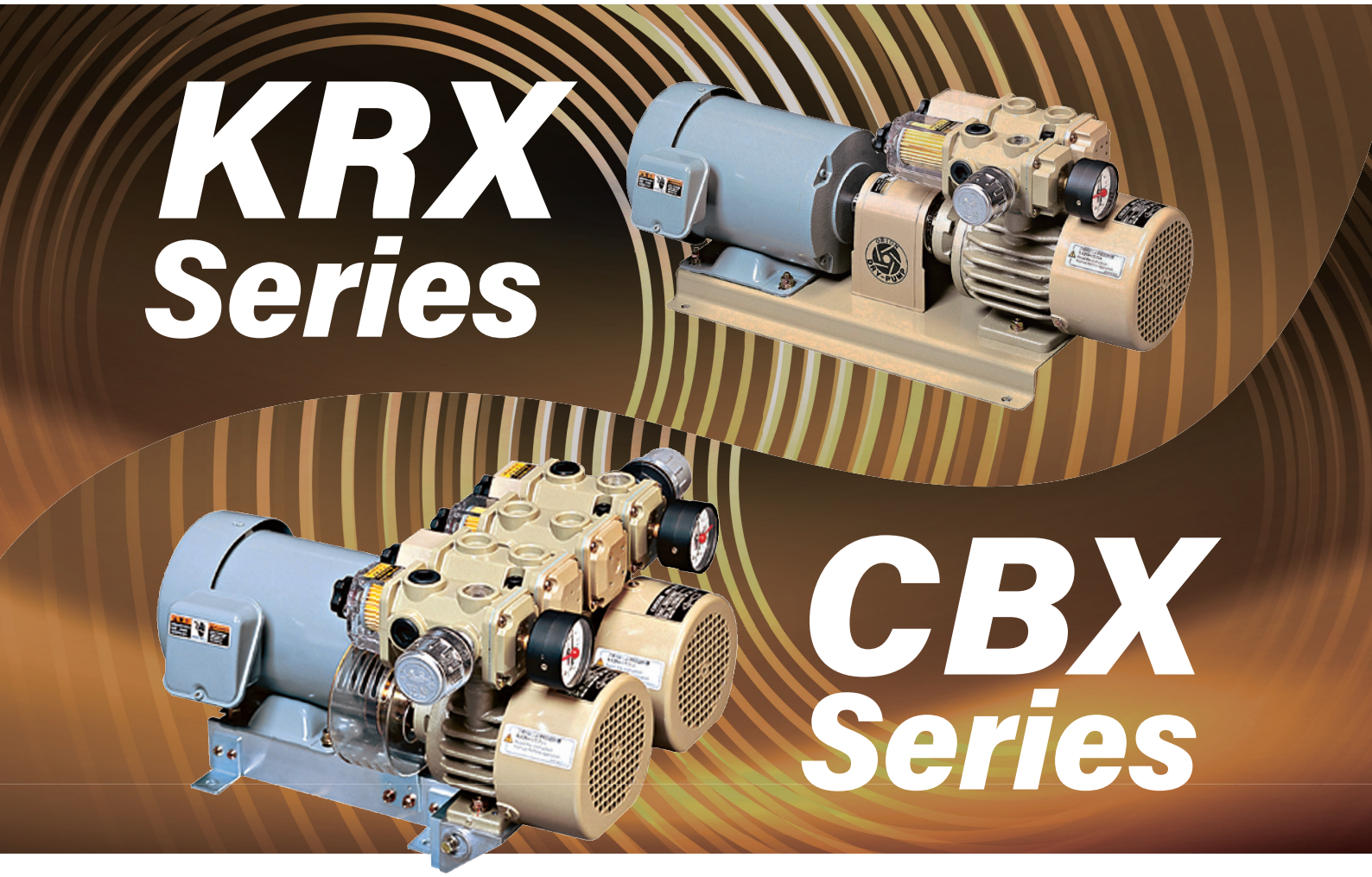
ORION

冷熱と真空でイノベーション
Innovating with Thermal Control and Vacuum

ORION Dry Vacuum Pump / Blower



Long-selling global design dry pump thanks to its high reliability and improved functionality.

July 2022 | V53
Orion Dry Vacuum & Blower pump in India

Striving to Make Products that Move You

Model Nomenclature / Functioning Principles / Sample Applications

Oil-Free Rotary Vane Vacuum Pump that Meets Your Clean Work Needs

In 1965, the history of the oil-free rotary vane vacuum pump began in Japan with the birth of the Orion Dry Pump. And ever since, due to their excellent functionality, Orion Dry Pumps are vital components regularly used in automation and energy-saving applications in various industries. On the other hand, despite impressive features, they are also traditionally known for their loud operating noise and short lifespans. Fortunately, the results of years of great efforts have yielded an oil-free pump with low operating noise levels and increased lifespans previously unimaginable. Starting with automation and energy savings in mind, it's time you took advantage of the infinite possibilities of Orion Dry Pumps.

