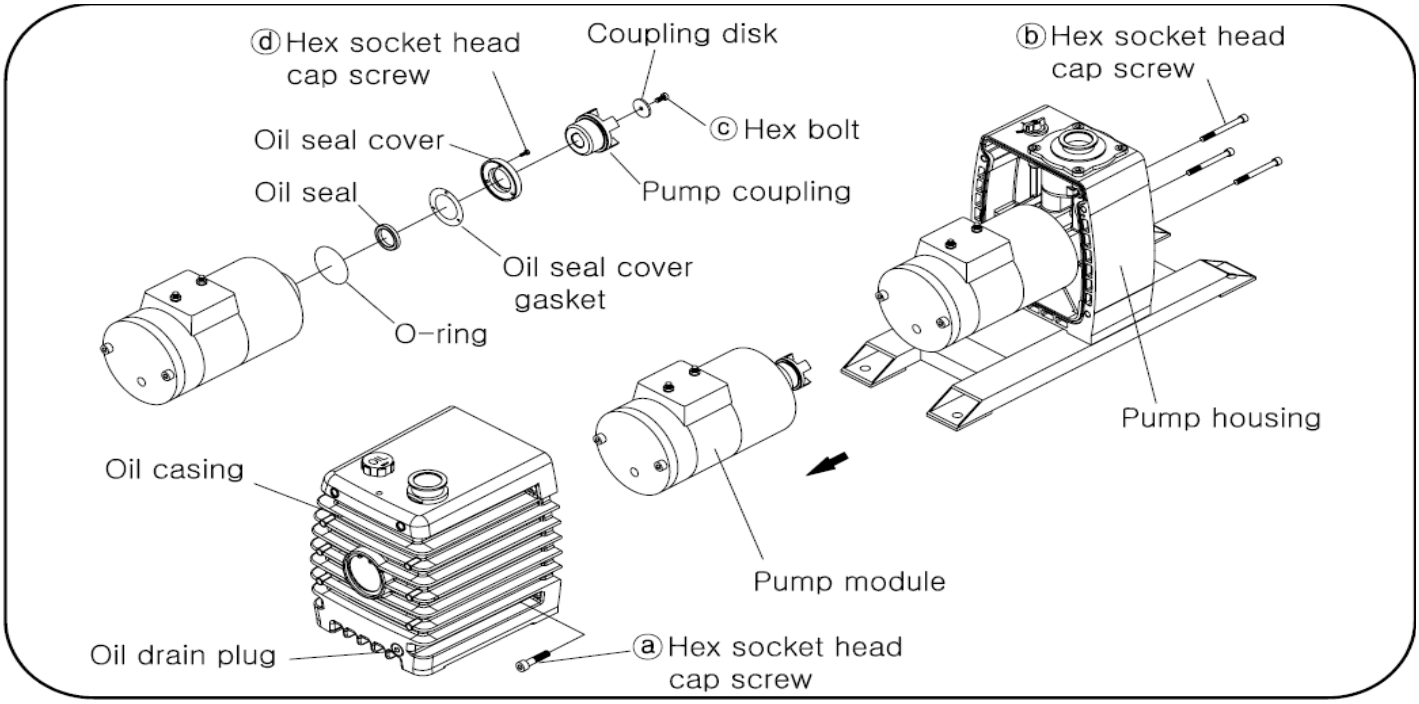

Figure 3

Modular design of VPA-R/Ex Double Stage Rotary Vacuum Pumps makes it very easy to repair as follows:

1- Disconnect the motor from mains.
2- Dismantle the motor from vacuum pump with its bracket. Figure 1
3- Drain the oil from oil box.
4- Remove the oil box from the pump. Figure 2
5- Remove 3 cap screws of vacuum pump module from back of the vacuum pump housing. Figure 3
6- Remove pumping module from housing. Figure 3
7- Insert new pump module in pump housing bracket. Figure 3
8- Put the oil box and motor back to the pump housing. Figure 1 and Figure 2
9- Fill the oil box with appropriate vacuum pump oil to the maximum level.
10- Your vacuum pump is ready to start.

