NITTO KOHKI

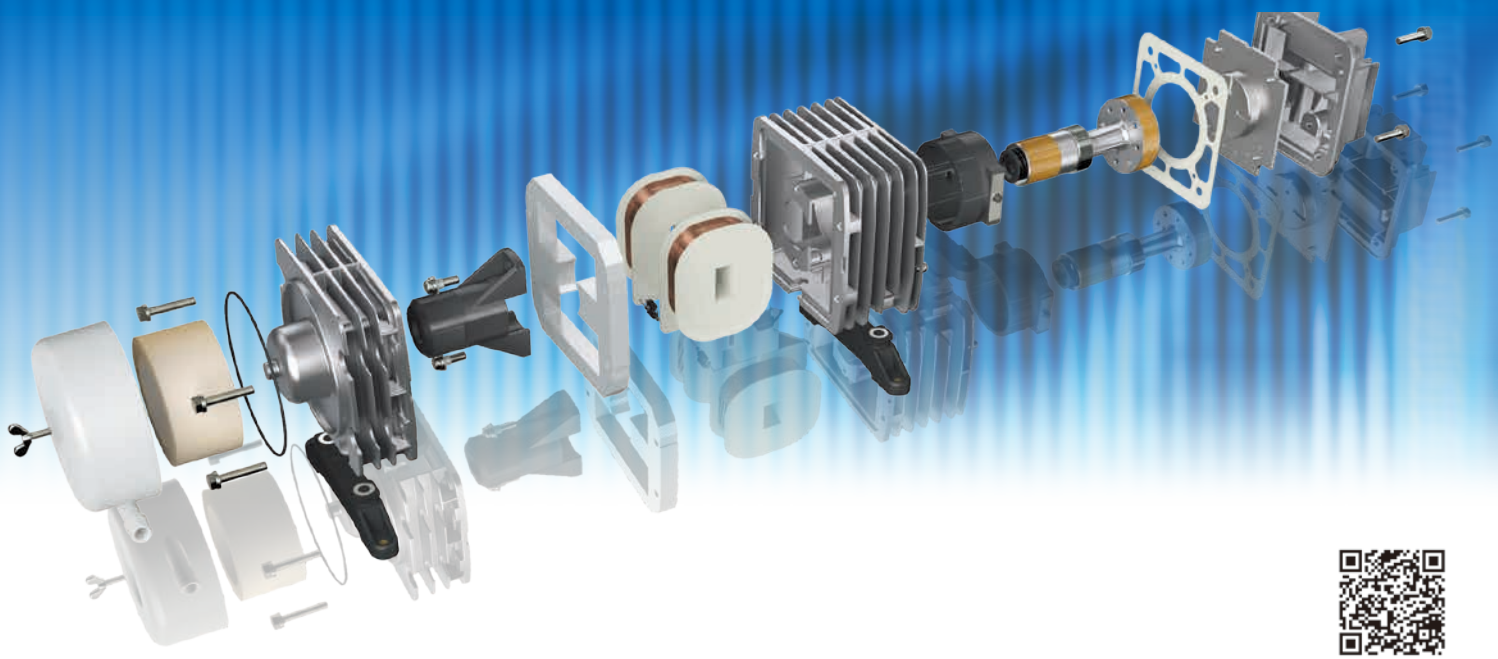
L08en

Linear-motor-driven Free Piston Pumps and other Pumps for various applications

AIR COMPRESSOR, VACUUM PUMP & LIQUID PUMP

LINEAR PRODUCTS OVERVIEW

NITTO KOHKI'S
ORIGINAL FREE PISTON PUMP



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Our air compressors and vacuum pumps are unique products featuring a Linear-motor-driven Free Piston System. Nitto Kohki has made available a complete series of air compressors and vacuum pumps that incorporate this revolutionary mechanism. These are quite appropriate as air sources or vacuum units for various pneumatically operated equipment and apparatus in advanced industries.

Linear-motor-driven Free Piston Mechanism

The Electro-magnet and return spring alternately drive the piston inside the cylinder, the mechanical resonance of which is synchronized with the input current cycle.
In a single mechanism, the piston combines the functions of two normally independent devices; the pump and the motor.

-Mechanism-
YouTube

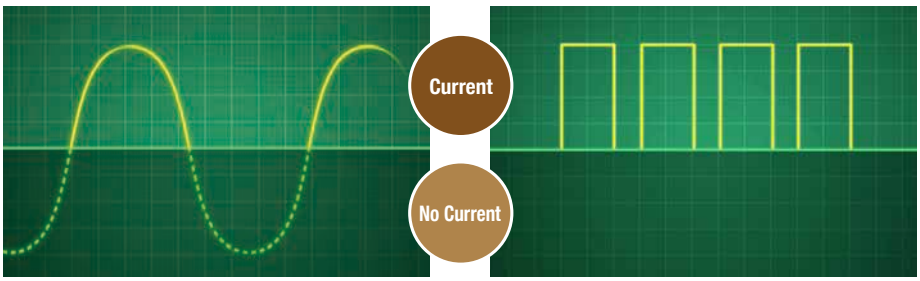
Operating Principle

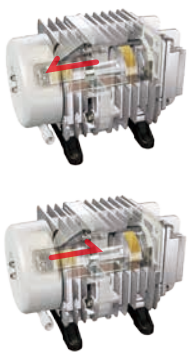
*1) Incorporated in AC models *2) Incorporated in DC models

A silicon diode*1 in between the coils or inverter*2 converts the full-wave input current into half-rectified current. In turn this activates and deactivates the electro-magnet, producing a smooth mechanically resonating action.

A The energized electro-magnet attracts the piston, compresses the return spring, and draws air into the cylinder through the opened inlet valve.

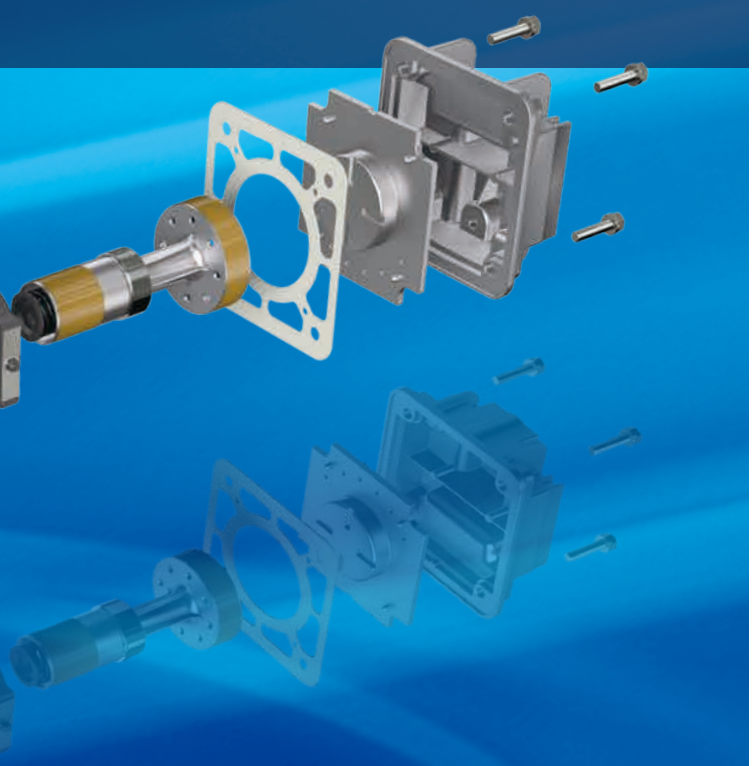
AC Power(The effect of using a silicon diode) **DC Power**(The effect of using an inverter)





B When the electro-magnet is de-energized, the return spring pushes the piston back, forcing the compressed air out of the cylinder through the now opened outlet valve.

Repeating the movements of A and B delivers the function of compressor or vacuum pump.



Compact Integrated Design

This unique system enables the mechanical resonance of a single part. An incredibly compact, lightweight design is achieved by combining what are entirely independent functions in conventional pumps – the motor and the compressor – into a superior single, unified structure.

Self-cooling Design

Cool intake air passes over the coils to reduce and control the rise in the pump's internal temperature. As a result of this feature, it is possible to almost completely seal the unit, thus improving the suppression of internal operating noise.

Overpressure Control Mechanism

Should the output pressure exceed the rated value, the piston will automatically adjust to a shorter stroke. Simultaneously, power consumption will automatically reduce to prevent the motor from failing or being burnt out.

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Nitto Kohki's Official YouTube Channel

Watch our products in action.

www.youtube.com/c/NittoKohkiGLOBAL

YouTube

Green Procurement

Nitto Kohki has made every effort in developing "Environmental Improvement Plans" through the implementation of ISO14001, to execute environmentally conscious business activities on a company-wide basis. As a part of our ongoing commitment to the environment, we are also committed to reduce and/or exclude restricted substances from our products as designated by RoHS directives, laws and regulations of chemical substances.

Series Selection

AC Linear Free Piston Compressor

Model	Rated Pressure		Max. Pressure		Rated Pressure & Max. Pressure	Rated Airflow		Rated Airflow	Pages
	kPa	psig	kPa	psig		L/min	cfm		
AC0102	20	2.84	40	5.69		5	0.177		12
AC0201A	10	1.42	20	2.84		20	0.71		12
AC0301A	10	1.42	30	4.27		28	0.99		12
AC0401A	10	1.42	35	4.98		35	1.24		12
AC0602	15	2.13	35	4.98		40	1.41		12
AC0901	10	1.42	40	5.69		80	2.83		12
AC0902	20	2.84	45	6.40		55	1.94		12
AC0105	50	7.11	80	11.4		2.5	0.088		13
AC0110	100	14.2	120	17.1		0.8	0.028		13
AC0207	70	9.96	100	14.2		3.5	0.124		13
AC0210	100	14.2	120	17.1		3.5	0.124		13
AC0410A	100	14.2	130	18.5		5	0.177		13
AC0610/AC0610A	100	14.2	150	21.3		8	0.283		13
AC0910	100	14.2	150	21.3		16	0.57		13
AC0920	200	28.4	350	49.7		8	0.283		13

0 50 100 150 200 250 300 350 (kPa)

0 20 40 60 80 100 120 (L/min)

AC Linear Free Piston Vacuum Pump

Model	Attainable Vacuum	Attainable Vacuum		Free Air Displacement		Free Air Displacement	Pages
		kPa	in.Hg	L/min	cfm		
VP0125		-33.3	-9.84	7	0.247		15
VP0140		-53.3	-15.7	3	0.106		15
VP0435A		-46.7	-13.8	25	0.88		15
VP0450		-66.7	-19.7	18	0.64		15
VP0625		-33.3	-9.84	40	1.41		15
VP0660		-80	-23.6	25	0.88		15
VP0940		-53.3	-15.7	60	2.12		15
VP0940T		-53.3	-15.7	120	4.24		15

(kPa) -100 -80 -60 -40 -20 0

0 20 40 60 80 100 120 (L/min)

DC Linear Free Piston Compressor

Model	Rated Pressure		Max. Pressure		Rated Pressure & Max. Pressure	Rated Airflow		Rated Airflow	Pages
	kPa	psig	kPa	psig		L/min	cfm		
DAH102-X1	20	2.84	50	7.11		5	0.177		17
DAH102-Y1	20	2.84	50	7.11		5	0.177		17
DAH105-X1	50	7.11	80	11.4		2.5	0.088		17
DAH105-Y1	50	7.11	80	11.4		2.5	0.088		17
DAH110-X1	100	14.2	120	17.1		1.0	0.035		17
DAH110-Y1	100	14.2	120	17.1		1.0	0.035		17

0 50 100 150 200 250 300 (kPa)

0 20 40 60 80 100 120 (L/min)

DC Linear Free Piston Vacuum Pump

Model	Attainable Vacuum	Attainable Vacuum		Free Air Displacement		Free Air Displacement	Pages
		kPa	in.Hg	L/min	cfm		
DVH130-X1		-40	-11.8	7	0.247		17
DVH130-Y1		-40	-11.8	7	0.247		17
DVH145-X1		-60	-17.7	3	0.106		17
DVH145-Y1		-60	-17.7	3	0.106		17

(kPa) -100 -80 -60 -40 -20 0

0 20 40 60 80 100 120 (L/min)

AC Linear Diaphragm Pump (Blower Type)

Model	Rated Pressure		Max. Pressure		Rated Pressure & Max. Pressure	Rated Airflow		Rated Airflow	Pages
	kPa	psig	kPa	psig		L/min	cfm		
VC0100	4	0.57	16	2.28		6	0.212		19
VC0101	10	1.42	20	2.84		10	0.35		19
VC0101S	5	0.71	26	3.70		15	0.53		20
VC0201B	10	1.42	18	2.56		20	0.71		20
VC0301B	10	1.42	20	2.84		25	0.88		20

0 50 100 150 200 250 300 (kPa)

0 20 40 60 80 100 120 (L/min)