ORION Dry Pumps are oil-free for both vacuum and pressure systems, and do not contaminate the work environment and workpieces with oil. These pumps are ideally suited for various applications.

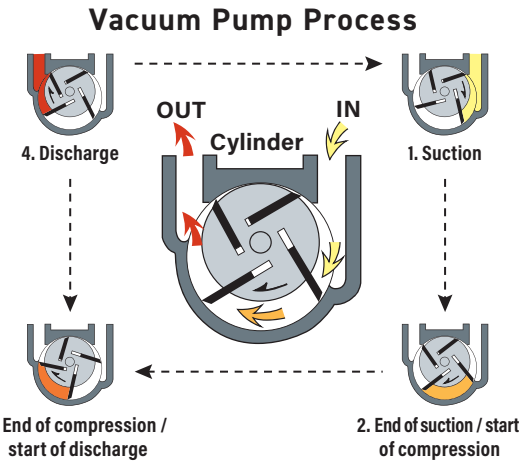
Low operating sound levels and long service life. Pre-equipped with gauges and controllers.

Specially designed wear-resistant, self-lubricating carbon vanes.

High-speed rotating multi-vane for stable suction / exhaust with little fluctuation.

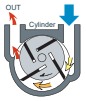
Functioning Principle

- A rotor is placed eccentrically within a cylinder. All components are precisely manufactured and adjusted to achieve minimum clearances. Vanes are inserted into slots in the rotor and are free to slip in and out within the walls of the cylinder. As the rotor turns, the vanes slide out and are kept in constant contact with the cylinder wall due to centrifugal force.
- As the rotor turns, the volume of space between the vanes changes. As shown in the illustration, when the rotor spins from state 1 to 2, the increase in volume at the intake creates a vacuum. As the volume of space between the vanes decreases during the cycle, the air trapped between the vanes is compressed as shown between states 2 and 3. Finally between states 3 and 4 the compressed air is allowed to escape through the air outlet. The process repeats as the rotor continuously rotates in order to achieve a constant air flow from inlet to outlet.
- A four-vane-type pump provides intake/discharge 4 times in a single rotation. Defining volume at the end of intake as V (L), and rotation speed as N (rpm), 4VN (L) of air is discharged per minute. This theoretical value is what's known as the designed pumping capacity.



Basic Specifications

Utilize Vacuum ▪ Vacuum Spec. (Suction Air)

Construction	Mark	Designation	Operation
		V	Intake-side (vacuum-side) of pump is utilized.This is called "Suction Air".

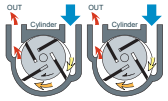
Utilize Exhaust ▪ Blower Spec. (Delivery Air)

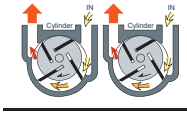
Construction	Mark	Designation	Operation
		B	Exhaust-side of pump is utilized. This is called "Delivery Air"

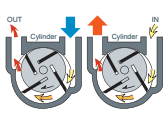
Vacuum/Blower Spec.

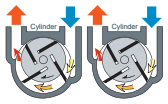
Construction	Mark	Designation	Operation
		VB	Simultaneously utilizes the intake and exhaust sides of the pump. This is called "1-Cylinder VB Spec."

Combination Type

Construction	Mark	Designation	Operation
		VV	Pump 1 and Pump 2 are both built in. Each are vacuum spec. pumps.

