

# ORION

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

## Oil-Free Vacuum Pumps and Vacuum Filter System



**KCM series**  
MODULE MULTI PUMP

**KCE series**  
INVERTER MODEL

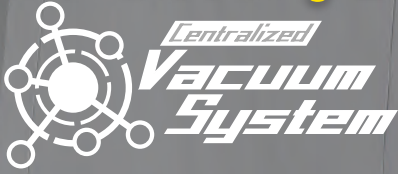
**KCP series**  
BASIC MODEL

**Accessory**  
VACUUM FILTER SYSTEM

### Oil Free Vacuum Pump and Vacuum Filter System

ORION's high efficiency twin rotors achieve high flow rates with less power. We have the vacuum pumps and accessories to meet your needs.

# Centralized Vacuum Systems for the Next Generation with Bleeding Edge Technology Built-in



Integrating Inverter /  
Multi-Unit Control / IoT



We are taking on the challenge of insatiable vacuum needs...



# KCP series





# KCE series

System Example of the KCE620F-VH with the Accessory VF500.  
(Sold separately)

*And using new technologies in our Vacuum Revolution!*



First in the world with a built-in 5.5 kW motor.  
Introducing a Pump Unit with sustained operation at attainable vacuum.

*\*Single-Stage Claw Rotor*

**Achieves Maximum Performance in its Class**

# KCP/KCE/KCM Series

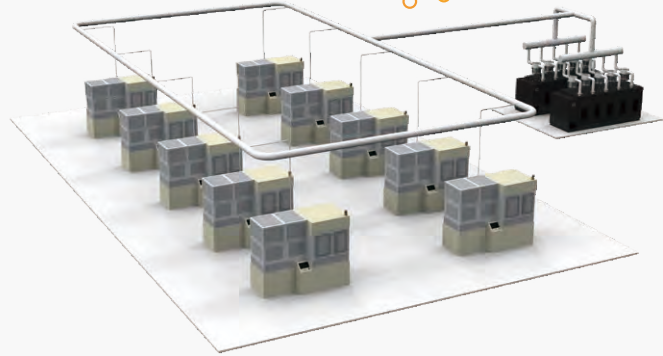
# APPLICATION

ORION Offers Users a Comfortable Vacuum / Blower Environment.

## Electronic Parts Factory / Can Manufacturing Factory



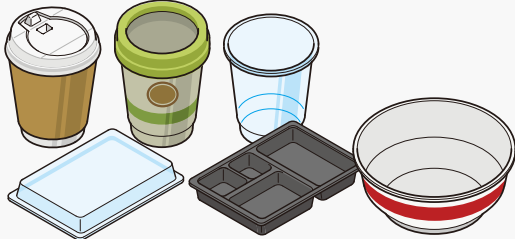
Vacuum pumps are used to vacuum-transport ICs to be mounted onto PCBs.  
A centralized vacuum system reduces workplace air conditioning loads and also offers effective power savings provided by the inverter, plus multi-unit control.



## Vacuum Forming Equipment



Forming by vacuum-bonding to the mold.  
Improves the working environment by reducing electricity consumption, preventing oil-smoke, and lowering noise levels.



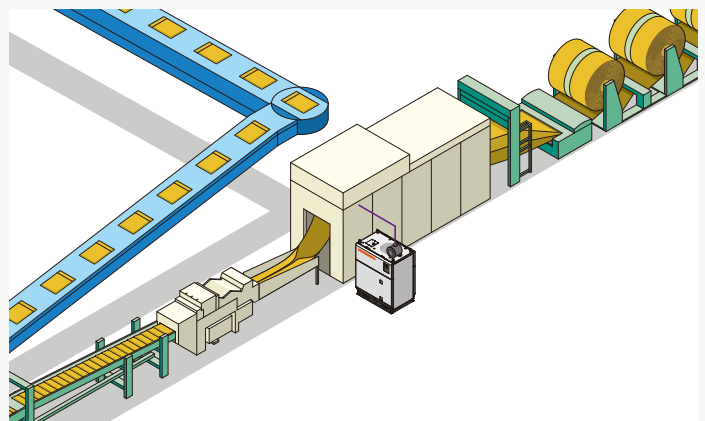
Plastic cups, plastic containers, etc.



## Bag Manufacturing and Paper Processing



Vacuum pump used as a vacuum source for bag manufacturing machines and cardboard punching machines. Energy savings can be achieved by centralizing smaller individual decentralized pumps.



	Icon	Model	Operation
1- Cylinder		V	●Vacuum Use / Vacuum Spec. Intake-side (vacuum-side) of pump is utilized. Also known as "Suction Air".
		B	●Exhaust Use / Blower Spec. Exhaust-side of pump is utilized. Also known as "Delivery Air".
		VB	●Vacuum/Blower Spec. Simultaneously utilizes the intake and exhaust sides of the pump. Also known as "1-Cylinder VB Spec."

	Icon	Model	Operation
2- Cylinder		VV	●Combination Type Pump 1 and Pump 2 are both built-in. Each are vacuum spec. pumps.
		VB	●Combination Type Pump 1 and Pump 2 are both built-in. One is a vacuum spec. pump and the other is a blower spec. pump. Also known as a "2-Cylinder VB Spec."

All Inverter Models and Module Multi Models Come Standard with Speed Control Functionality



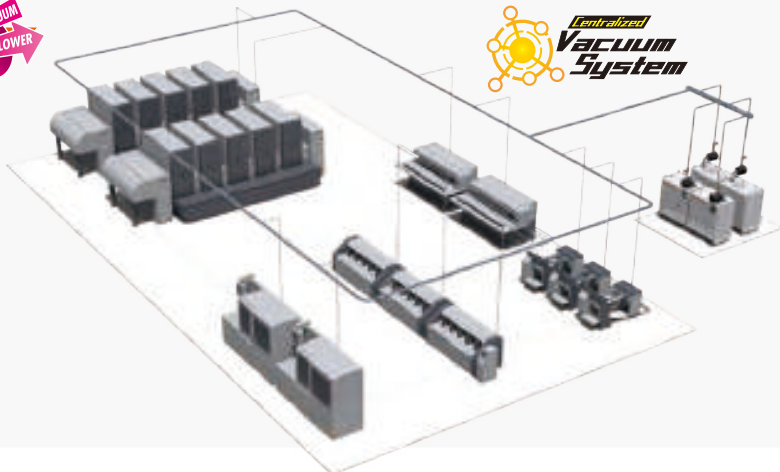
### Printing and Bookbinding



Problems for suction air (vacuum) for printing and bookbinding machines and delivery air (blower) are solved with our oil-free vacuum pump and blower.



Magazines and weekly journals, etc.



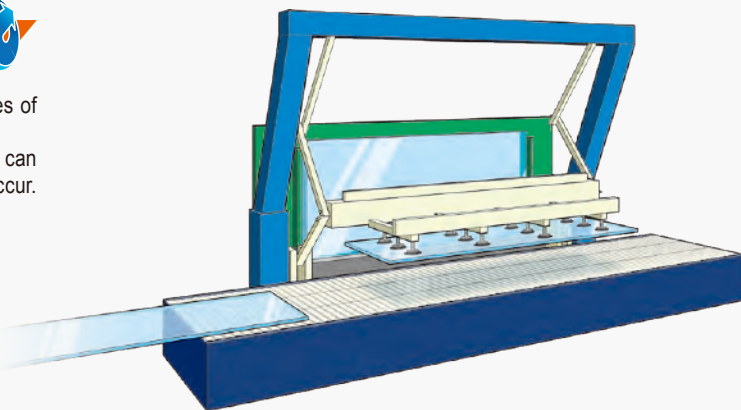
### Glass Vacuum Lift and Transport



Oil-free vacuum source supports lifting small to large panes of glass. A centralized vacuum system with a built-in backup machine can avert line outages in the unlikely change that trouble does occur.



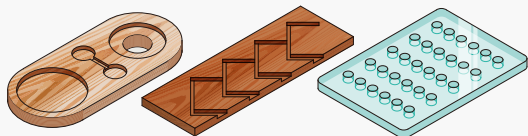
Tempered Glass



### NC Router and Wood Processing Machine

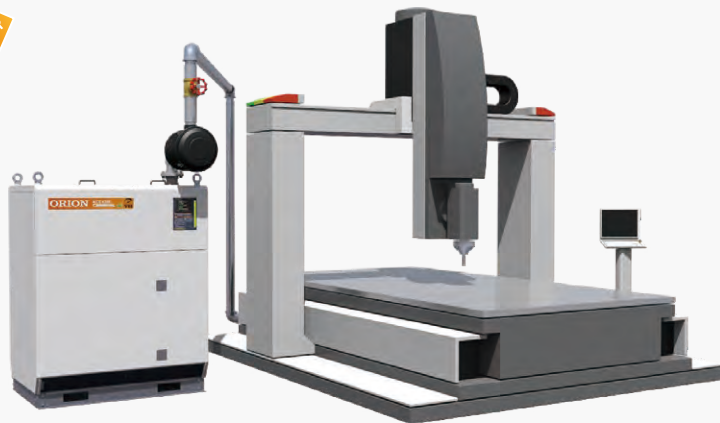


Our new pump with built-in rotor offers a higher degree of vacuum compared with other methods which means your workpiece won't budge even when cut by rotating tools. Since the amount of heat generated is suppressed by controlling the rotation speed of the inverter, the work environment in summer can also be improved.







Wood

Plastic Tray



# Line-up by Degree of Vacuum

Degree of Vacuum (kPa)					Model	
101.2 - 100	100 - 94	94 - 80	80 - 60	60 - 0	Basic Model	
					KCPH30-V-01A	
					KCPH60-V-01A	
					KCP150D-V-01A	
					KCP250E-V-01	
50 Hz Use Only					KCP100D-V-01A	
50 Hz Use Only				50 Hz Use Only	KCP150D-VH-01A	
50 Hz Use Only					KCP250E-VH-01	
					Inverter Model	
					KCE190F-V-01/02	
					KCE310F-V-01/02	
					KCE380F-V-01/02	
					KCE620F-V-01/02	
					KCE120F-VH-01/02	
					KCE190F-VH-01/02	
					KCE310F-VH-01/02	
					KCE380F-VH-01/02	
					KCE620F-VH-01/02	
					KCE620F-VW-01	
					KCE620F-VHW-01	
					KCE1240F-VW-01	
					KCE1240F-VHW-01	
					Module Multi Pump	
					KCM310-V-01/02	
					KCM620-V-01/02	
Upper-Level Degree of Vacuum (kPa)					Model	
101.2 - 100	100 - 94	94 - 80	80 - 60	60 - 0		
					Lower-Level Exhaust Pressure (kPa)	
	100 - 80	80 - 70	70 - 60	60 - 0	Combination Model	
					KCP100D-VB1-01A	
					KCP100D-VB2-01A	
					KCP150D-VB-01A	
					KCP150150D-VV-01A/02A	
					KCE190190E-VV-01/02	
					KCP150150D-VB-01A/02A	
					KCE190190E-VB-01/02	

Stated degree of vacuum is the degree of vacuum while under 1 atm. Stated exhaust pressure is the maximum sustainable exhaust pressure. Please refer to the Power Graph to confirm the actual flow rate.



												Centralized vacuum system						
Flow Rate		Motor Output (kW)										Compat. with Multi-Unit Control Panel	Control Panel			IoT	Applications	Relevant Pages
(m <sup>3</sup> /h)	(m <sup>3</sup> /min)	1.5	2.2	3.0	3.7	5.5	7.4	9.2	11	22	Numerical Controller		Group Controller	Comments				
29/29.7	0.48/0.50	○														Various Automation Machinery	16	
58/59.3	0.97/0.99			○												Various Automation Machinery	16	
158/192	2.6/3.2				○											Various Automation Machinery	13 to 15	
256/308	4.3/5.1					○										Various Automation Machinery	13 to 15	
96/117	1.6/2.0	○														Various Automation Machinery	13 to 15	
158/192	2.6/3.2				○											Various Automation Machinery	13 to 15	
256/308	4.3/5.1					○										Various Automation Machinery	13 to 15	

192	3.2				○							○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
308	5.1					○						○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
384	6.4						○					○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
616	10.3								○			○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
117	1.95	○										○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
192	3.2				○							○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
308	5.1					○						○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
384	6.4						○					○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
616	10.3								○			○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	7 to 10
595	9.9								○			○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	11, 12
595	9.9								○			○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	11, 12
1190	19.8									○		○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	11, 12
1190	19.8									○		○	EMB10A-NC-01		Expand to 10 Units	○	Factory Vacuum Source	11, 12

308	5.1					○						○	EMB05A-NC-01		For KCM310 Expand to 5 Units	○	Factory Vacuum Source	17 to 20
616	10.2									○		○	ESB5500	EMB25A-GC-01	By adding the ESB5500, up to 5 KCM620 units can be added, and by adding the EMB25A-GC, up to 25 KCM620 units can be added. See page 18 for details.	○	Factory Vacuum Source	17 to 20

												Centralized vacuum system						
Flow Rate		Motor Output (kW)										Compat. with Multi-Unit Control Panel	Control Panel			IoT	Applications	Relevant Pages
(m <sup>3</sup> /h)	(m <sup>3</sup> /min)	1.5	2.2	3.0	3.7	5.5	7.4	9.2	11	22	Numerical Controller		Group Controller	Comments				
97/118	1.6/2.0					○										Vacuum: 1 System Exhaust: 1 System	21	
97/118	1.6/2.0					○										Vacuum: 1 System Exhaust: 1 System	21	
158/192	2.6/3.2					○										Vacuum: 1 System Exhaust: 1 System	22	
158/192	2.6/3.2					○										Vacuum: 1 System Exhaust: 1 System	23 to 24	
158/192	2.6/3.2						○									Vacuum: 2 System	23 to 24	
192	3.2						○									Vacuum: 2 System	23 to 24	
158/192	2.6/3.2							○								Vacuum: 1 System Exhaust: 1 System	23 to 24	
158/192	2.6/3.2							○								Vacuum: 1 System Exhaust: 1 System	23 to 24	
192	3.2								○							Vacuum: 1 System Exhaust: 1 System	23 to 24	
192	3.2								○							Vacuum: 1 System Exhaust: 1 System	23 to 24	

Inverter Models that Offer Even Higher Energy Savings

# KCE INVERTER MODEL Air-Cooled Series

## Introducing the Vastly Improved KCE-F Series Improved Scalability for Centralized Vacuum Systems



eco speed control  
Energy saving mechanism that works by automatically adapting motor speed to changes in air consumption.



Centralized Vacuum System

### POINT 1

Improved scalability for centralized vacuum systems \* All models in the KCE-F Series



Continuous Attainable Operation

### POINT 2

All KCE-F Series models in the 120 to 620 range support "continuous attainable operation".



30,000 h Maint. Cycle

### POINT 3

Introducing New Models with an Extended 30,000-hour Overhaul Cycle

\* KCE310F-V/VH, 620F-V/VH

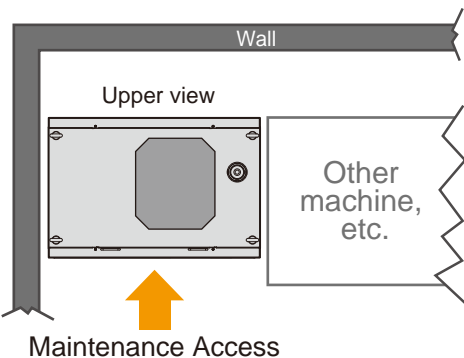
Thanks to our original temperature reduction technology\*, we have achieved the previously difficult continuous attainable operation of the 5.5 kW motor class pump unit, and at the same time, an overhaul cycle of 30,000 hours.



Modular Design

Our modularization offers improved installation and space savings. The installation footprint is only 87% compared to our previous model.

Set up possible with walls on both sides of the product. Maintenance access from the front.



Inverter Eco speed



Error Display



Intelligent Touch Panel



Maintenance Alert/Alarm



Multi-Information LED



Low Noise



Reinforced Cabinet



Modular Design



Commercial Power Supply Switchover Functionality



30,000 h Maint. Cycle



Claw Rotor





Centralized Vacuum System

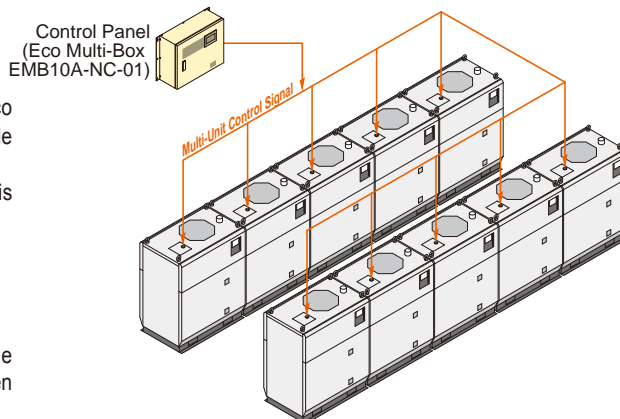


IoT Compatible

## Centralized vacuum system

The KCE-F series comes standard with terminals to connect to the Eco Multi-Box EMB10A -NC-01 (sold separately). Multi-unit control is possible by connecting to the EMB10A-NC-01.

If an increase is desired at a later time, expansion up to 10 pumps is possible with one EMB10A-NC-01 unit.



### Look! Good for unforeseen situations!

A centralized vacuum system that keeps the vacuum line operating and maintains your factory operating rate even when unforeseen situations crop up.

#### If the control board malfunctions...

Even if the EMB10A-NC-01 fails due to some sort of trouble, individual vacuum pumps will continue to operate using the controllers built into the vacuum pumps.

#### If the inverter malfunctions...

If the inverter built into the vacuum pump goes down, continued operation is possible by automatically or manually switching to a commercial power supply. (Not applicable during pump failure.)



Inverter eco speed

## The combination of inverter control and multi-unit control yields optimum operation and greater energy savings.



Optimum flow rate for lines that cannot run off simple ON/OFF control systems.

With the and ORION's Multi-Unit Control System, we can optimally adapt to loads and maintain the optimum vacuum to meet the user's application.



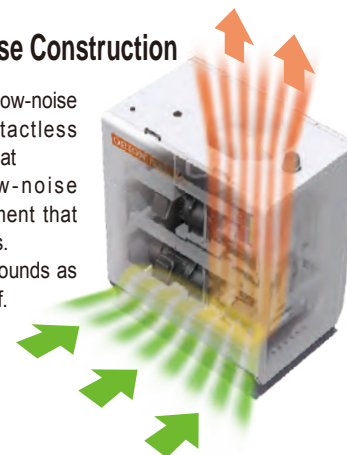
Low Noise



Air Cooled

## Reduced- Noise Construction

Our new-concept low-noise bodies and contactless rotor are effective at providing a low-noise working environment that is easy on workers. Operating noise sounds as if it were cut in half. \*Compared with our contact-type vacuum pump.



Intelligent Touch Panel

## Our intelligent touch panel and multi-information LED display make operation easier and improves visibility.

Easy operation and monitoring by simply touching various settings and operating conditions on the display. And the LED display shows the product operating condition at a glance.



Multi-Information LED



Error Display

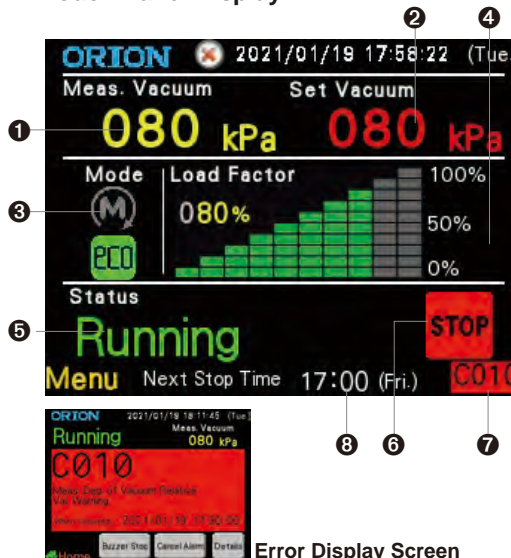
### Panel Details and Functions

- 1 Display Measured Degree of Vacuum  
Digital display of degree of vacuum(in 1 kPa units)
- 2 Display Set Degree of Vacuum  
Digital for easy vacuum settings(in 1 kPa units)
- 3 Display Operating Mode
- 4 Display Operating Load
- 5 Display Operating Conditions
- 6 Operation Control Buttons
- 7 Display Alarm Number
- 8 Display Pump Start/Stop Time

#### LED Display Function

Normal Operation (Yellow-green), Warning (Orange), Alarm (Red)  
Also, load conditions are indicated with constant-on or flashing.

### Touch Panel Display



### Operation Panel Layout



# KCE INVERTER MODEL Vacuum Series



Degree of Vacuum **0 - 94 kPa or higher**

Motor Output **2.2 - 11 kW**

Flow Rate **0 - 616 m<sup>3</sup>/h<sup>\*1</sup>**



## Applicable Models

**KCE190F-V**  
**KCE310F-V**  
**KCE380F-V**  
**KCE620F-V**

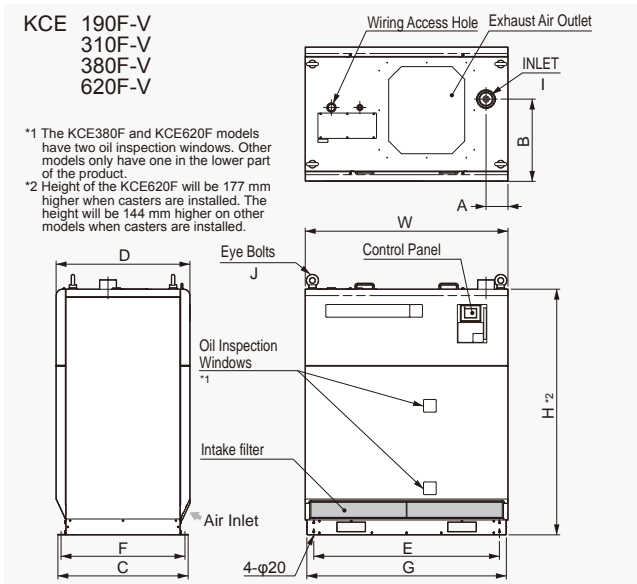
**KCE120F-VH**  
**KCE190F-VH**  
**KCE310F-VH**  
**KCE380F-VH**  
**KCE620F-VH**



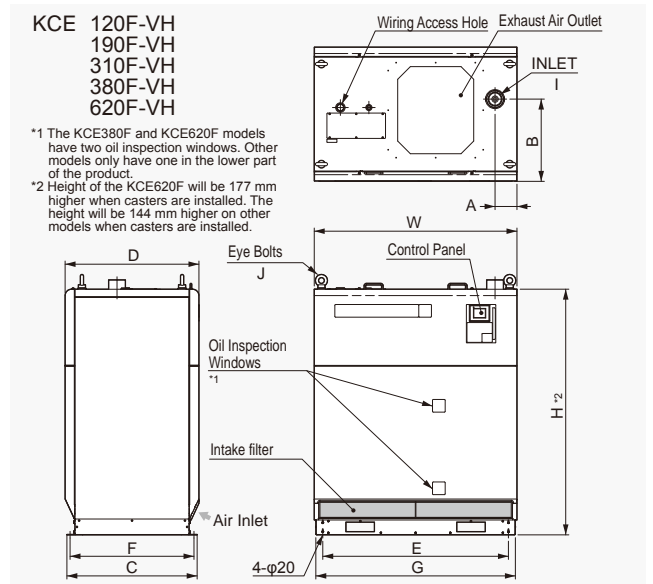
Model	Standard Models					High Vacuum Models				
	KCE190F-V-01	KCE310F-V-01	KCE380F-V-01	KCE620F-V-01	KCE120F-VH-01	KCE190F-VH-01	KCE310F-VH-01	KCE380F-VH-01	KCE620F-VH-01	
Motor Output	kW	3.7	5.5	7.4	11	2.2	3.7	5.5	7.4	11
Flow Rate	m <sup>3</sup> /h	192	308	384	616	117	192	308	384	616
	m <sup>3</sup> /min	3.2	5.1	6.4	10.3	1.95	3.2	5.1	6.4	10.3
Continuous Operating Vacuum	kPa	0 - 80				0 - Ultimate vacuum	60 - Ultimate vacuum			
Ultimate Vacuum	kPa	94 or higher								
Operating Noise Level	dB	65	71	68	74	65	67	71	73	74
Piping Connection Size		Rc1 1/2	Rc2		Rc3	Rc1 1/2		Rc2		Rc3
Mass	kg	333	495	521	706	310	333	498	521	706
Motor	Rated Voltage And Frequency	Three-phase 200V-50/60Hz 220V-60Hz								
	Output, Number of Units	3.7kW • 2P×1 unit	5.5kW • 2P×1 unit	3.7kW • 2P×2 units	5.5kW • 2P×2 units	2.2kW • 2P×1 unit	3.7kW • 2P×1 unit	5.5kW • 2P×1 unit	3.7kW • 2P×2 units	5.5kW • 2P×2 units
Specifications		Top Runner compliant high efficiency motors.								
Working Environment	Place of Installation	Indoors								
	Allowable Ambient Temperature	5 - 40 °C								
	Allowable Ambient Humidity	65 ± 20%RH(JIS Z8703)								
	Operable Elevation	1000 or lower m								
Control Method		Built-in load detecting automatic speed control circuit.								
Automatic Speed Control Range	Hz	20 - 60								
Recommended Overhaul Cycle	h	20000	30000	20000	30000	20000	20000	30000	20000	30000

\*1 This is the designed flow rate based on the cylinder volume of the pump. Confirm the actual flow rate based on the pressure-flow diagram. \*2 Under ambient pressure of 1 atm. When operating at high elevations, there will be a difference in operating pressure from 1 operation at a location under 1 atm of pressure. The calculation to measure the ultimate vacuum while operating at other elevations is as follows: Ultimate Vacuum Under Pressure (simplified) [kPa] = Specified Ultimate Degree of Vacuum [kPa] - Altitude [m] × 0.0115 [kPa/m] \*3 Operating noise measured at an operating vacuum of 80 kPa, and is not a guaranteed value. \*4 The specification includes casters and the mass including the casters will be the noted mass plus an additional 5 kg, KCE620F, or an additional 10 kg for KCE 620F. \*5 The power supply voltage must not have intermittent fluctuations greater than 10%, or 5% if fluctuations are continued. \*6 If the pump is started where the ambient temperature is around 0 °C, a high frequency noise may be heard. The noise will naturally go away in a short time and does not indicate abnormal operation. If a high pitch noise continues for more than 30 minutes, consult with your dealer or a qualified repair person. \*7 Please consult with ORION if the product is to be operated at an elevation above 1000 m.