AC Linear Diaphragm Pump (Dual Type)

Model	Attainable Vacuum	Attainable Vacuum		Rated Pressure		Max. Pressure		Rated Pressure & Max. Pressure	Rated Airflow		Rated Airflow	Pages
		kPa	in.Hg	kPa	psig	kPa	psig		L/min	cfm		
VC0100		-14.7	-4.33	4	0.57	16	2.28		6	0.212		19
VC0101 120 V		-18.7	-5.51	10	1.42	18	2.56		10	0.35		19
VC0101 230 V		-10	-2.95	10	1.42	15	2.13		10	0.35		19
VC0201B		-18.7	-5.51	10	1.42	18	2.56		20	0.71		20
VC0301B		-21.3	-6.30	10	1.42	20	2.84		25	0.88		20

(kPa) -80 -60 -40 -20 0

0 50 100 150 (kPa)

0 20 40 60 (L/min)

DC Liquid Pump

Model	Working Pressure Range		Working Pressure Range	Flow Rate	Flow Rate	Self-priming Pressure		Self-priming Pressure	Page
	kPa	psig		mL/min		kPa	psig		
DPE-100	0 to 100	0 to 14.2		100		20	2.84		26
DPE-400	0 to 100	0 to 14.2		400		40	5.69		26
DPE-400BL	0 to 100	0 to 14.2		400		40	5.69		26
DPE-800	0 to 100	0 to 14.2		800		40	5.69		26
DPE-100BLC	0 to 100	0 to 14.2		100		10	1.42		26
DPE-200BLC	0 to 100	0 to 14.2		200		20	2.84		26

(kPa) 0 20 40 60 80 100

(mL/min) 0 200 400 600 800

(kPa) 0 20 40 60

*Test conditions: Water at 25 degrees C

Liquid Pump (BIMOR PUMP)

Model	Discharge Pressure		Discharge Pressure	Flow Rate	Flow Rate	Self-priming Pressure		Self-priming Pressure	Pages
	kPa	psig		mL/min		kPa	psig		
BPS-215i	15	2.13		30		3	0.43		27
BPH-214E	18	2.56		350		8	1.14		27
BPH-214G	17	2.41		350		7	1.00		27
BPH-414E	35	4.98		500		12	1.70		27
BPH-474G	35	4.98		400		10	1.42		27
BPH-474P	35	4.98		400		10	1.42		27

(kPa) 0 20 40 60 80 100

(mL/min) 0 200 400 600 800

(kPa) 0 20 40 60

DC Compressor and Vacuum Pump (Dual Type)

Model	Attainable Vacuum	Attainable Vacuum kPa	Attainable Vacuum in.Hg	Max. Pressure kPa	Max. Pressure psig	Max. Pressure	Free Air Displacement L/min	Free Air Displacement cfm	Free Air Displacement	Pages
DP0125		-33.3	-9.84	30	4.27		2.5	0.088		23
DP0140		-53.3	-15.7	50	7.11		4	0.141		23
DP0102		-26.7	-7.87	45	6.40		5	0.177		23
DP0102S		-26.7	-7.87	45	6.40		7	0.247		23
DP0102H-X1		-50.7	-15.0	80	11.4		4	0.141		23
DP0110-X1		-66.7	-19.7	150	21.3		7.5	0.265		24
DP0110-Y1		-66.7	-19.7	150	21.3		7.5	0.265		24
DP0110-X3		-66.7	-19.7	150	21.3		7.5	0.265		24
DP0110T-X1		-60	-17.7	150	21.3		5.5	0.194		24
DP0110T-Y1		-60	-17.7	150	21.3		5.5	0.194		24
DP0210TA-Y1		-60	-17.7	150	21.3		10	0.35		24
DP0105-X1		-66.7	-19.7	250	35.6		2.8	0.099		22
DP0105-Y1		-66.7	-19.7	250	35.6		2.8	0.099		22

(kPa) -80 -60 -40 -20 0 | 0 50 100 150 200 250 (kPa) | 0 20 40 60 (L/min)

DC Compressor only

Model	Attainable Vacuum	Attainable Vacuum kPa	Attainable Vacuum in.Hg	Max. Pressure kPa	Max. Pressure psig	Max. Pressure	Free Air Displacement L/min	Free Air Displacement cfm	Free Air Displacement	Pages
DP0102H-X2				80	11.4		4	0.141		23
DPA0105-X1				220	31.3		2.8	0.099		22
DPA0105-Y1				220	31.3		2.8	0.099		22
DP0410-X2				180	25.6		18	0.64		22
DP0410-Y2				180	25.6		18	0.64		22
DP0410T-Y2				150	21.3		34	1.2		22

(kPa) -80 -60 -40 -20 0 | 0 50 100 150 200 250 (kPa) | 0 20 40 60 (L/min)

DC Vacuum Pump only

Model	Attainable Vacuum	Attainable Vacuum kPa	Attainable Vacuum in.Hg	Max. Pressure kPa	Max. Pressure psig	Max. Pressure	Free Air Displacement L/min	Free Air Displacement cfm	Free Air Displacement	Pages
DP0410-X1		-77.3	-22.8				18	0.64		22
DP0410-Y1		-77.3	-22.8				18	0.64		22
DP0410T-Y1		-77.3	-22.8				34	1.2		22

(kPa) -80 -60 -40 -20 0 | 0 50 100 150 200 250 (kPa) | 0 20 40 60 (L/min)

Experience gained in designing, engineering, manufacturing and continually perfecting our products in thousands of applications has resulted in a "functionally intelligent" package. Please review these key design features and see how every design element contributes overall to the creation of a superior compressor or vacuum pump.

The Key Design Features of the Linear-motor-driven Free Piston System

Compact and Lightweight
With the motor and compressor combined into the single structure

With the piston as the only moving part, efficient space utilization enables our pump to be considerably smaller and lighter than other pumps. This allows the OEM design engineer increased packaging options for other internal components.

Low Vibration
Using an ultra-lightweight piston

Reducing the moving parts to only the piston minimizes reactive force vibrations to the pump body. In addition, the secondary vibrations are isolated or absorbed through the anti-vibration rubber feet.

Low Noise Level
No transmission assemblies, means less noise

With no need for complicated transmission mechanisms riding on ball bearings, or actuating linkages creating friction and noise, NITTO KOHKI's pumps are inherently quieter. Additionally, the almost completely sealed configuration further suppresses secondary internal operating noises.

Clean Operation – Clean Air
Due to oil-less construction

All wearing surfaces use no oil, grease or other contaminating lubricants. The combination of a precision fluoropolymer sleeved piston assisted by an "air-bearing effect" made possible through a unique air path design, assures that the outlet air is completely free of oil.

Low Power Consumption
Truly energy efficient through integrated design

Since the low mass piston is the only moving part, frictional losses are minimized, allowing lower starting and running current, and thus greater efficiency. Related benefits are realized through a lower rise in temperature, facilitating a longer operating life for the pump and the other components within your system.

Overload Protection Structure
Protects against burnout

As the pressure within the compressor increases, the piston stroke decreases. Along with this, electric current decreases. Thus a temporary overload will not cause a failure or the pump to burnout.

Minimal Pulsating Effect
Due to the ideal piston stroke

The piston's mechanical resonance speed is synchronized with the input power frequency regardless of the load, i.e., 3000 strokes at 50 Hz, and 3600 strokes at 60 Hz per minute. This high speed produces shorter pulses which translate into a smoother, more uniform and "linear" motion.

Instant Response
Enabling easy start-ups in frequent on-off short cycle applications

A very low starting current enables our pumps to produce immediate performance in quick short cycle applications, even in the presence of residual back pressure.

Easy Maintenance
Only air filter and piston to change

The oil-less construction requires no lubrication. A simple mechanism containing the piston as the only moving part causes no failure or burning due to an overload and provides stable performance over a long period of time.

Longer Lifetime
Increased OEM value

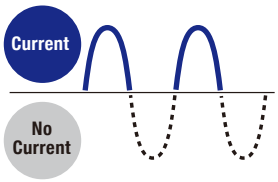
All key design features listed here combine to provide superior performance in all the important aspects of superior pump design. This enables the OEM engineer to have complete confidence in incorporating the unit into the most demanding systems, in the most advanced equipment.

The Mechanism and Structure of Nitto Kohki Pumps

Linear Motor Driven Free Piston System

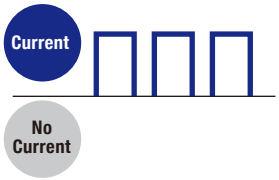
The attractive force of the electromagnet and the reaction force of the spring drive the piston to generate pressure.
There are AC models that use AC waveform and a silicon diode, and DC models that use DC waveform and an inverter.

[AC Power (The effect of using a silicon diode)] AC power



By utilizing the characteristics of the silicon diode, it creates a half-rectified current that repeats ON (current flows) and OFF (no current).

[DC Power (The effect of using an inverter)] DC power



The inverter creates a half-rectified current that repeats ON (current flows) and OFF (no current).

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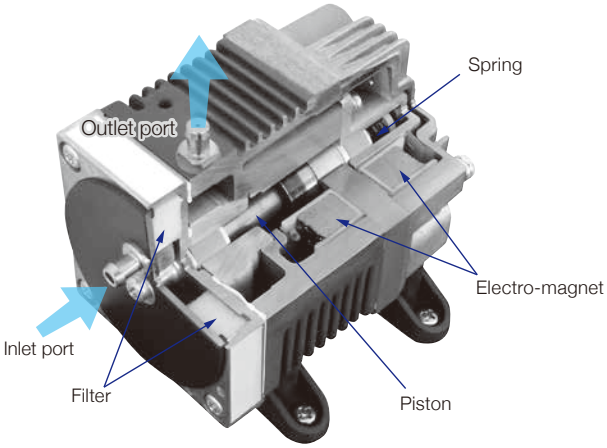
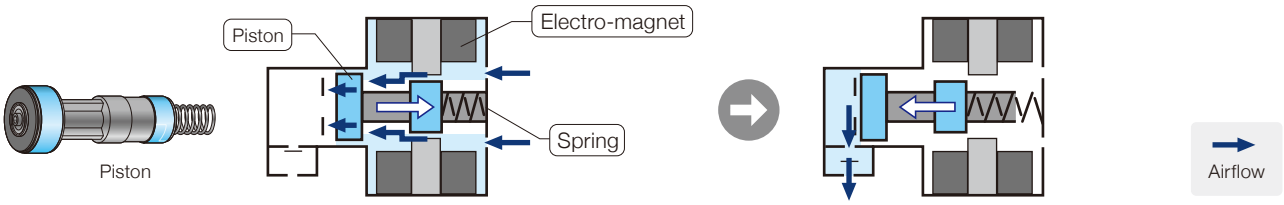




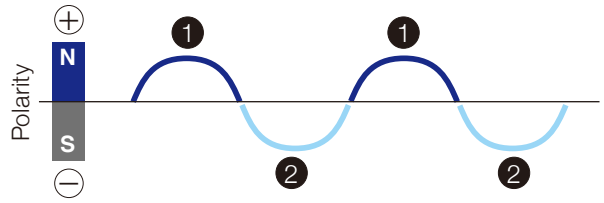
When electric current flows, a magnetic force is generated to pull the piston and the spring is compressed.

When the electric current stops, the magnetic force is lost and the piston is pushed back by the restoring force of the compressed spring.

Electromagnetic Driven Diaphragm System

The attractive / repulsive force of the electromagnet reciprocates a vibrator that moves the diaphragm to generate pressure.