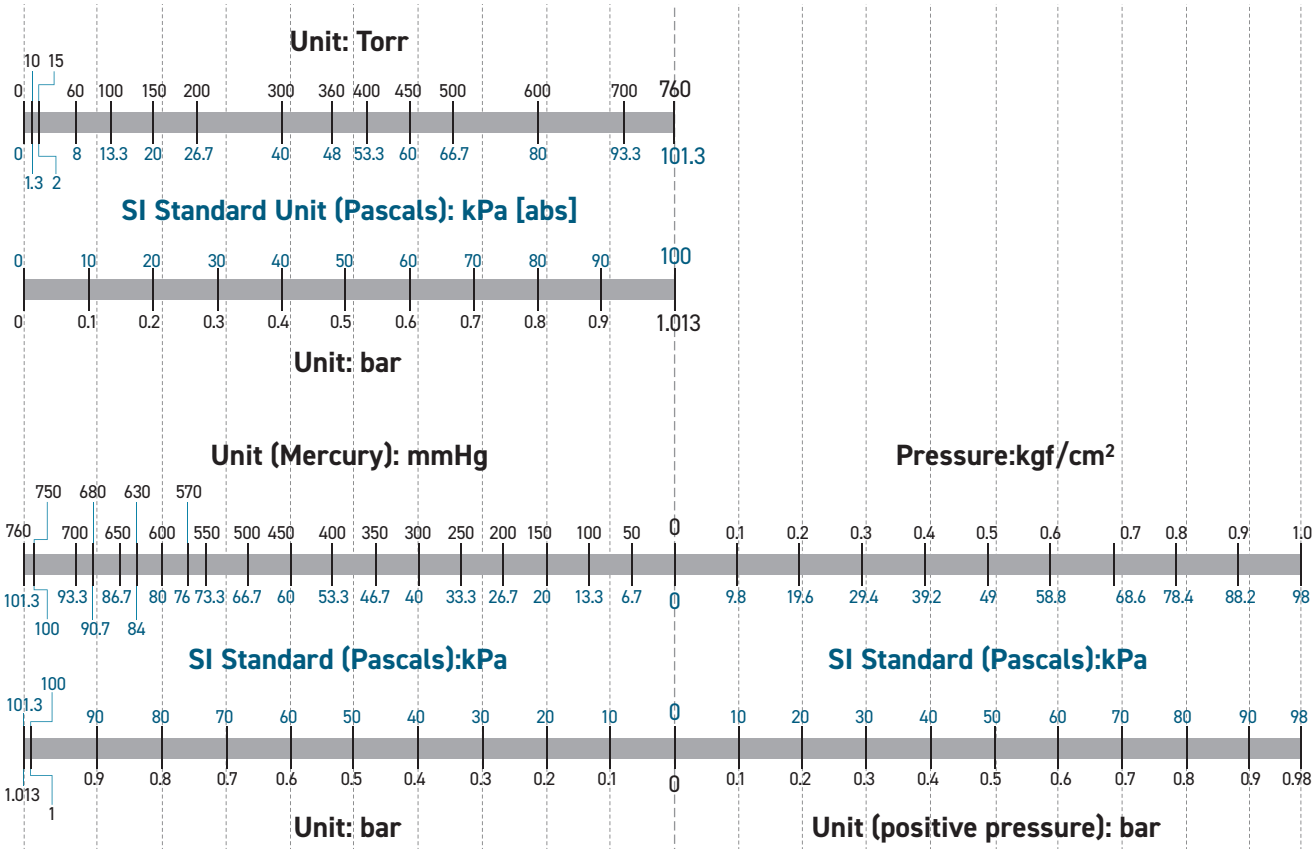
Construction	Mark	Designation	Operation
		BB	Pump 1 and Pump 2 are both built in. Each are blower spec. pumps.

Construction	Mark	Designation	Operation
		VB	Pump 1 and Pump 2 are both built in. 1 is a vacuum spec. pump and the other is a blower spec. pump. This is called "2-Cylinder VB Spec."

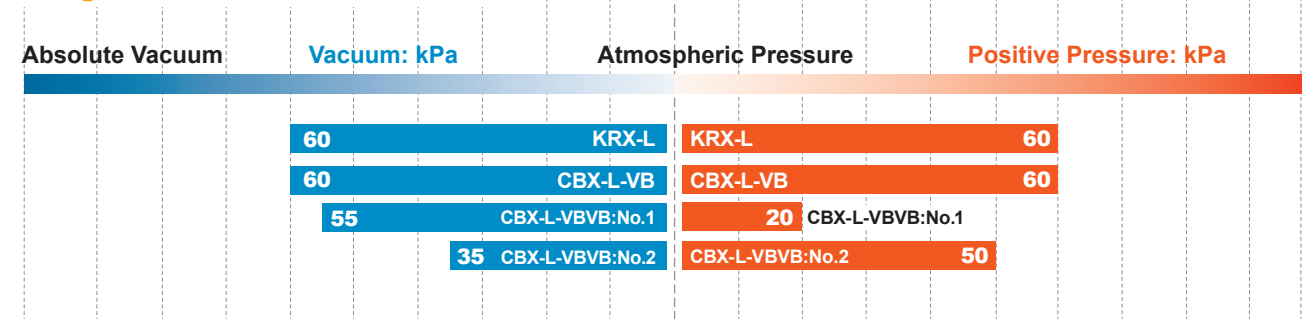
Construction	Mark	Designation	Operation
		VBVB	Pump 1 and Pump 2 are both built in. Each are vacuum spec. and blower spec. pumps. This is called "2-Cylinder VBVB Spec."

Pressure Unit Comparison Chart / Pump Pressure Guide / Pressure Unit Notes / Model List

Pressure Unit Comparison Chart



Pump Pressure Guide



Elevation Correction Value

Elevation(m)	Correction Value(kPa)
100	1.2
200	2.4
300	3.6
400	4.7
500	5.9
600	7.0
700	8.1
800	9.3
900	10.4
1,000	11.5

The elevation correction value is based on the elevation where the pump is operated and this value is to be subtracted from the degree of vacuum.

When operating at atmospheric pressure in areas of high elevation, there will be a difference in the actual degree of vacuum compared to operating at atmospheric pressure at sea level. Accordingly, the upper limit of the continuous degree of vacuum will be lower, and the pump should be operated within the adjusted range. Operating the pump at a degree of vacuum exceeding this adjusted upper limit will shorten the operating lifespan of the pump and can also result in breakdown of the pump. For the same reason, the actual ultimate vacuum will also be lower than the value noted in the specifications.