## KCE Vacuum Series External Dimensions (Units: mm)



	H	D	W	A	B	C	E	F	G	I	J
KCE190F-V	1100	700	1215	122	443	677	1108	637	1195	Rc1 1/2	M16
KCE310F-V	1203	845	1280	138	519	822	1172	782	1260	Rc2	M20
KCE380F-V	1423	700	1215	122	443	677	1108	637	1195	Rc2	M20
KCE620F-V	1551	845	1280	138	519	822	1172	782	1260	Rc3	M24



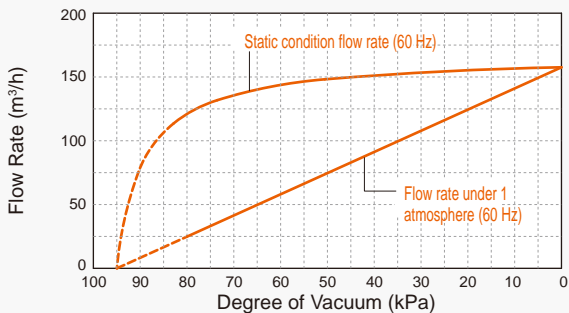
	H	D	W	A	B	C	E	F	G	I	J
KCE120F-VH	1100	700	1215	122	443	677	1108	637	1195	Rc1 1/2	M16
KCE190F-VH											
KCE310F-VH	1203	845	1280	138	519	822	1172	782	1260	Rc2	M20
KCE380F-VH	1423	700	1215	122	443	677	1108	637	1195	Rc2	M20
KCE620F-VH	1551	845	1280	138	519	822	1172	782	1260	Rc3	M24



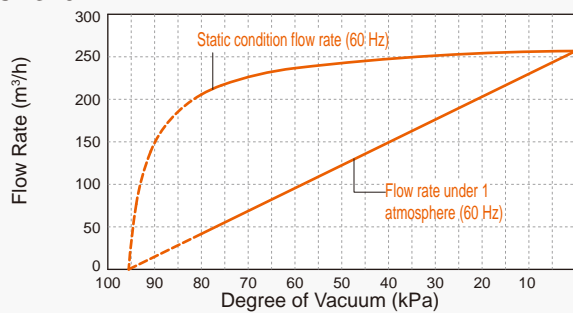
# Performance Data

\* Do not operate at the conditions indicated by the dashed pressure and flow rate lines. Operating condition: 20 °C  
 \* Typical value for standard built-in motor and not a guaranteed value.

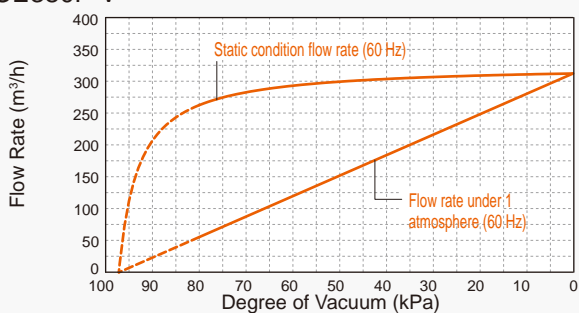
KCE190F-V



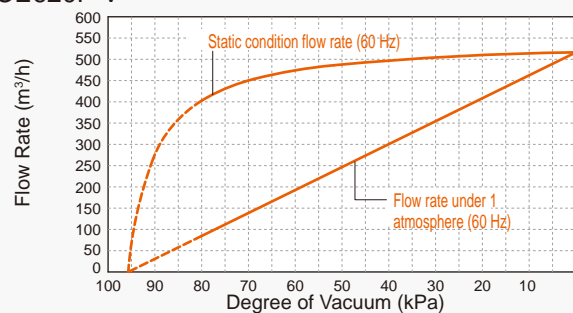
KCE310F-V



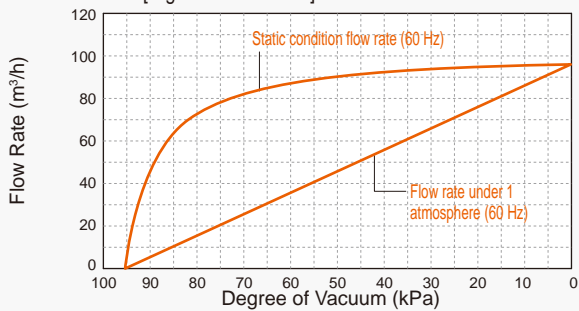
KCE380F-V



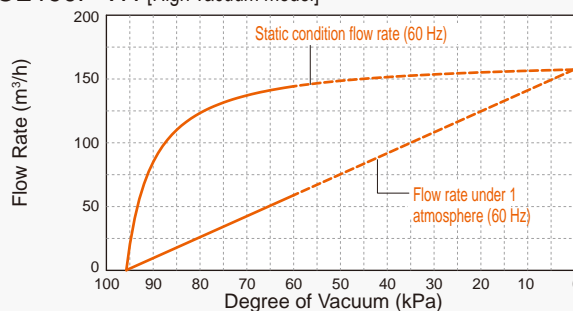
KCE620F-V



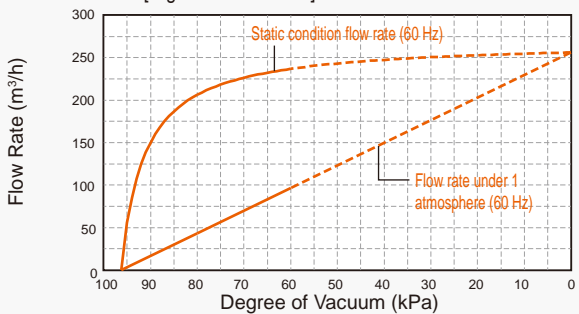
KCE120F-VH [High vacuum model]



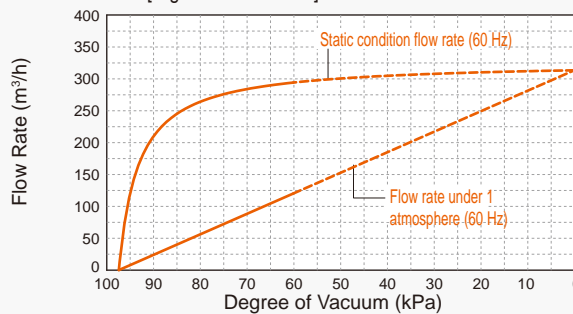
KCE190F-VH [High vacuum model]



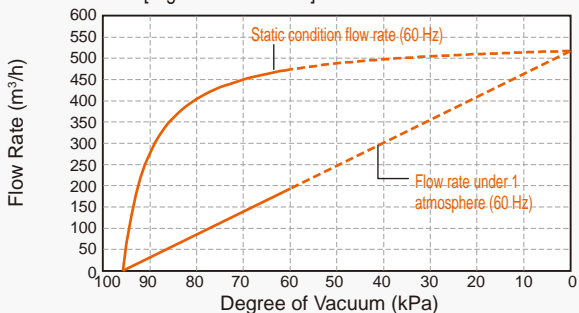
KCE310F-VH [High vacuum model]



KCE380F-VH [High vacuum model]



KCE620F-VH [High vacuum model]



Water-Cooled Models with Even Higher Flowrates

# KCE INVERTER MODEL Water-Cooled Series

Degree of Vacuum	40 - 94 kPa or higher
Motor Output	11 - 22 kW
Flow Rate	0 - 1190 m <sup>3</sup> /h <sup>1</sup>

**Oil-Free Vacuum Pumps with a 22 kW Water-Cooled Oil-Free Pump Offering High Flowrates**

**Introducing Our New Lineup of ORION's First-Ever Water-Cooled Models**



**Built-In**

eco speed control  
Energy saving mechanism that works by automatically adapting motor speed to changes in air consumption.

- KCE620F-VW
- KCE620F-VHW
- KCE1240F-VW
- KCE1240F-VHW



Following in the footsteps of our KCE-F Air-Cooled Series with popular functionality including inverter control, multi-unit control, backup functionality, commercial power supply switching, and more!!



Low Noise

**POINT 1**

High noise reduction of 70 to 73 dB.



Water Cooled

**POINT 2**

Water cooled means minimal heat dissipation to the surrounding area.

Water-cooled separation between the pump unit and internal cabinet for nearly zero heat emission to surroundings. Minimum heat output means lower air conditioning loads.



Continuous Attainable Operation

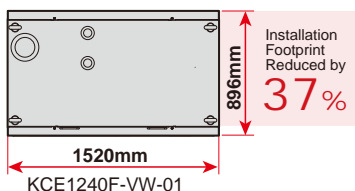
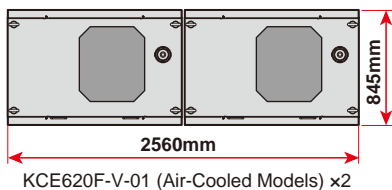
**POINT 3**

Offers continuous operation at ORION's max. attainable flowrate of 1190 m<sup>3</sup>/h.

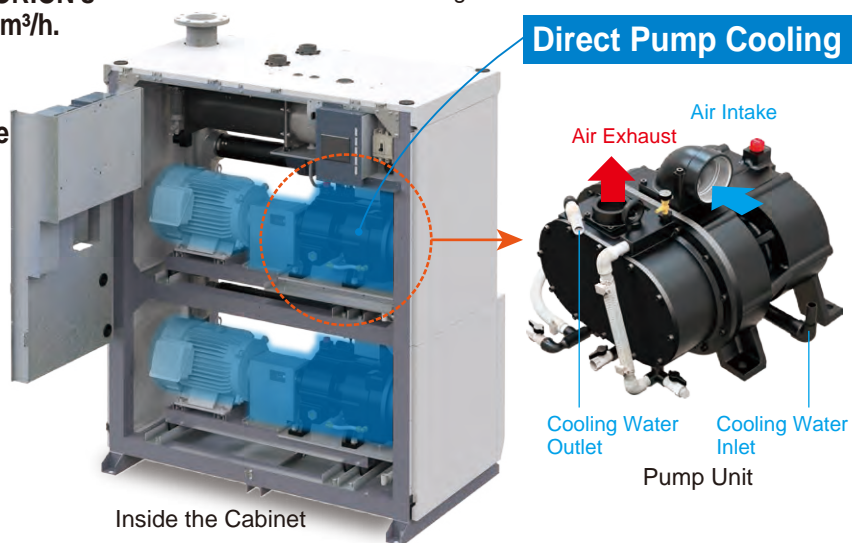


Small Footprint

37% cut in floor space compared to previous models with the same flowrate.



**Direct Pump Cooling**

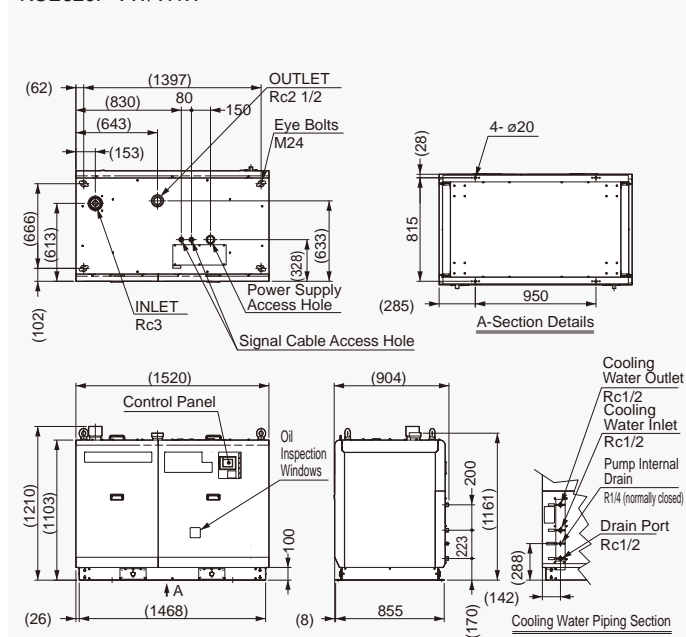


Model	Standard Models		High Vacuum Models			
	KCE620F-VW-01	KCE1240F-VW-01	KCE620F-VHW-01	KCE1240F-VHW-01		
Motor Output	kW	11	22	11	22	
Flow Rate	m <sup>3</sup> /h	595	1190	595	1190	
	m <sup>3</sup> /min	9.9	19.8	9.9	19.8	
Continuous Operating Vacuum	kPa	40 - 80		60 - Ultimate vacuum		
Ultimate Vacuum	kPa	94or higher				
Operating Noise Level	dB	70	73	70	73	
Intake Piping Connection Size		Rc3	125A JIS 10K Flange	Rc3	125A JIS 10K Flange	
Mass	kg	630	1120	630	1120	
Motor	Rated Voltage And Frequency	Three-phase 200V-50/60Hz 220V-60Hz				
	Output, Number of Units	11kW • 2P	11kW • 2P×2 units	11kW • 2P	11kW • 2P×2 units	
	Specifications	Top Runner compliant high efficiency motors.				
Cooling Water	Supply Volume	L/min	15	30	15	30
	Supply Temperature Range	°C	5 - 32			
	Supply Pressure	MPa	0.2 - 0.4			
Working Environment	Connection Port Size	Rc1/2	Rc3/4	Rc1/2	Rc3/4	
	Place of Installation	Indoors				
	Allowable Ambient Temperature	5 - 40				
Control Method	Allowable Ambient Humidity	65 ± 20%RH(JIS Z8703)				
	Operable Elevation	1000 or lower				
	Automatic Speed Control Range	Built-in load detecting automatic speed control circuit.				
Recommended Overhaul Cycle	h	30000				

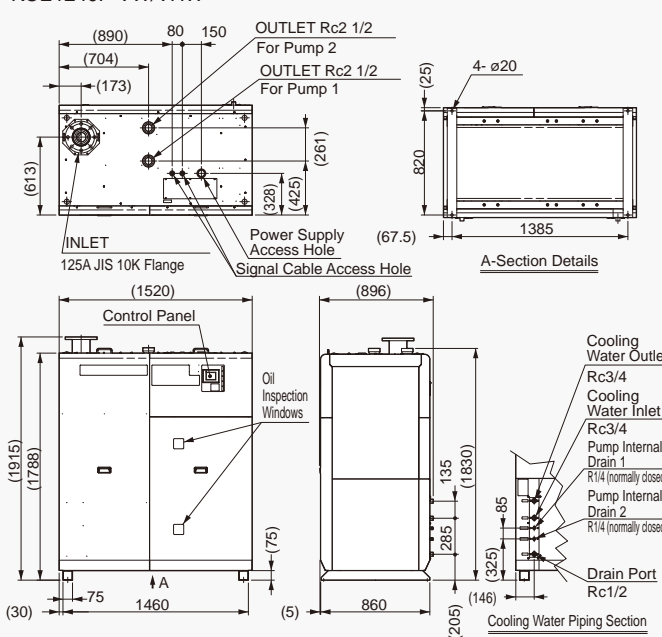
\*1 This is the designed flow rate based on the cylinder volume of the pump. Confirm the actual flow rate based on the pressure-flow diagram. \*2 Under ambient pressure of 1 atm. When operating at high elevations, there will be a difference in operating pressure from operation at a location under 1 atm of pressure. The calculation to measure the ultimate vacuum while operating at other elevations is as follows: Ultimate Vacuum Under Pressure (simplified) [ kPa ] = Specified Ultimate Degree of Vacuum [kPa] - Altitude [ m ] × 0.0115 [ kPa/m ] \*3 Ultimate vacuum is the point of the highest attainable vacuum. Continuous operation is not possible on standard models. Operate according to model-choice calculations. 90 kPa or higher when operating with a 50 Hz commercial power supply. \*4 Value when using ORION's standard motor. \*5 Typical value when operating at 80 kPa, 200 V, 60 Hz; not a warranted value. \*6 The allowable intermittent power supply voltage fluctuation range is ±10% of the specified voltage. The allowable sustained supply voltage fluctuation range is ±5% of the specified voltage. \*7 There may be a high pitch sound if the ambient temperature is near 0°C when starting, but such noise will go away after a short time and does not indicate abnormal operation. If the high pitch noise continues for more than 30 minutes, consult upper dealer or a qualified repair person. \*8 Please consult with ORION if the product is to be operated at an elevation above 1000 m. \*9 See page 50 for information on water quality for cooling water.

## KCE Vacuum Series External Dimensions (Units: mm)

KCE620F-VW/VHW



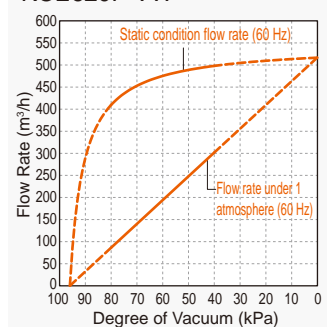
KCE1240F-VW/VHW



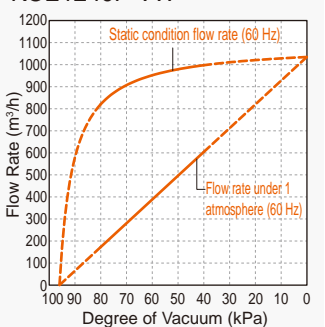
## Performance Data

\* Do not operate at the conditions indicated by the dashed pressure and flow rate lines. Operating condition: 20 °C  
 \* Typical value for standard built-in motor and not a guaranteed value.

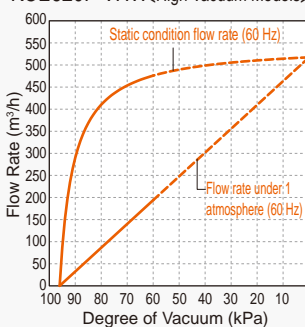
KCE620F-VW



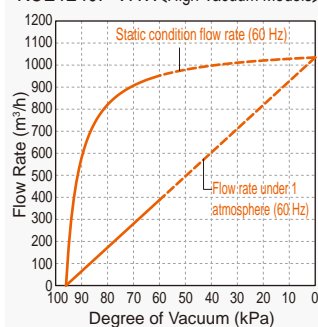
KCE1240F-VW



KCE620F-VHW(High Vacuum Models)



KCE1240F-VHW(High Vacuum Models)





Basic Model with Advanced Performance Specifications

# KCP BASIC MODEL Air-Cooled Series

Introducing the KCP-E Series with World-First and Industry-First Advanced Technology Built-In



Our newly developed vaneless, no-contact rotor gives vacuum power using less energy. And of course it's oil-free! Plus, no-contact means even lower noise. Large reduction of harsh low frequency noise (especially 300 Hz and below.)



Claw Rotor

### POINT 1

The first claw-rotor that doesn't require blade replacement. An excellent choice for clean environments and dry-rooms. The rotor diameter has been increased by 23%, and the contour curve has been revised, improving efficiency by 6% over our former KCP250D series. \* KCP250E-V/VH



Continuous Attainable Operation

### POINT 2

All KCP Series models in the 100 to 250 range support "continuous attainable operation".



30,000 h Maint. Cycle

### POINT 3

Introducing New Models with an Extended 30,000-hour Overhaul Cycle

\* KCP250E-V/VH

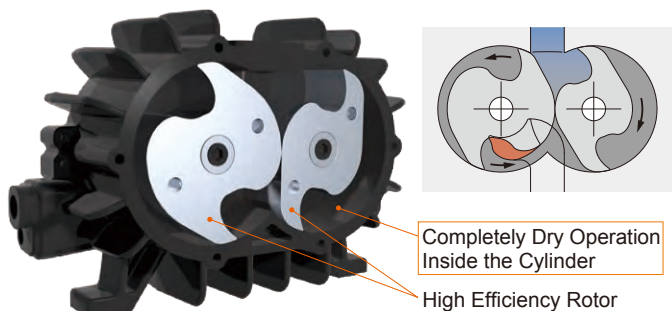
Thanks to our original temperature reduction technology\*, we have achieved the previously difficult continuous operation of the 5.5 kW motor class pump unit, and at the same time, an overhaul cycle of 30,000 hours.

Using digital analysis technology, we have achieved the optimum curve of our newly developed, high efficiency (non-contact) rotor.



Claw Rotor

Vacuum pumps create a vacuum by sweeping (moving) air out from a particular space. Thanks to our non-contact cylinder construction, the newly developed high efficiency rotor achieves low energy losses. And because the pump is oil-free, it provides economical clean air. In addition, an improved level of maintenance can also be realized.



30,000 h Maint. Cycle



Claw Rotor



Low Noise



Continuous Attainable Operation



**Look!** With ORION's original temperature reduction technology, we are the first to achieve continuous attainable operation of a 5.5 kW class motor.

A cutting-edge, innovative vacuum pump with three original built-in technologies. The heat-load problem which was an obstacle to continuous attainable operation was solved by ORION's original temperature reduction technology\*. And we succeeded in achieving the world's first continuous attainable operation with a single-stage claw vacuum pump of the same class.

Forced Local Cooling System	Temperature is significantly reduced by forcibly blowing air near the pump exhaust port, which is the area that generates the greatest amount of heat.
Heat-Transfer Reduction Construction	Propagation of heat from the pump cylinder to the gearbox is reduced.
Secondary Air Intake	Negative pressure inside the cylinder is used to introduce outside air and cool the pump without increasing power consumption.

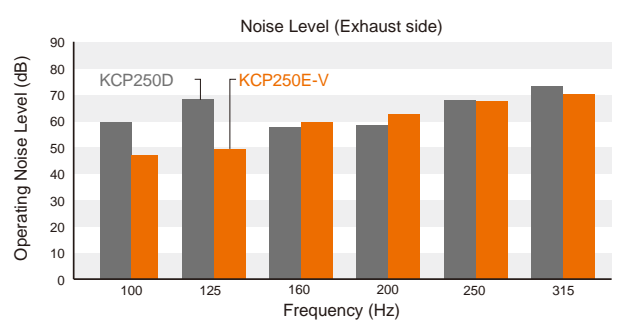
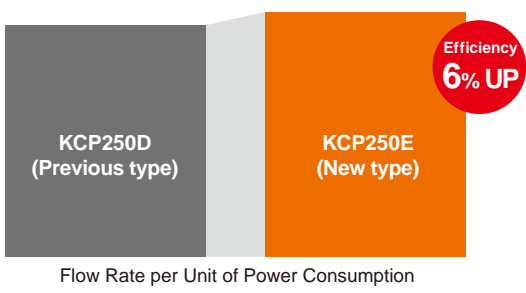
**Our high efficiency twin rotor gives a high flow rate using less power.**



**An Evolved High-Efficiency Rotor**  
By reviewing the rotor structure of our older KCP250D model, we were able to optimize the contour curves and increase the diameter in the new KCP250E, yielding an efficiency boost of 6%.



**"No-Contact" for Lower Noise. Runs quieter.**  
No contact between the cylinder and rotor means reduced and less harsh sounding noise levels. In particular, there is a large reduction of harsh low frequency noise (especially around 300 Hz and below).



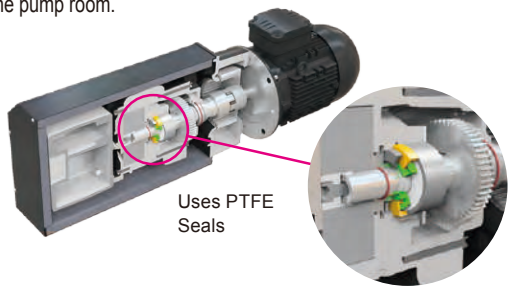
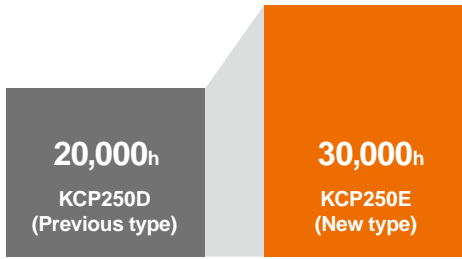
**Lower internal loading for a longer product lifespan.**



**Greatly Extended Overhaul Cycle**  
The only consumable part is the sliding seals, so the useful product life time is long.



**Oil-Free**  
Dry slide using PTFE seals. Thanks to our optimized design of sealed parts, our oil-free vacuum pumps and blowers have eliminated oil permeation into the pump room.



\*Only KCP250E-V, VH

**KCPH30, 60-V Continuous operation over the full range is possible thanks to our built-in scroll rotor.**



**Mid-range vacuum**  
ultimate pressure of 100 Pa [abs] or lower.  
\*According to JIS Z8126-1.



**Long Life**  
32,000-hour overhaul cycle.  
(Requires maintenance every 8000 hours. Refer to the instruction manual for details.)