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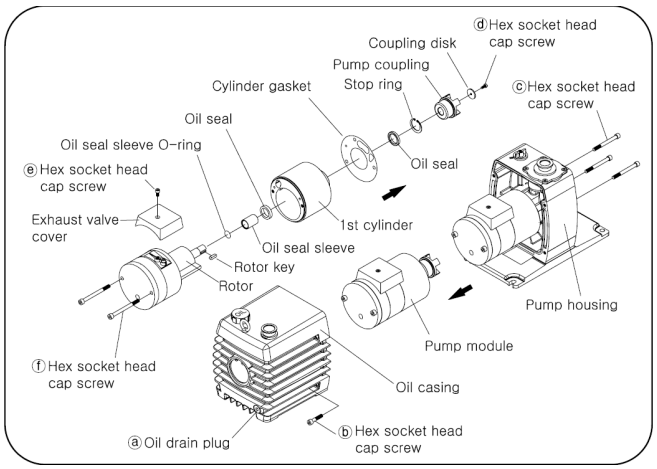
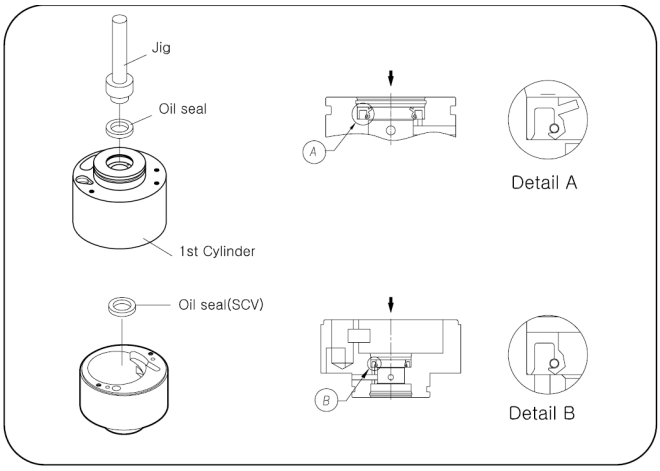
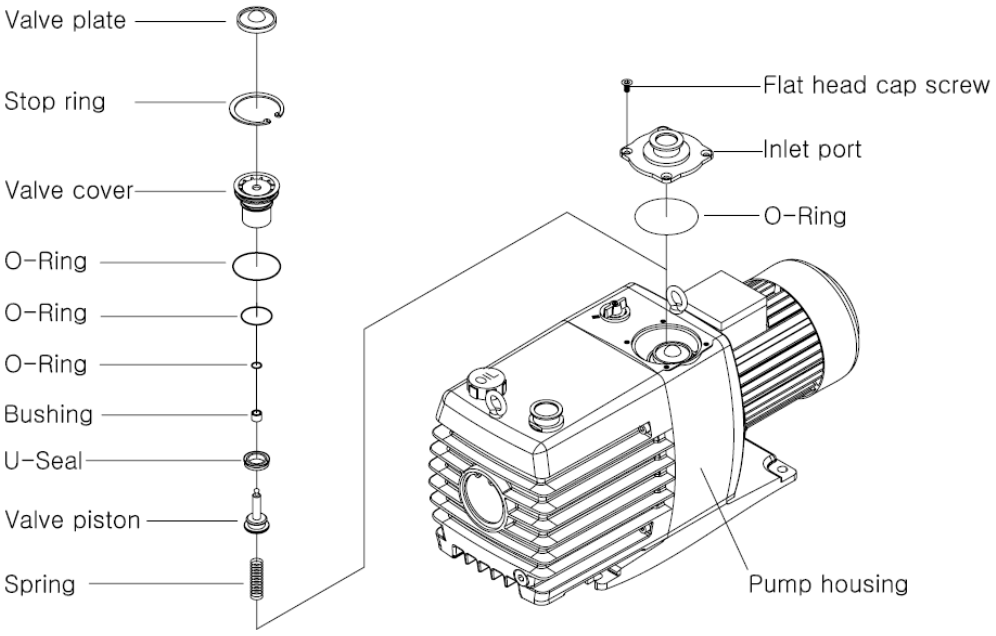