Example: For operation at an elevation of 500m:

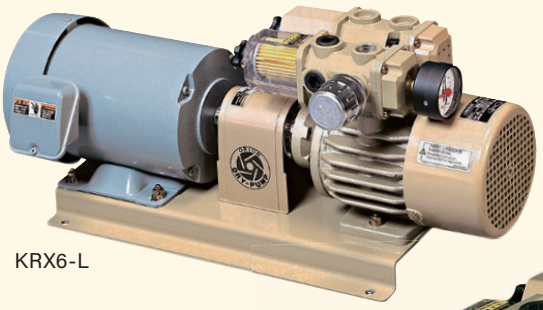
The continuous degree of vacuum of the KRX6 would be in the range of **60 - 5.9 = 54.1 kPa.**

KRX Series

Continuous Operating Vacuum
Recomm. 60 kPa or less (max. 90 kPa)

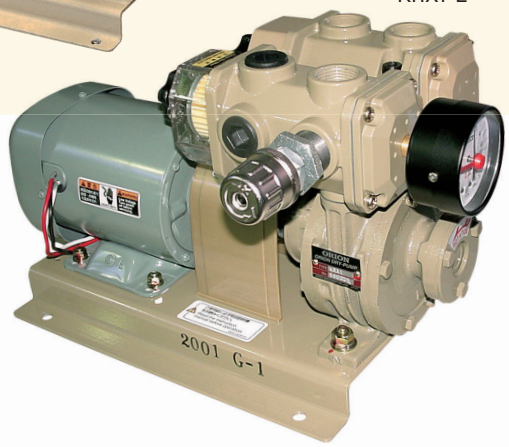
Continuous Operating Pressure
Recomm. 60 kPa or less

Flow Rate
135 – 1,190 L/min



KRX6-L

KRX1-L



Features

- No oil in either vacuum, blower or combination application
- Quiet operation
- Long life
- Gauge and controller equipment standard
- Dependable and proven design

Specifications

Model	Speed (rpm) 50Hz	Capacity *1 (L/min) 50Hz	Capacity *1 (L/min) 60Hz	Ultimate vacuum *2 (kPa)	Continuous vacuum *3 (kPa)	Continuous blower *3 (kPa)	I/O port	Motor voltage	Motor output (kW)	Mass (kg)
KRX1-L-V	1,400	135	155	79	60	—	Rc 3/4	3PH415V50Hz	0.18	16
KRX1-L-B	1,400	135	155	—	—	60	Rc 3/4	3PH415V50Hz	0.18	16
KRX1-L-VB	1,400	135	155	79	V+B ≦ 60		Rc 3/4	3PH415V50Hz	0.18	16
KRX3-L-V	1,400	235	280	84	60	—	Rc 3/4	3PH415V50Hz	0.37	21.5
KRX3-L-B	1,400	235	280	—	—	60	Rc 3/4	3PH415V50Hz	0.37	21.5
KRX3-L-VB	1,400	235	280	84	V+B ≦ 60		Rc 3/4	3PH415V50Hz	0.37	21.5
KRX5-L-V	1,400	405	480	86	60	—	Rc 3/4	3PH415V50Hz	0.75	33
KRX5-L-B	1,400	405	480	—	—	60	Rc 3/4	3PH415V50Hz	0.75	33
KRX5-L-VB	1,400	405	480	86	V+B ≦ 60		Rc 3/4	3PH415V50Hz	0.75	33
KRX6-L-V	1,400	575	685	86	60	—	Rc 3/4	3PH415V50Hz	1.5	40
KRX6-L-B	1,400	575	685	—	—	60	Rc 3/4	3PH415V50Hz	1.5	40
KRX6-L-VB	1,400	575	685	86	V+B ≦ 60		Rc 3/4	3PH415V50Hz	1.5	40
KRX7A-L-V	1,400	1,190	—	90	60	—	Rc 1	3PH415V50Hz	2.2	68
KRX7A-L-B	1,400	1,190	—	—	—	60	Rc 1	3PH415V50Hz	2.2	68
KRX7A-L-VB	1,400	1,190	—	90	V+B ≦ 60		Rc 1	3PH415V50Hz	2.2	68

*1 Capacity: Design displacement, logic value is calculated from the cubic volume.
The actual flow rate refers to the actual measurement data of performances.

*2 It is not allowable to use it at the maximum vacuum reaching point of the pump.

*3 Usable range of the degree of vacuum/blower pressure.