[AC Power (The effect of using a diaphragm)]



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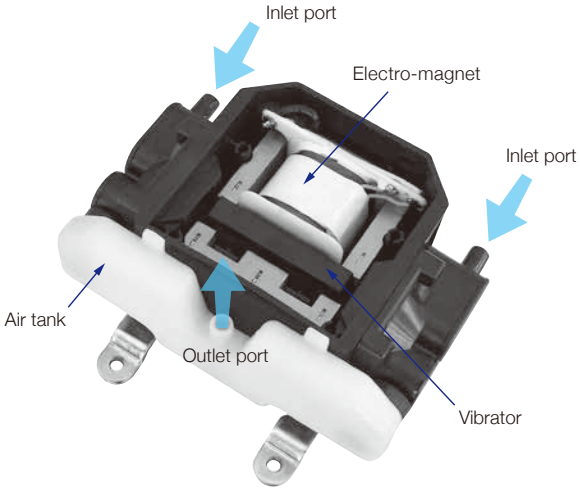
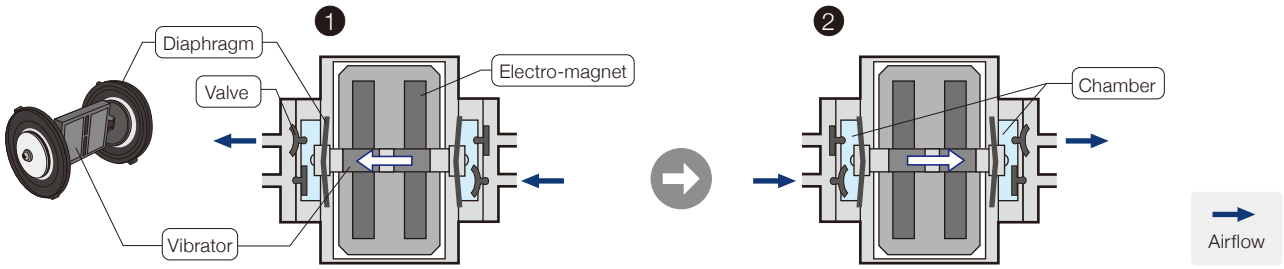
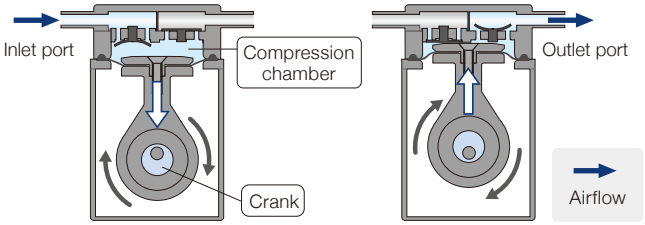


The air is drawn and discharged alternately by the changing polarity of the AC power supply



DC Motor Driven Diaphragm System

The rotational motion of the DC motor is converted into a reciprocating motion by the crank, and moves the diaphragm attached to the connecting rod to generate pressure.



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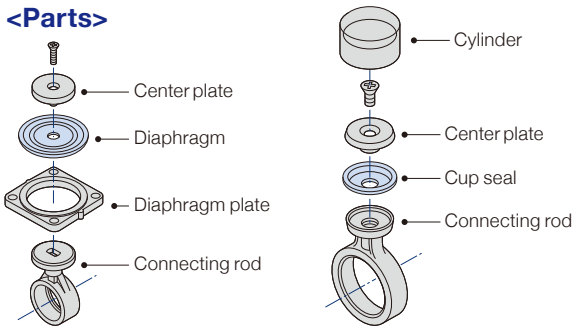
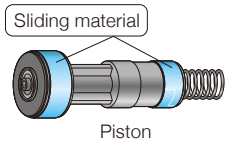


Diaphragm pump

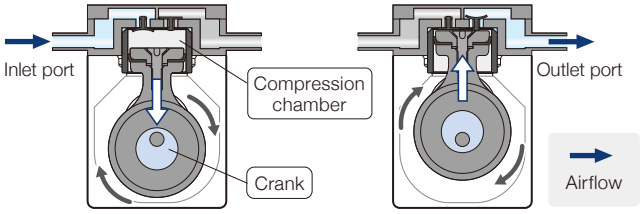
Piston pump (Cup seal system)



The know-how of the piston sliding material used for Nitto Kohki linear compressor and vacuum pump is utilized for the cup seal.

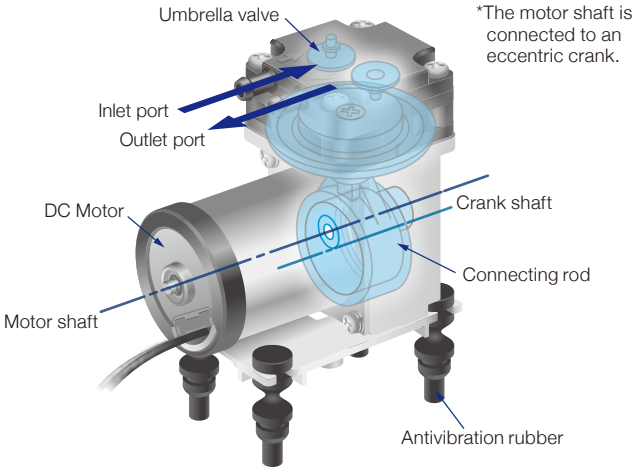
DC Motor Driven Piston Pump (Cup seal system)

The rotational motion of the DC motor is converted into a reciprocating motion by the crank, and moves the cup seal attached to the connecting rod to generate pressure.



The outer circumference of the seal part (cup seal) flexibly follows the inner wall of the cylinder against the dynamic movement of the piston.

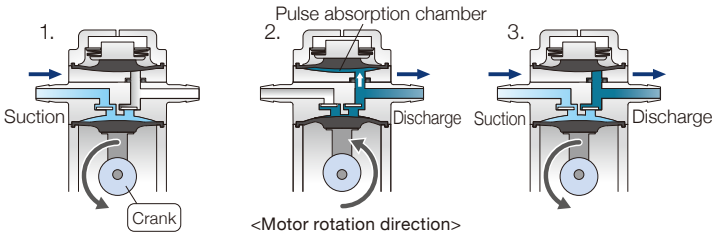
<Structural image> (Common to diaphragm and cup seal)

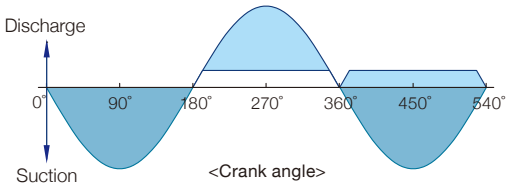


Liquid pump / Diaphragm System

<Pulse absorption mechanism>

1. Suction
2. Discharge. Partial fluid delivery to pulse absorption chamber, not directly forced to outlet port.
3. Cyclical suction drawn into pump is synchronized with the discharge. Pulses are attenuated through the process of 2 and 3 .



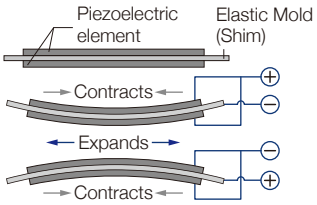


Liquid pump / Piezoelectric pump

<Piezoelectric element>

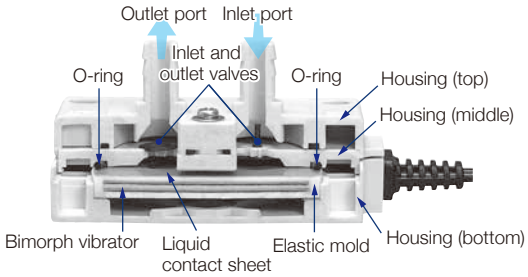
●Bimorph vibrator

BIMOR PUMP's driving force, the bimorph, comprises the elastic mold (Shim) between two parallel piezoelectric wafers.



*The shape of Bimorph is circular.
It deforms when applied with electricity.

<Cross section>



Information Found in the Model Name

The following indications of power consumption, rated pressure and attained vacuum should be used only as a general guideline for model selection.

AC 0102

- 02: Rated Pressure: 20 kPa {0.2 kgf/cm²}
- 01: Rated Consumption: 10 W
- AC: Air compressor

VP 0125

- 25: Attainable Vacuum: -33.3 kPa {-250 mmHg}
- 01: Rated Consumption: 10 W
- VP: Vacuum pump

Explanation of Technical Terms

Be sure to read the following "Explanation of Technical Terms" before selecting a model appropriate for your application.

Application Examples and Applicable Fluids for Compressors and Vacuum Pumps

Application: for incorporation into equipment **Applicable fluid:** Air

For Compressors & Vacuum Pumps

Rated performance:
The average total accumulated time over which the unit can be used without repair, except the maintenance of the filter. This indicates the expected time required for the rated air flow to fall to 80% of the specification value in the rated operation. The actual life might vary depending on the actual operating and environmental conditions such as output pressure setting, maintenance schedule, ventilation, ambient temperature, duty cycle, etc.

MTTF:
MTTF (Mean Time to Failure) is the average time that the product will function before it fails. However, this time is reference only and does not guarantee. Since MTTF depends on your actual operating environment and conditions, conduct performance evaluation test with an actual product prior to use.

Rated voltage:
The two major types are 115 V AC/60 Hz and 230 V AC/50 Hz (excluding DC motors). While most models can be operated at both 50 Hz and 60 Hz with different performance characteristics, there are some models that are frequency specific.

Duty cycle:
The period of operation under the condition that the coil temperature will not exceed the coil insulation class limit.

Rated frequency:
In the case of AC drive pumps, the rated frequency will vary according to the model. While some are designed for only 50 Hz or for 60 Hz, some are designed for both 50 Hz and 60 Hz.

Coil insulations:
The suggested class, most bare units attaining "E" class, is based on Japanese electric regulations. They are merely suggestions since bare units are considered "components" and are not classified as complete products or systems.

Coil Insulation Class(for reference only)	(Temperature limit, degrees C)
A	100
E	115
B	125
F	150

Control method:
Be careful when controlling compressors and vacuum pumps with electronic components because the power factor depends upon the load.

Outside & mounting dimensions:
Useful for assessing the required space for installation. Include sufficient space surrounding the pump when designing it into your application.

Operating ambient temperature: 0 to 40°C

Operating ambient humidity: 30 to 85% non-condensing

Storage environment temperature: -10 to 60°C

Storage environment humidity: 10 to 90% non-condensing

Improvement Suggestion

Our compressors and vacuum pumps employ a unique internal coil cooling feature to reduce or control the rise in internal temperature. If they are operated at higher than rated pressures, elevated temperatures may result. Should these temperatures become excessive, operating duty cycles may need to be reduced, or the use of an auxiliary cooling fan should be considered.

For Compressors

Rated pressure:	This is the pressure point where you will get optimum capabilities for performance and service life and where the pump is designed to have almost the same airflow regardless of a rated frequency of 50 Hz or 60 Hz.
Rated airflow:	The discharge airflow volume at the rated pressure.
Rated operation:	Operating conditions regarding the rated pressure, rated voltage, and rated frequency.
Maximum pressure:	The highest obtainable pressure at which the pump is designed to operate while producing zero discharge airflow (not guaranteed; for reference only).
Power consumption:	The wattage during operation at the rated pressure.
Electric current:	The electric current during operation at the rated pressure (for reference only).
Airflow characteristics:	Discharge pressure-airflow curve (for reference only).
Power consumption characteristics:	Discharge pressure-power consumption curve (for reference only).

For Vacuum Pumps

Attainable vacuum :	The highest vacuum the pump can attain with the pump inlet closed (except some of the exclusive models). *The degree of vacuum shown in this catalog is gauge pressure.
Free air displacement:	The airflow volume at 0 vacuum (within 3 minutes after starting).
Power consumption:	The maximum wattage on the power consumption curve when measured against vacuum levels up to the pumps attainable vacuum.
Electric current:	The maximum electric current on the current characteristics curve when measured against vacuum levels up to the pumps attainable vacuum. (for reference only).
Airflow characteristics:	Vacuum-airflow curve (for reference only).
Power consumption characteristics:	Vacuum-power consumption curve (for reference only).
Exhaust characteristics:	The time required to attain the respective vacuum in a 10 liter container (for reference only).

For DC Pumps

Free air displacement:	The airflow volume at 0 vacuum (within 3 minutes after starting).
Operating ambient temperature:	0 to 40°C (5 to 50°C for DP0105 only)
Operating ambient humidity:	30 to 85% non-condensing

Start-up the pump at the same level as the atmospheric pressure (Similarly in the case of DPE series pumps)

For Liquid Pumps

Self-priming pressure:	The power the pump requires to draw up 25°C water. 1 kPa is equal to the power needed to draw up 25°C water 10 cm.