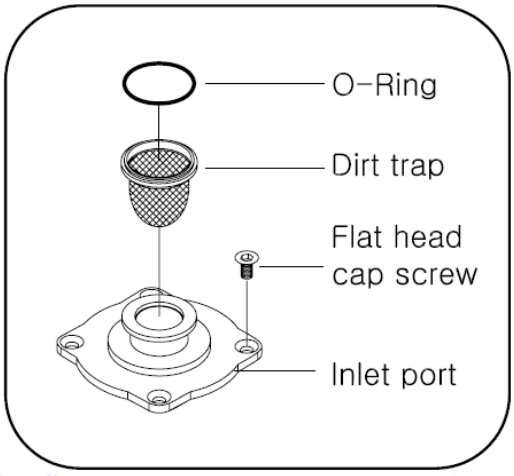
Vacuum pump module change and repair



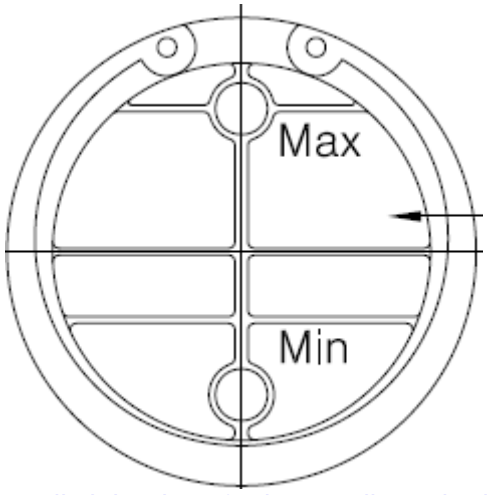
Shaft seal change and repair



Exclusive simple design of Anti Suck Back valve guaranties No Oil Back Steaming and No Air Leak into the vacuum system in case of power failure or sudden shut down.



Inlet dirt trap protects vacuum pump from particles



Large oil sight glass for better oil monitoring

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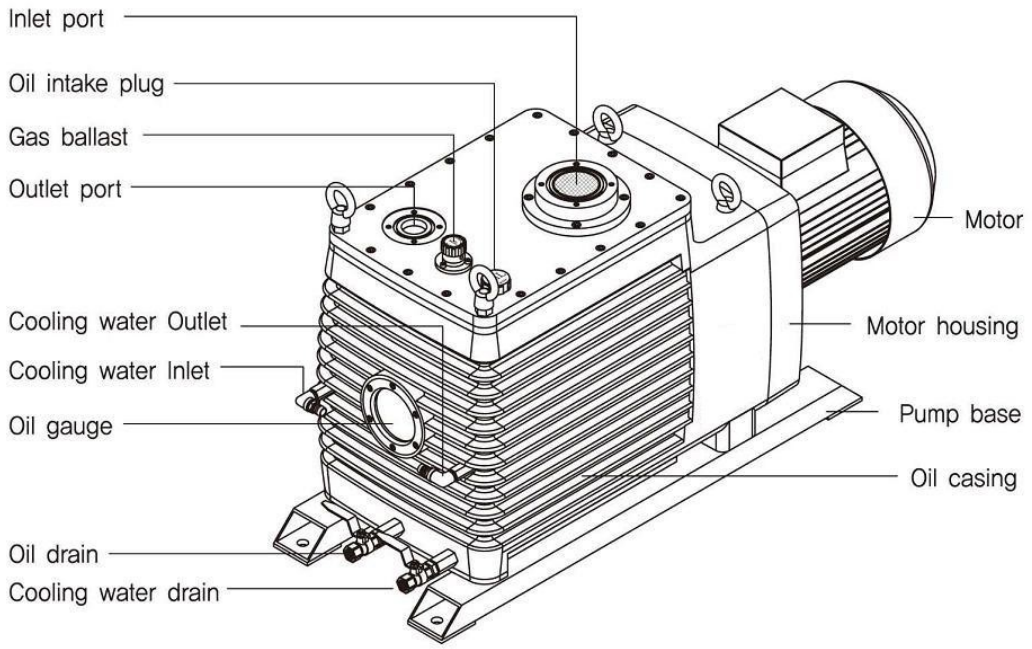
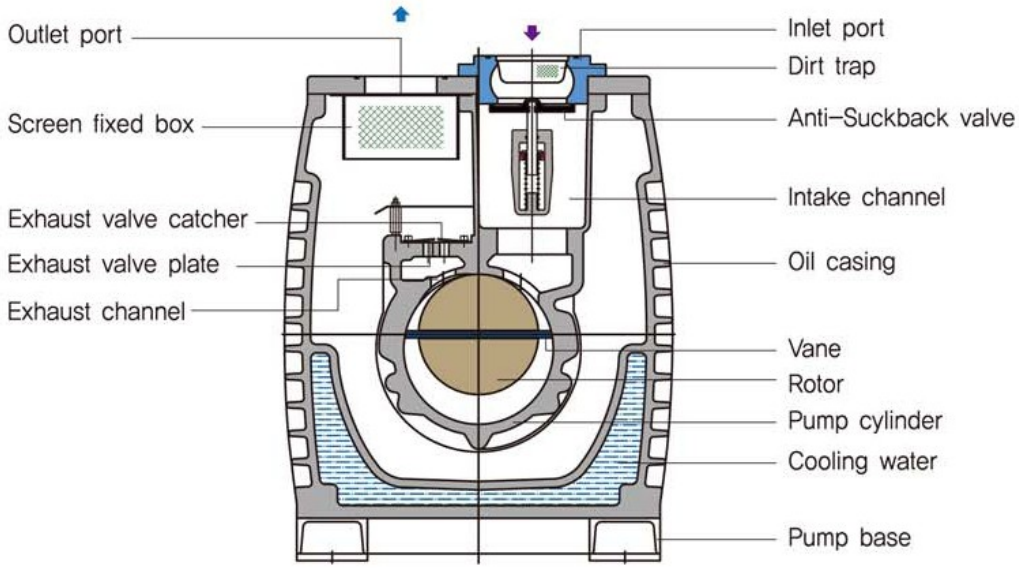
EXTERNAL PUMP SKETCH