**Oil Free**  
Clean exhaust air that doesn't dirty your work environment with oil.

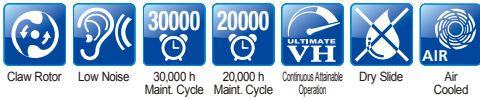
# KCP BASIC MODEL Vacuum Series



Degree of Vacuum **0 - 94 kPa or higher**

Motor Output **2.2 - 5.5 kW**

Flow Rate **0 - 308 m<sup>3</sup>/h<sup>\*1</sup>**



## Applicable Models

**KCP100D-V**  
**KCP150D-V**  
**KCP250E-V**

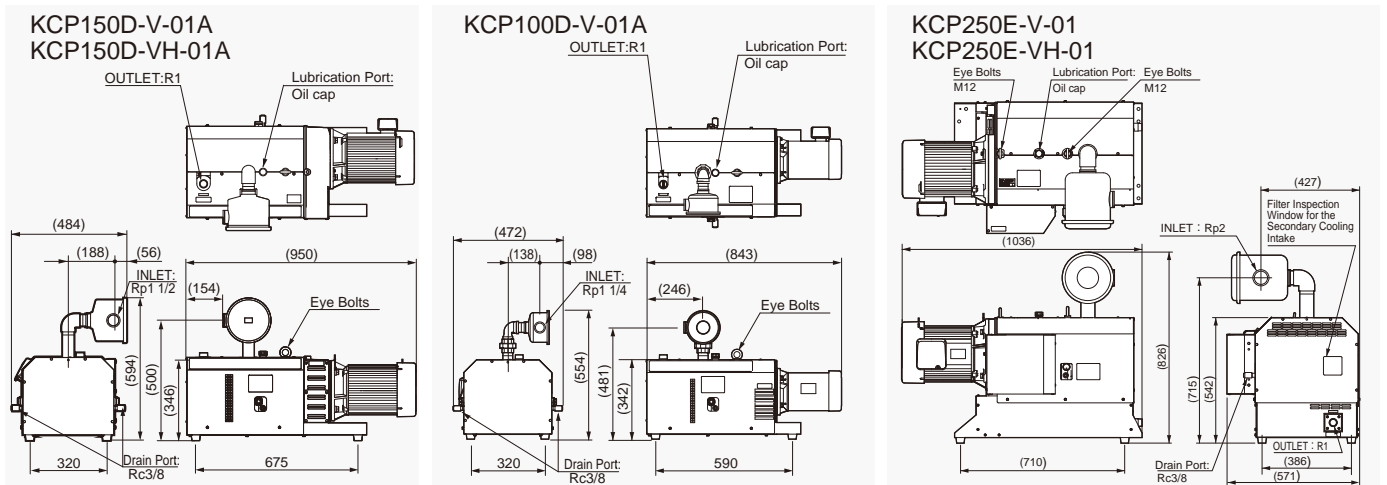
**KCP150D-VH**  
**KCP250E-VH**



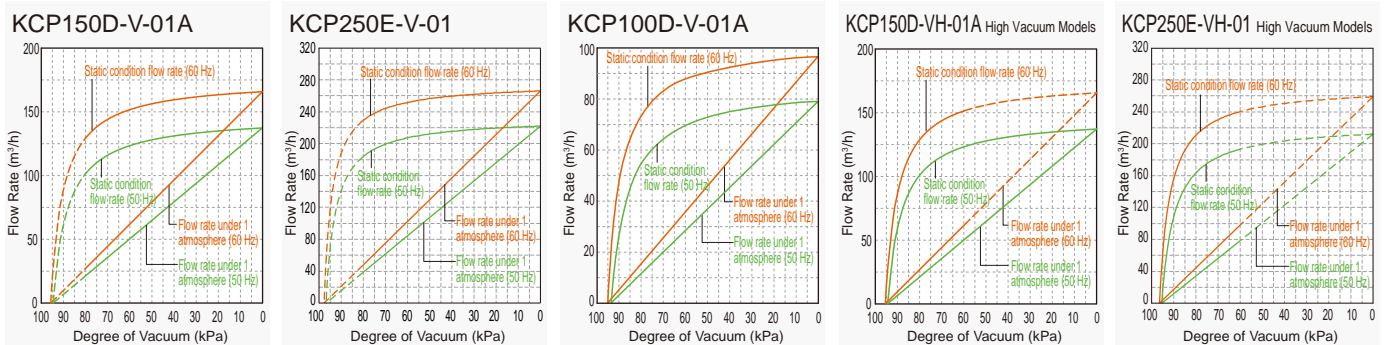
Model	Standard Models		High Vacuum Models			
	KCP150D-V-01A KCP150D-V-04A	KCP250E-V-01 KCP250E-V-04	KCP100D-V-01A KCP100D-V-04A	KCP150D-VH-01A KCP150D-VH-04A	KCP250E-VH-01 KCP250E-VH-04	
Motor Output	kW	3.7	5.5	2.2	3.7	5.5
Flow Rate(50/60Hz) *1	m <sup>3</sup> /h	158/192	256/308	96/117	158/192	256/308
	m <sup>3</sup> /min	2.6/3.2	4.3/5.1	1.6/2.0	2.6/3.2	4.3/5.1
Continuous Operating Vacuum(50/60Hz) *2	kPa	0 - 80		0 - Ultimate vacuum	0 - Ultimate vacuum / 60 - Ultimate vacuum	60 - Ultimate vacuum
Ultimate Vacuum(50/60Hz) *2	kPa	90/94 or higher		90/94 or higher		
Operating Noise Level(50/60Hz) *3 *5	dB	76/78	78/80	74/76	78/82	80/81
Piping Connection Size		Rp1 1/2	Rp2	Rp1 1/4	Rp1 1/2	Rp2
Mass	kg	143	231	125	143	231
Motor	Rated Voltage And Frequency *4 *5 *6	Three-phase 200V-50/60Hz 220V-60Hz				
	Output, Number of Units	Three-phase 380/400/415V-50Hz, 400/440/480V-60Hz				
Specifications	Top Runner compliant high efficiency motors.					
Working Environment	Place of Installation	Indoors				
	Allowable Ambient Temperature *7	0 - 40				
	Allowable Ambient Humidity	65±20%RH(JIS Z8703)				
Standard Equipment	Hour meter / Intake filter					
Accessory (Sold Separately)	Vacuum controller, pressure gauge, casters *9					
Inverter Control	Possible					
Recommended Overhaul Cycle	h	20000	30000	20000	20000	30000

\*1 This is the designed flow rate based on the cylinder volume of the pump. Confirm the actual flow rate based on the pressure-flow diagram. \*2 Under ambient pressure of 1 atm. When operating at high elevations, there will be a difference in operating pressure from operation at a location under 1 atm of pressure. The calculation to measure the ultimate vacuum while operating at other elevations is as follows: Ultimate Vacuum Under Pressure (simplified) [kPa] = Specified Ultimate Degree of Vacuum [kPa] - Altitude [m] × 0.0115 [kPa/m] \*3 Noted operating noise level is when using an ORION motor. Operating noise measured at on operating vacuum of 80 kPa, and is not a guaranteed value. \*4 The power supply voltage must not have intermittent fluctuations greater than 10%, or 5% if fluctuations are continued. \*5 The indicated value is when using the standard factory-installed motor. \*6 When using other than the ORION standard motor, follow the electrical guidelines printed on the nameplate of the motor used. \*7 If the pump is started where the ambient temperature is around 0 °C, a high frequency noise may be heard. The noise will naturally go away in a short time and does not indicate abnormal operation. If a high pitch noise continues for more than 30 minutes, consult with your dealer or a qualified repair person. \*8 Please consult with ORION if the product is to be operated at an elevation above 1000 m. \*9 Please see pages 43 to 44 of the catalog for details.

## KCP Vacuum Series External Dimensions (Units: mm)



## Performance Data \* Do not operate at the conditions indicated by the dashed pressure and flow rate lines. Operating condition: 20 °C \* Typical value for standard built-in motor and not a guaranteed value.





# KCPH BASIC MODEL Vacuum Series

Built To Order



Degree of Vacuum 0 - 101.2 kPa or higher

Motor Output 1.5 - 3.0 kW

Flow Rate 0 - 58.0 / 59.3 m<sup>3</sup>/h \*2



## Applicable Models

KCPH30-V  
KCPH60-V



## Application Examples

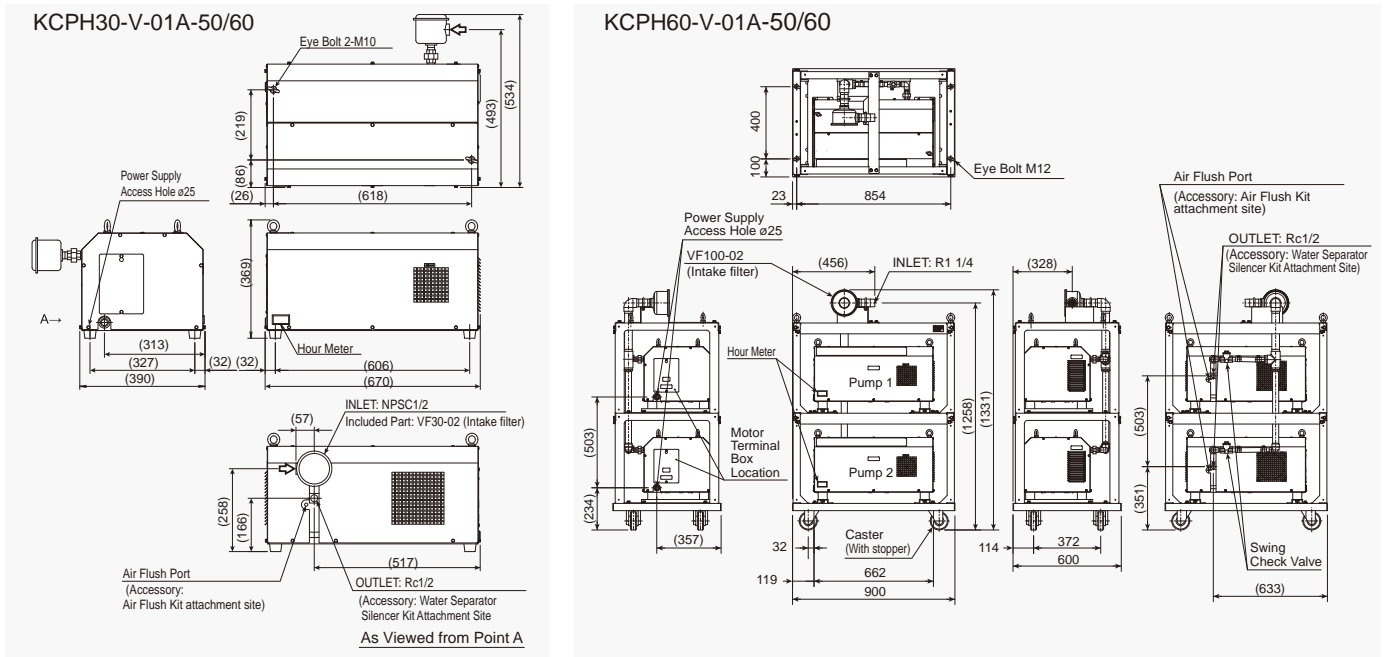
Vacuum Forming, Vacuum Packaging, Deaeration, Leak Testing, Vacuum Cleaning and Drying, Food Cooling, Impregnation, Gas Displacement, Medical Aspiration, etc.

KCP Series

Model		KCPH30-V-01A-50/60*1	KCPH60-V-01A-50/60*1
Motor Output	kW	1.5	3.0
Flow Rate(50/60Hz) *2	m <sup>3</sup> /h	29.0/29.7	58.0/59.3
	m <sup>3</sup> /min	0.48/0.50	0.97/0.99
Ultimate Vacuum	Pa(abs)	100 or lower	
Operating Noise Level(50/60Hz) *3	dB	74/75	79
Piping Connection Size *4		NPSC1/2	R1 1/4
Mass	kg	57	185
Motor	Rated Voltage And Frequency *5	Three-phase 200V-50/60Hz 220V-60Hz	
	Output, Number of Units	1.5kW • 4P×1 Unit	1.5kW • 4P×2 Units
Specifications			
Place of Installation			
		Indoors	
Working Environment	Allowable Ambient Temperature	°C	
	Allowable Ambient Humidity	%RH	
	Operable Elevation *6	m	
		1000 or lower	
Standard Equipment		Intake filter (Included Part)	Intake filter (Incl. with Unit)

\*1 Models for 50 Hz and 60 Hz regions are different. \*2 The flow rate is the theoretical value based on the designed pumping capacity. Please confirm the actual flow rate on the Discharge Air Curve Chart. \*3 The attainable value is the actual value measured at 200 V, however this is not a guaranteed value. \*4 NPSC1/2 has a thread pitch very similar to that of Rc1/2, and therefore R1/2 threaded connections can be used. \*5 The allowable intermittent power supply voltage fluctuation range is ±10% of the specified voltage and the allowable sustained supply voltage fluctuation range is ±5% of the specified voltage. \*6 Please consult with ORION if the product is to be operated at an elevation above 1000 m.

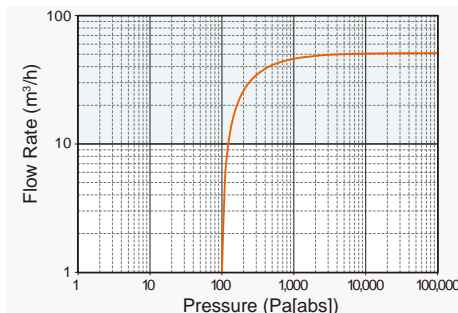
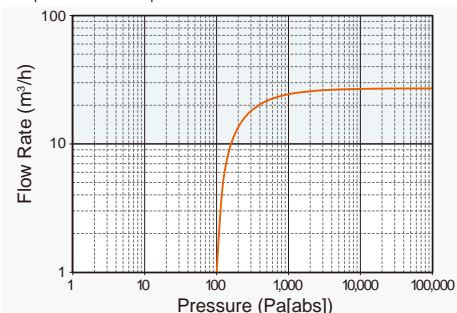
## KCPH Spec. External Dimensions (Units: mm)



## Discharge Air Curve

\* Operating Conditions: 20 °C, Static condition flow rate  
\* Typical value for standard built-in motor and not a guaranteed value.

\*Graph shows absolute pressure.



## Accessories (Sold separately)



Water Separation Silencer Set

●Part No.: 03087607010

Air Flush Kit

●Part No.: 0A004109000

Please contact your dealer if you need a model specification with casters, a check valve modification (swing check valve), or English specifications.

Possible to Schedule for Required Increases in Flow Rate.

# KCM MODULE MULTI PUMP Air-Cooled **Series**

**Module Multi Pumps offer a full operating range of 0 – 100 kPa AND energy savings!**



eco speed control  
Energy saving mechanism that works by automatically adapting motor speed to changes in air consumption.

Our Module Multi Pump makes it possible to add pumps which in turn allows the product to match our customers' increasing flow rate needs. We've implemented Planned Capital Investment. The inverter control and multi-unit control, using our standard equipment item, Eco Speed Box, further evolves Eco Speed Control for even greater energy savings. Multi-Unit Control of up to 5 units. Group control of over 5 units is also possible.



Full-Range Vacuum

## POINT 1

Thanks to our 2-stage claw rotor and supplementary exhaust mechanism\*, the ORION Oil-Free Vacuum Pump can achieve all-time high operating efficiency as well as full-range operation from 0 to 100 kPa.



2-Stage Rotor

## POINT 2

Thanks to the 2-stages (2-stage compression), we can achieve continuous operation at the attainable pressure of 100 kPa, despite being oil-free.



Modular Design

## POINT 3

The compact modular design that doesn't require side maintenance-space, making installation easy, anywhere.



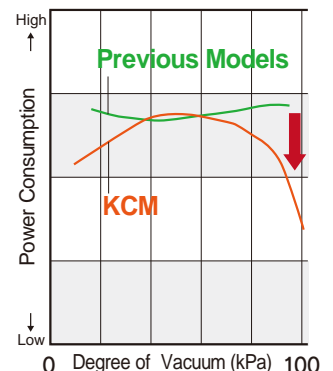
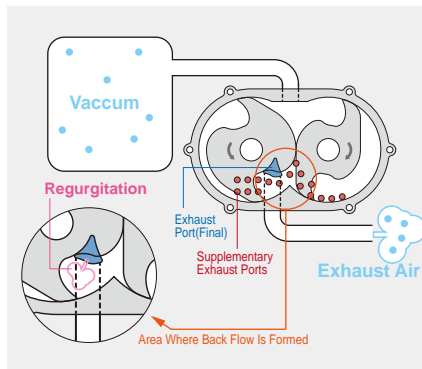
3 Connected KCM620 Units

**Look!** Built to offer energy-saving wide ranging vacuum.

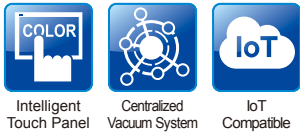
■ **Electrical power consumption optimized over the full range of degree of vacuum (from open-atmosphere to attainable vacuum).**

■ **Constructed to prevent over-compression of exhaust air.**

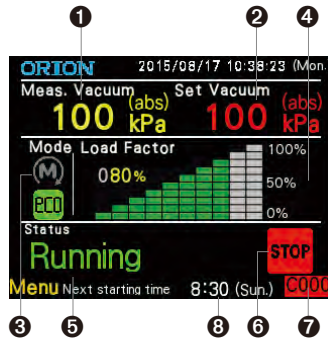
At high degrees of vacuum, a back-flow of air is formed in the exhaust process, and this returning air results in a loss of energy. The KCM series sports a new design that reduces energy losses by reducing the volume just before opening the exhaust port. On the other hand, when open, the volume of air increases, there is an over-increase in pressure, and power consumption will rise. "Supplementary Exhaust Ports" are established and the power consumption drops.



# KCM 310



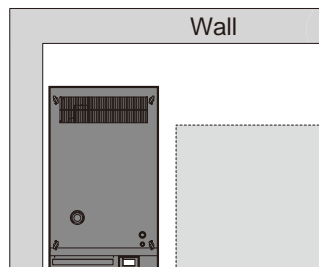
Degree of Vacuum: 100 kPa  
5.5 kW Output Spec. Motor with Control Panel and Inverter in a Single Package



## Panel Details and Functions

- 1 Display Measured Degree of Vacuum  
Digital display of degree of vacuum (in 1 kPa units)
- 2 Display Set Degree of Vacuum  
Digital for easy vacuum settings (in 1 kPa units)
- 3 Display Operating Mode
- 4 Display Operating Load
- 5 Display Operating Conditions
- 6 Operation Control Buttons
- 7 Display Alarm Number
- 8 Display Pump Start/Stop Time

## Compact, Space Saving Design

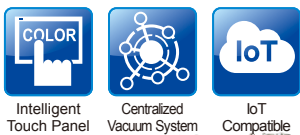


The inverter, filter, and pressure sensor are all built into the KCM unit. Control board installation space requirements and wiring costs have been greatly reduced.

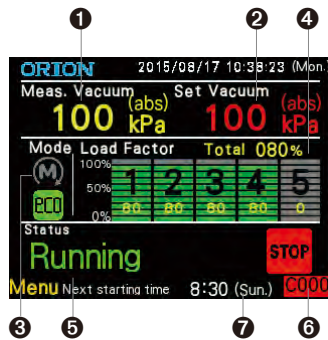
◀ Setup possible with walls on both sides of the product.

KCM Series

# KCM 620



Specialized model for centralized vacuum systems to meet users' high flow-rate vacuum needs.



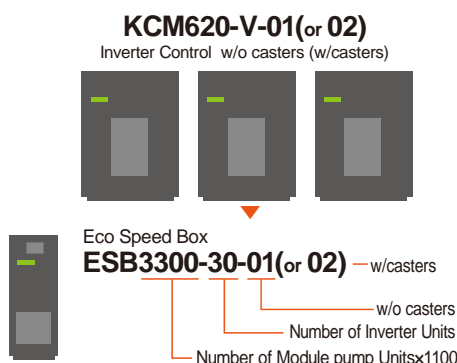
## Panel Details and Functions

- 1 Display Measured Degree of Vacuum  
Digital display of degree of vacuum (in 1 kPa units)
- 2 Display Set Degree of Vacuum  
Digital for easy vacuum settings (in 1 kPa units)
- 3 Display Operating Mode
- 4 Display Operating Load
- 5 Display Operating Conditions
- 6 Display Alarm Number
- 7 Display Pump Start/Stop Time

## System Image

The KCM620 requires an ESB (Eco Speed Box / Multi-Unit Control and Inverter Control Board) for operation. The ESB can control up to 5 units. Expansion of up to 25 units is possible using the group controller (Eco Multi Box). (Special Order)

Example: Upgrade your system to operate 3 KCM620 units, by using the 3-unit control functionality of the ESB3300.



Example: Expand with the "Eco Multi-Box" Group Controller.

Allows for planned expansion based on an anticipated investment budget, and a reduction in the number of years required for depreciation.

Can be expanded to a maximum of 25 modules (15,400 m<sup>3</sup>/h).





# KCM310 Series

MODULE MULTI PUMP

Built To Order



Degree of Vacuum	0 - 100 kPa
Motor Output	5.5 kW
Flow Rate	0 - 308 m <sup>3</sup> /h <sup>*1</sup>

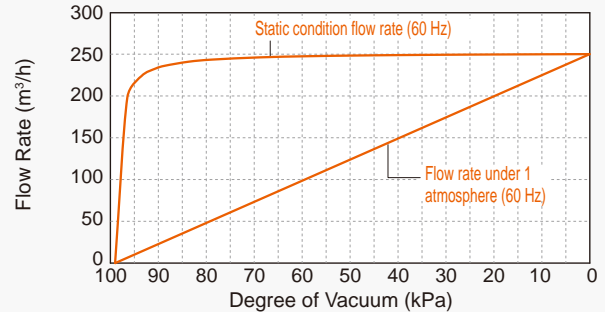


Applicable Models **KCM310-V-01,02**

Model		KCM310-V-01/02	
Motor Output	kW	5.5	
Flow Rate	m <sup>3</sup> /h	308	
	m <sup>3</sup> /min	5.1	
Ultimate Vacuum	kPa	100 or higher	
	kPa	1.3 or lower	
Operating Noise Level	*3 dB	72	
Piping Connection Size		Rc2	
Mass	kg	485 (01) , 495 (02)	
Motor	Rated Voltage And Frequency *4	Three-phase 200V-50/60Hz 220V-60Hz	
	Output, Number of Units	5.5 kW • 4P×1 Unit	
	Specifications	Top Runner compliant high efficiency motors.	
Working Environment	Place of Installation	Indoors	
	Allowable Ambient Temperature *5	°C 5 - 40	
	Allowable Ambient Humidity	65 ±20% RH (JIS Z8703)	
	Operable Elevation *6	m 1000 or higher	
Control Method		Built-in load detecting automatic speed control circuit.	
Automatic Speed Control Range	Hz	20 - 60	

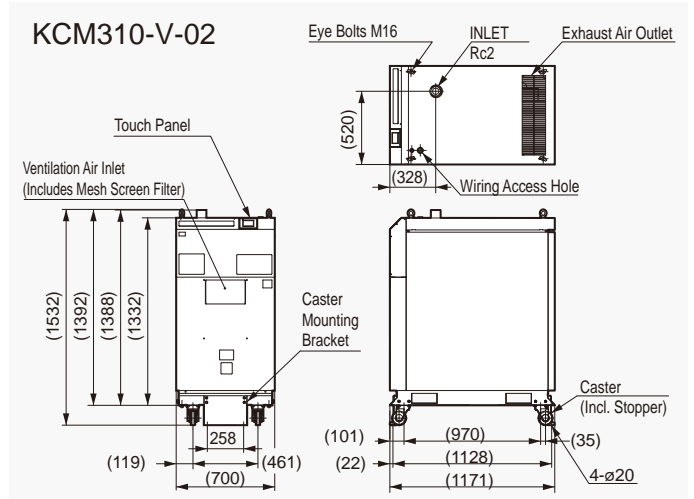
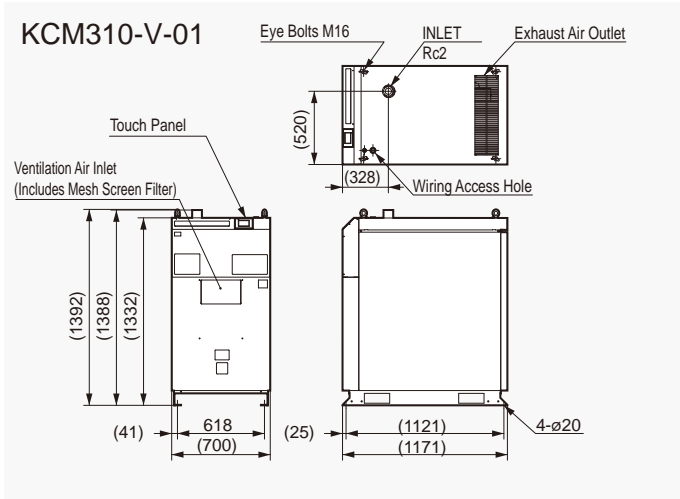
## Performance Data

\* Operating condition: 20 °C  
\* Typical value for standard built-in motor and not a guaranteed value.



\*1 This is the designed flow rate based on the cylinder volume of the pump. Confirm the actual flow rate based on the pressure-flow diagram. \*2 Under ambient pressure of 1 atm. When operating at high elevations, there will be a difference in operating pressure from operation at a location under 1 atm of pressure. The calculation to measure the ultimate vacuum while operating at other elevations is as follows: Ultimate Vacuum Under Pressure (simplified) [kPa] = Specified Ultimate Degree of Vacuum [kPa] - Altitude [m] × 0.0115 [kPa/m] \*3 Operating noise measured at an operating vacuum of 80kPa with 200V / 60Hz power supply, and is not a guaranteed value. \*4 The power supply voltage must not have intermittent fluctuations greater than 10%, or 5% if fluctuations are continued. \*5 If the pump is started where the ambient temperature is around 5 °C, a high frequency noise may be heard. The noise will naturally go away in a short time and does not indicate abnormal operation. If a high pitch noise continues for more than 30 minutes, consult with your dealer or a qualified repair person. \*6 Please consult with ORION if the product is to be operated at an elevation above 1,000 m.

## KCM310 Vacuum Series External Dimensions (Units: mm)



# KCM620 Series

MODULE MULTI PUMP

Built To Order



Degree of Vacuum	0 - 100 kPa
Motor Output	11 - 275 kW
Flow Rate	0 - 15400 m <sup>3</sup> /h <sup>*1</sup>



Applicable Models **KCM620-V-01,02 / ESB1100 - 5500**

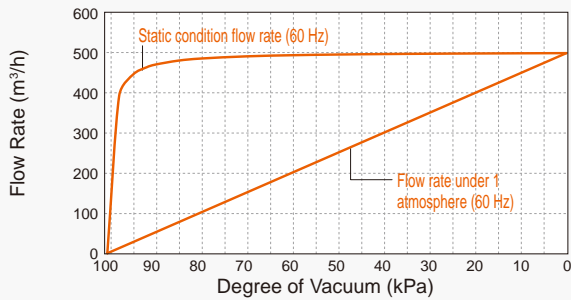
Please consult your dealer regarding water-cooled specifications.