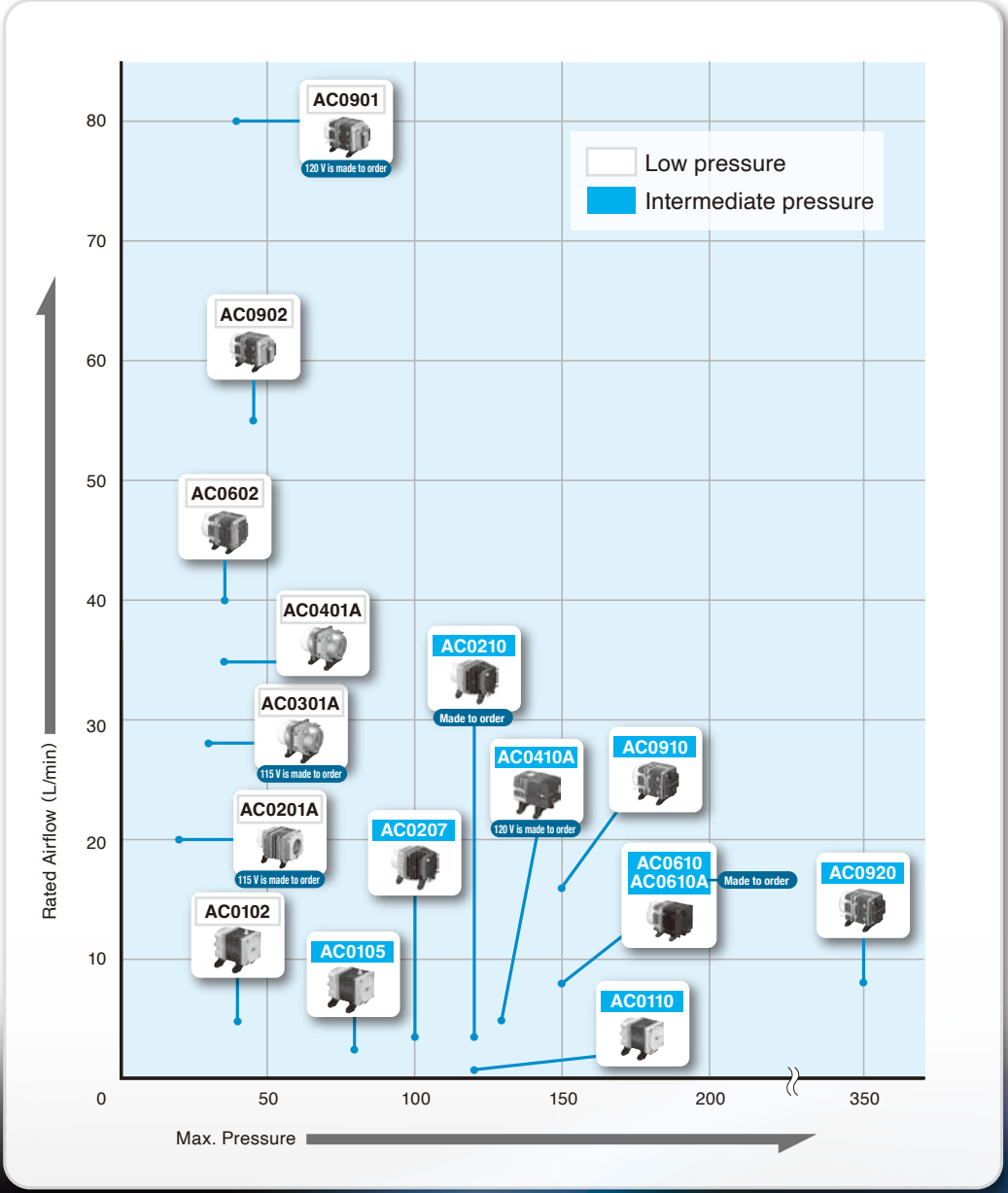
This catalog will give the guidelines needed to determine the appropriate model for your application(s). However, in certain cases you may need further detailed information, which will be provided in the form of a specifications sheet for each model/version by our technical staff who will further assist you in your selection.

Specifications and designs are subject to change at any time without notice.
It is recommended that OEM customers confirm the required specifications in writing before placing orders.

AIR COMPRESSOR

AC series Low pressure

AC series Intermediate pressure



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AC LINEAR

Free Piston Compressor

AC Linear Piston Compressor Low Pressure Series

AC0102

AC0201A

AC0301A / AC0401A

AC0602

AC0901 / AC0902

Specifications

Model	AC0102		AC0201A	
Rated Voltage	115 V AC	230 V AC	115 V AC*	230 V AC
Certifications	UL, CE, UKCA	UL, CE, UKCA	UL, CE, UKCA	CE, UKCA
Rated Pressure	20 kPa 0.2 bar 2.84 psig		10 kPa 0.1 bar 1.42 psig	
Rated Airflow	5 L/min 0.177 cfm		20 L /min 0.171 cfm	
Maximum Pressure	40 kPa (0.4 kgf/cm^2) 0.4 bar 5.69 psig		20 kPa (0.2 kgf/cm^2) 0.2 bar 2.84 psig	
Weight	0.7 kg (1.54 Lbs)		1.5 kg (3.3 Lbs)	
Mounting Dimensions	48 mm(L) × 62 mm(W) 1-$^{57}/_{64}$"(L) × 2-$^{7}/_{16}$"(W)		73 mm(L) × 88 mm(W) 2-$^{7}/_{8}$"(L) × 3-$^{15}/_{32}$"(W)	

*115 V is made to order

Model	AC0301A		AC0401A	
Rated Voltage	115 V AC*	230 V AC	120 V AC	230 V AC
Certifications	UL, CE, UKCA	CE, UKCA	UL, CE, UKCA	CE, UKCA
Rated Pressure	10 kPa 0.1 bar 1.42 psig		10 kPa 0.1 bar 1.42 psig	
Rated Airflow	28 L /min 0.99 cfm		35 L /min 1.24 cfm	
Maximum Pressure	30 kPa (0.3 kgf/cm^2) 0.3 bar 4.27 psig		30 kPa (0.3 kgf/cm^2) 0.3 bar 4.27 psig	35 kPa (0.35 kgf/cm^2) 0.35 bar 4.98 psig
Weight	1.9 kg (4.27 Lbs)		1.9 kg (4.27 Lbs)	
Mounting Dimensions	68 mm(L) × 84 mm(W) 2-$^{43}/_{64}$"(L) × 3-$^{5}/_{16}$"(W)		68 mm(L) × 84 mm(W) 2-$^{43}/_{64}$"(L) × 3-$^{5}/_{16}$"(W)	

*115 V is made to order

Model	AC0602		AC0901	
Rated Voltage	115 V AC	230 V AC	120 V AC*	230 V AC
Certifications	UL, CE, UKCA	CE, UKCA	UL, CE, UKCA	CE, UKCA
Rated Pressure	15 kPa 0.15 bar 2.13 psig		10 kPa 0.1 bar 1.42 psig	
Rated Airflow	40 L /min 1.41 cfm		80 L /min 2.83 cfm	
Maximum Pressure	35 kPa (0.35 kgf/cm^2) 0.35 bar 4.98 psig		40 kPa (0.4 kgf/cm^2) 0.4 bar 5.69 psig	
Weight	3 kg (6.6 Lbs)		4.9 kg (10.8 Lbs)	
Mounting Dimensions	68 mm(L) × 84 mm(W) 2-$^{43}/_{64}$"(L) × 3-$^{5}/_{16}$"(W)		102 mm(L) × 130 mm(W) 4-$^{1}/_{64}$"(L) × 5-$^{1}/_{8}$"(W)	

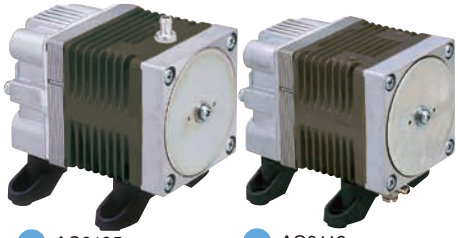
*120 V is made to order

Model	AC0902	
Rated Voltage	115 V AC	230 V AC
Certifications	UL, CE, UKCA	CE, UKCA
Rated Pressure	20 kPa 0.2 bar 2.84 psig	
Rated Airflow	55 L /min 1.94 cfm	
Maximum Pressure	45 kPa (0.45 kgf/cm^2) 0.45 bar 6.4 psig	
Weight	4.9 kg (10.8 Lbs)	
Mounting Dimensions	102 mm(L) × 130 mm(W) 4-$^{1}/_{64}$"(L) × 5-$^{1}/_{8}$"(W)	

AC LINEAR

Free Piston Compressor

AC Linear Piston Compressor
Intermediate Pressure Series



AC0105 AC0110

AC0207 / AC0210

AC0410A

AC0610 / AC0610A

AC0910 / AC0920

Specifications

Model	AC0105		AC0110	
Rated Voltage	115 V AC	230 V AC	115 V AC	230 V AC
Certifications	UL, CE, UKCA	CE, UKCA	UL, CE, UKCA	CE, UKCA
Rated Pressure	50 kPa 0.5 bar 7.11 psig		100 kPa 1.0 bar 14.2 psig	
Rated Airflow	2.5 L /min 0.088 cfm		0.8 L /min 0.028 cfm	
Maximum Pressure	80 kPa (0.8 kgf/cm^2) 0.8 bar 11.4 psig		130 kPa (1.3 kgf/cm^2) 1.3 bar 18.5 psig	120 kPa (1.2 kgf/cm^2) 1.2 bar 17.1 psig
Weight	0.7 kg (1.54 Lbs)		0.7 kg (1.54 Lbs)	
Mounting Dimensions	48 mm(L) × 62 mm(W) 1-$^{57}/_{64}$"(L) × 2-$^{7}/_{16}$"(W)		48.5 mm(L) × 62 mm(W) 1-$^{29}/_{32}$"(L) × 2-$^{7}/_{16}$"(W)	48 mm(L) × 62 mm(W) 1-$^{57}/_{64}$"(L) × 2-$^{7}/_{16}$"(W)

Model	AC0207		AC0210*	
Rated Voltage	115 V AC	230 V AC	115 V AC	230 V AC
Certifications	UL, CE, UKCA	CE, UKCA	CE, UKCA	CE, UKCA
Rated Pressure	70 kPa 0.7 bar 9.96 psig		100 kPa 1.0 bar 14.2 psig	
Rated Airflow	3.5 L /min 0.124 cfm		3.5 L /min 0.124 cfm	
Maximum Pressure	100 kPa (1.0 kgf/cm^2) 1.0 bar 14.2 psig		120 kPa (1.2 kgf/cm^2) 1.2 bar 17.1 psig	
Weight	1.7 kg (3.7 Lbs)		1.7 kg (3.7 Lbs)	
Mounting Dimensions	75 mm(L) × 88 mm(W) 2-$^{61}/_{64}$"(L) × 3-$^{15}/_{32}$"(W)		76 mm(L) × 88 mm(W) 2-$^{63}/_{64}$"(L) × 3-$^{15}/_{32}$"(W)	

*Made to order

Model	AC0410A		AC0610/AC0610A*2	
Rated Voltage	115 V AC*1	230 V AC	115 V AC	230 V AC
Certifications	–	CE, UKCA	UL*3, CE*3, UKCA*3	CE*3, UKCA*3
Rated Pressure	100 kPa 1.0 bar 14.2 psig		100 kPa 1.0 bar 14.2 psig	
Rated Airflow	5 L /min 0.177 cfm		8 L /min 0.283 cfm	
Maximum Pressure	130 kPa (1.3 kgf/cm^2) 1.3 bar 18.5 psig		150 kPa (1.5 kgf/cm^2) 1.5 bar 21.3 psig	
Weight	2.1 kg (4.6 Lbs)		3.2 kg (7.1 Lbs)	
Mounting Dimensions	68 mm(L) × 98 mm(W) 2-$^{43}/_{64}$"(L) × 3-$^{55}/_{64}$"(W)		68 mm(L) × 84 mm(W) 2-$^{43}/_{64}$"(L) × 3-$^{5}/_{16}$"(W)	

*1: 115 V is made to order *2: Made to order *3: AC0610 only

Model	AC0910		AC0920	
Rated Voltage	115 V AC	230 V AC	115 V AC	230 V AC
Certifications	UL, CE, UKCA	UL, CE, UKCA	UL*1, CE*1, UKCA*1	CE*2, UKCA*2
Rated Pressure	100 kPa 1.0 bar 14.2 psig		200 kPa 2.0 bar 28.4 psig	
Rated Airflow	16 L /min 0.57 cfm		8 L /min 0.283 cfm	
Maximum Pressure	150 kPa (1.5 kgf/cm^2) 1.5 bar 21.3 psig		280 kPa (2.8 kgf/cm^2) 2.8 bar 39.8 psig	350 kPa (3.5 kgf/cm^2) 3.4 bar 49.7 psig
Weight	4.9 kg (10.8 Lbs)		5 kg (11 Lbs)	
Mounting Dimensions	102 mm(L) × 130 mm(W) 4-$^{1}/_{64}$"(L) × 5-$^{1}/_{8}$"(W)		102 mm(L) × 130 mm(W) 4-$^{1}/_{64}$"(L) × 5-$^{1}/_{8}$"(W)	