VPA-R144/Ex, VPA-R216/Ex, VPA-R324/Ex, VPA-R432/Ex and VPA-R540/Ex General Drawing

SIMPLIFIED PUMP STRUCTURE SKETCH



VPA-R144/Ex, VPA-R216/Ex, VPA-R324/Ex, VPA-R432/Ex and VPA-R540/Ex Sectional Drawing

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Specifications of VPA-R/Ex Double Stage Rotary Vane Vacuum Pumps

Model	Pumping Speed L/min m^3/h (CFM) 50Hz /60Hz		Ultimate Pressure Torr -GB / +GB Water vapor tolerance millibar		Power kW (HP) 50Hz/60Hz		Rotational Speed (min^{-1}) 50Hz/60Hz		Port Size Quick Clamp Inlet/Outlet		Oil Capacity (L) Cooling water (L/min)	Weight** (kg)
VPA-R6/Ex	83 5 (3)	100 6 (3.5)	3×10^{-3}	0.05 40	0.4 (0.5)	0.4 (0.5)	1500	1800	KF25	KF25	1.1	23
VPA-R12/Ex	166 10 (6)	200 12 (7)	3×10^{-3}	0.05 40	0.4 (0.5)	0.4 (0.5)	1500	1800	KF25	KF25	1.2	23
VPA-R24/Ex	333 20 (12)	400 24 (14)	3×10^{-3}	0.05 25	0.75 (1)	0.75 (1)	1500	1800	KF25	KF25	2	30
VPA-R36/Ex	500 30 (17.5)	600 36 (21)	3×10^{-3}	0.05 25	0.75 (1)	0.75 (1)	1500	1800	KF25	KF25	2.3	54
VPA-R60/Ex	830 50 (30)	1000 60 (35.5)	3×10^{-3}	0.05 40	1.5 (2)	1.5 (2)	1500	1800	KF40	KF40	4.5	67
VPA-R90/Ex	1250 75 (44)	1500 90 (53)	3×10^{-3}	0.05 40	2.2 (3)	2.2 (3)	1500	1800	KF40	KF40	6.5	84
VPA-R144/Ex	2000 120 (71)	2400 144 (85)	3×10^{-3}	0.05 40	3.7 (5)	3.7 (5)	1500	1800	ISO63	ISO40	11	172
VPA-R216/Ex	3000 180 (106)	3600 216 (128)	3×10^{-3}	0.05 40	5.5 (7.5)	5.5 (7.5)	1500	1800	ISO63	ISO40	16	290
VPA-R324/Ex	4500 270 (160)	5400 324 (192)	3×10^{-3}	0.05 40	7.5 (10)	7.5 (10)	1500	1800	ISO63	ISO40	17 (6)	358
VPA-R432/Ex	6000 360 (213)	7200 432 (256)	3×10^{-3}	0.05 40	11 (15)	11 (15)	1500	1800	ISO100	ISO100	28 (8)	584
VPA-R540/Ex	7500 450 (266)	9000 540 (319)	3×10^{-3}	0.05 40	15 (20)	15 (20)	1500	1800	ISO100	ISO100	35 (8)	668

VPA-R324/Ex, VPA-R432/Ex and VPA-R540/Ex are Water cooled version only.
**Weight depends on type of motor.