Model		Module Pump					Eco Speed Box
		1Unit	2Units	3Units	4Units	5Units	ESB□-□□-01
Motor Output	kW	11	22	33	44	55	—
Flow Rate	m <sup>3</sup> /h	616	1232	1848	2464	3080	—
	m <sup>3</sup> /min	10.2	20.5	30.8	41.1	51.3	—
Ultimate Vacuum	kPa	100 or higher					—
	kPa(abs)	1.3 or lower					—
Operating Noise Level	*2 dB	75					—
Piping Connection Size		100A JIS10K Flange	100A JIS10K Flange×2	100A JIS10K Flange×3	100A JIS10K Flange×4	100A JIS10K Flange×5	—
Mass	kg	800	1600	2400	3200	4000	120 - 200
Motor	Output, Number of Units	11 kW • 4P×1 Unit	11 kW • 4P×2 Units	11 kW • 4P×3 Units	11 kW • 4P×4 Units	11 kW • 4P×5 Units	—
	Specifications	Top Runner compliant high efficiency motors.					—
Working Environment	Place of Installation	indoors					—
	Allowable Ambient Temperature *3	°C 5 - 40					—
	Allowable Ambient Humidity	65 ±20% RH (JIS Z8703)					—
	Operable Elevation *4	m 1000 or less					—
Rated Voltage And Frequency *5		Three-phase 200 V 50/60 Hz, 220 V -60 Hz					—
Control Method		Inverter					Built-in load detecting automatic speed control circuit.
Automatic Speed Control Range	Hz	20 - 60					—
Accessory (Sold Separately)		Intake filter					—

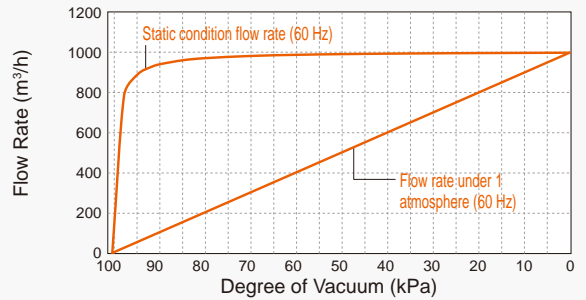
\*1 This is the designed flow rate based on the cylinder volume of the pump. Confirm the actual flow rate based on the pressure-flow diagram. \*2 Operating noise measured at an operating vacuum of 80kPa with 200V / 60Hz power supply, and is not a guaranteed value.\*3 If the pump is started where the ambient temperature is around 0 °C, a high frequency noise may be heard. The noise will naturally go away in a short time and does not indicate abnormal operation. If a high pitch noise continues for more than 30 minutes, consult with your dealer or a qualified repair person. \*4 Please consult with ORION if the product is to be operated at an elevation above 1000 m. \*5 The power supply voltage must not have intermittent fluctuations greater than 10%, or 5% if fluctuations are continued.

# Performance Data \* Typical value for standard built-in motor and not a guaranteed value.

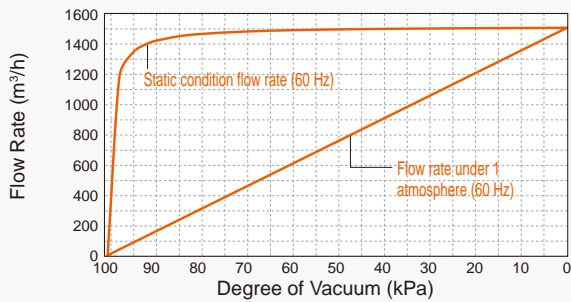
KCM620 × 1 Unit



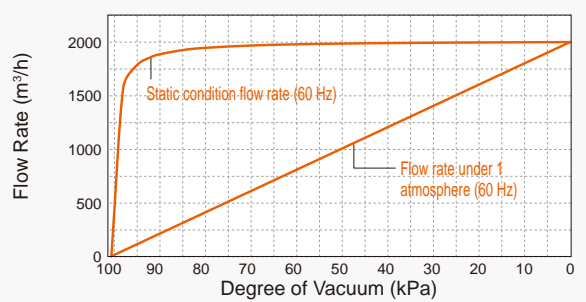
KCM620 × 2 Units



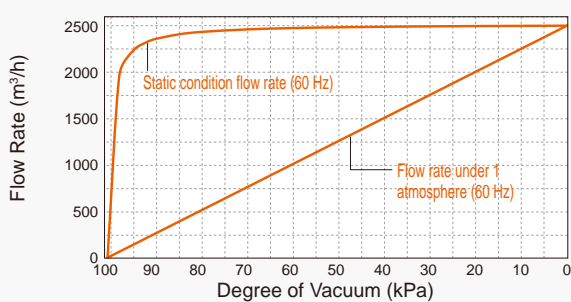
KCM620 × 3 Units



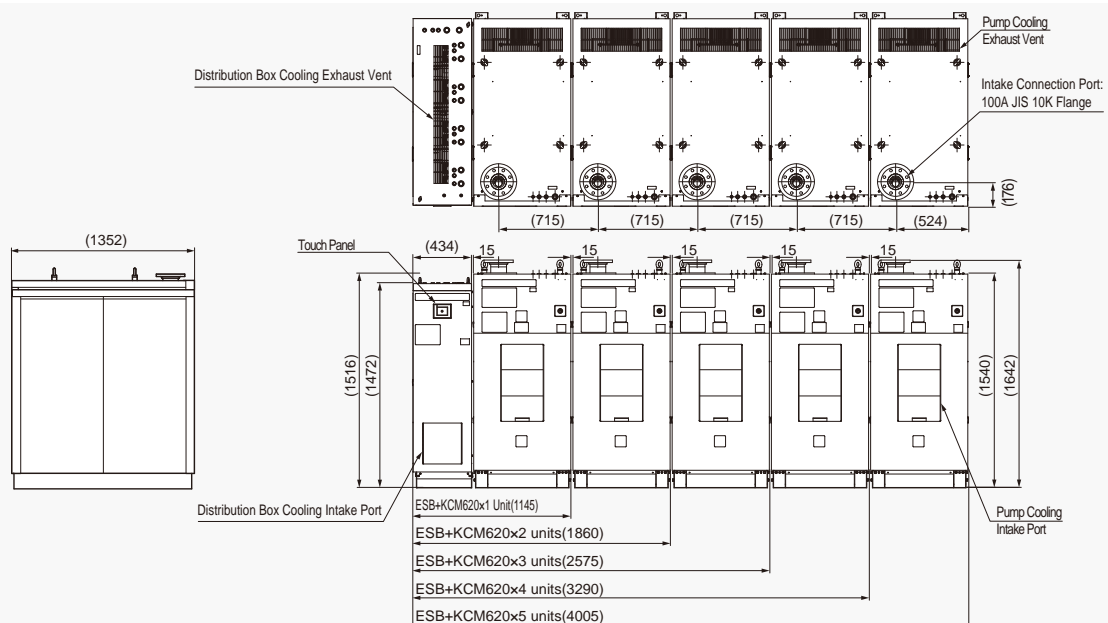
KCM620 × 4 Units



KCM620 × 5 Units



# KCM620 Vacuum Series External Dimensions (Units: mm)



# Combination Pump (1-Cylinder Spec.)

**Built To Order**



Degree of Vacuum	0 - 60 kPa
Pressure	0 - 70 kPa
Motor Output	5.5 kW
Flow Rate	0 - 118 m <sup>3</sup> /h <sup>*1</sup>

## Applicable Models

**Aftercooler Included**  
KCP100D-VB1-01A  
**Aftercooler Not Included**  
KCP100D-VB2-01A



Model	Aftercooler Included		Aftercooler Not Included	
	KCP100D-VB1-01A		KCP100D-VB2-01A	
Motor Output	kW 5.5			
Flow Rate(50/60 Hz)	m <sup>3</sup> /h	Vacuum : 97/118, Blower : 97/118		
	m <sup>3</sup> /min	Vacuum : 1.6/2.0, Blower : 1.6/2.0		
Continuous Operating Vacuum *2	kPa	60 or less		
Continuous Pressure *3	kPa	70 or less		
Exhaust Temperature *4	°C	45 or less	125 or less	
Operating Noise Level *5	dB	87		
Piping Connection Size	Intake: Rc1 1/4, Exhaust: Rc1 1/4			
Mass	kg	163	142	
Motor	Rated voltage and frequency *6	Three-phase 200 V 50/60 Hz, 220 V 60 Hz		
	Output, Number of Units	5.5 kW 2P×1 Unit		
	Specifications	Top Runner compliant high efficiency motors.		
Working Environment	Place of Installation	Indoors		
	Allowable Ambient Temperature *7	°C 0 - 40		
	Allowable Ambient Humidity	65 ±20% RH (JIS Z8703)		
	Operable Elevation *8	m 1000 or lower		
Standard Equipment	Vacuum controller / Hour meter Pressure controller / Compound gauge			

\*1 This is the designed flow rate based on the cylinder volume of the pump. Confirm the actual flow rate based on the pressure-flow diagram. \*2 Upper limit of the sustainable degree of vacuum of the pump. Pressures indicated are when operating the pump under 1 atm. 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 actual ultimate vacuum will be lower than the noted value. Simplified Correction Formula for Ultimate Vacuum [kPa] = Written Operating Value (from the specifications chart) [kPa] - Elevation [m] × 0.0115 [kPa/m] \*3 Upper limit of continuous operable exhaust pressure. Do not operate the pump above this limit. Doing so can reduce the lifespan of the pump and may result in breakdown or an accident. \*4 The indicated temperature is the rise in temperature over the ambient temperature. \*5 Noted operating noise level is when using an ORION motor. \*6 The power supply voltage must not have intermittent fluctuations greater than 10%, or 5% if fluctuations are continued. \*7 If the pump is started where the ambient temperature is around 0 °C, a high frequency noise may be heard. The noise will naturally go away in a short time and does not indicate abnormal operation. If a high pitch noise continues for more than 30 minutes, consult with your dealer or a qualified repair person. \*8 Please consult with ORION if the product is to be operated at an elevation above 1000 m.



## Contactless Construction for Long Life

In our contactless construction, our specially designed high-efficiency rotor does not contact the cylinder. We've achieved long life operation because there are no consumable parts like those found inside rotary vane pumps.

**20,000**  
Hour  
Overhaul Cycle  
Achieved

**Maintenance Free**  
Operation of  
5000 h/year for  
**4 Years**

**20,000h**  
KCP  
100D-VB1  
(5.5kW)

**2.9 Times**  
Prev. Models  
**7,000h**  
Previous type  
CBXP  
6070A  
(5.5kW)

\*5000 h = 20 h/day x 250 day/year.  
\*Gearbox oil change (every 5000 h), filter element replacement, and other periodic inspections are required.  
(ORION product comparison)

## Exhaust Air is Clean Air

**Zero Abrasive Particulate**

Vaneless means clean air with zero abrasive particulate.

**Zero Oil**

The pump room is completely dry. Zero-Oil Clean Air

Choosing the aftercooler spec. greatly reduces the exhaust temperature. Large flow rate thanks to our no-contact construction.

**Aftercooler Not Included**  
**125°C**

**Aftercooler Included**  
**45°C**

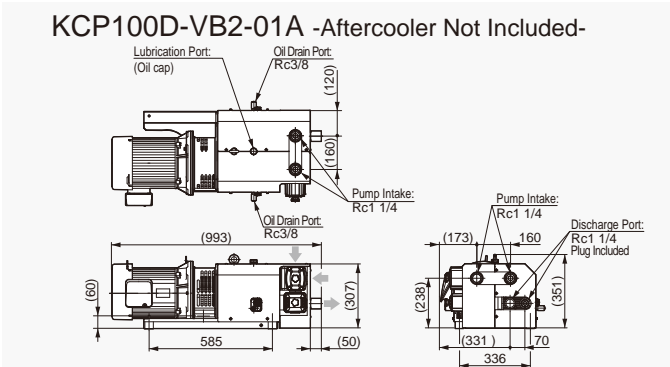
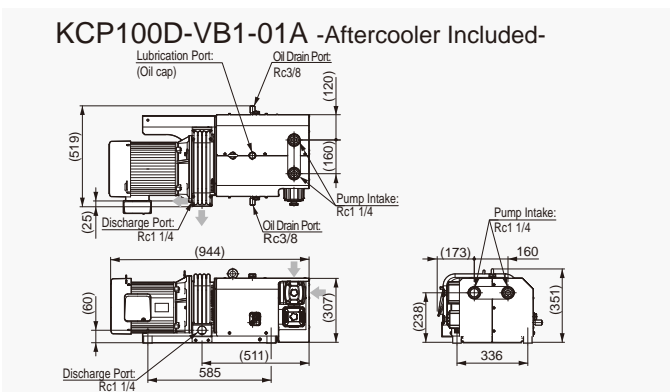
**1,750 L/min**  
KCP  
100D-VB1  
(5.5kW)

**920 L/min**  
Previous type  
CBXP  
6070A  
(5.5kW)

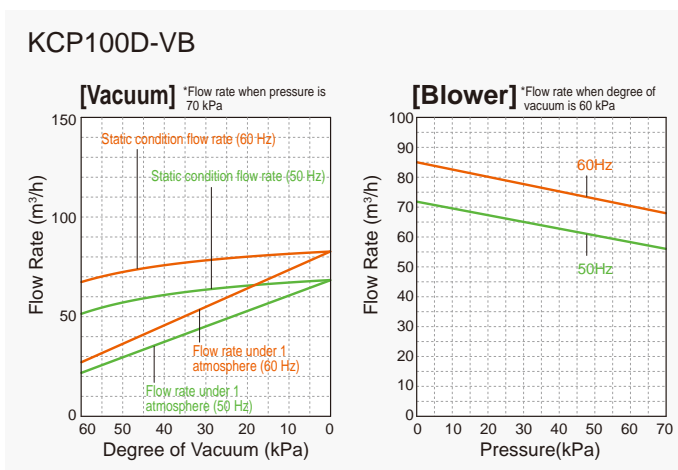
**1,417 L/min**  
KCP  
100D-VB1  
(5.5kW)

**1,110 L/min**  
Previous type  
CBXP  
6070A  
(5.5kW)

## Combination Pump External Dimensions (Units: mm)



## Performance Data





# (1-Cylinder Spec.) Combination Pump

**Built To Order**



Degree of Vacuum	0 - 60 kPa
Pressure	0 - 60 kPa
Motor Output	5.5 kW
Flow Rate	0 - 192 m <sup>3</sup> /h <sup>*1</sup>



**Applicable Models**

**KCP150D-VB-01A**



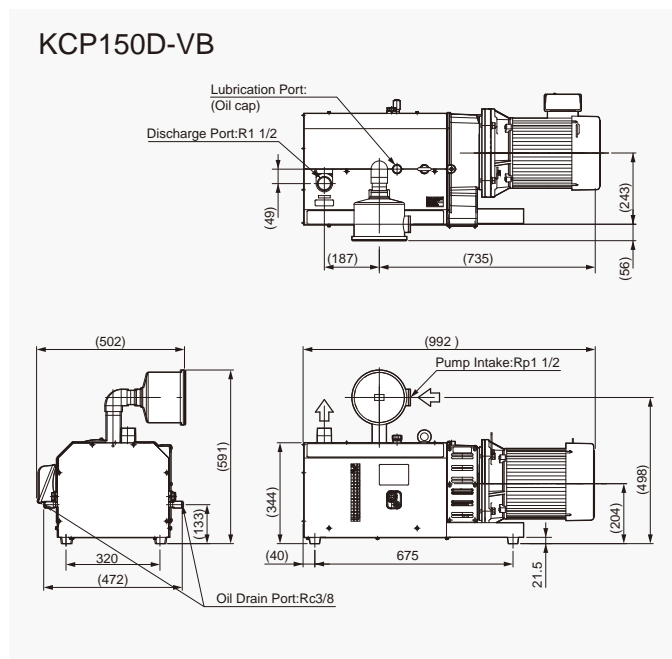
Introducing a high flow rate combination pump with operation up to 60 kPa possible on the vacuum side as well as the blower side.

Model		KCP150D-VB-01A
Motor Output	kW	5.5
Flow Rate(50/60 Hz)	m <sup>3</sup> /h	158 / 192
	m <sup>3</sup> /min	2.6 / 3.2
Continuous Operating Vacuum *2	kPa	0 - 60 (1 atm or lower)
Continuous Pressure *3	kPa	0 - 60
Operating Noise Level *4	dB	72 / 79
Piping Connection Size		Intake: Rp1 1/2, Exhaust:R1 1/2
Mass	kg	142
Motor	Rated voltage and frequency *5	Three-phase 200 V 50/60 Hz, 220 V 60 Hz
	Output, Number of Units	5.5 kW 2P×1 Unit
	Specifications	Top Runner compliant high efficiency motors.
Working Environment	Place of Installation	Indoors
	Allowable Ambient Temperature *6	0 - 40 °C
	Allowable Ambient Humidity	65±20%RH (JIS Z8703)
	Operable Elevation *7	1000 or lower m
Standard Equipment		Intake filter / Vacuum controller / Pressure controller / Hour meter
Accessory (Sold Separately)		Compound gauge

\*1 This is the designed flow rate based on the cylinder volume of the pump. Confirm the actual flow rate based on the pressure-flow diagram. \*2 Under ambient pressure of 1 atm. \*3 Upper limit of continuous operable exhaust pressure. \*4 Values are actual measured values using the standard built-in ORION motor, operating at a degree of vacuum of 40 kPa and a pumping pressure of 20 kPa. These are not warranted values. \*5 The power supply voltage must not have intermittent fluctuations greater than 10%, or 5% if fluctuations are continued.\*6 If the pump is started where the ambient temperature is around 0 °C, a high frequency noise may be heard. The noise will naturally go away in a short time and does not indicate abnormal operation. If a high pitch noise continues for more than 30 minutes, consult with your dealer or a qualified repair person. \*7 Please consult with ORION if the product is to be operated at an elevation above 1000 m.

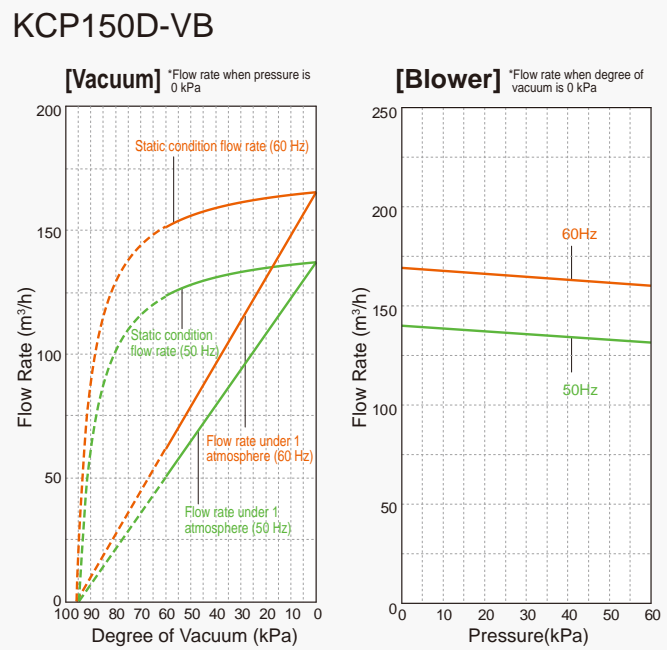
Combination Pump

## Combination Pump External Dimensions (Units: mm)



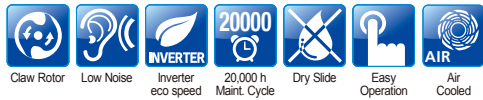
## Performance Data

\* Do not operate at the conditions indicated by the dashed pressure and flow rate lines. Operating condition: 20 °C  
\* Typical value for standard built-in motor and not a guaranteed value.



# Combination Pump (2-Cylinder Spec.)

**Built To Order**



Degree of Vacuum	0 - 94 kPa or higher
Pressure	0 - 100 kPa
Motor Output	7.4 - 9.2 kW
Flow Rate	0 - 192 m <sup>3</sup> /h <sup>*1</sup>

## Applicable Models

**Vacuum × Vacuum Combination**  
**KCP150150D-VV**  
**KCE190190E-VV**  
**Vacuum × Blower Combination**  
**KCP150150D-VB**  
**KCE190190E-VB**

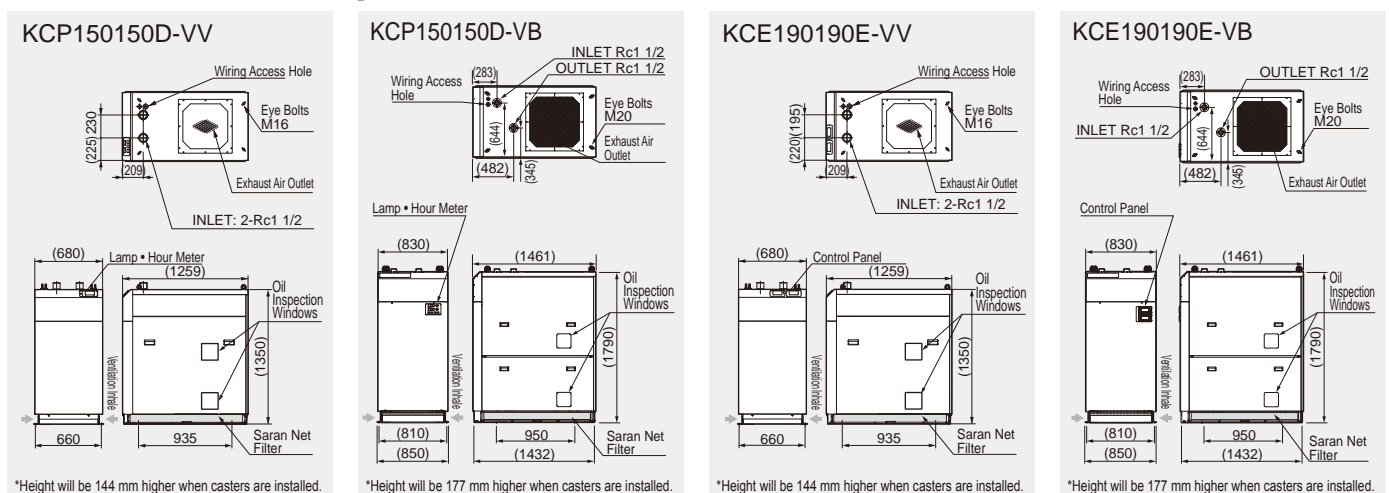


Models manufactured to meet various demands. Please consult your dealer for details.

Model	Vacuum × Vacuum Model				Vacuum × Blower Model				
	KCP150150D-VV-01A		KCE190190E-VV-01		KCP150150D-VB-01A		KCE190190E-VB-01		
	KCP150150D-VV-02A		KCE190190E-VV-02		KCP150150D-VB-02A		KCE190190E-VB-02		
Motor Output	kW	7.4		7.4		9.2		9.2	
Flow Rate(50/60 Hz)	m <sup>3</sup> /h	158/192	158/192	192	192	158/192	158/192	192	192
	m <sup>3</sup> /min	2.6/3.2	2.6/3.2	3.2	3.2	2.6/3.2	2.6/3.2	3.2	3.2
Continuous Operating Vacuum	kPa	0 - 80				0 - 80		0 - 80	
Ultimate Vacuum (50/60 Hz)	kPa	90/94 or higher		94 or higher		90/94 or higher		94 or higher	
Exhaust Temperature	kPa	—		—		100 or less		100 or less	
Piping Connection Size		Rc1 1/2							
Mass	kg	446		476		616		646	
Motor	Rated voltage and frequency	Three-phase 200 V 50/60 Hz, 220 V 60 Hz		Three-phase 200 V 50/60 Hz		Three-phase 200 V 50/60 Hz, 220 V 60 Hz		Three-phase 200 V 50/60 Hz	
	Output, Number of Units	3.7 kW × 2P×2 Units		3.7 kW × 2P×2 Units		3.7 kW × 2P×1 Unit, 5.5 kW × 2P×1 Unit		3.7 kW × 2P×1 Unit, 5.5 kW × 2P×1 Unit	
Specifications		Top Runner compliant high efficiency motors.							
Working Environment	Place of Installation	indoors							
	Allowable Ambient Temperature	5 - 40 °C							
	Allowable Ambient Humidity	65 ±20% RH (JIS Z8703)							
	Operable Elevation	1000 or less m							
Accessory (Sold Separately)		Compound gauge Vacuum controller		—		Compound gauge Vacuum controller Pressure controller		—	
Inverter Control		Possible		Built-in load detecting automatic speed control circuit.		Possible		Built-in load detecting automatic speed control circuit.	

\*1 This is the designed flow rate based on the cylinder volume of the pump. Confirm the actual flow rate based on the pressure-flow diagram. \*2 Under ambient pressure of 1 atm. When operating at high elevations, there will be a difference in operating pressure from operation at a location under 1 atm of pressure. The calculation to measure the ultimate vacuum while operating at other elevations is as follows: Ultimate Vacuum Under Pressure (simplified) [kPa] = Specified Ultimate Degree of Vacuum [kPa] - Altitude [m] × 0.0115 [kPa/m] \*3 Upper limit of continuous operable exhaust pressure. Do not operate the pump above this limit. Doing so can reduce the lifespan of the pump and may result in breakdown or an accident. \*4 The specification includes casters and the mass including the casters will be the noted mass plus an additional 5 kg. \*5 The power supply voltage must not have intermittent fluctuations greater than 10%, or 5% if fluctuations are continuous. \*6 If the pump is started where the ambient temperature is around 0 °C, a high frequency noise may be heard. The noise will naturally go away in a short time and does not indicate abnormal operation. If a high pitch noise continues for more than 30 minutes, consult with your dealer or a qualified repair person. \*7 Please consult with ORION if the product is to be operated at an elevation above 1000 m.

## Combination Pump External Dimensions (Units: mm)



\*Height will be 144 mm higher when casters are installed.

\*Height will be 177 mm higher when casters are installed.

\*Height will be 144 mm higher when casters are installed.

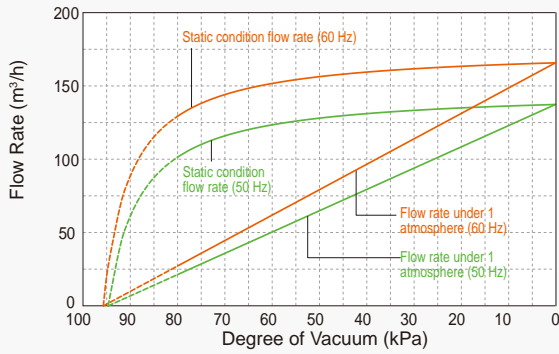
\*Height will be 177 mm higher when casters are installed.

# Performance Data

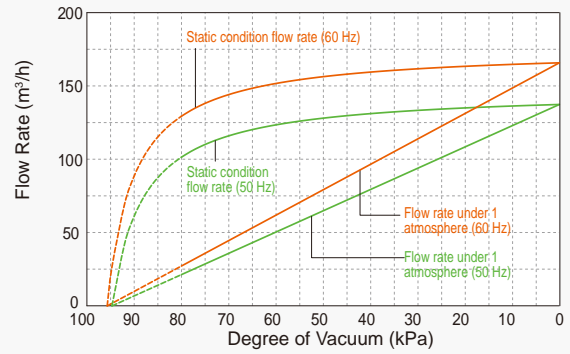
\* Do not operate at the conditions indicated by the dashed pressure and flow rate lines. Operating condition: 20 °C  
 \* Typical value for standard built-in motor and not a guaranteed value.