*1: 60 Hz only *2: 50 Hz only

VACUUM PUMP

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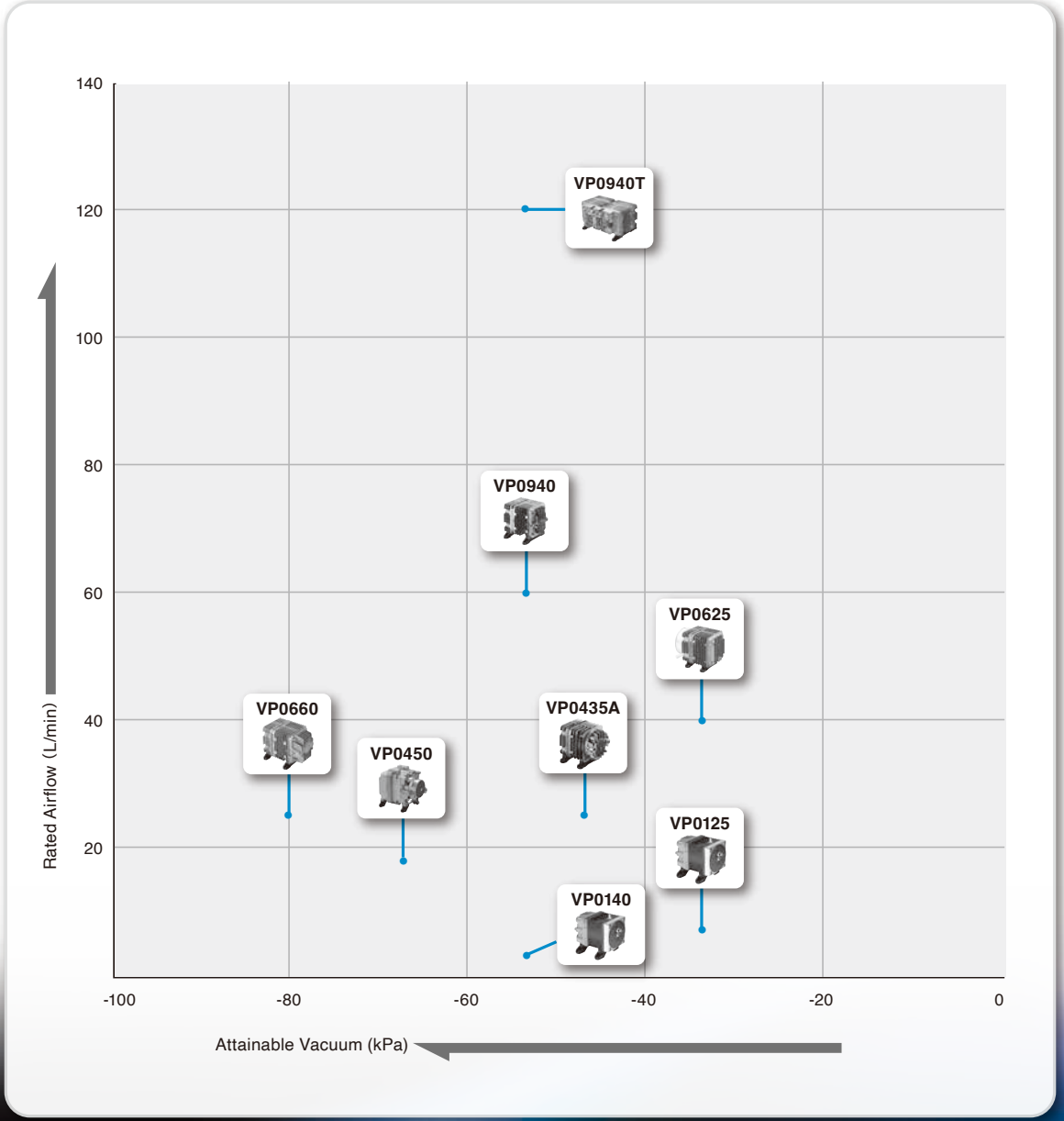
VP series



AC LINEAR

Free Piston Vacuum Pump

AC Linear Piston Vacuum Pump

VP0125 / VP0140

VP0435A

VP0450

VP0625

VP0660

VP0940

VP0940T

Specifications

Model	VP0125		VP0140	
Rated Voltage	115 V AC	230 V AC	115 V AC	230 V AC
Certifications	UL, CE, UKCA	UL, CE, UKCA	UL, CE, UKCA	CE, UKCA
Attainable Vacuum	-33.3 kPa -250 mmHg -333 mbar -9.84 in.Hg		-53.3 kPa -400 mmHg -533 mbar -15.7 in.Hg	
Free Air Displacement	7 L/min 0.247 cfm		3 L /min 0.106 cfm	
Weight	0.7 kg 1.54 Lbs		0.7 kg 1.54 Lbs	
Mounting Dimensions	48 mm(L) × 62 mm(W) 1-$^{57}/_{64}$"(L) × 2-$^{7}/_{16}$"(W)		48 mm(L) × 62 mm(W) 1-$^{57}/_{64}$"(L) × 2-$^{7}/_{16}$"(W)	

Model	VP0435A		VP0450	
Rated Voltage	115 V AC	230 V AC	120 V AC	230 V AC
Certifications	UL, CE, UKCA	CE, UKCA	UL, CE, UKCA	CE, UKCA
Attainable Vacuum	-46.7 kPa -350 mmHg -467 mbar -13.8 in.Hg		-66.7 kPa -500 mmHg -667 mbar -19.7 in.Hg	
Free Air Displacement	25 L /min 0.88 cfm		18 L /min 0.64 cfm	
Weight	2.3 kg 5.1 Lbs		2.2 kg 4.9 Lbs	
Mounting Dimensions	68 mm(L) × 84 mm(W) 2-$^{43}/_{64}$"(L) × 3-$^{5}/_{16}$"(W)		85 mm(L) × 88 mm(W) 3-$^{11}/_{32}$"(L) × 3-$^{15}/_{32}$"(W)	

Model	VP0625		VP0660	
Rated Voltage	115 V AC	230 V AC	115 V AC	230 V AC
Certifications	UL, CE, UKCA	UL, CE, UKCA	UL*1, CE*1, UKCA*1	CE*2, UKCA*2
Attainable Vacuum	-33.3 kPa -250 mmHg -333 mbar -9.84 in.Hg		-80 kPa -600 mmHg -800 mbar -23.6 in.Hg	
Free Air Displacement	40 L /min 1.41 cfm		25 L /min 0.88 cfm	
Weight	3 kg 6.6 Lbs		5 kg 11 Lbs	
Mounting Dimensions	68 mm(L) × 84 mm(W) 2-$^{43}/_{64}$"(L) × 3-$^{5}/_{16}$"(W)		102 mm(L) × 130 mm(W) 4-$^{1}/_{64}$"(L) × 5-$^{1}/_{8}$"(W)	

*1: 60 Hz only *2: 50 Hz only

Model	VP0940		VP0940T
Rated Voltage	115 V AC	230 V AC	230 V AC*
Certifications	UL, CE, UKCA	CE, UKCA	CE, UKCA
Attainable Vacuum	-53.3 kPa -400 mmHg -533 mbar -15.7 in.Hg		-53.3 kPa -400 mmHg -533 mbar -15.7 in.Hg
Free Air Displacement	60 L /min 2.12 cfm		120 L /min 4.24 cfm
Weight	4.55 kg 10 Lbs		10 kg 22 Lbs
Mounting Dimensions	102 mm(L) × 130 mm(W) 4-$^{1}/_{64}$"(L) × 5-$^{1}/_{8}$"(W)		172 mm(L) × 211 mm(W) 6-$^{49}/_{64}$"(L) × 8-$^{5}/_{16}$"(W)

*Please contact us for 115 V AC model.

AIR COMPRESSOR
VACUUM PUMP

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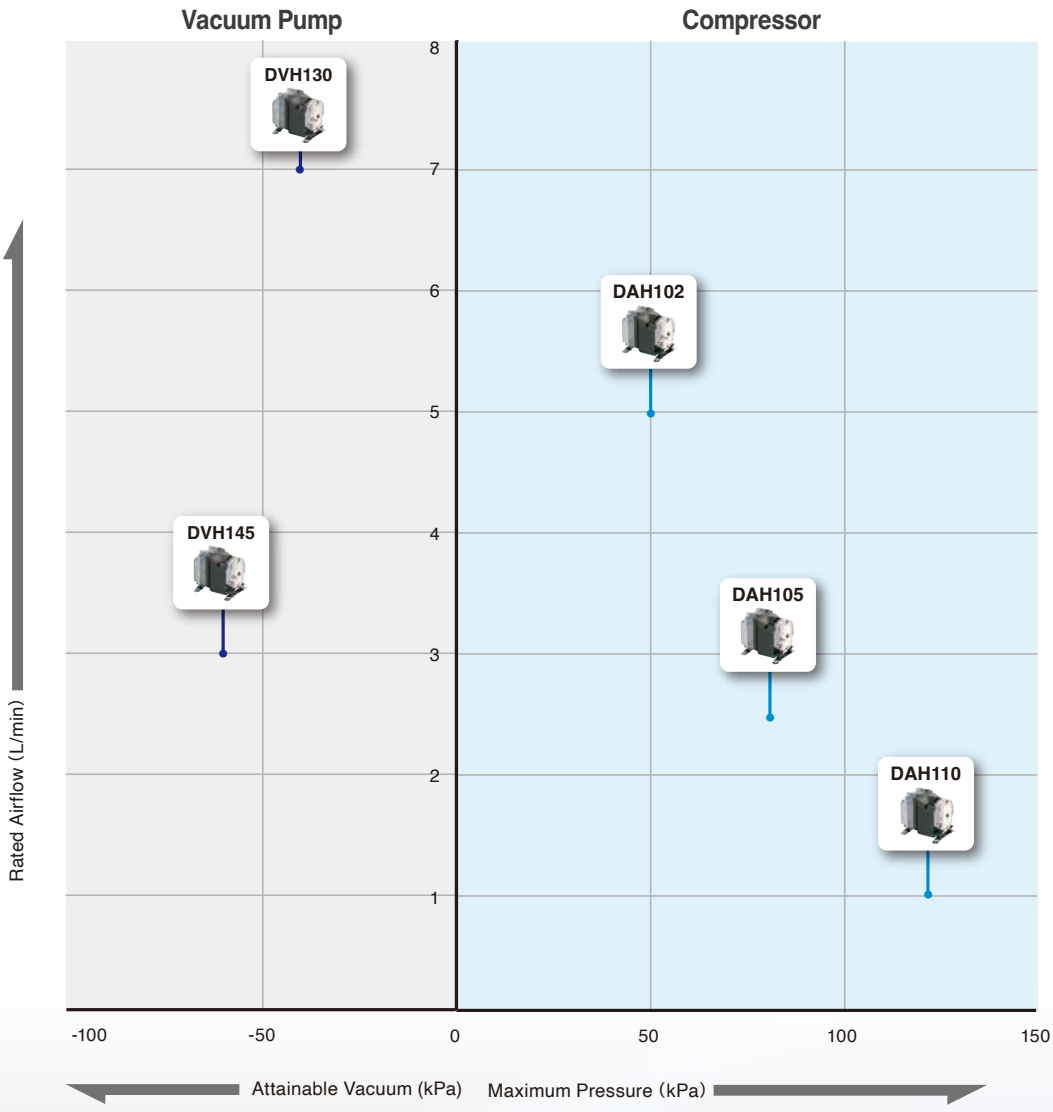

DC LINEAR

Free Piston Compressor
Free Piston Vacuum Pump

DC Linear Piston Compressor

DAH102

DAH105

DAH110

Specifications

Model	DAH102-X1	DAH102-Y1
Rated Voltage	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Rated Pressure	20 kPa 0.2 bar 2.84 psig	
Rated Airflow	5 L/min 0.177 cfm	
Maximum Pressure	50 kPa (0.5 kgf/cm^2) 0.5 bar 7.11 psig	
Weight	0.91 kg 2.01 Lbs	
Mounting Dimensions	76 mm(L) x 70 mm(W) 2-$^{63}/_{64}$"(L) x 2-$^{3}/_{4}$"(W)	

Model	DAH105-X1	DAH105-Y1
Rated Voltage	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Rated Pressure	50 kPa 0.5 bar 7.11 psig	
Rated Airflow	2.5 L /min 0.088 cfm	
Maximum Pressure	80 kPa (0.8 kgf/cm^2) 0.8 bar 11.4 psig	
Weight	0.91 kg 2.01 Lbs.	
Mounting Dimensions	76 mm(L) x 70 mm(W) 2-$^{63}/_{64}$"(L) x 2-$^{3}/_{4}$"(W)	

Model	DAH110-X1	DAH110-Y1
Rated Voltage	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Rated Pressure	100 kPa 1.0 bar 14.2 psig	
Rated Airflow	1.0 L /min 0.035 cfm	
Maximum Pressure	120 kPa (1.2 kgf/cm^2) 1.2 bar 17.1 psig	
Weight	0.91 kg 2.01 Lbs.	
Mounting Dimensions	76 mm(L) x 70 mm(W) 2-$^{63}/_{64}$"(L) x 2-$^{3}/_{4}$"(W)	

DC Linear Piston Vacuum Pump

DVH130 / DVH145

Model	DVH130-X1	DVH130-Y1	DVH145-X1	DVH145-Y1
Rated Voltage	12 V DC	24 V DC	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA	CE, UKCA	CE, UKCA
Attainable Vacuum	-40 kPa -300 mmHg -400 mbar -11.8 in.Hg		-60 kPa -450 mmHg -600 mbar -17.7 in.Hg	
Free Air Displacement	7 L /min 0.247 cfm		3 L /min 0.106 cfm	
Weight	0.91 kg 2.01 Lbs.		0.91 kg 2.01 Lbs.	
Mounting Dimensions	76 mm(L) x 70 mm(W) 2-$^{63}/_{64}$"(L) x 2-$^{3}/_{4}$"(W)			