Different types VPA-R/Ex Dual Stage Rotary Vane Vacuum Pumps as follows:

- ATEX
- Explosion proof
- Radiation proof with radiation proof enclosure
- Some Catagories of ATEX Motors are always in stock

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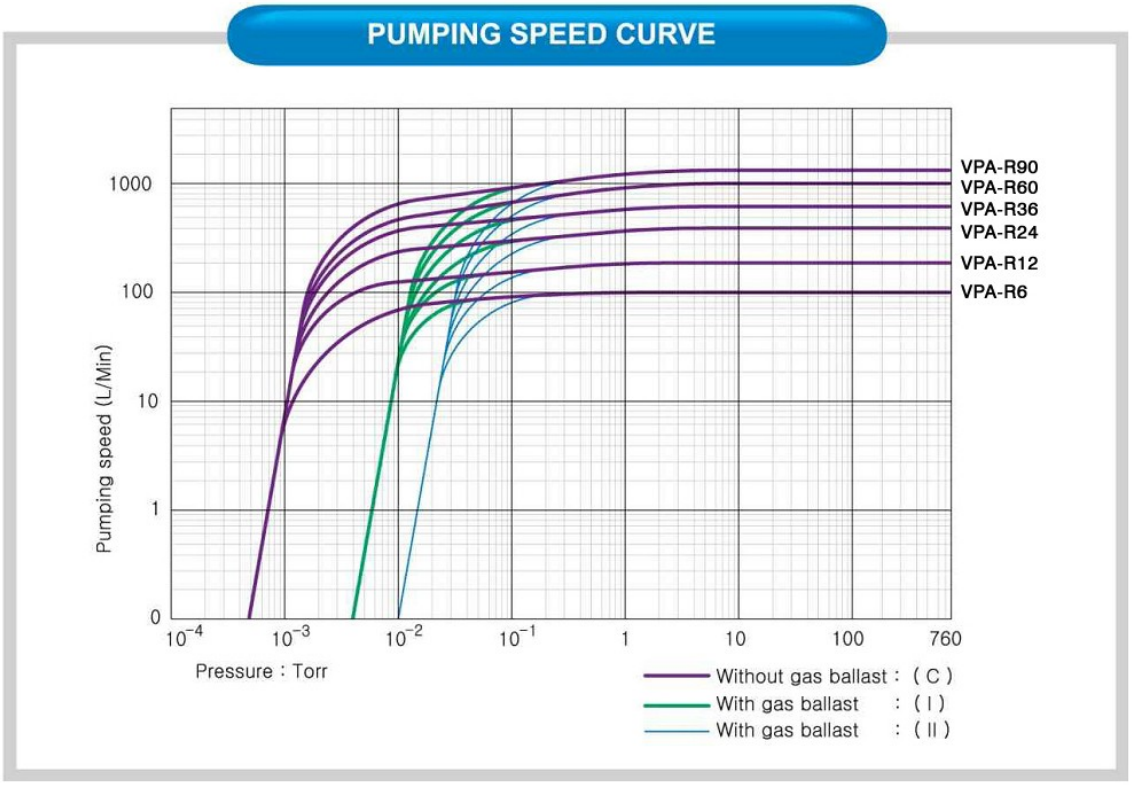
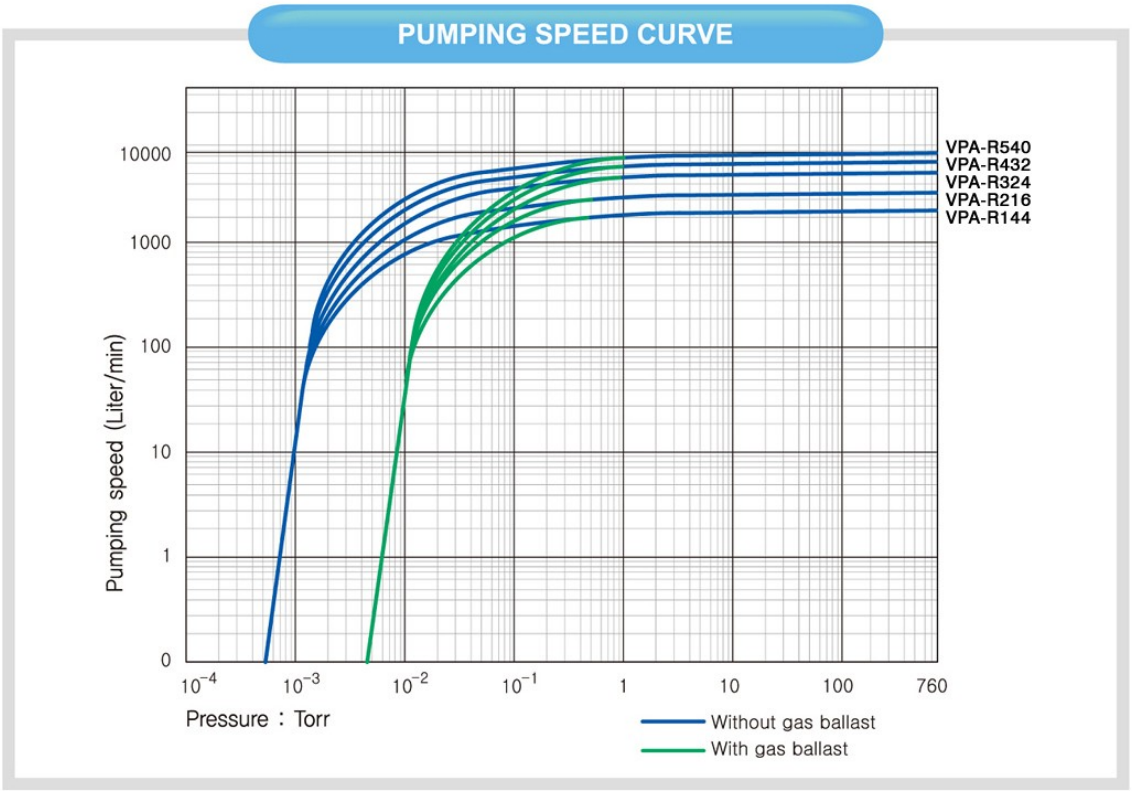