KCP150150D-VV

Pump 1 [ Vacuum ]

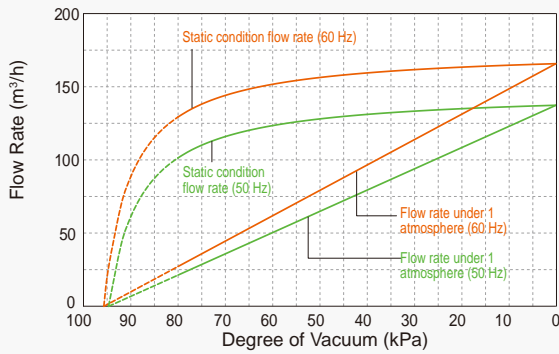


Pump 2 [ Vacuum ]

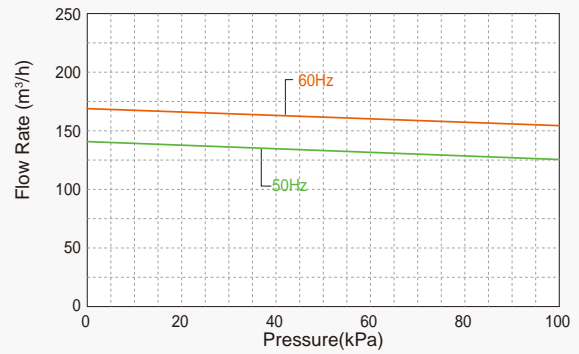


KCP150150D-VB

Pump 1 [ Vacuum ]

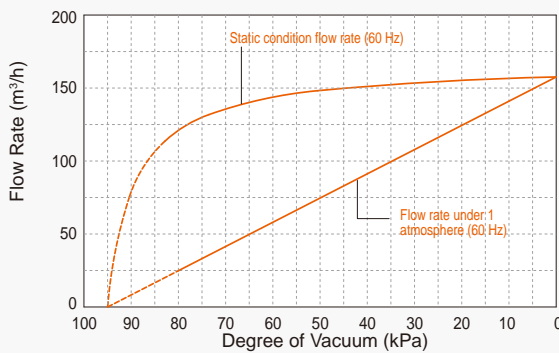


Pump 2 [ Blower ]

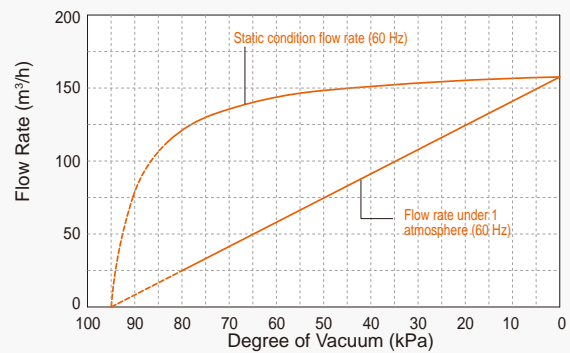


KCE190190E-VV

Pump 1 [ Vacuum ]

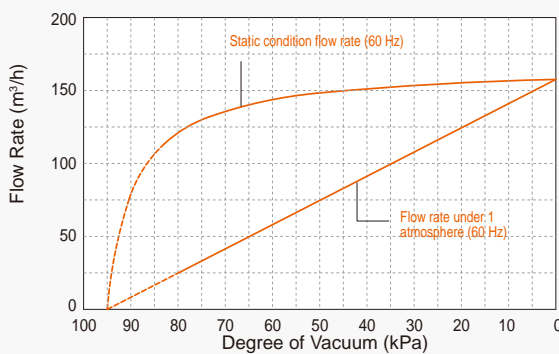


Pump 2 [ Vacuum ]

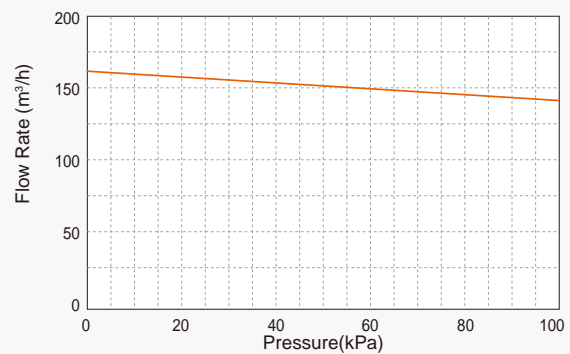


KCE190190E-VB

Pump 1 [ Vacuum ]



Pump 2 [ Blower ]



Combination Pump





# Centralized Vacuum System

## Why we recommend a Centralized Vacuum System

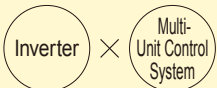


◀ Online Video Link

URL <https://www.orionkikai.co.jp/product/vacuum-pump/movie/oilfree/>

### Three Premium Advantages for High Flow Vacuum Sources Developed to Produce Maximum Energy Savings

**1**  
**PREMIUM**

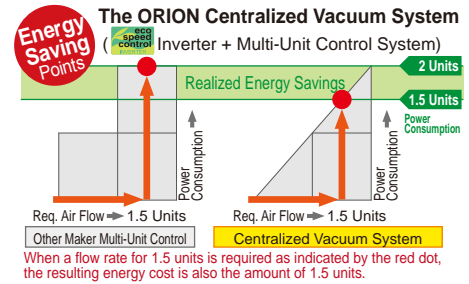


**Get Maximum Energy Savings**

Combined inverter and multi-unit control system gives **maximum energy cost savings.**

Since previous multi-unit control of vacuum pumps have only had ON-OFF control, there has they exhibited wide fluctuations in the degree of vacuum, and since pumps cannot be turned on and off frequently, operating conditions were very wastefulness's Centralized Vacuum System is the first in the industry with a genuine manufacturer standardized combined system of inverter and multi-unit control offering low investment cost and high energy savings.

It has received high marks from users and has won many awards.



**2**  
**PREMIUM**

Backup Machine  
||  
**Avoided Line Stoppage**

**Maintain Stability by Avoiding Line Stops**

In case of pump failure, a backup unit that was previously stopped due to decreased vacuum load will automatically start operating, and the production line will continue to operate without any ill effect.



**Automatic Start of Backup Unit**

Seamless Continuous Operation of the Production Line

**3**  
**PREMIUM**

**Simple Design**



**Reduced Design Load**

For new factories, many facilities must be introduced in addition to vacuum pumps. From a wealth of past experiences, the ORION Centralized Vacuum System prepares "construction industry specifications" which have been accumulated and have satisfied the requirements specifications that are often received by those in the construction industry during new plant construction, and can result in systems where safety and energy-savings coexist without putting a heavy burden on users and independent contractors.

- Meets many points of building standards for government agencies and new factories.
- Pump unit maintenance possible under continuous 24-hour, 365-day operation.
- Provides a backup and quick recovery system to deal with unforeseen trouble.

### Additional Specifications

ORION can meet the specifications requests from builders and equipment suppliers. (Items marked with ◦ are possible via special order.)

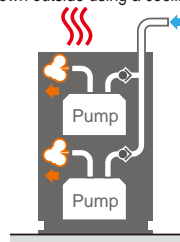
Model	KCE620F-V	KCM620-V
Exhaust Piping Specifications *1	◦	◦
Seismic Calculation Report	Can submit on request.	Can submit on request.
Commercial Power Supply Switchover Functionality	Standard	◦
Different Voltage (380 - 440V) *2	◦	◦
Control System 100 V	◦	◦
Momentary Power Loss Measures *3	Standard	Standard
PC Communication Functionality	Standard	◦
Pump-Only Operating Signal Output	Standard	◦
Emergency Stop Button	◦	◦

\*1 See the right illustration for exhaust piping specifications. \*2 Contact us for information regarding voltages outside the following ranges: 380/400/415 V, 50 Hz, 400/440 V, 60 Hz. \*3 Please contact us for details.

### About the Exhaust Piping Specification (For the KCM620)

#### Normal Specification

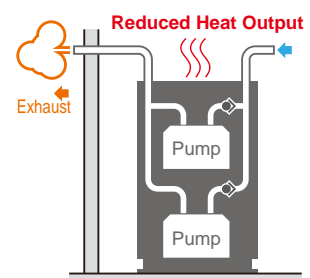
In our quiet design, exhaust air from the vacuum pump is discharged inside the enclosure where it is then blown outside using a cooling fan.



\*Comes with a built-in check valve. Please ask us in advance about installation of check valves on the intake side of new products.

#### Exhaust Piping Specifications

Exhaust piping releases vacuum pump exhaust air outdoors, reducing indoor heat output.



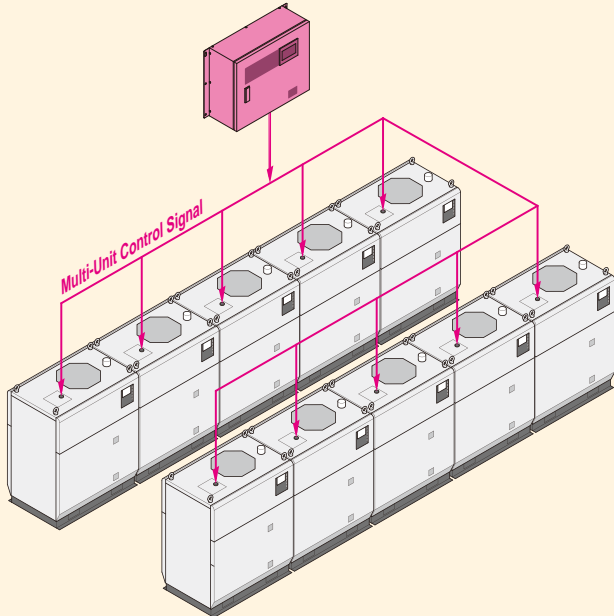
## Multi-Unit Control

### KCE-F Series

#### When Controlling up to 10 Units

[Communication with EMB10A-NC-01]

Control Panel  
(Eco Multi Box EMB10A-NC-01)

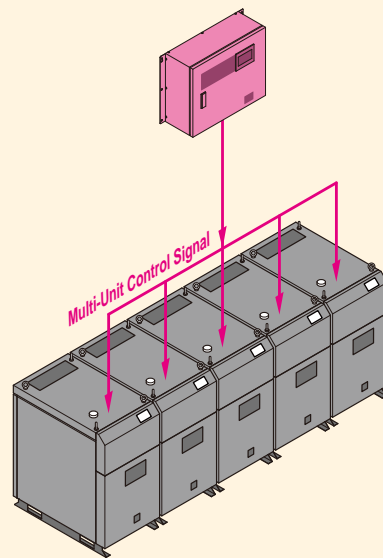


### KCM310

#### When Controlling up to 5 Module Pumps

[Communication with EMB05A-NC-01]

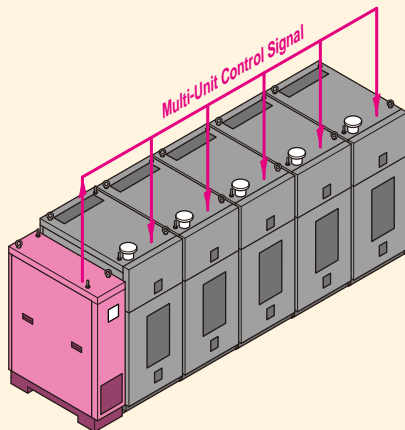
Control Panel  
(Eco Multi Box EMB05A-NC-01)



### KCM620

#### When Controlling up to 5 Module Pumps

[Communication with ESB5500]



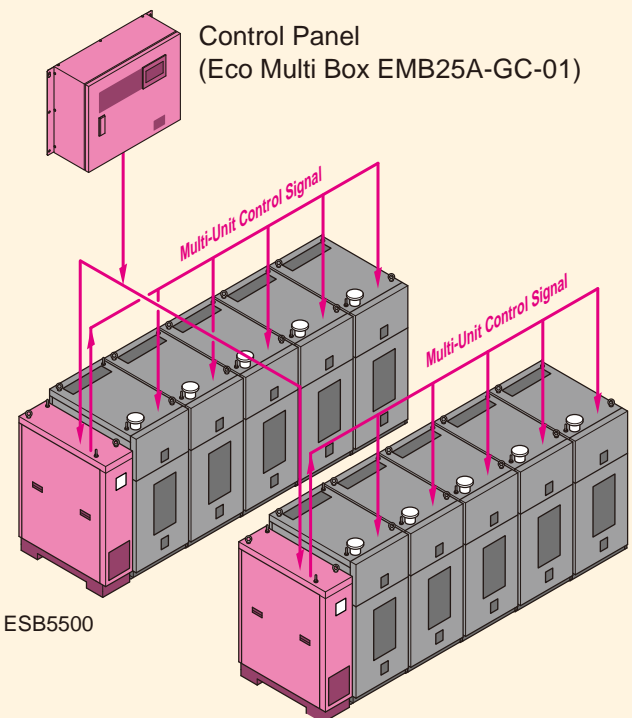
ESB5500

### KCM620

#### When Controlling from 6 to 25 Module Pumps

[Communication with EMB25A-GC-01]

Control Panel  
(Eco Multi Box EMB25A-GC-01)





ESB5500

ESB5500

\*Installation of 10 KCM620 Units

# Eco Multi-Box Multi-Unit Control Panel (Sold separately)

Model	EMB10A-NC-01	EMB05A-NC-01	EMB25A-GC-01
Name	Eco Multi Box		
	Number Controller		Group Controller
External View			
Targeted Models	KCE-F Series 	For KCM310 	ESB5500 (KCM620) 
Max. no. of Controllable Pumps	10 Units	5 Units	25 Units
Role	Combines inverter- and multi-unit-control of KCE-F Series units.	Used for combined inverter- and multi-unit-control.	Used as a higher-level control panel of the ESB5500 to control 6 or more KCM620 units.
System Image	See page 26 (for KCE-F units).	See page 26 (for KCE-F units).	See pages 18 and 26 (for KCM620 units).
<b>IoT Compatible</b>	<b>Compatible*</b>		
Comments	—	—	Control up to 5 ESB5500 units (= 25 KCM620 units).

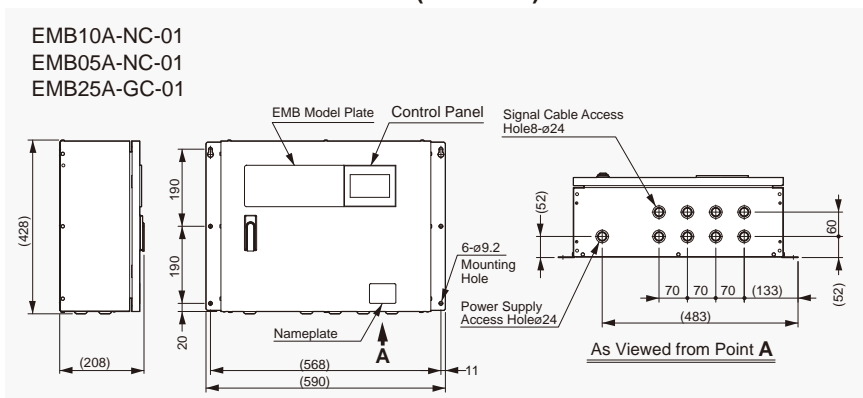
\*Functionality will differ depending on the model. Please consult your dealer for details.

## Eco Multi Box Specification Chart

Model		EMB10A-NC-01	EMB05A-NC-01	EMB25A-GC-01
Targeted Models		KCE-F Model *1	KCM310-V-01, KCM310-V-02 *2	Eco Speed Box(ESB Series) *3
External Dimensions (H×C×W)		mm		
		590×208×428		
Mass		kg		
		12		
Power Source *4		V		
		Single-Phase 100 / 200		
Device Specifications	Electric Circuit	Earth leakage breaker		
		Current rating: 75 A / Current sensitivity: 30 mA		
		Temperature sensor		
		53°C Warning / 58°C Alarm Signal		
Working Environment	Installation Location		Indoors	
	Allowable Ambient Temperature		5 – 40°C	
	Pollution Degree *5		Pollution degree 3 (General factory grade environment)	
	Overvoltage Category *5		Cat 3 (Supplied from fixed wiring facility)	

\*1 The number of KCE-F models that can be controlled by the controller is up to a maximum of 10 units. Also, up to 4 base units (KCE-E1/E/D/C/A models) can be controlled. Please contact your dealer for details. \*2 Can connect up to a maximum of 5 KCM310 units (EMB5-NC compatible spec.). Also, please contact us regarding KCM310 specification details. \*3 Up to a maximum of 5 Eco Speed Box units can be connected (EMB5-GC compatible spec.). Also, please contact us regarding Eco Speed Box specification details. \*4 The allowable intermittent power supply voltage fluctuation range is ±10%, and the allowable continuous supply voltage fluctuation range is ±5% of the specified voltage. \*5 Please refer to IEC60664-1.

## External Dimensions (Units: mm)







Utilizing IoT to back up production line stabilization and energy saving factory management.

# ORION IoT Compatible System (Image)

The ORION IoT proposal for vacuum pump systems is compatible with a wide range of industrial networks, and in connection with your management system, supports the realization and visualization of images of the system for managers and power facility staff. Feel free to ask one of our sales representatives about arranging a meeting with our specialized staff.

Centralized Management

Multi-Unit Control  
(Max. 10 Units)

When connecting to your Management System (Orig. management software)

## Connection to a Multi-Unit Control Panel for Centralized Management

Control Items: Remote operation, operating state, set degree of vacuum, measured degree of vacuum, alarm state

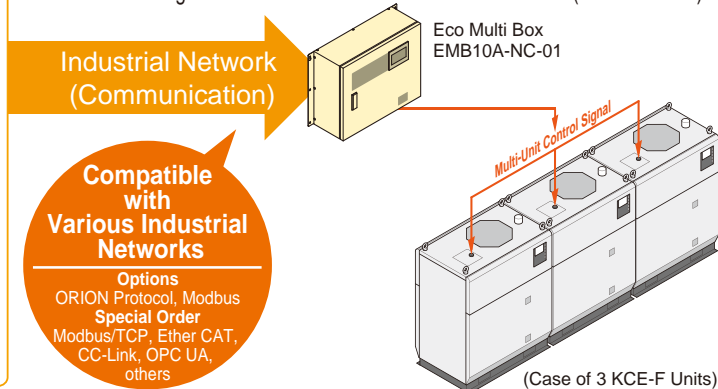
### Your Management System

(Original program creation)



### ORION IoT Compatible System (Image)

Centralized Management + Multi-Unit Control Recommendation (Max. 10 Units)



Compatible with Various Industrial Networks  
Options: ORION Protocol, Modbus  
Special Order: Modbus/TCP, Ether CAT, CC-Link, OPC UA, others

Centralized Vacuum Systems

IoT  
Using Free ORION Software

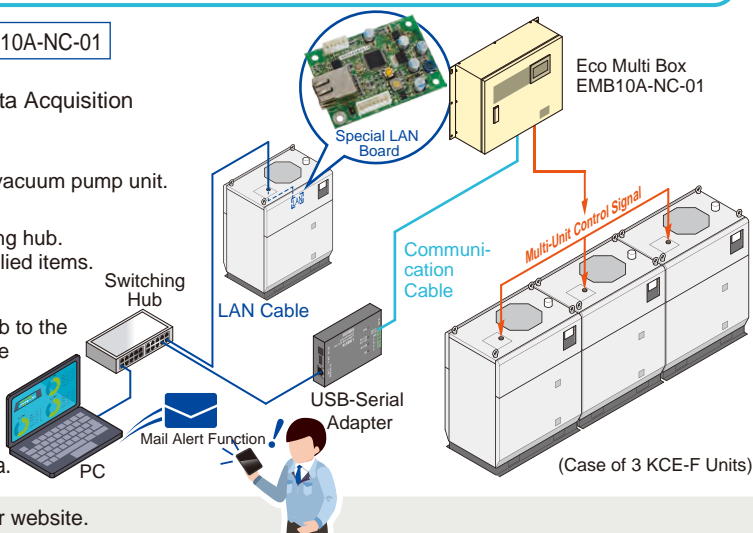
Connection with ORION's Free Software (Remote Monitoring & Operation Data Acquisition Software)

## Remote Tracking of Vacuum Pump & Multi-Unit Control Panel

Acquirable Operation Data: Operation/stop, settings, measured values, alarm codes, run time, load factor, power consumption, various temperatures, pressure values

Connection Example Using the KCE-F Series and the EMB10A-NC-01

- Download the "Remote Monitoring & Operation Data Acquisition Software" from our website.
- If connecting to the KCE-F:
  - Install our special LAN Board (sold separately) to the vacuum pump unit. LAN Communication Interface Assembly: 03087958010
  - Connect the PC and Special LAN board to the switching hub. PC, switching hub, and required cables are user-supplied items.
- If connecting to the EMB10A-NC-01:
  - Connect the PC to the switching hub, the switching hub to the USB-Serial Adapter, and the USB-Serial Adapter to the Eco Multi-Boxcar. Switching Hub, USB-Serial Adapter and connection cables are user-supplied items. Recommended USB-Serial Adapter: LINE EYE Co. Ltd. SI-65A
- Operate as needed in order to collect various types of data.



Please download and use the free software available from our website.

Software Name		Applicable Model	Function
	Operation Data Acquisition Software	KCE-F Series, KCM Series (ESB Series), EMB10A-NC-01	Displayed Items: Measured degree of vacuum, set degree of vacuum, operating state, alarm code and history, accumulated run time, power consumption, etc.
	Contact State Monitoring Software	KCE Series, KCM Series (ESB Series), EMB Series	Contact Outputs: Operating signal, alarm signal, pressure alarm signal, etc.
	Module Multi Pump Communication Software	KCM Series	Displayed Items: Measured degree of vacuum, set degree of vacuum, operating state, alarm code and history, accumulated run time Operation Item: Remote operation and stop, change set degree of vacuum, change parameters

Please visit our website for details.

<https://www.orionkikai.co.jp/download/iot>

Note that our software is only offered in Japanese. Operation with non-Japanese operating systems has not been confirmed. Please refer to the instruction manual for required equipment and specifications.

## KCP/KCE/KCM Series

# ACCESSORY (Sold Separately)

## Works with Various Kinds of Vacuum Environments

### Caution

Accessory (Sold separately) listed below are designed for use with ORION Oil-Free Pumps.  
Please contact us regarding use with products or equipment from other manufacturers.

### Air Environments Containing Particulate Matter

For example, these applications:

- Vacuum Chuck
- Powder (Air) Transport
- Vacuum Mixer

#### Basic Filter for Particulate Intake

- ▶ VF Intake Filter



#### For High Quantity of Particulate Intake...

- ▶ VSF Spin Filter



### Air Environments Containing Water

For example, these applications:

- Food Packaging
- Vacuum Emulsification
- Expansion Molding
- Vacuum Drying
- Extrusion Molding Machine
- Parallel Setup of Liquid Ring Vacuum Pumps \*1

#### Cases When Adulterated with Water (Liquid)...

- ▶ VLS Liquid Separator  
(Manual Drain Release)
- ▶ KLSA Auto Liquid Separator  
(Auto Drain Release)



### Air Environments Containing Oil

For example, these applications:

- Vacuum Forming
- Injection Molding
- Extrusion Machine

#### Cases when Adulterated with Oil Mist...

- ▶ VMF Intake Oil Mist Filter



#### Cases when Adulterated with Liquid Oil...

- ▶ VCS Intake Cyclone Separator



\*1 For parallel setups of liquid ring vacuum pumps (water sealed vacuum pump, etc.), please refer to the specifications sheet and instruction manual of the oil-free pump, and always install a (VLS Series) liquid separator.

\*The processing capacity of a filter (separator) will change depending on the concentration and volume of foreign matter at the inlet. May not operate under some conditions.

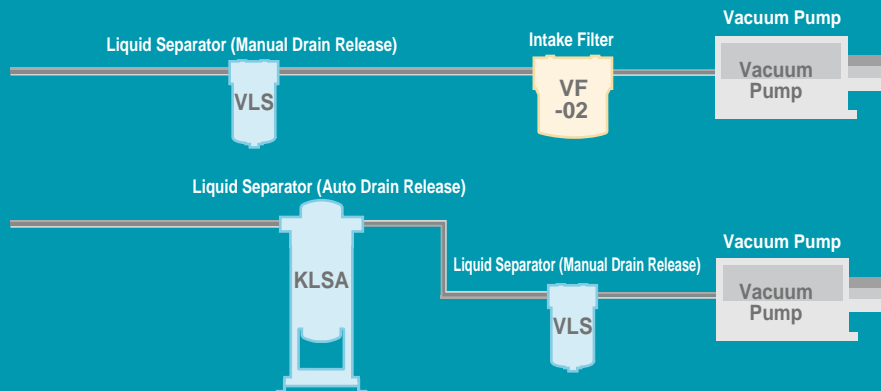
### System Example

High Quantity of Particulate Matter



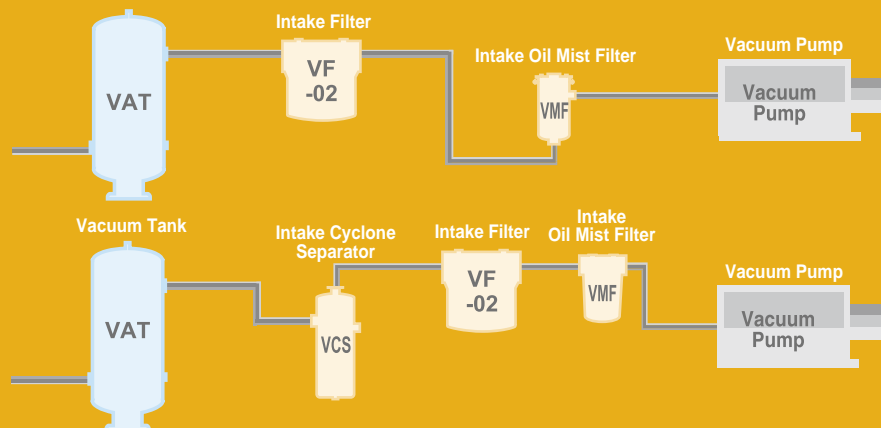
### System Example

Water (Liquid)



### System Example

Oil Mist



Accessory (Sold Separately)



### Removes 99% of Particulate of 2 μm and Larger (when using a paper element)

This filter prevents particulate from entering the vacuum pump. To protect your pump, install it on the airline before the pump. Two types of filter elements are available: a 2 μm paper element and a 5 μm polyester element. The paper element can remove smaller particulate. The polyester element can be cleaned.