DIAPHRAGM PUMP

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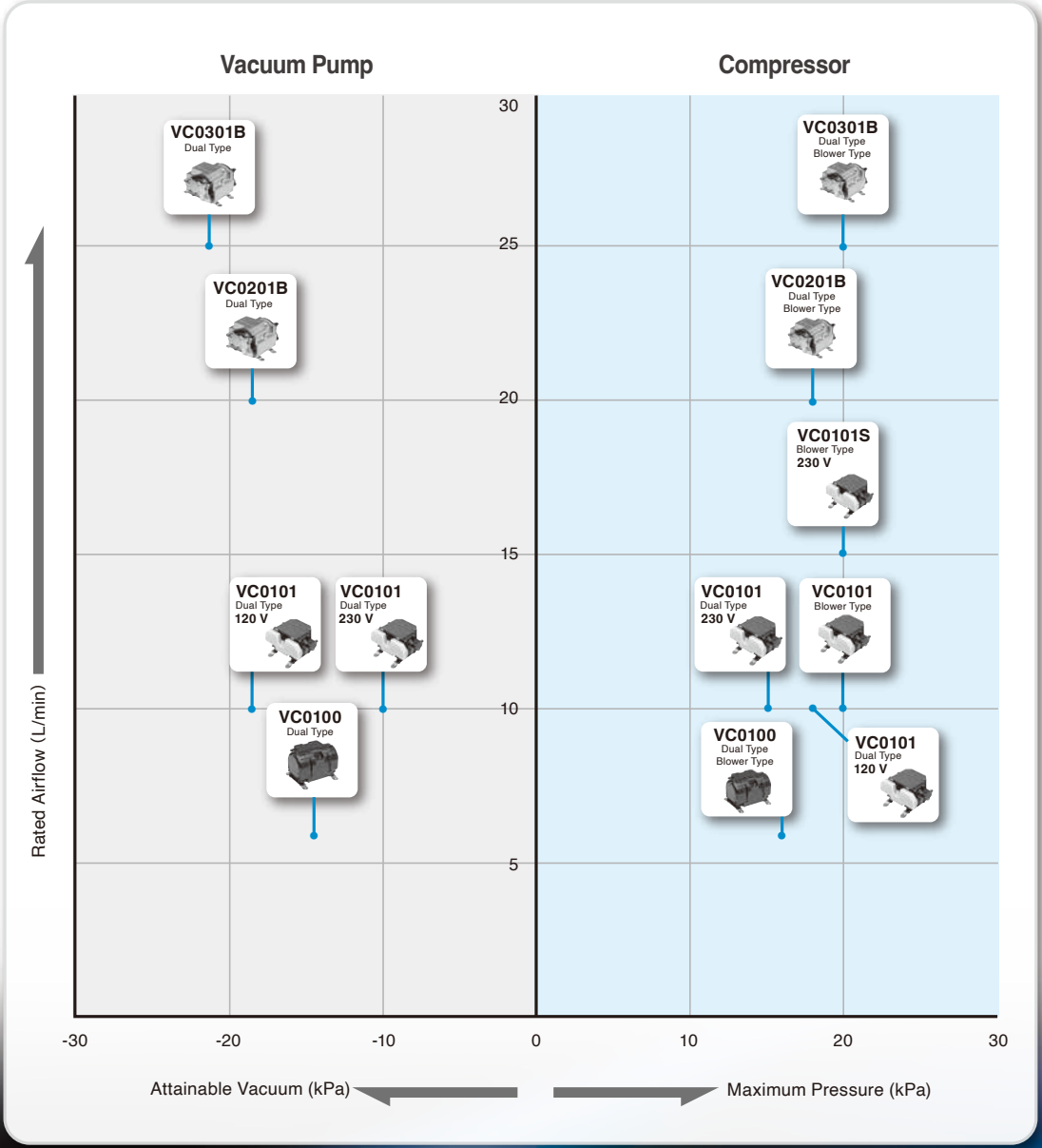
VC series



AC Linear Diaphragm Pump

VC0100

★ Compressor ☆ Vacuum Pump

Specifications

Model	VC0100 ★☆		VC0100 ★	
Type	Dual Type (Compressor and Vacuum Pump)		Blower Type (Compressor)	
Rated Voltage	120 V AC	230 V AC	120 V AC	230 V AC
Certifications	UL, CE, UKCA	CE, UKCA	UL, CE, UKCA	CE, UKCA
Rated Pressure	4 kPa 0.04 bar 0.57 psig			
Rated Airflow	6 L /min 0.21 cfm			
Maximum Pressure	16 kPa (0.16 kgf/cm^2) 0.16 bar 2.28 psig			
Working Pressure Range	-14.7 to 16 kPa -110 mmHg to 0.16 kgf/cm^2 -147 mbar to 0.16 bar -4.33 in.Hg to 2.28 psig		0 to 16 kPa 0 to 0.16 kgf/cm^2 0 to 0.16 bar 0 to 2.28 psig	
Weight	0.45 kg 0.99 Lbs			
Mounting Dimensions	70 mm(L) × 72 mm(W) 2-$^{3}/_{4}$"(L) × 2-$^{53}/_{64}$"(W)			

VC0101

Model	VC0101 ★☆		VC0101 ★	
Type	Dual Type (Compressor and Vacuum Pump)		Blower Type (Compressor)	
Rated Voltage	120 V AC	230 V AC	120 V AC	230 V AC
Certifications	UL, CE, UKCA	CE, UKCA	UL, CE, UKCA	CE, UKCA
Rated Pressure	10 kPa 0.1 bar 1.42 psig			
Rated Airflow	10 L /min 0.35 cfm			
Maximum Pressure	18 kPa (0.18 kgf/cm^2) 0.18 bar 2.56 psig	15 kPa (0.15 kgf/cm^2) 0.15 bar 2.13 psig	20 kPa (0.2 kgf/cm^2) 0.2 bar 2.84 psig	
Working Pressure Range	-18.7 to 18 kPa -140 mmHg to 0.18 kgf/cm^2 -187 mbar to 0.18 bar -5.51 in.Hg to 2.56 psig	-10 to 15 kPa -76 mmHg to 0.15 kgf/cm^2 -100 mbar to 0.15 bar -2.95 in.Hg to 2.13 psig	0 to 20 kPa 0 to 0.2 kgf/cm^2 0 to 0.2 bar 0 to 2.84 psig	
Weight	0.82 kg 1.81 Lbs	0.84 kg 1.85 Lbs	0.82 kg 1.81 Lbs	0.84 kg 1.85 Lbs
Mounting Dimensions	66 mm(L) × 100 mm(W) 2-$^{19}/_{32}$"(L) × 3-$^{15}/_{16}$"(W)			

AC Linear Diaphragm Pump

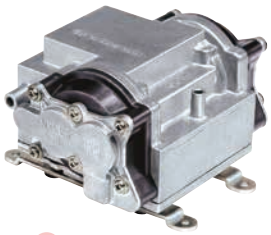
★ Compressor ☆ Vacuum Pump

VC0101S

Specifications

Model	VC0101S ★
Type	Blower Type (Compressor)
Rated Voltage	230 V AC*
Certifications	CE, UKCA
Rated Pressure	5 kPa 0.05 bar 0.71 psig
Rated Airflow	15 L /min 0.53 cfm
Maximum Pressure	26 kPa (0.26 kgf/cm^2) 0.26 bar 3.70 psig
Working Pressure Range	0 to 26 kPa 0 to 0.26 kgf/cm^2 0 to 0.26 bar 0 to 3.70 psig
Weight	0.83 kg 1.81 Lbs
Mounting Dimensions	66 mm(L) × 100 mm(W) 2-$^{19}/_{32}$"(L) × 3-$^{15}/_{16}$"(W)

*Please contact us for 120 V AC model.



VC0201B / VC0301B

Model	VC0201B ★☆		VC0201B ★
Type	Dual Type (Compressor and Vacuum Pump)		Blower Type (Compressor)
Rated Voltage	120 V AC	230 V AC	230 V AC*
Certifications	UL, CE, UKCA	CE, UKCA	CE, UKCA
Rated Pressure	10 kPa 0.1 bar 1.42 psig		
Rated Airflow	20 L /min 0.71 cfm		
Maximum Pressure	18 kPa (0.18 kgf/cm^2) 0.18 bar 2.56 psig		
Working Pressure Range	-18.7 to 18 kPa -140 mmHg to 0.18 kgf/cm^2 -187 mbar to 0.18 bar -5.51 in.Hg to 2.56 psig		0 to 18 kPa 0 to 0.18 kgf/cm^2 0 to 0.18 bar 0 to 2.56 psig
Weight	1.7 kg 3.7 Lbs		
Mounting Dimensions	125 mm(L) × 56 mm(W) 4-$^{59}/_{64}$"(L) × 2-$^{13}/_{64}$"(W)		

*Please contact us for 120 V AC model.

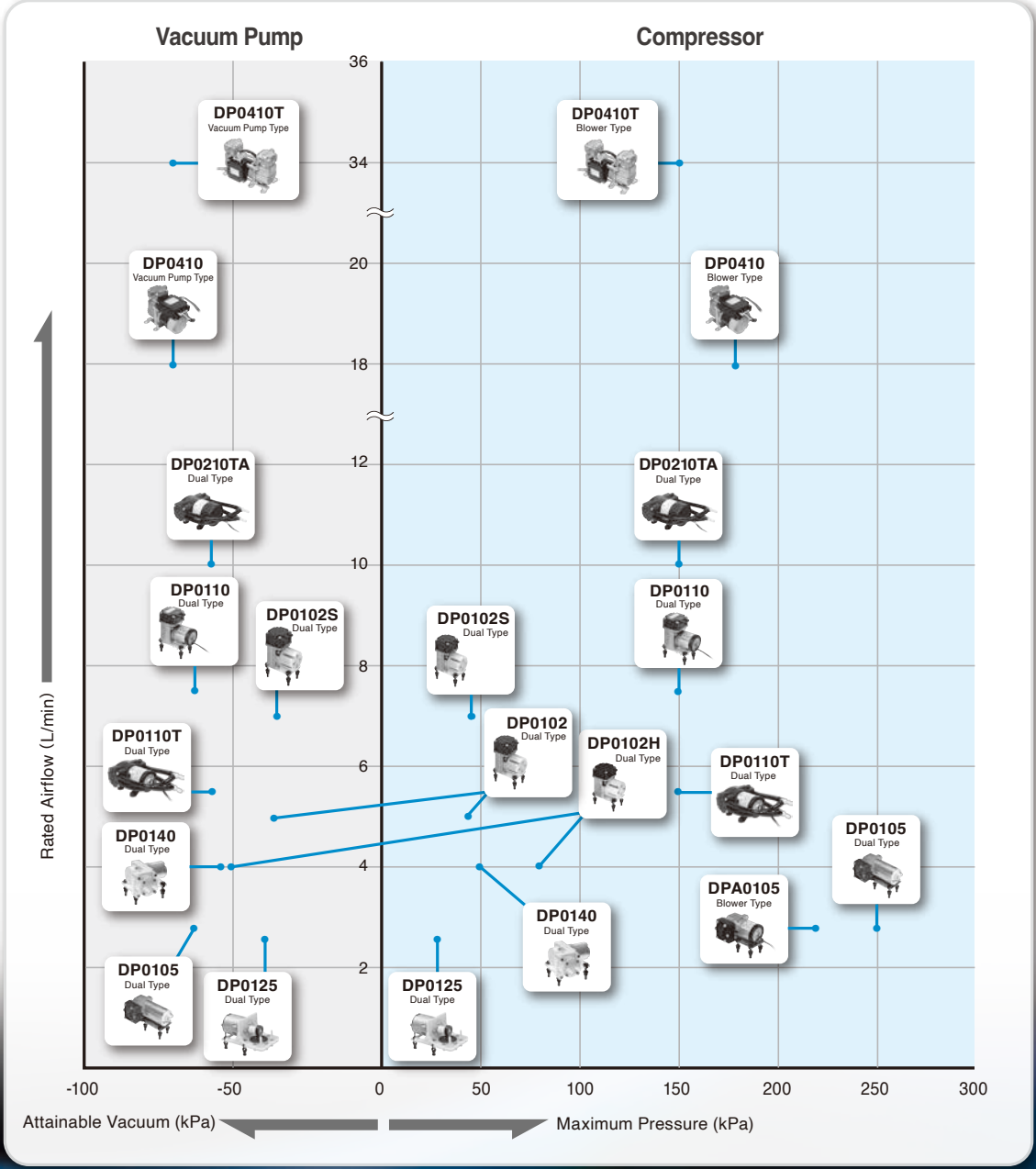
Model	VC0301B ★☆		VC0301B ★
Type	Dual Type (Compressor and Vacuum Pump)		Blower Type (Compressor)
Rated Voltage	120 V AC	230 V AC	230 V AC*
Certifications	UL, CE, UKCA	UL, CE, UKCA	CE, UKCA
Rated Pressure	10 kPa 0.1 bar 1.42 psig		
Rated Airflow	25 L /min 0.88 cfm		
Maximum Pressure	20 kPa (0.2 kgf/cm^2) 0.2 bar 2.84 psig		
Working Pressure Range	-21.3 to 20 kPa -160 mmHg to 0.2 kgf/cm^2 -213 mbar to 0.2 bar -6.3 in.Hg to 2.84 psig		0 to 20 kPa 0 to 0.2 kgf/cm^2 0 to 0.2 bar 0 to 2.84 psig
Weight	1.7 kg 3.7 Lbs		
Mounting Dimensions	125 mm(L) × 56 mm(W) 4-$^{59}/_{64}$"(L) × 2-$^{13}/_{64}$"(W)		

*Please contact us for 120 V AC model.