Pumping Speed Curves for VPA-R6/Ex to VPA-R90/Ex



Pumping Speed Curves for VPA-R144/Ex to VPA-R540/Ex

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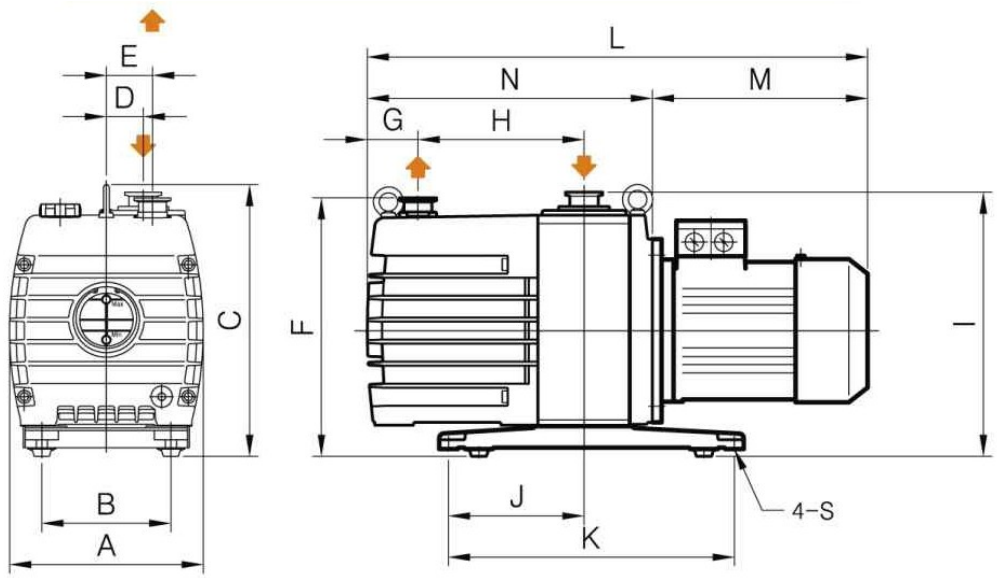
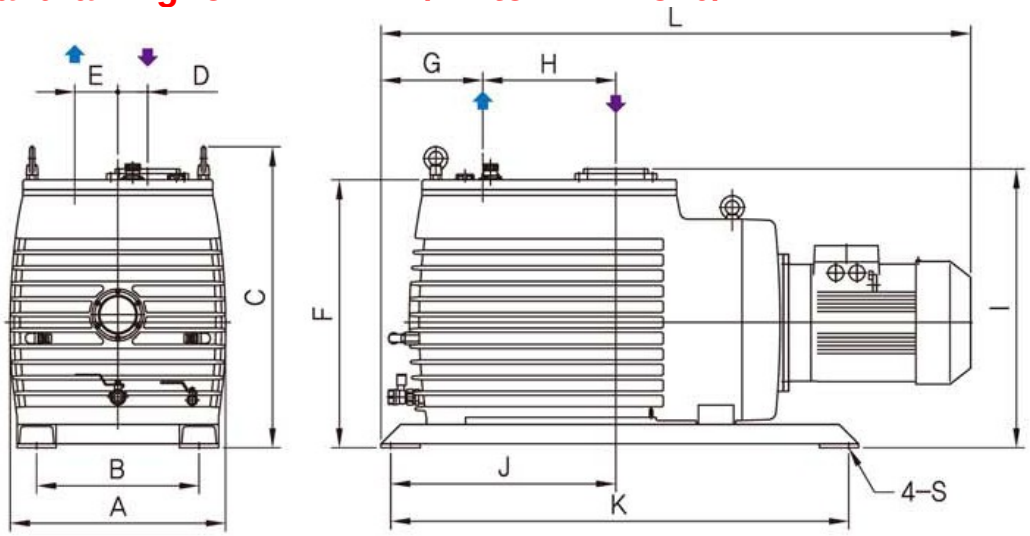
Dimensional drawing for VPA-R6/Ex to VPA-R90/Ex:



Model	A	B	C	D	E	F	G	H	I	J	K	N	S	M*	L*
VPA-R6	170	120	261	24	40	247	45	130	253	94	240	244	∅9	210	454
VPA-R12	170	120	261	24	40	247	45	155	253	94	240	269	∅9	210	479
VPA-R24	210	140	297	40	50	282	55	180	288	147	310	309	∅12	234	543
VPA-R36	210	140	297	40	50	282	58	210	288	147	310	342	∅12	234	576
VPA-R60	250	185	387	30	50	368	80	255	370	305	550	428	∅14	281	709
VPA-R90	280	184	441	30	50	412	85	295	415	305	600	479	∅14	312	791

***Length of the pump can be changed by use of different types of motors.**

Dimensional drawing for VPA-R144/Ex to VPA-R540/Ex



Model	A	B	C	D	E	F	G	H	I	J	K	S	L*
VPA-R144	320	230	501	40	65	414	193	175	465	348	740	∅14	974
VPA-R216	400	305	575	58	75	490	195	200	528	375	805	∅18	1101
VPA-R324	400	305	645	58	75	560	203	250	598	433	895	∅18	1179
VPA-R432	550	415	771	76	110	686	258	225	714	458	1040	∅18	1377
VPA-R540	550	415	771	76	110	686	260	340	714	575	1170	∅18	1507

***Length of the pump can be changed by use of different types of motors.**

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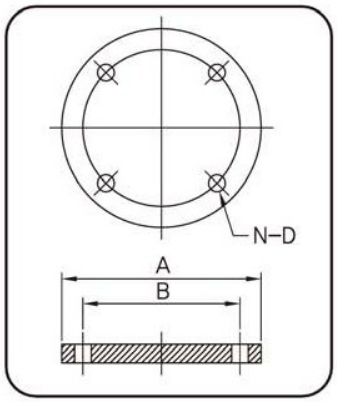
Flange Dimensions for VPA-R144/Ex to VPA-R540/Ex

DIMENSIONS OF ISO FLANGE



(UNIT : mm)

STANDARD	A	B	N	D
ISO 40	ø100	ø 80	4	M8
ISO 63	ø130	ø110	4	M8
ISO 100	ø165	ø145	8	M8

Applications of VPA-R/Ex Double Stage Rotary Vane Vacuum Pumps:

Autoclaves
Automotive
Backing pump for High Vacuum Pumps
Brazing
Casting
Central vacuum Systems
Chemical Distillation
Chemical Laboratories
Chemical Processing
Chemical Vapour Deposition
Cluster Tool Load locks
Coating and Sputtering
Cryopump Roughing
Cryopump Regeneration
Debinderization
Diffusion Pump backing
Diffusion Pump Holding
Degassers
Degassing
Drying
Drying Chambers
Electron Microscopes
Evacuating of Refrigeration Systems
Evacuation of Process Chambers
Forming
Freeze Dryers
Heat Treatment
Impregnating
Investment Casting
Laboratory Experimentation
Leak Detection
Light Bulb Manufacturing
Liquid Gas Storage
Lyophilizers
Metallurgy
Metals Processing
Packaging
Oil and Gas Industry
Oil Degassers
PET Processing
Pharmaceutical processes
Physics Laboratories
Potting
Research & Development
Roll Coating
Roughing of Vacuum Vessels
Roots Pump Backing
Silicon Crystal Growing
Sintering
Transformer Drying
Vacuum Degassing
Vacuum Furnaces
Vacuum Heat Treating
Vacuum Melting
Vacuum Metalizing
Vacuum Ovens
Vacuum Packaging
Vacuum Pressure Impregnation

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INFS-25 Inlet filter for VPA-R/Ex Pumps

EXFP Exhaust Filter for VPA-R/Ex Pumps

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Vacuum Pumps America Inc. Vacuum Pump Oils
VPA-HO Stabndard Vacuum Pump Fluids

Introduction

VPA-HO Fluids are advanced lubricants specifically designed for use in mechanically operated vacuum pump. VPA-HO Fluids are blended with semi-synthetic HT Severely Hydro-Cracked base oils and a patented additive system to provide extremely low vapor pressures for maximum pump efficiency. The anti-oxidant system delivers extended lubricant life, under conditions of high pump load and elevated operating temperatures.

Features and Benefits

- Exceptional synthetic-like resistance to high temperature fluid breakdown.
- Extends the interval between fluid changes.
- Minimizes deposits in vacuum pump systems.
- Increases pump reliability and reduce maintenance costs.
- Ash-less formulation uses non-toxic base oils.
- Creates a clean, low vapor and odor-free work place.
- Fluid has a High Viscosity Index.
- Strong lubricant film present over a wide range of temperatures.
- Improves energy efficiency.
- Superior protection against corrosion.
- Protects pumps from the corrosive effects of air, moisture and standard laboratory solvents.
- Food industry approved.
- Acceptable as a lubricant in and around food processing areas where there is no possibility of food contact.
- NSF H2 Approved.

VPA-HO Standard Vacuum Pump Oils are always in stock in different containers: 5 Gallon and 55 Gallon Drum.

Applications

VPA-HO Fluids are recommended for lubricating and cooling Rotary Piston and Rotary Vane Vacuum Pumps handling air. They are particularly suited to pumps running at high operating temperatures100°C – 130°C (212°F – 266°F). VPA-HO fluids are compatible with standard seal and hose materials except natural rubber, ethylene-propylene rubber (EPDM) and latex. Mixing of vacuum pump fluids will reduce the performance of Fluids. However, VPA-HO Fluids are compatible with mineral oils, Polyalphaolefins (PAOs) and some semi-synthetic based lubricants. VPA-HO Fluids are incompatible with Polyglycol based products. VPA-HO Fluids are also recommended for use in vacuum pumps handling inert gases such as Nitrogen, Hydrogen, Carbon Dioxide, Carbon monoxide, Argon, Neon and Helium.

VPA-HO Fluids are NOT recommended for pumps handling strong oxidizing vapors from materials such as Oxygen, Fuming Nitric Acid, Sulphuric Acid, Hydrogen Sulphide and Glacial Acetic Acid.

Typical Performance Data

PROPERTY	TEST METHOD	VPA-HO FLUIDS		
		VPA-HO 15	VPA-HO 19	VPA-HO 20
Density, kg/L@15°C	D4052	0.861	0.865	0.868
Viscosity cSt @ 40°C (SUS @ 100°F) cSt @ 100°C (SUS @ 210°F)	D445	38 (195) 6.2 (46.8)	55 (284) 7.6 (51.7)	103 (537) 11.4 (66.4)
Viscosity Index	D2270	108	101	97
Vapor Pressure, mm Hg @ 25°C	-	6×10^{-7}	5×10^{-8}	5×10^{-8}
Flash Point, °C (°F)	D92	220 (428)	225 (437)	260 (500)
Pour Point, °C (°F)	D97	-18 (0)	-15 (5)	-12 (10)
Corrosion Protection: Rust A - Distilled Water Rust B - Synthetic Sea Water	 ASTM 665 ASTM 665	 Pass Pass	 Pass Pass	 Pass Pass
Rotary Pressure Vessel Oxidation Test, minutes	D2272	1,000	1,000	1,000
Color	-	Clear Liquid	Clear Liquid	Clear Liquid

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