\*Use an Accessory (Sold Separately) pre-filter in particularly high-particulate environments.

\*The ORION KCM620 oil free vacuum pump does not include an intake filter. Please choose the filter that best suits your working environment.

### Features

See-through housing (VF500 only)

T-Type Piping Configuration (Models VF500 to 1500)

Easy Maintenance

VF30



VF100

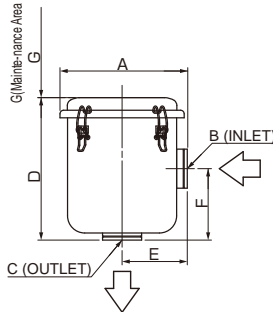
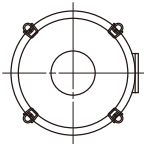


VF500

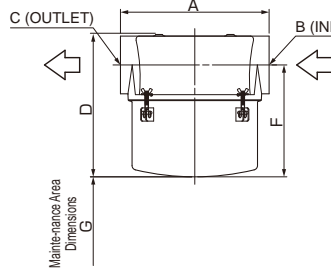
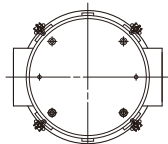


### External Dimensions (Units: mm)

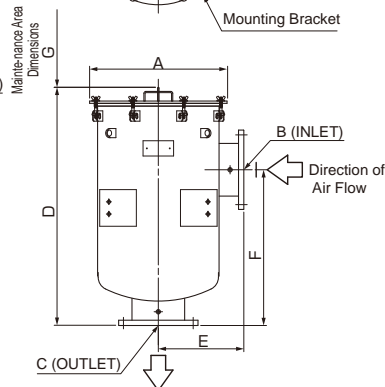
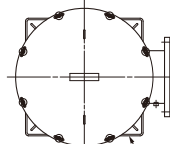
VF30 - 450



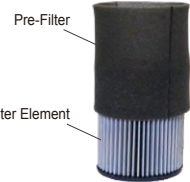
VF500 - 1500



VF3000



Accessory (Sold Separately) Pre-Filter



Part	Part Number
Pre-Filter VF100	04108395010 (For VF100)
Pre-Filter VF150	04107722010 (For VF150)
Pre-Filter VF250	04107723010 (For VF250)
Pre-Filter VF450	04109311010 (For VF450)
Pre-Filter VF500	04108218010 (For VF500)
Pre-Filter VF1500	04108231010 (For VF1000/1500)
Pre-Filter VF3000	04108232010 (For VF3000)

### Specification

Model <sup>*1</sup>	Applicable Models	Specification			Dimensions(mm)							Pre-Filter
		Filter Efficiency	Flow rate(m <sup>3</sup> /h)	Mass(kg)	A	B	C	D	E	F	G	
VF30-02	KCPH30-V	5μm 99%	31	0.54	105	NPSC1/2 <sup>*3</sup>	91	58	49	100	-	
VF100-01 <sup>*2</sup>	KCPH60-V, KCP100D-V	2μm 99%	94	1.4	167	Rp1 1/4	114	83	67	100	Accessory (Sold Separately)	
VF100-02		5μm 99%										
VF150-01 <sup>*2</sup>	KCP150D-V/VH, KCE120F-VH	2μm 99%	195	2	217	Rp1 1/2	177	106	115	150	Accessory (Sold Separately)	
VF150-02		5μm 99%										
VF250-01 <sup>*2</sup>	KCP250E-V/VH, KCE310F-V/VH, KCM310-V, KCE380F-V/VH	2μm 99%	298	5	228	Rp 2	255	117	127	250	Accessory (Sold Separately)	
VF250-02		5μm 99%										
VF450-01	KCE620F-V/VH, KCM620-V	2μm 99%	510	15	352	Rp 3	360	184	182	300	Accessory (Sold Separately)	
VF450-02		5μm 99%										
VF500-01	KCM620-V×1 Unit	2μm 99%	884	11	343	Rp 4	511	-	433	250	Included	
VF500-02		5μm 99%										
VF1000-01	KCM620-V×2 Units	2μm 99%	1,360	23	483	Rp 5	472	-	363	300	Included	
VF1000-02		5μm 99%										
VF1500-01	KCM620-V×3 Units	2μm 99%	1,870	20	483	Rp 6	472	-	363	300	Included	
VF1500-02		5μm 99%										
VF3000-01	KCM620×4 Units/5 Units	2μm 99%	3,060	83	572	200A/10K	991	356	648	550	Included	
VF3000-02		5μm 99%										

\*1 Model numbers ending in -01 indicate paper filters. Model numbers ending in -02 indicate polyester filters. \*2: Included with ORION KCP and KCE Oil-Free Vacuum Pumps, and built-in on the KCM310 (-01). \*3 NPSC 1/2 has a thread pitch very similar to that of Rc 1/2, and therefore R 1/2 threaded connections can be used.

\* The VF Series inlet air temperature range and ambient temperature range are 0 to 60 °C.

VSF Series

# Spin Filter

## Removes a High Quantity of Particulate by Centrifugal Separation

When there is a high quantity of particulate contained in the intake air, installation before the VF intake filter can greatly improve the lifespan of the intake filter element. The inside of the unit can be checked visually for easy maintenance.

\*Do not use in environments with air adulterated with water or oil.

### Features

See-through housing

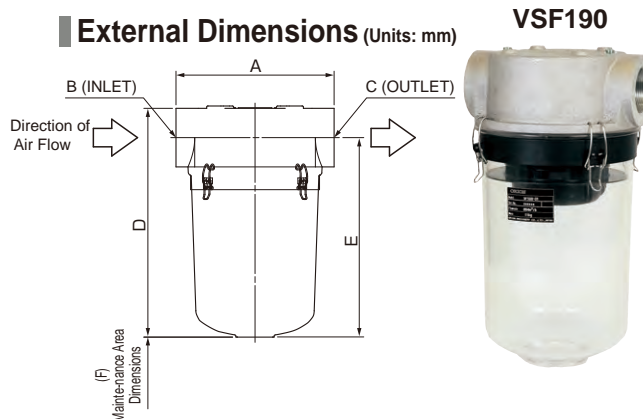
T-Type Piping Configuration (For easy piping.)

Easy Maintenance

### Specification

Model	Applicable Models	Specification			Dimensions(mm)					
		Separation Efficiency	Flow rate(m <sup>3</sup> /h)	Mass(kg)	A	B	C	D	E	F
VSF190	Accessory based on operating flow rate	15µm 85%	68 – 187	6.4	229	Rp2	412	362	250	
VSF380			170 – 340	11	343	Rp3	501	433	250	
VSF620			340 – 765	10	343	Rp4	501	433	250	

\* The VSF Series inlet air temperature range and ambient temperature range are 0 to 60 °C.



VLS Series

# Liquid Separator

( Circuit-Breaking Float)Built-in  
( Manual Drain Release)

## Liquid Separator That Allows Easy-to-See Confirmation of the Drain State

The float that cuts off the vacuum circuit is built-in, so even if release of the collected drain is neglected, it will be prevented from entering the vacuum pump. The inside of the unit can be checked visually for easy maintenance.

\* Cannot collect water vapor or oil mist.

\* Cannot release drain while the vacuum pump is operating.

### Features

See-through housing

T-Type Piping Configuration (For easy piping.)

Easy Maintenance



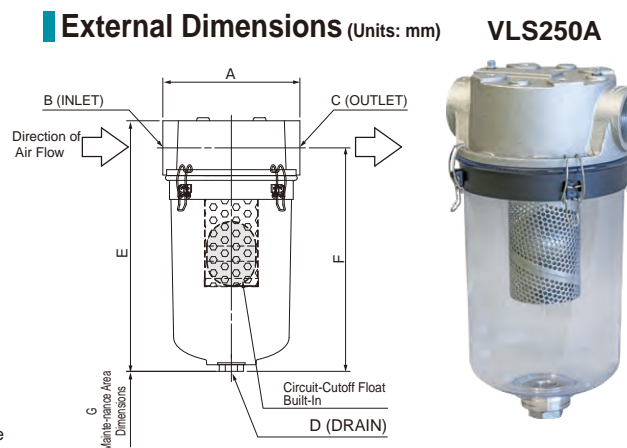
Online Video Link

<https://www.orionkikai.co.jp/product/vacuum-pump/equipment/filter/vls/#movie>

### Specification

Model	Applicable Models	Specification			Dimensions(mm)					
		Flow rate(m <sup>3</sup> /h)	Holding Capacity(L)	Mass(kg)	A	B	C	D	E	F
VLS150A	KCP100D-V, KCP150D-V/VH, KCE120F-V/VH, KCE190F-V/VH	136	1.6	4	178	Rp1 1/2	Rp1	381	336	250
VLS250A	KCP250E-V/VH, KCE310F-V/VH, KCM310	297	1.9	5.4	229	Rp2	Rp1	449	393	250
VLS500A	KCE380F-V/VH, KCE620F-V/VH, KCM620, KCE620F-VW/VHW	510	5.7	11	343	Rp3	Rp1	541	467	250

\* The VLS Series inlet air temperature range and ambient temperature range are 0 to 60 °C.



Accessory (Sold Separately)

## KLSA Series

# Auto Liquid Separator (Auto Drain Release)

## Automatic Drain Release Possible while Vacuum Pump is Operating

Prevents liquid from entering the vacuum pump. Removes 99% of liquids such as water and oil with automatic release of drain. Can perform a drain release during vacuum pump operation with no drop in the degree of vacuum, making it the ideal choice for long continuous operation.

\* Cannot collect water vapor or oil mist operating.

### Features

#### Auto Drain Release

### Specification

Model	KLSA10A-G-01
Flow rate(m <sup>3</sup> /h)	510
Processing Water Pressure (1 atm to 90 kPa)	10 L/min
Processing Water Volume (90 to 96 kPa)	6 L/min
Mass(kg)	63

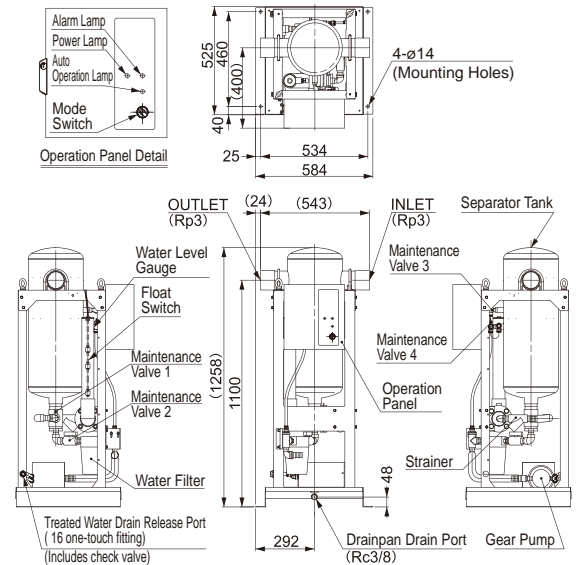
\* The KLSA Series inlet air temperature range and ambient temperature range are 5 to 40 °C.



Online Video Link

<https://www.orionkikai.co.jp/product/vacuum-pump/equipment/filter/klsa/#movie>

### External Dimensions (Units: mm)



## KLSM Series

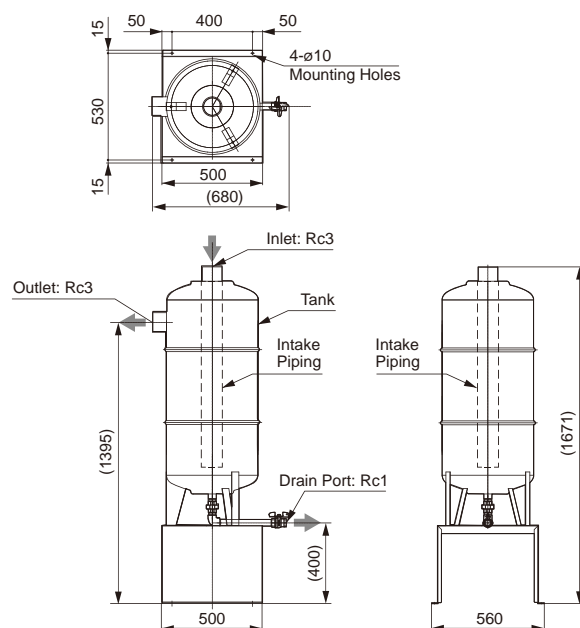
# Manual Liquid Separator

## Separation of Liquid Contained in Air

Can be operated at flow rates achieved by the KCE620F.

(Please consult your dealer regarding use with multiple integrated pumps or other uestions.)

### External Dimensions (Units: mm)



### Features

#### No Electricity Required

#### Incl. Vapor-Liquid Separation Intake Piping

### Specification

Model	KLSM30
Flow rate(m <sup>3</sup> /h) <sub>-1</sub>	620
Holding Capacity(L) <sub>-2</sub>	30
Intake Air Temp (°C)	5 – 40

\*1: Indicated flow rate value is when the degree of vacuum of the intake air is 0 kPa.

\*2: The retention volume is the amount of water that the manual liquid separator can hold at one time.



## VMF Series

## Intake Oil Mist Filter

### 99% Removal of 0.3 μm or Larger Oil Mist.

Prevents oil mist from entering the vacuum pump. Cannot completely collect liquid oil, therefore, if intake of liquid oil is a possibility, then an intake Cyclone Separator should be installed before this filter.

\* Cannot release drain while the vacuum pump is operating.

#### Features

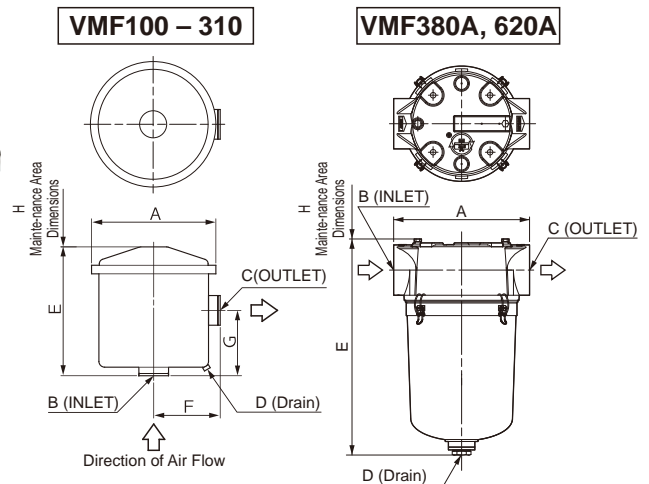
Collects Oil Mist

See-through housing (VMF380A, 620A)

See-through housing (VMF380A, 620A)



### External Dimensions (Units: mm)



#### Specification

Model	Applicable Models	Specification			Dimensions(mm)							
		Filter Efficiency	Flow rate(m <sup>3</sup> /h)	Mass(kg)	A	B	C	D	E	F	G	H
VMF100	KCP100V	0.3μm 99.97%	100	2.3	187	Rp1 1/2	NPSC1/4	190	106	115	200	
VMF190	KCP150D-V/VH, KCE190F-V/VH		190	7	227	Rp1 1/2	NPSC1/4	287	117	128	300	
VMF310	KCP250E-V/VH, KCE310F-V/VH, KCM310		310	14	227	Rp2	NPSC1/4	443	117	127	300	
VMF380A	KCE380F-V-VH		380	20	343	Rp3	Rp1	545	-	-	300	
VMF620A	KCE620F-V/VH, KCE620F-VW/VHW, KCM620		600	24	343	R4	Rp1	545	-	-	300	

\* The VMF Series inlet air temperature range and ambient temperature range are 0 to 60 °C.

## VCS Series

## Intake Cyclone Separator (Manual Drain Release)

### Removes 99% of Liquid of Oil, Water, etc.

Prevents liquid from entering the vacuum pump. Please release the drain regularly as overflow is possible.

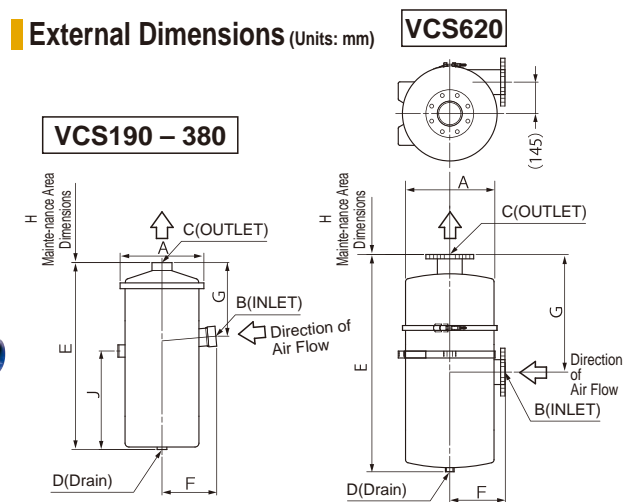
\* Cannot be used to collect water vapor or oil mist.

\* Cannot release drain while the vacuum pump is operating.

#### Features

Combined Liquid Separator

Ample Liquid Holding Capacity



#### Specification

Model	Applicable Models	Specification				Dimensions(mm)							
		Filter Efficiency	Flow rate(m <sup>3</sup> /h)	Holding Capacity(L)	Mass(kg)	A	B	C	D	E	F	G	H
VCS190	KCP100-V, KCP150D-V/VH, KCE190F-V/VH	8μm 99%	190	4	12	227	Rp1 1/2	Rp1	461	154	213	200	
VCS380	KCP250E-V/VH, KCE310F-V/VH, KCE380F-V/VH, KCM310		380	17	32	346	Rp2 1/2	Rp1	771	222	303	250	
VCS620	KCE620F-V/VH, KCE620F-VW/VHW, KCM620		600	30	56	436	DN100/PN10	Rp1	1000	254	541	250	

\* The VCS Series inlet air temperature range and ambient temperature range are 0 to 60 °C.

VAT Series

## Vacuum Tank

### Stainless Steel Tank that Reduces Vacuum Pulsation

Reduces vacuum fluctuation and pulsation. Stainless steel tank is strong against rust and has excellent corrosion resistance and durability. The filter element lifespan can be extended by installing a water or oil filter before the tank.



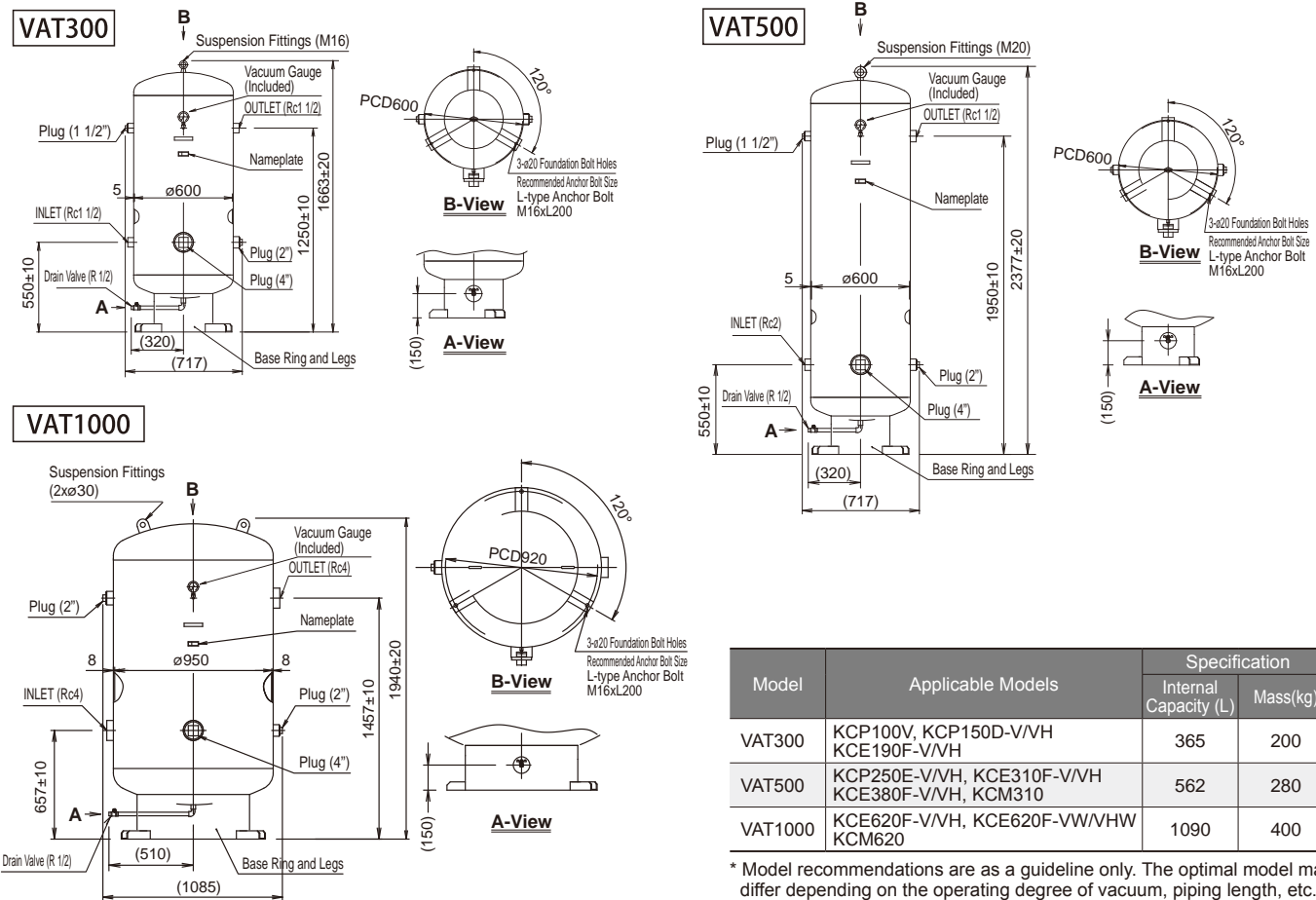
VAT500 (Product Image)

#### Features

Tank Built with SUS304

Easy Maintenance (Incl. cleaning port)

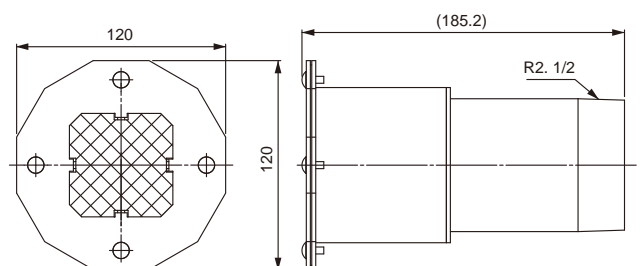
#### External Dimensions (Units: mm)



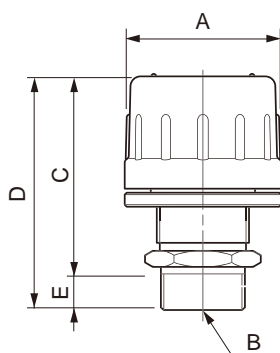
## Silencer Assembly for Water-Cooled Models

	Part Number	Applicable Models
Silencer Assembly	03088024010	KCE620F-VW/VHW, KCE1240F-VW/VHW

\* For exhaust muffling



## Vacuum Controller



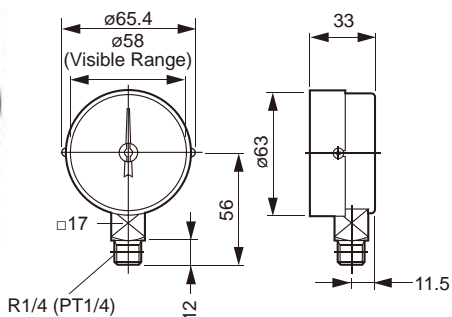
E: Thread Length

Model	Part Number	Applicable Models	A	B	C	D	E
VC100B	03044148010	KCP100D-V, KCP150D-V(30 – 60kPa)	ø78	R1 1/4	104	117	13
VC100H	03037915010	KCP100D-V, KCP150D-V(60 – 80kPa)	ø78	R1 1/4	104	117	13
VC100H-01	03087423010	KCP100D-V, KCP150D-VH(75 – 90kPa)	ø78	R1 1/4	104	117	13
VC121	03087114010	KCP250E-V(30 – 50kPa)	ø100	R1 1/2	117	130	13
VC121H	03087121010	KCP250E-V, VH (50 – 80kPa)	ø100	R1 1/2	117	130	13

## Type A, Type D Compound Gauge

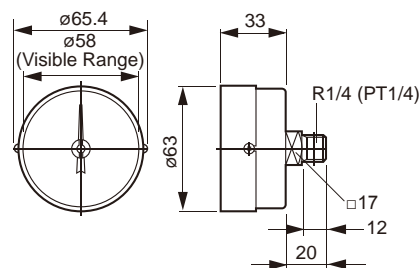
Setting Needle (Red)

A Type



Setting Needle (Red)

D Type



Type	Part Number	Applicable Models	Range	Value	Units
A Type	04102121010	KCP100D, 150D, 250E	Vacuum Pressure	100	kPa
D Type	04100705010	KCP100D, 150D, 250E	Vacuum Pressure	100	kPa

## Genuine A-02 OIL-FREE Vacuum Pump Oil



quantity (sets needed per unit)

Model	quantity
KCP100D-V	1
KCP150D-V,VH	1
KCP250E-V,VH	1
KCE120F-VH	1
KCE190F-V,VH	1
KCE310F-V,VH	1
KCE380F-V,VH	2
KCE620F-V,VH	2
KCE620F-VV,VHW	2
KCE1240F-VV,VHW	4

quantity (sets needed per unit)

Model	quantity
KCM310-V	1
KCM620-V	2
KCP100D-VB	1
KCP150D-VB	1
KCP150150D-VV,VB	2
KCE190190E-VV,VB	2

Part Number  
03087122010

\*Use only genuine oil.