PISTON PUMP

DIAPHRAGM PUMP

DP series



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Piston Pump

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DC MOTOR DRIVEN

Compressor and Vacuum Pump

Piston Pump

★ Compressor ☆ Vacuum Pump

Specifications

Model	DP0105-X1 ★☆	DP0105-Y1 ★☆	DPA0105-X1 ★	DPA0105-Y1 ★
Type	Dual Type (Compressor and Vacuum Pump)		Blower Type (Compressor)	
Rated Voltage	12 V DC	24 V DC	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA	CE, UKCA	CE, UKCA
Attainable Vacuum	-66.7 kPa (-500 mmHg) -667 mbar -19.7 in.Hg		–	
Free Air Displacement	2.8 L/min (0.099 cfm)		2.8 L/min (0.099 cfm)	
Maximum Pressure	250 kPa (2.5 kgf/cm^2) 2.5 bar 35.6 psig		220 kPa (2.2 kgf/cm^2) 2.2 bar 31.3 psig	
Working Pressure Range	-66.7 kPa to 100 kPa -500 mmHg to 1 kgf/cm^2 -667 mbar to 1 bar -19.7 in.Hg to 14.2 psig		0 to 100 kPa 0 to 1 kgf/cm^2 0 to 1 bar 0 to 14.2 psig	
Weight	0.36 kg (0.79 Lbs)		0.3 kg (0.66 Lbs)	
Mounting Dimensions	42 mm(L) x 24.5 mm(W) 1-$^{21}/_{32}$"(L) x 1-$^{31}/_{32}$"(W)		32 mm(L) x 27.5 mm(W) 1-$^{9}/_{32}$"(L) x 1-$^{5}/_{64}$"(W)	

DP0105

DPA0105
Brushless Motor

Model	DP410-X1 ☆	DP410-Y1 ☆
Type	(Vacuum Pump)	(Vacuum Pump)
Rated Voltage	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Attainable Vacuum	-77.3 kPa (-580 mmHg) -773 mbar -22.8 in.Hg	
Free Air Displacement	18 L /min (0.64 cfm)	
Weight	1.1 kg (2.4 Lbs)	
Mounting Dimensions	70 mm(L) × 45 mm(W) 2-$^{3}/_{4}$"(L) × 1-$^{49}/_{64}$"(W)	

DP0410*
Brushless Motor
*PWM Controllable

Model	DP0410-X2 ★	DP0410-Y2 ★
Type	(Compressor)	(Compressor)
Rated Voltage	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Free Air Displacement	18 L/min (0.64 cfm)	
Maximum Pressure	180 kPa (1.8 kgf/cm^2) 1.8 bar 25.6 psig	
Working Pressure Range	0 to 180 kPa 0 to 1.8 kgf/cm^2 0 to 1.8 bar 0 to 25.6 psig	
Weight	1.1 kg (2.4 Lbs)	
Mounting Dimensions	70 mm(L) × 45 mm(W) 2-$^{3}/_{4}$"(L) × 1-$^{49}/_{64}$"(W)	

DP0410T-Y1*
Brushless Motor
*PWM Controllable

DP0410T-Y2*
Brushless Motor
*PWM Controllable

Model	DP0410T-Y1 ☆	DP0410T-Y2 ★
Type	(Vacuum Pump)	(Compressor)
Rated Voltage	24 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Attainable Vacuum	-77.3 kPa (-580 mmHg) -773 mbar -22.8 in.Hg	–
Free Air Displacement	34 L /min (1.2 cfm)	34 L /min (1.2 cfm)
Maximum Pressure	–	150 kPa (1.5 kgf/cm^2) 1.5 bar 21.3 psig
Working Pressure Range	0 to -77.3 kPa (0 to -580 mmHg) 0 to -773 mbar 0 to -22.8 in.Hg	0 to 150 kPa (0 to 1.5 kgf/cm^2) 0 to 1.5 bar 0 to 21.3 psig
Weight	1.6 kg (3.5 Lbs)	
Mounting Dimensions	166 mm(L) × 84 mm(W) 6-$^{17}/_{32}$" (L) × 3-$^{5}/_{16}$"(W)	

DC MOTOR DRIVEN

Diaphragm Pump

Compressor and Vacuum Pump

DP0125

DP0140

★ Compressor ☆ Vacuum Pump

Specifications

Model	DP0125 ★☆	DP0140 ★☆
Type	(Compressor and Vacuum Pump)	(Compressor and Vacuum Pump)
Rated Voltage	12 V DC	12 V DC
Certifications	CE, UKCA	CE, UKCA
Attainable Vacuum	-33.3 kPa (-250 mmHg) -333 mbar -9.84 in.Hg	-53.3 kPa (-400 mmHg) -533 mbar -15.7 in.Hg
Free Air Displacement	2.5 L /min 0.088 cfm	4.0 L /min 0.141 cfm
Maximum Pressure	30 kPa (0.3 kgf/cm^2) 0.3 bar 4.27 psig	50 kPa (0.5 kgf/cm^2) 0.5 bar 7.11 psig
Weight	0.08 kg (0.18 Lbs)	0.19 kg (0.42 Lbs)
Mounting Dimensions	32 mm(L) × 32.5 mm(W) 1-$^{17}/_{64}$"(L) × 1-$^{9}/_{32}$"(W)	52 mm(L) × 36 mm(W) 2-$^{3}/_{64}$"(L) × 1-$^{27}/_{64}$"(W)

DP0102 / DP0102S
Brushless Motor

Model	DP0102 ★☆	DP0102S ★☆
Type	(Compressor and Vacuum Pump)	(Compressor and Vacuum Pump)
Rated Voltage	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Attainable Vacuum	-26.7 kPa (-200 mmHg) -267 mbar -7.87 in.Hg	
Free Air Displacement	5.0 L/min 0.177 cfm	7.0 L/min 0.247 cfm
Maximum Pressure	45 kPa (0.45 kgf/cm^2) 0.45 bar 6.40 psig	
Working Pressure Range	-26.7 to 45 kPa -200 mmHg to 0.45 kgf/cm^2 -267 mbar to 0.45 bar -7.87 in.Hg to 6.40 psig	
Weight	0.25 kg (0.55 Lbs)	
Mounting Dimensions	50 mm(L) x 30 mm(W) 1-$^{31}/_{32}$"(L) x 1-$^{3}/_{16}$"(W)	

DP0102H
Brushless Motor

Model	DP0102H-X1 ★☆	DP0102H-X2 ★
Type	(Compressor and Vacuum Pump)	(Compressor)
Rated Voltage	12 V DC	12 V DC
Certifications	CE, UKCA	CE, UKCA
Attainable Vacuum	-50.7 kPa (-380 mmHg) -507 mbar -15 in.Hg	–
Free Air Displacement	4.0 L/min 0.141 cfm	
Maximum Pressure	80 kPa (0.8 kgf/cm^2) 0.8 bar 11.4 psig	
Working Pressure Range	-50.7 to 80 kPa -380 mmHg to 0.8 kgf/cm^2 -507 mbar to 0.8 bar -15 in.Hg to 11.4 psig	0 to 80 kPa 0 to 0.8 kgf/cm^2 0 to 0.8 bar 0 to 11.4 psig
Weight	0.25 kg (0.55 Lbs)	
Mounting Dimensions	50 mm(L) x 30 mm(W) 1-$^{31}/_{32}$"(L) x 1-$^{3}/_{16}$"(W)	

DC MOTOR DRIVEN

Diaphragm Pump

Compressor and Vacuum Pump

★ Compressor ☆ Vacuum Pump

DP0110-X1 / DP0110-Y1 / DP0110-X3*
Brushless Motor
*PWM Controllable

Specifications

Model	DP0110-X1/DP0110-X3 ★☆	DP0110-Y1 ★☆
Type	(Compressor and Vacuum Pump)	(Compressor and Vacuum Pump)
Rated Voltage	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Attainable Vacuum	-66.7 kPa (-500 mmHg) -667 mbar -19.7 in.Hg	
Free Air Displacement	7.5 L/min 0.265 cfm	
Maximum Pressure	150 kPa (1.5 kgf/cm^2) 1.5 bar 21.3 psig	
Weight	0.30 kg (0.66 Lbs)	
Mounting Dimensions	50 mm(L) × 30 mm(W) 1-$^{31}/_{32}$"(L) × 1-$^{3}/_{16}$"(W)	

DP0110-T
Brushless Motor

Model	DP0110T-X1 ★☆	DP0110T-Y1 ★☆
Type	(Compressor and Vacuum Pump)	
Rated Voltage	12 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA
Attainable Vacuum	-60.0 kPa (-450 mmHg) -600 mbar -17.7 in.Hg	
Free Air Displacement	5.5 L /min 0.194 cfm	
Maximum Pressure	150 kPa (1.5 kgf/cm^2) 1.5 bar 21.3 psig	
Weight	0.27 kg (0.60 Lbs)	
Mounting Dimensions	36.5 mm(L) × 37.5 mm(W) 1-$^{7}/_{16}$"(L) × 1-$^{15}/_{32}$"(W)	

DP0210-TA-Y1*
Brushless Motor
*PWM Controllable

Model	DP0210TA-Y1 ★☆
Type	(Compressor and Vacuum Pump)
Rated Voltage	24 V DC
Certifications	CE, UKCA
Attainable Vacuum	-60.0 kPa (-450 mmHg) -667 mbar -17.7 in.Hg
Free Air Displacement	10 L/min 0.35 cfm
Maximum Pressure	150 kPa (1.5 kgf/cm^2) 1.5 bar 21.3 psig
Weight	0.32 kg (0.71 Lbs)
Mounting Dimensions	36.5 mm(L) × 37.5 mm(W) 1-$^{7}/_{16}$"(L) × 1-$^{15}/_{32}$"(W)

LIQUID PUMP

Page

Piezoelectric Pump

BIMOR series

BPS Type
BPH Type
BPHS Type — 27
BPF Type

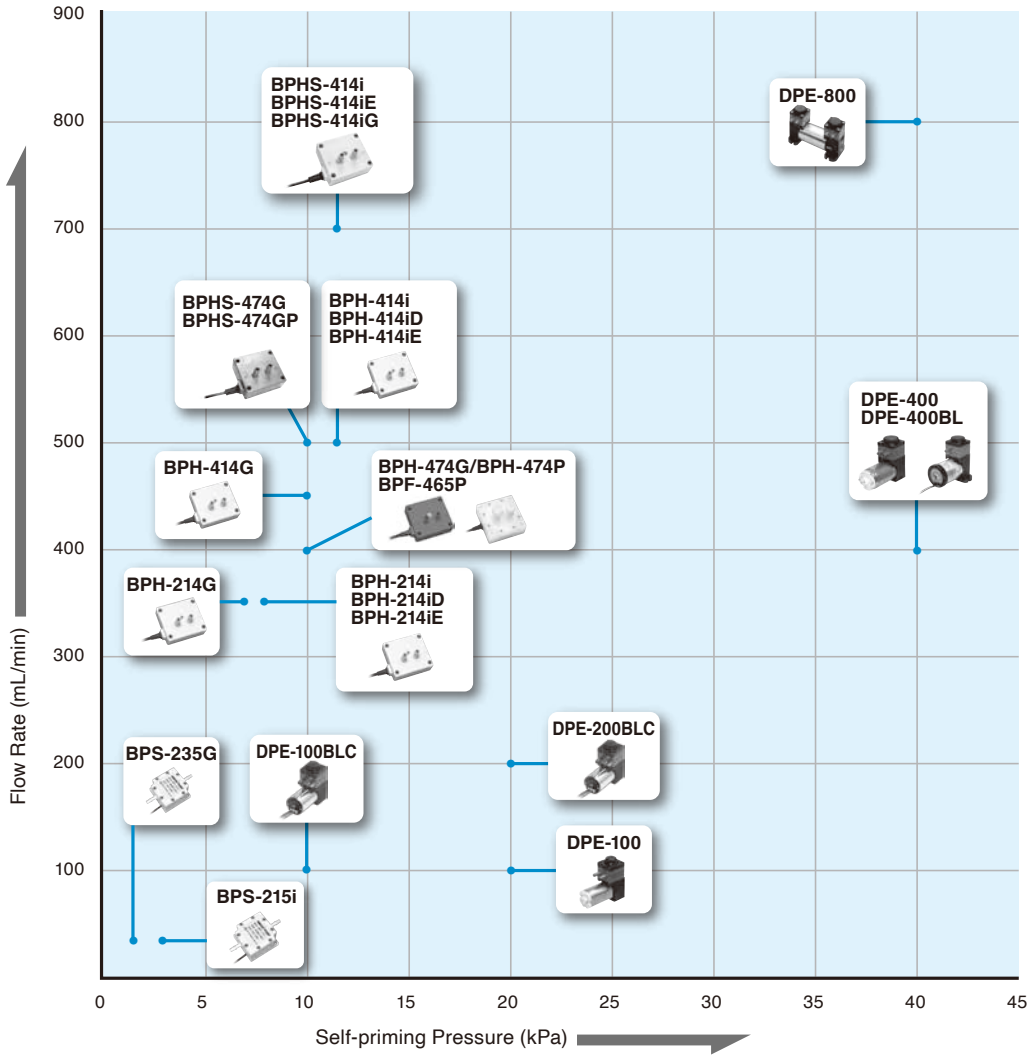
DC Diaphragm Liquid Pump

DPE series

DPE-100
DPE-400 — 26
DPE-400BL
DPE-800

DPE-100BLC — 26
DPE-200BLC

Liquid Pump series



i : Butyl Rubber
G : Fluorine Rubber
D : Dimethyl rubber
E : Ethylene Propylene Rubber
P : Perfluor