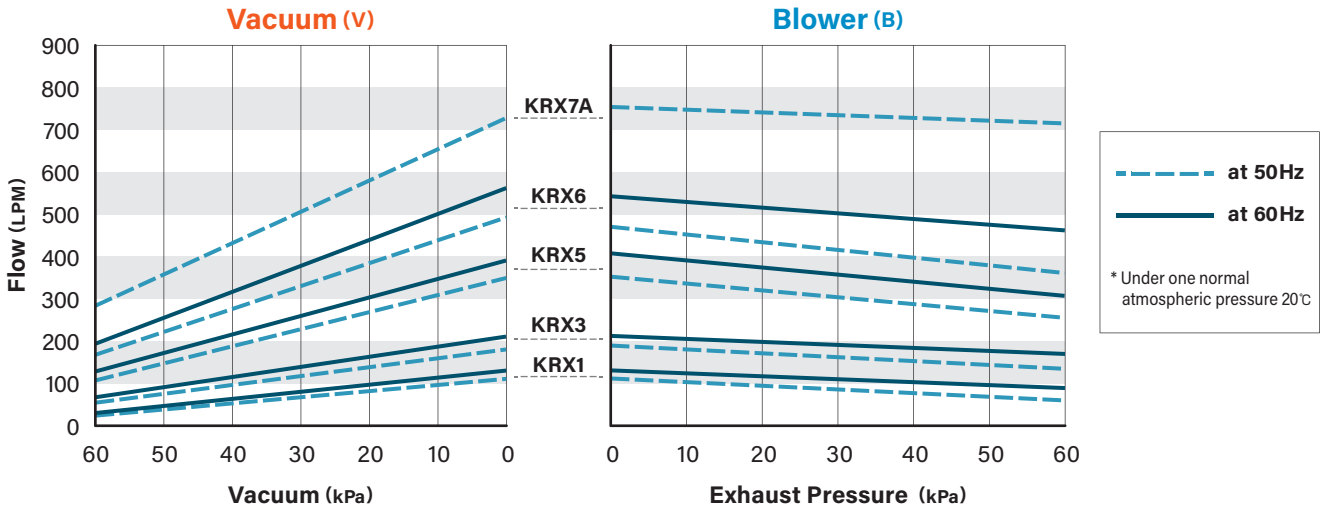
* For the intake air, use clean air of normal temperature and normal humidity whenever possible.
Intake air condition: Temperature 0 to 40℃ and Humidity 65%RH±20%.

* The allowable variation range of the supply voltage should be ± 10% of rated voltage.

* Install an overload protector (thermal relays, etc.) Setting value: Use the rated current value which is indicated on the specification plate of the motor as the target value.

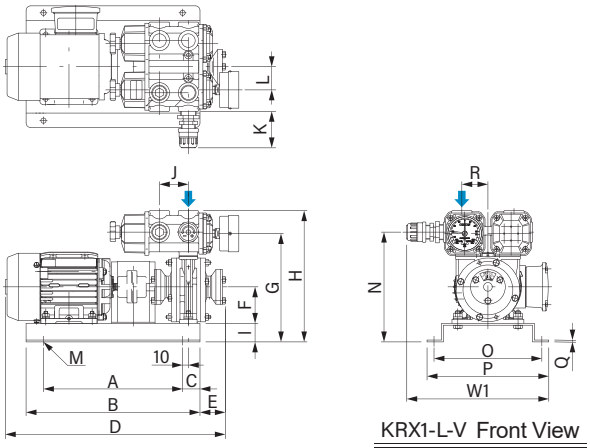
* Check availability to Kumark, if operating Orion vacuum pumps with 60Hz condition.

Performance Data



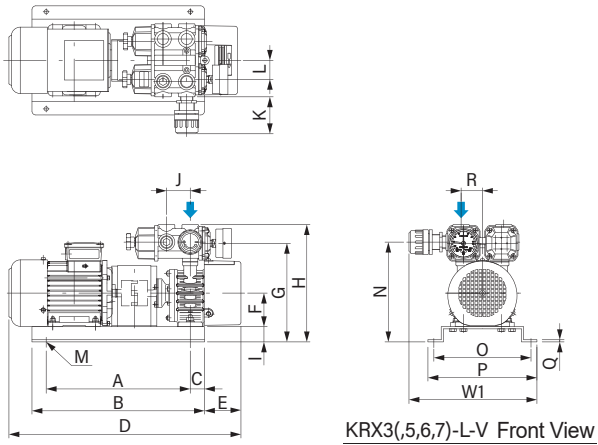
Outer dimensions

KRX1-L (-V, -B, -VB)

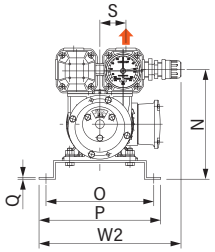


KRX1-L-V Front View

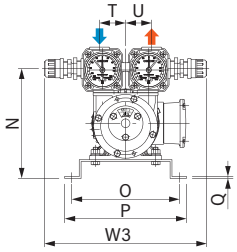
KRX3-L (-V, -B, -VB), **KRX5-L** (-V, -B, -VB)
KRX6-L (-V, -B, -VB), **KRX7A-L** (-V, -B, -VB)