# KCP/KCE/KCM Series ACCESSORIES

## Filter and Accessory (Sold Separately) Application Table

Model	Intake Filter		Vacuum(Intake)				
	Model	Status	Spin Filter	Liquid Separator	Auto Liquid Separator	Oil Mist Filter	Cyclone Separator
<b>Basic Model</b>							
KCPH30-V-01A	VF30-02×1	Included Parts					
KCPH60-V-01A	VF100-02×1	Incl. with Unit					
KCP150D-V-01A	VF150-01×1	Included Parts	VSF190 – 380	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCP250E-V-01	VF250-01×1	Included Parts	VSF380	VLS250A	KLSA10A-G-01	VMF310	VCS380
KCP100D-V-01A	VF100-01×1	Included Parts	VSF190	VLS150A	KLSA10A-G-01	VMF100	VCS190
KCP150D-VH-01A	VF150-01×1	Included Parts	VSF190 – 380	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCP250E-VH-01	VF250-01×1	Included Parts	VSF380	VLS250A	KLSA10A-G-01	VMF310	VCS380
<b>Inverter Model</b>							
KCE190F-V-01/02	VF150-01×1	Included Parts	VSF190	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCE310F-V-01/02	VF250-01×1	Included Parts	VSF380	VLS250A	KLSA10A-G-01	VMF310	VCS380
KCE380F-V-01/02	VF250-01×1	Included Parts	VSF380	VLS250A	KLSA10A-G-01	VMF380A	VCS380
KCE620F-V-01/02 <sup>2</sup>	VF450-01×1	Included Parts	VSF620	VLS500A	KLSA10A-G-01	VMF620A	VCS620
KCE120F-VH-01/02	VF150-01×1	Included Parts	VSF190	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCE190F-VH-01/02	VF150-01×1	Included Parts	VSF190	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCE310F-VH-01/02	VF250-01×1	Included Parts	VSF380	VLS250A	KLSA10A-G-01	VMF310	VCS380
KCE380F-VH-01/02	VF250-01×1	Included Parts	VSF380	VLS250A	KLSA10A-G-01	VMF380A	VCS380
KCE620F-VH-01/02 <sup>2</sup>	VF450-01×1	Included Parts	VSF620	VLS500A	KLSA10A-G-01	VMF620A	VCS620
KCE620F-VW-01	VF450-01×1	Included Parts	VSF620	VLS500A	KLSA10A-G-01	VMF620A	VCS620
KCE1240F-VW-01	VF1000-01×1	Included Parts	Please consult your dealer for information.	Please consult your dealer for information.	Please consult your dealer for information.	Please consult your dealer for information.	Please consult your dealer for information.
KCE620F-VHW-01	VF450-01×1	Included Parts	VSF620	VLS500A	KLSA10A-G-01	VMF620A	VCS620
KCE1240F-VHW-01	VF1000-01×1	Included Parts	Please consult your dealer for information.	Please consult your dealer for information.	Please consult your dealer for information.	Please consult your dealer for information.	Please consult your dealer for information.
<b>Module Pump</b>							
KCM310-V-01/02	VF250-01×1	Built into Unit	VSF380	VLS250A	KLSA10A-G-01	VMF310	VCS380
KCM620-V-01/02 <sup>3</sup>	VF500-01×1	Sold Separately	VSF620	VLS500A	KLSA10A-G-01	VMF620A	VCS620
<b>Combination Model</b>							
KCP100D-VB1-01A	Special Filter	Built into Unit					
KCP100D-VB2-01A	Special Filter	Built into Unit					
KCP150D-VB-01A	VF150-01×1	Included Parts	VSF190	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCP150150D-VV-01A/02A	VF150-01×2	Built into Unit	VSF190	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCE190190E-VV-01/02	VF150-01×2	Built into Unit	VSF190	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCP150150D-VB-01A/02A	VF150-01×2	Built into Unit	VSF190	VLS150A	KLSA10A-G-01	VMF190	VCS190
KCE190190E-VB-01/02	VF150-01×2	Built into Unit	VSF190	VLS150A	KLSA10A-G-01	VMF190	VCS190

\*1. Pressure control on KCE models is only for models with eco speed control. There is no pressure control mechanism during manual operation.

\*2. Can also work with VF500-01.

\*3. Can also work with VF450-01.

### ■ Elevation Correction Value

Operable Elevation (m)	Correction (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 depends on elevation and the degree of vacuum of the pump will be reduced by this amount.

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 500 m:

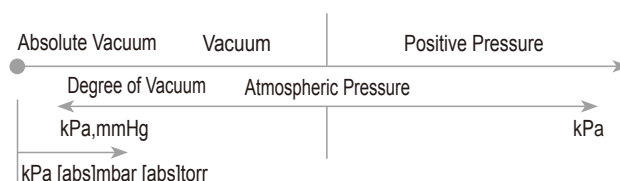
The continuous degree of vacuum of the KCE would be in the range of **80-5.9 = 74.1 kPa**.

### ■ Pressure Standard Values

Please note that the same units can be used to indicate atmospheric or absolute pressure standard measurements based on the individual case. Please be careful regarding these units.

	Atmospheric Pressure Standard	Absolute Pressure Standard
Notes	<ul style="list-style-type: none"> <li>Atmospheric Pressure regarded as "0"</li> <li>Also known as "gauge pressure".</li> <li>We refer to it as "degree of vacuum." A '-' (minus) sign will not be indicated as it is an absolute value.</li> </ul>	<ul style="list-style-type: none"> <li>Absolute vacuum will be indicated as "0".</li> <li>Indicated as pressure.</li> </ul>
Units	<ul style="list-style-type: none"> <li>kPa</li> <li>mmHg</li> </ul>	<ul style="list-style-type: none"> <li>kPa [abs]</li> <li>mbar [abs]</li> <li>torr</li> </ul>

\* mmHg and torr units cannot be used in business transactions.





Standard Equipment Accessory Equipment














Blower(Discharge)		Check Valve	Pressure Gauge	Vacuum Control Valve <sup>1</sup>	Pressure Control Valve	Silencer	Air Flush Kit	Model
Delivery Filter	Status							
<b>Basic Model</b>								
		Built-In				See page 14	See page 14	KCPH30-V-01A
						See page 14	See page 14	KCPH60-V-01A
			See page 34	VC100B/100H				KCP150D-V-01A
			See page 34	VC121/121H				KCP250E-V-01
			See page 34	VC100B/100H/100H-01				KCP100D-V-01A
			See page 34	VC100B/100H/100H-01				KCP150D-VH-01A
			See page 34	VC121/121H				KCP250E-VH-01
<b>Inverter Model</b>								
		Built-In	Built-In Function	Built-In Function				KCE190F-V-01/02
		Built-In	Built-In Function	Built-In Function				KCE310F-V-01/02
		Built-In	Built-In Function	Built-In Function				KCE380F-V-01/02
		Built-In	Built-In Function	Built-In Function				KCE620F-V-01/02 <sup>2</sup>
		Built-In	Built-In Function	Built-In Function				KCE120F-VH-01/02
		Built-In	Built-In Function	Built-In Function				KCE190F-VH-01/02
		Built-In	Built-In Function	Built-In Function				KCE310F-VH-01/02
		Built-In	Built-In Function	Built-In Function				KCE380F-VH-01/02
		Built-In	Built-In Function	Built-In Function				KCE620F-VH-01/02 <sup>2</sup>
		Built-In	Built-In Function	Built-In Function		See page 35		KCE620F-VV-01
		Built-In	Built-In Function	Built-In Function		See page 35		KCE1240F-VV-01
		Built-In	Built-In Function	Built-In Function		See page 35		KCE620F-VHW-01
		Built-In	Built-In Function	Built-In Function		See page 35		KCE1240F-VHW-01
<b>Module Pump</b>								
		Built-In	Built-In Function	Built-In Function				KCM310-V-01/02
		Built-In	Built-In Function	Built-In Function				KCM620-V-01/02 <sup>3</sup>
<b>Combination Model</b>								
			Included Parts	Included Parts	Included Parts			KCP100D-VB1-01A
			Included Parts	Included Parts	Included Parts			KCP100D-VB2-01A
DF150×1	Sold Separately		○	Included Parts	Included Parts			KCP150D-VB-01A
		Built-In	○	VC100B/100H				KCP150150D-VV-01A/02A
		Built-In	Built-In Function	Built-In Function				KCE190190E-VV-01/02
DF150×1	Included Parts	Built-In	○	VC100B/100H	PCA10H			KCP150150D-VB-01A/02A
DF150×1	Included Parts	Built-In	Built-In Function	Built-In Function	Built-In Function			KCE190190E-VB-01/02

Accessory (Sold Separately)

## ■ Conversion table

Units of Vacuum		Degree of Vacuum (Gauge pressure)				
From	To	kPa	mmHg	mbar		
1 kPa	→	1	7.5	10		
1 mmHg	→	0.1333	1	1.333		
1 mbar	→	0.1	0.75	1		
Units of Vacuum		Absolute Pressure				
From	To	kPa[abs]	Torr	atm	mbar[abs]	
1 kPa[abs]	→	1	7.5	$9.87 \times 10^{-3}$	10	
1 Torr	→	0.1333	1	$1.316 \times 10^{-3}$	1.333	
1 atm	→	$1.013 \times 10^2$	760	1	$1.013 \times 10^3$	
1 mbar[abs]	→	0.1	0.75	$9.87 \times 10^{-3}$	1	
Units of Pressure		Exhaust Pressure (Gauge Pressure)				
From	To	kPa	kgf/cm <sup>2</sup>	psi	mbar	
1 kPa	→	1	$1.02 \times 10^{-2}$	$1.45 \times 10^{-1}$	10	
1 kgf/cm <sup>2</sup>	→	98.07	1	14.223	$9.807 \times 10^2$	
1 psi(lb/in)	→	6.89	$7.031 \times 10^{-2}$	1	68.9	
1 mbar	→	0.1	$1.02 \times 10^{-3}$	$1.45 \times 10^{-2}$	1	
Units of Capacity						
From	To	cfm	m <sup>3</sup> /h	L/min	L/s	m <sup>3</sup> /s
1 cfm(ft <sup>3</sup> /min)	→	1	1.6992	28.32	0.472	$4.72 \times 10^{-4}$
1 m <sup>3</sup> /h	→	0.589	1	16.67	0.278	$2.78 \times 10^{-4}$
1 L/min	→	0.0353	0.06	1	0.0167	$1.67 \times 10^{-5}$
1 L/s	→	2.119	3.6	60	1	$10^{-3}$
1 m <sup>3</sup> /s	→	2119	3600	60000	1000	1

# Table of Standard Functions by Model

Model	Rotor type					Vacuum Operating Conditions		Control			Visual Function		
	 Scroll Rotor	 Claw Rotor	 2-Stage Rotor	 Roots Rotor	 Dry Slide	 Full-Range Vacuum	 Continuous Attainable Operation	 Inverter eco speed	 Commercial Power Supply Switchover Functionality	 Easy Operation	 Intelligent Touch Panel	 LCD Monitor	 Error Display
<b>Basic Model</b>													
KCPH30-V-01A	○				○	○	○						
KCPH60-V-01A	○				○	○	○						
KCP150D-V-01A		○			○								
KCP250E-V-01		○			○								
KCP100D-V-01A		○			○	○	○						
KCP150D-VH-01A		○			○		○						
KCP250E-VH-01		○			○		○						
<b>Inverter Model</b>													
KCE190F-V-01		○			○			○	○		○		○
KCE190F-V-02		○			○			○	○		○		○
KCE310F-V-01		○			○			○	○		○		○
KCE310F-V-02		○			○			○	○		○		○
KCE380F-V-01		○			○			○	○		○		○
KCE380F-V-02		○			○			○	○		○		○
KCE620F-V-01		○			○			○	○		○		○
KCE620F-V-02		○			○			○	○		○		○
KCE120F-VH-01		○			○	○	○	○	○		○		○
KCE120F-VH-02		○			○	○	○	○	○		○		○
KCE190F-VH-01		○			○		○	○	○		○		○
KCE190F-VH-02		○			○		○	○	○		○		○
KCE310F-VH-01		○			○		○	○	○		○		○
KCE310F-VH-02		○			○		○	○	○		○		○
KCE380F-VH-01		○			○		○	○	○		○		○
KCE380F-VH-02		○			○		○	○	○		○		○
KCE620F-VH-01		○			○		○	○	○		○		○
KCE620F-VH-02		○			○		○	○	○		○		○
KCE620F-VV-01		○			○		○	○	○		○		○
KCE620F-VHW-01		○			○		○	○	○		○		○
KCE1240F-VV-01		○			○		○	○	○		○		○
KCE1240F-VHW-01		○			○		○	○	○		○		○
<b>Module Pump</b>													
KCM310-V-01			○		○	○	○	○			○		○
KCM310-V-02			○		○	○	○	○			○		○
KCM620-V-01			○		○	○	○	○			○		○
KCM620-V-02			○		○	○	○	○			○		○
<b>Combination Model</b>													
KCP100D-VB1-01A				○	○								
KCP100D-VB2-01A				○	○								
KCP150D-VB-01A		○			○								
KCP150150D-VV-01A		○			○					○			
KCP150150D-VV-02A		○			○					○			
KCE190190E-VV-01		○			○			○			○	○	
KCE190190E-VV-02		○			○			○			○	○	
KCP150150D-VB-01A		○			○					○			
KCP150150D-VB-02A		○			○					○			
KCE190190E-VB-01		○			○			○			○	○	
KCE190190E-VB-02		○			○			○			○	○	



# How to Find the Option Part Numbers for the KCE and KCM Series Oil-Free Vacuum Pumps

The manufacturer option part number is 6 digits. Check the option part numbers in the table below and specify it to your dealer. Please contact your dealer regarding water-cooled series models.

Product Model

Manufacturer Optional Item Number

KCE620F-V-01 + 1st Digit 2nd Digit 3rd Digit 4th Digit 5th Digit 6th Digit

## KCE Series Option Numbers

1st Digit Voltage Option		2nd Digit Parts Change		3rd Digit Oil	
0	Standard 200 V, class 3 rating <sup>*1</sup>	0	Standard	0	Standard
1	380 V, 50 Hz option <sup>*1</sup>	1	Change polyester element to VF. <sup>*2</sup>	1	Food-grade oil <sup>*2</sup>
2	400 V, 50/60 Hz option <sup>*1</sup>	2	VF not included		
3	415 V, 50 Hz option <sup>*1</sup>				
4	440 V, 60 Hz option <sup>*1</sup>				

\*1 Japanese Top Runner compliant. External dimensions are the same as the standard. \*2 Cannot be delivered with the standard maintenance set.

\*3 The high-temperature pump exhaust can be changed to any desired location by installing exhaust piping.

## KCM Series Option Numbers

1st Digit Voltage Option		2nd Digit Parts Change		3rd Digit Oil	
0	Standard 200 V, class 3 rating <sup>*1</sup>	0	Standard	0	Standard
1	380 V, 50 Hz option <sup>*1</sup>	1	Change polyester element to VF. <sup>*2 *3</sup>	1	Food-grade oil <sup>*3 *4</sup>
2	400 V, 50/60 Hz option <sup>*1</sup>				
4	440 V, 60 Hz option <sup>*1</sup>				

\*1 Japanese Top Runner compliant. External dimensions are the same as the standard. \*2 The KCM310 cannot be delivered with the standard 5000-h set.

\*3 Not compatible with ESB1100-10 to ESB5500-50. \*4 Cannot be delivered with the standard maintenance set.

## Functional Equipment in Addition to the 6-Digit Part Number Options

Please contact your dealer regarding water-cooled series models.

Function		Corresponding Item	Comments
Control-Related Items		Multi-Unit Control (Eco Speed Box: ESB system)	Can control up to 5 KCM620 units. <sup>*1</sup>
		Multi-Unit Control (Eco Multi Box: EMB system)	Control up to 10 KCE units, up to 5 KCM310 units, or up to 25 KCM620 units. <sup>*1</sup>
		Commercial Power Supply Switchover Spec.	Can automatically switch to operation using a required power supply instead of inverter-drive in emergency situations. <sup>*2</sup>
		Change Default Parameter Settings	Can change settings from their factory defaults.
		Momentary Power Loss Measure (0.2 s)	<sup>*3</sup>
	No Inverter Control	<sup>*4</sup>	
IoT-Related Items		Module Multi Pump Communication Software	By downloading the (free) communication software from our website, remote operation of stop functionality, changing of various settings, and confirmation of operating states is possible.
		Data Acquisition Software	By downloading the (free) data acquisition software from our website, data can be collected about operating states, alarm history, power consumption, and others.
		LAN Communication Board Assembly	The software is required for operation data acquisition. Please purchase separately.
Heat-Output Related Items		Water-Cooling Unit Built-In	Note that this will change the external dimensions.
Pressure Sensor Wire Extension		10m	The standard ESB unit includes a 1.5 m long pressure sensor cable.
		30m	
		50m	
		100m	
Documentation		Additional Instruction Manual	Please indicate number of manuals required.
Factory Witness		Witness Inspection	Standard inspection-standards only.

\*1 380 to 440 V compatibility is also possible. Please consult your dealer. \*2 Operation with a commercial power supply is for emergency use only. Do not use for normal operation. When using a commercial power supply, always use a vacuum controller and gauge.



Example: "KCE620F-V-02-150113"

# KCE620F-V-02+ 1 1 0 1 1 3

Voltage: 380 V, 50Hz spec.

Normal Specification

English Specification

Change polyester element to VF.

Exhaust Piping Specification

Incl. Inspection Results Report and Inspection Manual (both shipped separately).

4th Digit Piping		5th Digit Export		6th Digit Documentation	
0	Standard	0	Standard	0	Standard
1	Exhaust Piping <sup>*3</sup>	1	English Specification <sup>*4</sup>	1	Incl. Inspection Results Report (shipped separately)
		2	Packaging for Export <sup>*5</sup>	2	Incl. Inspection Manual (shipped separately) <sup>*6</sup>
		3	English Specification <sup>*4</sup> Packaging for Export <sup>*5</sup>	3	Incl. Inspection Results Report and Inspection Manual (both shipped separately). <sup>*6</sup>
				4	Incl. Inspection Results Report (shipped separately) <sup>*6</sup>
				5	Incl. Inspection Manual (shipped separately) <sup>*6</sup>
				6	Incl. Inspection Results Report and Inspection Manual (both shipped separately). <sup>*6</sup>

\*4 Will be provided with operation panel in English and instruction manuals and labels in both Japanese and English.

\*5 Packaged in plywood crating with plywood paneling. Plywood crating and plywood paneling may not be an option depending on the country. \*6 ORION in-house certification.

4th Digit Piping		5th Digit Export		6th Digit Documentation	
0	Standard	0	Standard	0	Standard
1	Exhaust Piping <sup>*3 *5</sup>	1	English Specification <sup>*6</sup>	1	Incl. Inspection Results Report (shipped separately)
		2	Packaging for Export <sup>*7</sup>	2	Incl. Inspection Manual (shipped separately) <sup>*8</sup>
		3	English Specification <sup>*6</sup> Packaging for Export <sup>*7</sup>	3	Incl. Inspection Results Report and Inspection Manual (both shipped separately). <sup>*8</sup>
				4	Incl. Inspection Results Report (shipped separately) <sup>*8</sup>
				5	Incl. Inspection Manual (shipped separately) <sup>*8</sup>
				6	Incl. Inspection Results Report and Inspection Manual (both shipped separately). <sup>*8</sup>

\*5 The high-temperature pump exhaust can be changed to any desired location by installing exhaust piping. \*6 Will be provided with operation panel in English and instruction manuals and labels in both Japanese and English. \*7 Packaged in plywood crating with plywood paneling. Plywood crating and plywood paneling may not be an option depending on the country. \*8 ORION in-house certification.

■ =Accessories (Sold separately) ★ =Special Specifications

Inverter Model KCE					Module Multi Model KCM		Eco Speed Box				
KCE120F-VH	KCE190F-V KCE190F-VH	KCE310F-V KCE310F-VH	KCE380F-V KCE380F-VH	KCE620F-V KCE620F-VH	KCM310-V	KCM620-V	ESB1100-10	ESB2200-20	ESB3300-30	ESB4400-40	ESB5500-50
-						o	Connect to the KCM620 according to the number of units.				
EMB10A-NC-01					EMB05ANC-01	EMB25AGC-01	-				
Standard Equipment					★	-	★				
Standard Equipment					★						
★					-		-				
-					Connect Products	Connect to ESB	-				
Connect Products (See page 28)					-		-				
03087958010					-		-				
-					★		-				
-					-	04087140010	-				
-					-	04087140020	-				
-					-	04087140030	-				
-					-	04087140040	-				
★					-		-				
					★						

\*3 Please consult your dealer for measures against momentary power interruptions exceeding 0.2 s. \*4 Vacuum controllers and gauges are user-supplied items.

# How to Find the Option Part Numbers for the KCP Series Oil-Free Vacuum Pumps

The manufacturer option part number is 6 digits. Check the option part numbers in the table below and specify it to your dealer.

Product Model

Manufacturer Optional Item Number

KCP250E-V-01 + 

1st Digit
-----------

2nd Digit
-----------

3rd Digit
-----------

4th Digit
-----------

5th Digit
-----------

6th Digit
-----------

## KCP Series Option Numbers

1st Digit		2nd Digit		3rd Digit	
Voltage Option		Parts Change		Oil	
0	Normal voltage <sup>*1</sup>	0	Standard	0	Standard
1		1	Change polyester element to VF. <sup>*2</sup>	1	Food-grade oil <sup>*2</sup>
2		2	VF not included		
3		3	Includes casters.		
4		4	Change rubber feet to cushion feet. <sup>*3</sup>		
5		5	Change polyester element to VF. <sup>*2</sup> Includes casters.		
6		6	Change polyester element to VF. <sup>*2</sup> Change rubber feet to cushion feet. <sup>*3</sup>		

\*1 Japanese Top Runner compliant. External dimensions are the same as the standard. \*2 Cannot be delivered with the standard maintenance set.

\*3 There are M10 screw holes on the bottom side. \*4 English manuals will be available for other manufacturer options and special-order specifications.

## Functional Equipment in Addition to the 6-Digit Part Number Options

Corresponding Item		Function	Comments
Special Motor	Taiwan Premium-Efficiency Standard Compliant (IE3) 220 V, 60 Hz		Does not include an hour meter. Export packaging available upon request. <sup>*1</sup>
	Safety Enhanced Explosion Proof Motor (eG3 (EXE II T3) )		Note that the pump surface temperature is compliant with eG2 (Exe II T2).
Casters	Incl. 4 Swivel Locking Casters		Installed on-site.
Pressure Gauge	Type D Pressure Gauge		Installed on-site.
	Type A Pressure Gauge		
Vacuum Controller	VC100B		Installed on-site.
	VC100H		
	VC100H-01		
	VC121		
	VC121H		
Check Valve	Swing Check Valve		Not RoHS compliant.
	Ball Check Valve		Some parts are not RoHS compliant.
Export Specification	No motor or hour meter. Packaged for export. (General-purpose motor to be installed at export destination.)		Packaged in plywood crating with plywood paneling. <sup>*2</sup>
Documentation	Additional Instruction Manual		Please indicate number of manuals required.
Factory Witness	Witness Inspection		Standard inspection-standards only.

\*1 If you need a different motor, please confirm the voltage, standard, etc., and ask your dealer.

\*2 Plywood crating and plywood paneling may not be an option depending on the country.

Example: "KCP250E-V-04-061036"

# KCP250E-V-04+

**0 6 1 0 3 6**

- Change polyester element to VF.  
Change rubber feet to cushion feet.
- Normal voltage specification
- Food-grade machine oil
- English specifications and export packaging
- Standard piping measures
- Incl. Inspection Results Report and Inspection Manual. (Both included with the product.)

4th Digit Piping		5th Digit Export		6th Digit Documentation	
<b>0</b>	Standard	<b>0</b>	Standard	<b>0</b>	Standard
		<b>1</b>	English Specification <sup>*4</sup>	<b>1</b>	Incl. Inspection Results Report (shipped separately)
		<b>2</b>	Packaging for Export <sup>*5</sup>	<b>2</b>	Incl. Inspection Manual (shipped separately) <sup>*6</sup>
		<b>3</b>	English Specification <sup>*4</sup> Packaging for Export <sup>*5</sup>	<b>3</b>	Incl. Inspection Results Report and Inspection Manual (both shipped separately). <sup>*6</sup>
				<b>4</b>	Incl. Inspection Results Report (shipped separately) <sup>*6</sup>
				<b>5</b>	Incl. Inspection Manual (shipped separately) <sup>*6</sup>
				<b>6</b>	Incl. Inspection Results Report and Inspection Manual (both shipped separately). <sup>*6</sup>

\*5 Packaged in plywood crating with plywood paneling. Plywood crating and plywood paneling may not be an option depending on the country.

\*6 ORION in-house certification.

■ =Accessories (Sold separately) ★ =Special Specifications

Vacuum Pump Basic Model KCP				
KCP100D-V	KCP150D-V	KCP150D-VH	KCP250E-V	KCP250E-VH
		★		
		★		
		04087045010		
		04100705010		
		04102121010		
03044148010		-	-	-
	03037915010		-	-
03087423010	-	03087423010		-
-	-	-	03087114010	-
-	-	-		03087121010
57002000035		57002000065		57002207110
	03087592010			03087593010
		★		
		★		
		★		

Equipment / Function

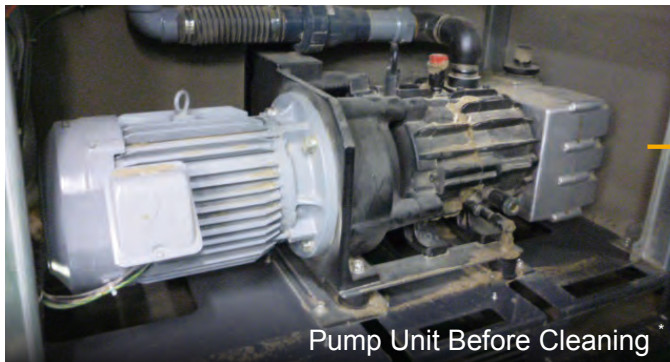
# Why we Recommend Fixed Term Maintenance

(Filter inspection and cleaning, changing gear oil, overhaul)

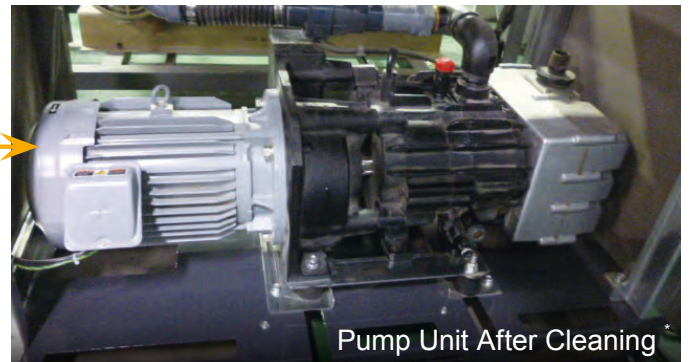
For safe and satisfactory use,  
regular inspections and maintenance.

Clean off dirt and dust from the entire pump body.

Pump body recommended inspection period: Weekly



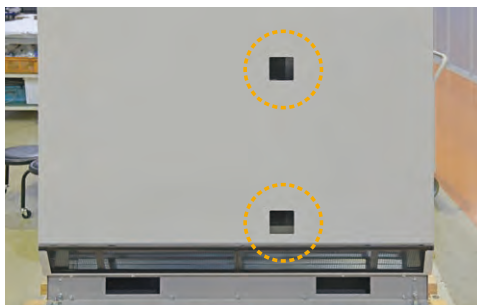
Pump Unit Before Cleaning



Pump Unit After Cleaning

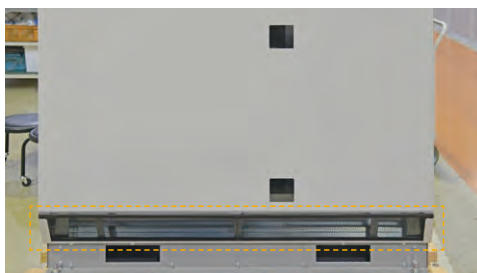
\*Photo: KCE190E-V Pump Unit

## Gear Oil (KCE Models)



- ① Inspect oil color and amount through the oil-inspection window.
- ② If the oil level is below the lower level, then add Genuine ORION Oil.

## Mesh Screen Filter (KCE Models)



- ① Remove the mesh screen filter.
- ② Use a vacuum, brush, water wash, or air blow, etc. to remove any dust.

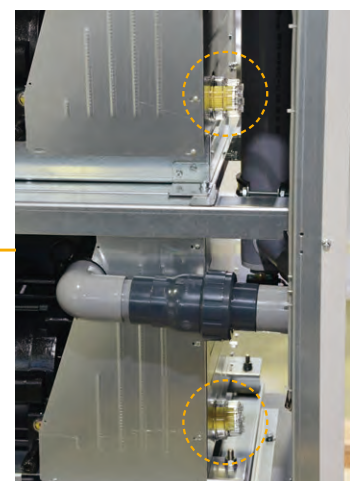
## Top of the Ventilation Fan Screen (KCE Models: Outer Surface)



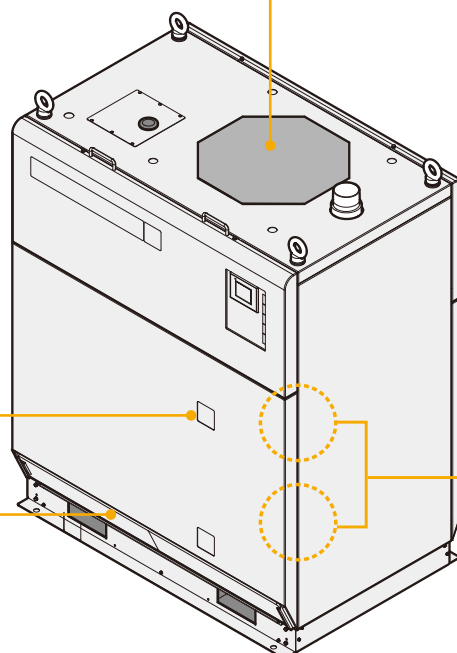
- ① Remove dust using a brush, vacuum cleaner, or air blow, etc.

\*Do not place anything on the ventilation fan outlet.

## Cooling Secondary Intake Filter (KCE Models: Inside)



- ① Remove the front cabinet panel.
- ② Check to see if the filter element is dirty.
- ③ If dirty, remove the filter element, and clean off any dirt using a vacuum cleaner or air blow, etc.





## Other Inspection and Replacement Items \*Refer to the product instruction manual for details on each product.

Inspection Period	KCP100D,150D	KCP250E	KCE120F, 190F, 380F	KCE310F,620F KCE620F(Water-Cooled) KCE1240F(Water-Cooled)	KCM310,620	Combination Pump	
						1-Cylinder Spec.	2-Cylinders Spec.
5000 h Operating Time or 1 Year after First Use	[Common] Tighten pipes. / Check that oil caps, gauges, and screws are not loose. Gear oil replacement / Centrifugal fan inspection and cleaning						
	Inspect rubber feet. / Inspect well nuts. Clean the (optional) controller.	Inspect cushion feet.			Inspect rubber feet. / Inspect well nuts. Clean the (Accessory) controller.	Inspect cushion feet.	
10000 h Operating Time or 2 Year after First Use	[Common] Inspect the coupling element.				Inspect the timing belt.	Inspect the coupling element.	
	/	/	Ventilation fan maintenance / Inspect the ball check valves.			/	Ventilation fan maintenance / Inspect the ball check valves.
20000 h Operating Time or 4 Year after First Use	[Common] Motor unit (Overall)	[Common] Motor unit (Overall)	[Common] Motor unit (Overall)	[Common] Motor unit (Overall)	[Common] Motor unit (Overall)		
	Overhaul (replacement) Pump Unit Silencer noise absorbing material and muffler gasket		Overhaul (replacement) Pump Unit Silencer noise absorbing material and muffler gasket		Overhaul (replacement) Pump Unit Silencer noise absorbing material and muffler gasket		
			Inverter Unit (Overall)	Inverter Unit (Overall)	Inverter Unit (Overall)	/	Inverter Unit (Overall)
30000 h Operating Time or 6 Year after First Use	/	Overhaul (replacement) Pump Unit Silencer noise absorbing material	/	Overhaul (replacement) Pump Unit Silencer noise absorbing material	/	/	/

# ORION Machinery has been combining vac with innovative new technologies, making it a

Since the founding of our company, in addition to our traditional rotary vane vacuum pumps, we have been developing new pumps one after another. In recent years we introduced "Oil-Free Vacuum Pumps and Blowers with Built-In Inverters", which have changed the very concept of these description will continue to innovate in vacuum pumps and blowers and strive to manufacture products that meet our customers' needs.



## Company overview

### Head Office & Main Plant:

246 Kotaka, Suzaka City, Nagano Prefecture  
382-8502, Japan Tel. (main line): +81-(0)26-245-1230  
Site area: 74,000m<sup>2</sup> / Total floor space: 33,000m<sup>2</sup>

**Founded:** November 3, 1946

**Annual Sales:** [Consolidated] ¥53.2 billion  
[Non-consolidated] ¥31.7 billion  
\*As of March 2020

**Capital:** ¥100 million

### The ORION Group:

25 companies (includes overseas subsidiaries) with  
2,276 employees (includes Head Office)



Creating new vacuum pumps and blowers also requires innovation in production methods and manufacturing processes. We offer a wide range of products, from precision metal processing to electronic control technology, and make efforts to motivate our employees to improve their skills in many areas and maintain a high level of quality. Please come and visit us for a factory tour.

### ◀Vibration Testing Equipment

As part of our reliability assessment, products that we develop are subjected to the same vibration and shock that they would incur during actual transport to ensure that they will be delivered undamaged. (Product mass up to 700 kg)

## History of Pump Technology Development

### 1951

#### Vane • Oil Lubricated Pump Technology

Production of Priming Water Vacuum Pumps for Fire Fighting Use

### 1963

#### The First Oil Free Vane Pump in Japan

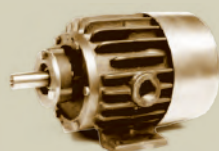
##### Built Into Milking Machines

The physically hard work of milking has been made much easier and less time consuming for the dairy farmer thanks to the advent of bucket milking, which became popular from around 1960.

### 1965

#### First in Japan: Dry Pump Development

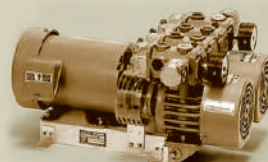
First Debut at the International Trade Fair in Harumi, Tokyo



### 1979

#### 2-Cylinder Combination Technology

An Instant Hit in the Printing Industry



### 1985

#### Low Noise Technology

KD Series Released to Market



### 2005

KRF Winner of the Good Design Prize of Excellence

### 2006

KRF15, 25, 40 Winner of the Red Dot Design Award



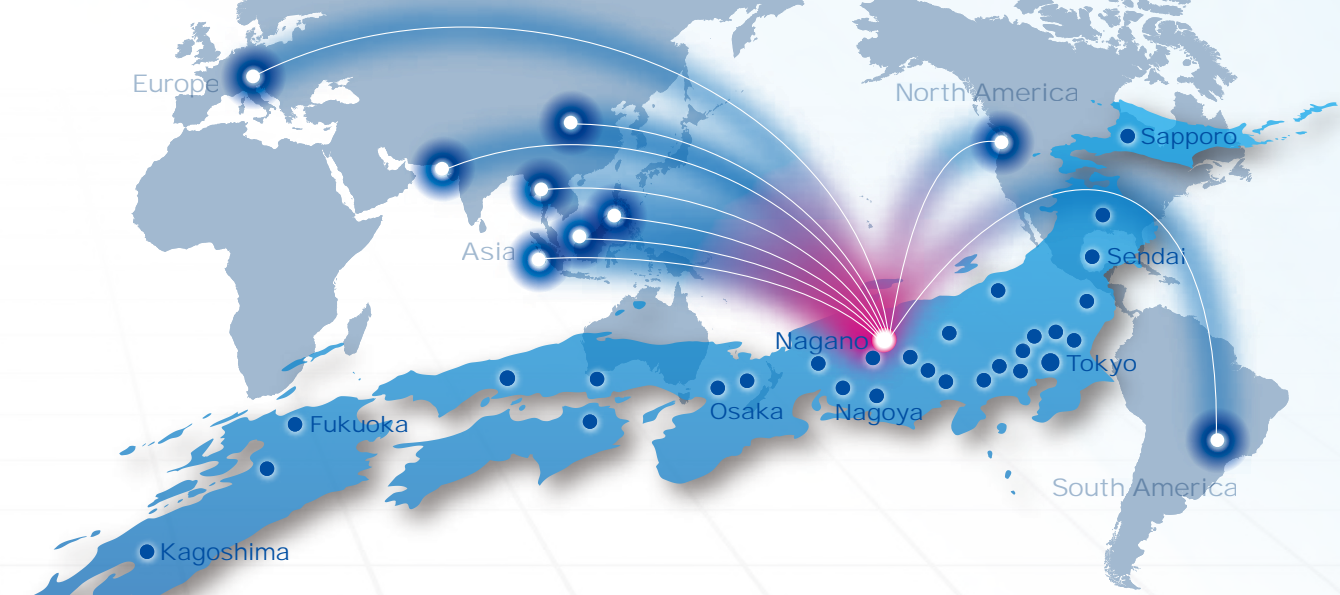
\*Photo: KRF40



# 60 years of vacuum technology accumulated over 60 years true innovator of vacuum pumps and blowers.

## ORION Global Network

Along with industrial demand, the ORION network has been expanding both domestically and internationally. We continue to work with our customers to address any issues and provide optimal solutions.



### In Japan



Chitose Plant



Koshoku Plant



Tochigi Plant



Hokkaidō ORION Co., Ltd.



Kumagai Sales Office



Tokyo Sales Office



Nagoya Sales Office



Osaka Sales Office



West Japan ORION Co., Ltd.

### Foreign Entities



Orion Machinery Asia Co., Ltd.



GEM Orion Machinery (P) LTD.



Orion Machinery (Shanghai) Co., Ltd.



Dongguan Orion Machinery Co., Ltd.



Shanghai Orion Chemical Co., Ltd.  
Shanghai I-Orion Machinery Co., Ltd.



Taiwan Orion Industry Co., Ltd.

### 2010

#### No-Contact Operation Control Technology

Oil-Free Pumps  
Basic Model and Inverter Model  
Released to Market



High Efficiency  
Twin Rotor

Basic Model  
KCP Series



Inverter Model KCE Series

第24回 中小企業優秀新技術・  
新製品賞 優良賞受賞

### 2015

#### KCM Series Winner of Award of Excellence in Energy Saving Equipment



Module Multi Model KCM Series

### 2020

#### Succeeded in producing the world's first 5.5 kW single-stage claw-type vacuum pump with continuous attainable operation.

Basic Model KCP 250E-VH



Inverter model,  
full model change  
KCE-F Series  
The next generation of centralized  
vacuum systems is born!



### 2022

#### Water-Cooled Oil-Free Pump of High Flowrates Released to Market



KCE620F-VW



KCE1240F-VW

## Further Evolution!

# Important Safety Guidelines

## Safety Symbols

The safety precautions listed herein are to ensure safe and proper use of this product for your protection and to prevent losses to you, the surrounding area, and people nearby. Important safety precautions are classified into two categories,

 **WARNINGS** and  **CAUTIONS**.



## DANGER

Mistakes in handling pose imminent risk of death or serious injury to the operator.



## WARNING


Failure to follow instructions contained in a **WARNING** may result in death or serious injury.




## CAUTION

Failure to follow instructions contained in a **CAUTION** may result in personal injury or damage to property.





 symbols inform you of a **WARNING** or **CAUTION** to observe. The illustration within the triangle shows the nature of the precaution. (For example, the symbol at the left indicates possible danger from a rotating fan.)



 symbols indicate actions which must be taken. The illustration within the circle shows the nature of the precaution. (For example, the symbol at the left indicates that the product must be grounded.)



 symbols indicate prohibited actions. The illustration within the circle shows the nature of the action which is prohibited. (The example to the left indicates that user disassembly is prohibited.)

Please note that items noted in  **CAUTIONS** can result in very serious consequences depending on the particular situation. Both **CAUTIONS** and **WARNINGS** must be heeded to ensure adequate safety.



## DANGER

Mistakes in handling pose imminent risk of death or serious injury to the operator.



**Intake of combustible or explosive gases is prohibited.**

Do not allow combustible or explosive gases to enter the product. And never operate the product where combustible or explosive gases may be present. Failure to follow this warning could result in an explosion or fire.



## WARNING

Failure to follow instructions contained in a **WARNING** may result in death or serious injury.



**Product Use Limitations**

- (1) When using this product in connection with important facilities, be sure to establish backup and/or failsafe measures so that even in the event of breakdown of this product, such breakdown won't lead to serious accidents or losses.
- (2) This product is designed and produced as general purpose product to be used in general manufacturing applications. Accordingly, the warranty does not apply to nor cover the following applications. However, in cases where the customer/user takes full responsibility and confirms the performance of the product in advance, and takes necessary safety precautions, please consult with ORION and we will consider if use of the unit in the desired application is appropriate.
  - ① Atomic energy, aviation, aerospace, railway works, shipping, vehicles, medical applications, transportation applications, and/or any applications where it might have a great effect on human life or property.
  - ② Electricity, gas, or water supply systems, etc. where high levels of reliability and safety are demanded.



**Do not operate over the specified pressure.**

Operating the product over the specified pressure will reduce the lifespan of the product and can lead to breakdown, overheating, or accidents.



**Do not operate with a blocked outlet pipe**

Do not operate with the pressure controller fully closed and the exhaust piping blocked. Doing so may cause an abnormal rise in pressure and temperature which could cause pump components to fail or to burst which could in turn lead to serious injury or damage.



**Do not attempt to clean filter elements using organic solvents.**

Do not attempt to clean dirty filter elements, etc., with thinner, alcohol, benzene, gasoline, kerosene, etc. Failure to follow this warning could result in an explosion or fire.



**Never remove the product cover.**

Do not operate with the cover removed. The cooling fan and coupling are moving at high speed and coming into contact with them could lead to serious injury.



**Do not place hands in areas with rotating parts.**

Do not place hands in areas with rotating parts. Doing so could result in a severed finger or hand or other serious injury.



**Do not damage the power cord.**

Do not bundle the cord. Also, do not place objects on the cord or sandwich the cord between things. Doing so could damage the cord and could result in electric shock or fire.



**Do not expose the product to water.**

Do not get water directly on the pump or motor and do not clean the product with water. Do not use in areas where the product may come into contact with water or other liquids. Doing so can result in electric shocks, fire, or product breakdown.



**Electric Shock Warning.**

Do not touch the power cord plug or other electrical components with wet hands. And also do not operate controls with wet hands. Failure to follow this warning can lead to electric shock.



**Do not modify the product.**

Do not modify this product. Modifications can result in improper operation which can lead to injury, electric shock, or fire.



**Always properly ground this product.**

Always ground the product to the ground screw which is located in the terminal box or at the lower part of the frame. Improper grounding can lead to electric shock.



**For proper installation, ask a qualified specialist or technician.**

Failure to properly install the product can lead to electric shock or fire, or injury from the product tipping over or dropping.



**Shut down the product if operation seems abnormal.**

If abnormal operation is observed, stop the product, remove the power plug or cut off the main power, and contact your dealer or a qualified repair person. Continued operation when the product is performing abnormally can lead to electric shock or fire.



**Cut off the power source when cleaning or during inspection.**

Always remove the power source before cleaning, servicing, or inspecting this product. Place a sign on the main power switch that indicates, "POWER OFF FOR CLEANING, SERVICE, INSPECTION". Failure to post such a warning can lead to electric shock or injury.

\* Request installation and inspection of this product from qualified personnel.



**Periodically inspect the power plug.**

For products with a plug on the power cord, periodically inspect the plug for dust and make sure it is inserted all the way in the socket leaving no gap between the plug and socket. Plugs which are dusty or are incompletely seated or connected can lead to electric shock or fire.



**Always install required safety devices.**

Have a qualified person install an earth leakage breaker. Improper installation can result in electric shock or fire. Also install an overload protection device (thermal relay). Failure to do so can result in breakdown or fire due to overload. (KCE and KCM models are "Standard Product" models.)



**Use 2 people when carrying items weighing 25 kg or more.**

Use 2 people when carrying items weighing 25 kg or more. When the product is being carried by 2 people, do not hold the product by the motor terminal box, filter, control panel, or other such parts. Failure to follow this warning could result in injury from the product falling, or damage or breakdown of the product.



**For products weighing 50 kg or more, the product should be moved using a suspension belt.**

For products weighing 50 kg or more, the product should be moved using a suspension belt. Failure to use a suspension belt when moving the product can result in injury or other trouble.



**Make use of eyebolts properly.**

When making use of the eyebolts, suspend the product from 2 eyebolts and make sure there is at least a 60° angle between the top face of the product and each of the suspension cables. Failure to properly suspend the product could result in injury from it tipping over or falling.



**Do not use the product outside.**

This product is for indoor use only. Operating the product outside could expose it to rain, which could lead to damage to the motor insulation and cause electrical shorts or fire.



**Lock caster stops.**

After installing the product, lock the front casters. Failure to lock the casters can result in injury from the pump moving or tipping over, and could also lead to product breakdown.



**Consult your dealer if installation is required in narrow spaces with little or no ventilation.**

Please consult ORION before installing this product in narrow environments with little or no ventilation (such as in a simple box, shed, etc.) Abnormal rises in temperatures could lead to earlier-than-normal pump failure.





# CAUTION

Failure to follow instructions contained in a CAUTION may result in personal injury or damage to property.



**Do not operate the motor outside its specified power rating.**  
Operating the motor outside its specified power rating can lead to breakdown or accidents.



**Do not place other objects on top of the product.**  
Do not place heavy objects or containers of water on the product. Items falling down could lead to injury, spilled water could lead to rust or cause damage to electrical insulation, and there could be a danger of electric shorts or shock.



**Do not operate over the specified pressure.**  
Operating the product over the specified pressure will reduce the lifespan of the product and can lead to breakdown or accidents.



**Burn Hazard.**  
Do not touch the pump surfaces, exhaust port, or exhaust-side piping surfaces as these become hot. Contact with these surfaces or exhaust can cause burns.



**Periodically inspect the earth leakage breaker.**  
Regularly check the function of the breaker. Operating with a faulty earth leakage breaker can result in an electric shock if the breaker fails to activate during electrical trouble.



**Install a check valve.**  
A check valve should be installed horizontally within 50 cm of the pump intake (or exhaust port) because back pressure when the pump is stopped may cause it to turn in reverse. Failure to do so can result in product breakdown. (The KCE has a built-in check valve.)



**Remove the power source if the product is not used for extended periods.**  
If the product is not to be used for an extended period, it should be removed from its power source for safety's sake. Failure to remove power can result in electric shock or combustion due to electric shorts in cases where the insulation deteriorates.



**When unplugging the product, grasp and pull the power cord by the plug.**  
For models that have power cords with electrical plugs, when removing the plug, be sure to grasp and pull the plug from the socket. Attempting to remove the plug by pulling on the cord can damage some of the wires in the cord which could lead to overheating or fire.



**Prevent cable contact damage.**  
Route cables so they do not come into contact with the motor frame. Depending on the type of contact, cable coverings could possibly melt and cause an ignition.



**Wear protective clothing during cleaning and inspection.**  
Wear gloves when undertaking cleaning and inspection. Failure to wear protective clothing can result in burns or other injury from contact with hot surfaces.



**Wear protective clothing when moving the product.**  
Wear non-slip gloves and safety shoes when moving the product. Failure to do so can result in injury.



**Do not use sealing tape on the gauge or controller.**  
Do not use sealing tape when installing the gauge or controller. Overtightening can result in deformation of parts and possibly malfunction of the product.



**Do not install the product in places where there is excessive dust.**



**Use Genuine Oil**  
Breakdown or accidents resulting from the use of other than genuine oil will not be covered by the product warranty.

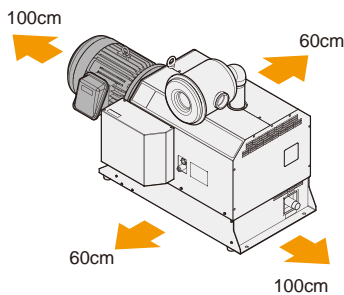


**If installed in parallel with a liquid ring vacuum pump (water ring vacuum pump, etc.), malfunction of check valves or incorrect operation of valves, etc., can result in the intake of liquid, and therefore, in such cases, a (VLS Series) liquid separator should always be installed.**  
If by some chance liquid is sucked into the product, it could result in serious failure of the oil-free vacuum pump.

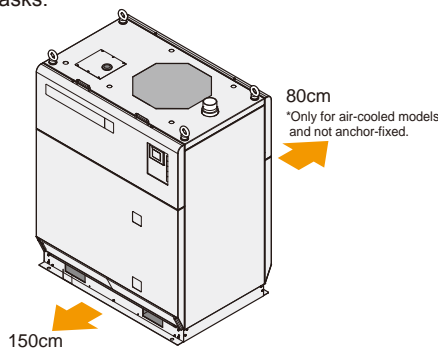
## Regarding Inspection and Maintenance



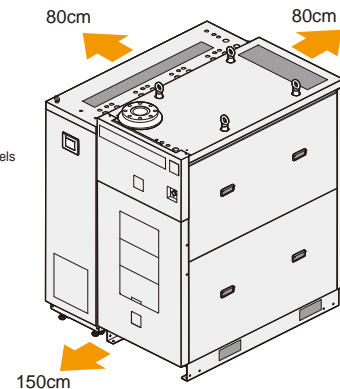
Plan for enough space around the product to facilitate optimum performance as well as a working space for maintenance tasks.



Basic Model



Inverter Model



Module Model

## Regarding Cooling Water Choice (Water-Cooled Series)

Basically, cooling water can be underground water, tap water, or water from a cooling tower. However, the final choice should be made after carefully considering the following points.

- (1) If water other than tap water is to be used as cooling water, please refer to the table on the right, and operate with water that meets the indicated water standards.
- (2) Within the "Tendency toward" column, items marked with a ◦ indicate this component can lead to corrosion or scaling as indicated.
- (3) The 15 items listed to the right are the primary components that can lead to corrosion or scaling.

Item	Cooling Water System		Has Tendency Towards:	
	Circulating Water	Make-up Water	Corrosion	Scaling
pH(25°C)	6.5 - 8.2	6.0 - 8.0	◦	◦
Electrical Conductivity(μS/cm) (25°C)	800 or lower	300 or lower	◦	◦
Chloride Ion(mgCl/L)	200 or lower	50 or lower	◦	◦
Sulfate Ion(mgSO <sub>4</sub> <sup>2-</sup> /L)	200 or lower	50 or lower	◦	◦
Acid Consumption(pH4.8) (mgCaCO <sub>3</sub> /L)	100 or lower	50 or lower		◦
Total Hardness (mgCaCO <sub>3</sub> /L)	200 or lower	70 or lower		◦
Calcium Hardness (mgCaCO <sub>3</sub> /L)	150 or lower	50 or lower		◦
Ionic Silica (mgSiO <sub>2</sub> /L)	50 or lower	30 or lower		◦
Iron (mgFe/L)	1.0 or lower	0.3 or lower	◦	◦
Copper (mgCu/L)	0.3 or lower	0.1 or lower	◦	◦
Sulfide Ion (mgS <sub>2</sub> <sup>-</sup> /L)	None detected.	None detected.	◦	
Ammonium Ion (mgNH <sub>4</sub> <sup>+</sup> /L)	1.0 or lower	0.1 or lower	◦	
Residual Chlorine(mgCl/L)	0.3 or lower	0.3 or lower	◦	
Free Carbon Dioxide (mgCO <sub>2</sub> /L)	4.0 or lower	4.0 or lower	◦	
Ryznar Stability Index	6.0 - 7.0	-	◦	◦

\*Excerpt from JRA-GL-02-1994 of The Japan Refrigeration and Air Conditioning Industry Association

**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-less 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  
PAP10C-W



**Safety  
Precautions**

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

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



ISO9001 / ISO14001 obtained  
at Main Plant, Koshoku Plant  
and Chitose Plant.



Orion Supports the SDGs

**For Orders and Inquiries:**

**ORION MACHINERY CO.,LTD.**

International Group 246, Kotaka, Suzaka-shi, Nagano-ken, 382-8502 Japan  
TEL +81-(0)26-246-5664 FAX +81-(0)26-246-6753  
Email: kokusai@orionkikai.co.jp

Head Office & Factory 246, Kotaka, Suzaka-shi, Nagano-ken, 382-8502 Japan  
TEL +81-(0)26-245-1230 FAX +81-(0)26-245-5424  
URL: <http://www.orionkikai.co.jp>

This catalog contains product specifications as of December, 2020.

- Actual product colors may vary slightly from catalog.
- The structure or specifications of products contained in this catalog are subject to change without prior notice.