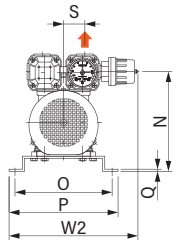
KRX3(,5,6,7)-L-V Front View



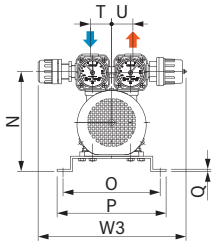
KRX1-L-B Front View



KRX1-L-VB Front View



KRX3(,5,6,7)-L-B Front View



KRX3(,5,6,7)-L-VB Front View

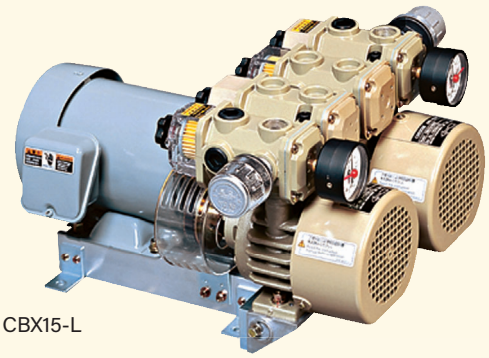
Model (mm)	H	D	W1	W2	W3	A	B	C	E	F	G	I
KRX1-L (-V, -B, -VB)	(227)	(380)*	(245)	(245)	(280)	240	300	30	(44)	63	(187)	32
KRX3-L (-V, -B, -VB)	(248)	(490)*	(270)	(272)	(312)	304	364	30	(77)	71	(208)	32
KRX5-L (-V, -B, -VB)	(250)	(542)*	(270)	(272)	(312)	340	402	31	(83)	80	(210)	32
KRX6-L (-V, -B, -VB)	(273)	(664)*	(276)	(278)	(312)	420	470	25	(102)	90	(233)	38
KRX7A-L (-V, -B, -VB)	(325)	(767)*	(326)	(333)	(379)	430	530	50	(136)	100	(270)	38

Model (mm)	J	K	L	M	N	O	P	Q	R	S	T	U
KRX1-L (-V, -B, -VB)	50	(63)	40	4-φ9	(190)	186	210	3.2	45	45	45	45
KRX3-L (-V, -B, -VB)	50	(78)	40	4-φ9	(211)	205	230	4.5	45	45	45	45
KRX5-L (-V, -B, -VB)	50	(78)	40	4-φ9	(213)	205	230	4.5	45	45	45	45
KRX6-L (-V, -B, -VB)	50	(78)	40	4-φ10	(236)	220	242	4.5	45	45	45	45
KRX7A-L (-V, -B, -VB)	70	(86)	50	4-φ12	(270)	250	280	4.5	55	55	55	55

* Dimensions are for V type. * Reference data with standard motor

CBX Series

- Continuous vacuum 60 kPa
- Continuous blower 60 kPa
- Capacity 470 to 2,230 L/min



CBX15-L

CBX62-L

Features

- "COMBINATION" is both Vacuum and Blower Operation
- Compact Dual Pump Design
- Quiet Operation

Specifications

Model	Speed (rpm)	Capacity *1 (L/min)				Continuous vacuum *2 (kPa)		Continuous blower *2 (kPa)		I/O port	Motor voltage	Motor output (kW)	Mass (Kg)
		Pump No.1		Pump No.2									
	50Hz	50Hz	60Hz	50Hz	60Hz	Pump No.1	Pump No.2	Pump No.1	Pump No.2				
CBX15-L-VB	1,400	235	280	235	280	60	—	—	60	Rc 3/4	3PH415V50Hz	0.75	41
CBX15-L-VBVB	1,400	235	280	235	280	55	35	20	50	Rc 3/4	3PH415V50Hz	0.75	41
CBX25-L-VB	1,400	405	480	405	480	60	—	—	60	Rc 3/4	3PH415V50Hz	1.5	49
CBX25-L-VBVB	1,400	405	480	405	480	55	35	20	50	Rc 3/4	3PH415V50Hz	1.5	49
CBX40-L-VB	1,400	575	685	575	685	60	—	—	60	Rc 3/4	3PH415V50Hz	2.2	67
CBX40-L-VBVB	1,400	575	685	575	685	55	35	20	50	Rc 3/4	3PH415V50Hz	2.2	67
CBX62-L-VB	1,400	935	1115	935	1115	60	—	—	60	Rc 1	3PH415V50Hz	3.7	111
CBX62-L-VBVB	1,400	935	1115	935	1115	55	35	20	50	Rc 1	3PH415V50Hz	3.7	111

*1 Capacity: Design displacement: logic value is calculated from the cubic volume.
The actual flow rate refers to the actual measurement data of performances.

*2 Usable range of the degree of vacuum/blower pressure.

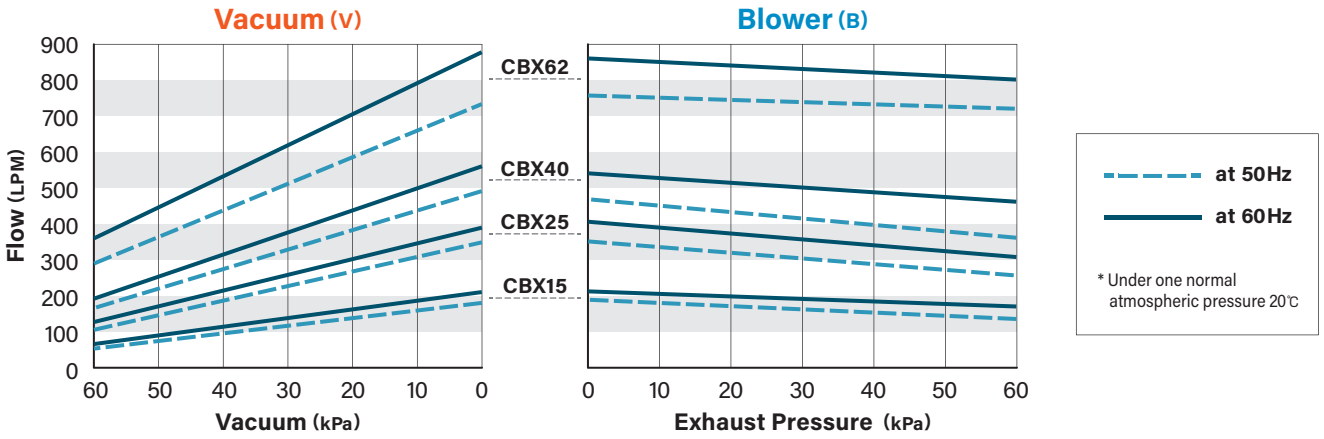
* For the intake air, use clean air of normal temperature and normal humidity whenever possible.
Intake air condition : Temperature 0 to 40℃ and Humidity 65%RH±20%.

* The allowable variation range of the supply voltage should be ± 10% of rated voltage.

* Install an overload protector (thermal relays, etc.) Setting value: Use the rated current value which is indicated on the specification plate of the motor, 110% at 50Hz, 120% at 60Hz.

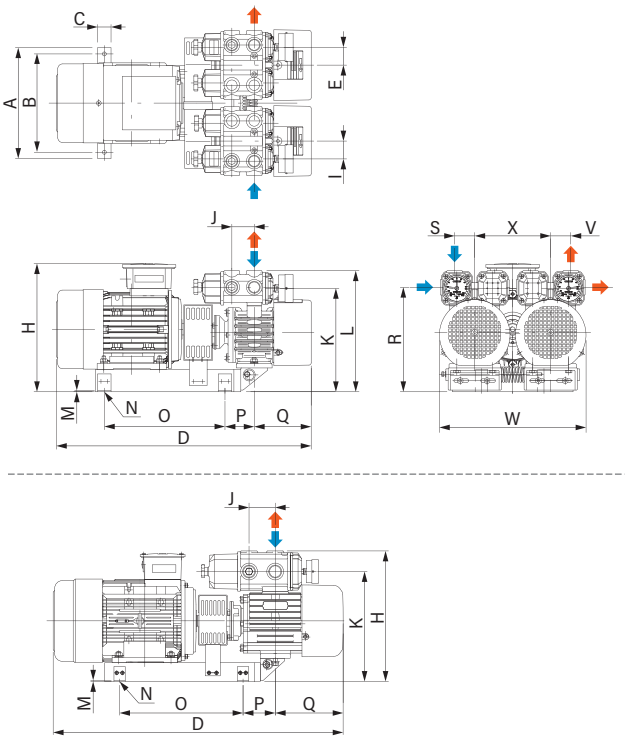
* Check availability to Kumark, if operating Orion vacuum pumps with 60Hz condition.

Performance Data



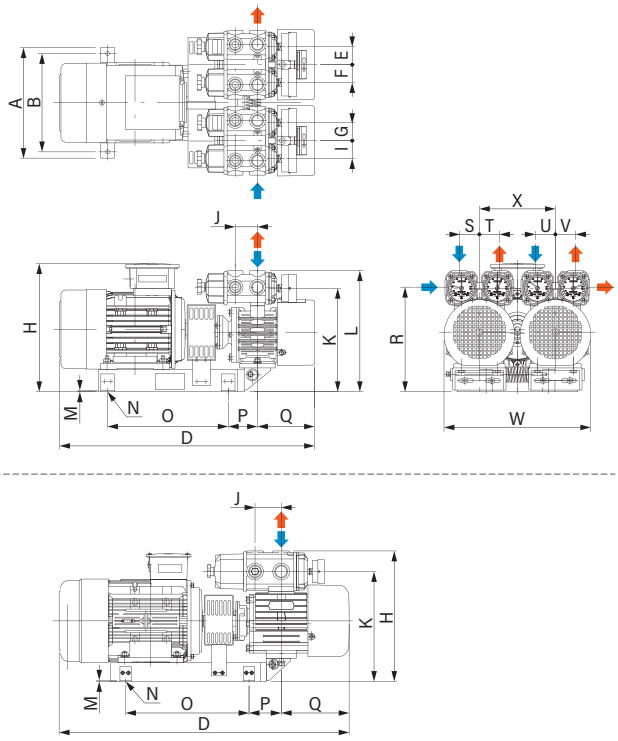
Outer dimensions

CBX15-L-VB, CBX25-L-VB
CBX40-L-VB, CBX62-L-VB



CBX62-L-VB Left Side View

CBX15-L-VBVB, CBX25-L-VBVB
CBX40-L-VBVB, CBX62-L-VBVB



CBX62-L-VBVB Left Side View

Model (mm)	H	D	W	A	B	C	E	F	G	I	J	K
CBX15-L-VB	(269)	(474)*	(324)	233	205	30	40	-	-	40	50	(230)
CBX15-L-VBVB	(269)	(474)*	(324)	233	205	30	40	40	40	40	50	(230)
CBX25-L-VB	(287)*	(571)*	(329)	248	220	30	40	-	-	40	50	(232)
CBX25-L-VBVB	(287)*	(571)*	(329)	248	220	30	40	40	40	40	50	(232)
CBX40-L-VB	(308)*	(675)*	(328)	268	240	30	40	-	-	40	50	(249)
CBX40-L-VBVB	(308)*	(675)*	(328)	268	240	30	40	40	40	40	50	(249)
CBX62-L-VB	(349)	(775)*	(421)	298	270	30	50	-	-	50	70	(294)
CBX62-L-VBVB	(349)	(775)*	(421)	298	270	30	50	50	50	50	70	(294)

Model (mm)	L	M	N	O	P	Q	R	S	T	U	V	X
CBX15-L-VB	(269)	3.2	4-φ9	225	65	(107)	(232)	45	-	-	45	170
CBX15-L-VBVB	(269)	3.2	4-φ9	225	65	(107)	(232)	45	45	45	45	170
CBX25-L-VB	(272)	3.2	4-φ9	270	65	(128)	(234)	45	-	-	45	170
CBX25-L-VBVB	(272)	3.2	4-φ9	270	65	(128)	(234)	45	45	45	45	170
CBX40-L-VB	(288)	3.2	4-φ9	305	75	(152)	(251)	45	-	-	45	170
CBX40-L-VBVB	(288)	3.2	4-φ9	305	75	(152)	(251)	45	45	45	45	170
CBX62-L-VB	-	3.2	4-φ10	330	86	(182)	-	55	-	-	55	(221)
CBX62-L-VBVB	-	3.2	4-φ10	330	86	(182)	-	55	55	55	55	(221)

* Dimensions are for V type. * Reference data with standard motor

Products by ORION

Dairy Equipment

Products

- Milking Equipment
- Refrigerating Equipment
- Feeding Equipment
- Animal Waste Treatment Equipment

Photo: Milking Unit Automated Transportation Equipment Carry Robo UCA30A

Vacuum Pumps and Related Equipment

Products

- Dry Pump (Oil-free rotary vane vacuum pump)
- Silent Box (Dry pump soundproofing enclosure)
- Clean Filter

Photo : Dry Pump KRFSeries

Heating Equipment

Products

- Jet Heater BRITE (Infrared heater)
- Jet Heater HP (Portable warm air heater)
- Jet Heater HS (Convection warm air heater)

Photo : Jet Heater BRITE HRR480B-S

Refrigerating Equipment

Products

- Inverter Chiller
- Unit Cooler (Fluid circulation refrigeration unit)
- Dehumidifier
- Food Processing and Preserving Equipment
- Others

Photo :DC Inverter Chiller RKE3750B-V

Compressed Air Equipment

Products

- Air Dryer (Refrigerated compressed air dryer)
- Heatless Air Dryer (Adsorption type compressed air dryer)
- Air Filter (Compressed air purification equipment)
- Others

Photo : DC Inverter Air Dryer RAXE1100B-SE

Precision Air Processor

Products

- Precision Air Processor
- Percision Water Chiller (Precision control of water temperature)
- In-Line Type Temperature Inspection Equipment
- Thermal Fresh (Precision control of temperature and humidity)
- Others

Photo : Precision Air Processor PAP10A1-K

Safety Precautions

Please read the Operating Manual thoroughly and operate the product accordingly. For specialists in installation and wiring of ORION equipment, please consult your ORION dealer. Choose the ORION product that best suits your needs. Please do not use any product in a manner for which it was not intended. Doing so may lead to product damage or failure.

Continually developing a complete and trustworthy nation-wide network of expedient sales and service everywhere, anytime.

ORION Machinery Co., ltd is an ISO Certified, Quality Management and Environmental Management company.

PERRY JOHNSON REGISTRARS, INC.

UKAS MANAGEMENT SYSTEMS 0105

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