LIQUID PUMP

DC Diaphragm Liquid Pump

DPE series - DC Liquid Pump

DPE-100

DPE-400

DPE-800

DPE-400BL
Brushless Motor

DPE-100BLC* / DPE-200BLC*
Brushless Motor
*PWM Controllable

Specifications

Model	DPE-100	DPE-400	DPE-800
Rated Voltage	24 V DC	24 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA	CE, UKCA
Flow Rate*1	100 mL/min 0.0035 cfm	400 mL/min 0.0141 cfm	800 mL/min 0.0283 cfm
Working Pressure Range	0 to 100 kPa 0 to 1.0 kgf/cm^2 0 to 1.0 bar 0 to 14.2 psig		
Maximum Pressure*2	300 kPa (3.0 kgf/cm^2) 3.0 bar 42.7 psig		
Self-priming Pressure*1	20 kPa 0.2 bar 2.84 psig	40 kPa 0.4 bar 5.69 psig	
Maximum Current	100 mA	345 mA	600 mA
Weight	67 g 0.148 Lbs	187 g 0.412 Lbs	350 g 0.771 Lbs
Mounting Dimensions	9.5 mm(L) x 17 mm(W) $^{3}/_{8}$"(L) x 1-$^{43}/_{64}$"(W)	19 mm(L) x 26 mm(W) $^{3}/_{4}$"(L) x 1-$^{1}/_{32}$"(W)	74.5 mm(L) x 41 mm(W) 2-$^{15}/_{16}$"(L) x 1-$^{39}/_{64}$"(W)

Model	DPE-400BL-X1	DPE-400BL-Y1	DPE-100BLC	DPE-200BLC
Rated Voltage	12 V DC	24 V DC	24 V DC	24 V DC
Certifications	CE, UKCA	CE, UKCA	CE, UKCA	CE, UKCA
Flow Rate*1	400 mL/min 0.0141 cfm		100 mL/min 0.0035 cfm	200 mL/min 0.0071 cfm
Working Pressure Range	0 to 100 kPa 0 to 1.0 kgf/cm^2 0 to 1.0 bar 0 to 14.2 psig			
Maximum Pressure*2	300 kPa (3.0 kgf/cm^2) 3.0 bar 42.7 psig			
Self-priming Pressure*1	40 kPa 0.4 bar 5.69 psig		10 kPa (75 mmHg) 0.1 bar 1.42 psig	20 kPa (150 mmHg) 0.2 bar 2.84 psig
Maximum Current	900 mA	450 mA	90 mA	140 mA
Weight	230 g 0.507 Lbs		80 g 0.176 Lbs	
Mounting Dimensions	41 mm(W) 1-$^{39}/_{64}$"(W)		9.5(L) x 17 mm(W) $^{3}/_{8}$"(L) x $^{43}/_{64}$"(W)	

*1: When the check valve is hardened due to low liquid temperature, self-priming performance and flow rate will go down.
*2: Restarting pumps with flow passage closed is impossible.
*: Tubing between two pumping heads must be done in parallel. Tubing in series between the two pumping heads should not be made. This may cause extreme pressure hike that will result in broken parts, liquid splash out or possible ignition. (DPE-800)

Material of wetted parts and applicable fluids

Model	Material of wetted parts					Example of suitable chemical liquid*	Example of unsuitable chemical liquid
	Cylinder Head	Head Cover	Diaphragm	Valve	O-ring		
DPE- ○○ -2E	PA Polyamide(Nylon)		PTFE Polytetrafluoroethylene	EPDM Ethylene-propylene rubber		Caustic soda, Citric acid Ammonia water, Caustic potash, Ethanol	Mineral oil, Trichloroethylene, Benzaldehyde, Carbon tetrachloride, Toluene
DPE- ○○ -2G				FKM Fluoro rubber		Ethanol, Ethylene glycol Sodium carbonate, mineral oil	Chlorosulfonic acid, Folmalin, Glacial acetic acid, Methyl ethyl ketone
DPE- ○○ -7G	PPS Polyphenylene sulfide					Xylene, Carbon tetrachloride Trichloroethylene, Silicon oils, Ethanol	Acetone, Chlorosulfonic acid, Formalin, Ammonia water, Glacial acetic acid
DPE- ○○ -7P				FFKM Perfluoroelastomer		Ethanol, Chloroform, Benzene Glacial acetic acid, Methyl ethyl ketone	Chlorosulfonic acid, Fluorine oil, CFC 112, CFC 113

*This chart is for reference only. Please confirm under the operating conditions before use.

LIQUID PUMP

Piezoelectric Pump

BIMOR PUMP - Piezoelectric Pump

CE 120 V/240 V | UK CA 120 V/240 V

BPS type

BPH type

BPF type*3

BPHS-414 type*3

BPHS-474 type*3

Condition of Use

Ambient temperature	5 to 50°C *1
Ambient humidity	35 to 85% *2
Fluid temperature	5 to 50°C

*1: No Freezing
*2: No condensation

Specifications

Voltage(AC)— 120 V *1					Voltage(AC)— 240 V*1					Material of Wetted Parts			Weight (g)
Model	Current (mA)	Self-priming Pressure (kPa)*2	Flow Rate (mL/min)*2	Discharge Pressure (kPa)	Model	Current (mA)	Self-priming Pressure (kPa)*2	Flow Rate (mL/min)*2	Discharge Pressure (kPa)	Housing	Liquid Contact Sheet	Valve / O-ring	
BPS-215i	3	3	30	15	—	—	—	—	—	PP	PP	IIR	40
BPH-214E	15	8	350	18	BPH-214E	7.5	8	350	18	PP	PP	EPDM	140
BPH-214G	15	7	350	17	BPH-214G	7.5	7	350	17	PP	PTFE	FKM	140
BPH-414E	30	12	500	35	—	—	—	—	—	PP	PP	EPDM	140
—	—	—	—	—	BPH-474G	15	10	400	35	PPS	PTFE	FKM	170
—	—	—	—	—	BPH-474P	15	10	400	35	PPS	PTFE	FFKM/FEP	170

*1: The above performance is obtained by using 25°C water at AC frequency 60 Hz. When the pump is used at AC frequency 50 Hz, the flow rate will decrease approximately 20%.
*2: When the liquid temperature is low, the check valve will harden. As a result, the flow rate and the self-priming pressure will decrease.
For fluorine rubber in particular, the flow rate will decrease by half at 5°C, so select a pump with sufficient allowance.
Since highly viscous liquids decrease the flow rate, please check the flow rate with an actual pump before use.
*3: BPHS, BPF types are made-to-order models. For details, please see our general catalog.

Suitable/unsuitable chemical liquids

Model	Examples of suitable chemical liquids ○	Examples of unsuitable chemical liquids ✕
BPS-215i	Ethanol, Dilute hydrochloric acid, Sodium carbonate, Benzaldehyde, Formalin	Xylene, Mineral oil, Carbon tetrachloride, Trichloroethylene, Toluene, Benzene
BPH-214E BPH-414E	Ammonia water, Ethanol, Dilute hydrochloric acid, Caustic potash, Caustic soda, Methanol	
BPH-214G	Ethanol, Hydrogen peroxide, Mineral oil, Sodium hypochlorite	Acetone, Ammonia water, Glacial acetic acid, Hydrofluoric acid, Formalin
BPH-474G	Ethanol, Xylene, Carbon tetrachloride, Silicone oil, Trichloroethylene	Acetone, Ammonia water, Chlorosulfonic acid, Glacial acetic acid, Hydrofluoric acid, Formalin
BPH-474P	Ethanol, Chloroform, Glacial acetic acid, Benzene, Methyl ethyl ketone	Chlorosulfonic acid, Fluorine oil, CFC 112, CFC 113

*This chart is for reference only. Please confirm under the operating conditions before use.

Material Description

EPDM
Ethylene Propylene Rubber
FEP
Fluoroethylene Propylene
FFKM
Perfluoroelastomer
FKM
Fluorine Rubber
IIR
Butyl Rubber
PP
Polypropylene
PPS
Polyphenylene Sulfide
PTFE
Tetrafluororesin (Polytetrafluoroethylene)

The meaning of each letter in the model name

BP H – 4 1 4 D

Pump type
S : Small type
H : Dismantlable type
F : Chemical-resistant type
HS : High flow type

Diaphragm type
2: Single
4: Double

Housing material
1: Polypropylene (PP)
2: Polyacetal (POM)
6: Fluororesin (Perfluoroalkoxy) (PFA)
7: Polyphenylene Sulfide (PPS)

Pump type
4: Dismantlable type
5: Chemical-resistant type and small type

Rubber material (Valve, O-ring)
i : Butyl Rubber (IIR)
D : Dimethyl Silicon Rubber (VMQ)
E : Ethylene Propylene Rubber (EPDM)
G : Fluorine Rubber (FKM)
P : Perfluoroelastomer (FFKM)

OTHER PRODUCT

		Page
Cutting oil collecting unit	HK-400A	29
Linicon	LV-125A	30

Cutting oil collecting unit

Model HK-400A

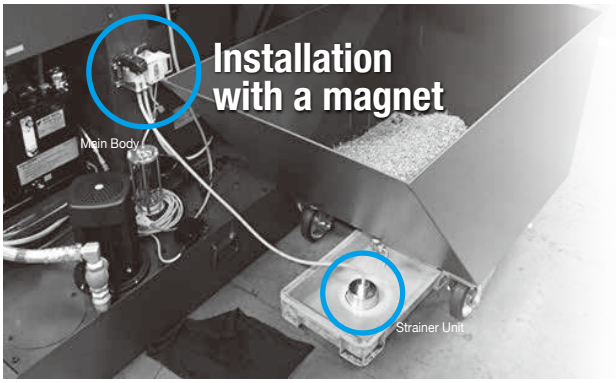
-Oil collecting test-
YouTube

CE 24 V | UKCA 24 V

The HK-400A collects small amounts of cutting oil that spill from machine tools.

*Compatible with both oil-based cutting oils and water-soluble cutting oils

- Install on the side of machines with a magnet.
- No air piping required. Save energy by switching from vacuum ejectors.
- Comes with a strainer to prevent suction of cutting chips.
- Capable of suction of gas & liquid mixture, no worry of motor burns even when idling.

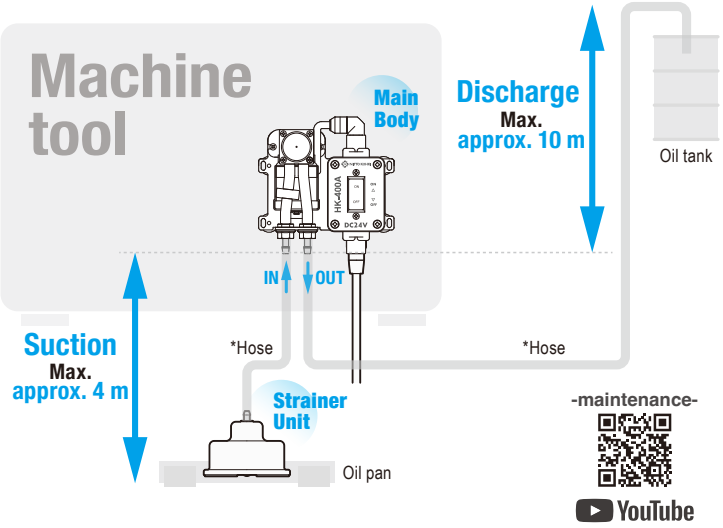


Specifications

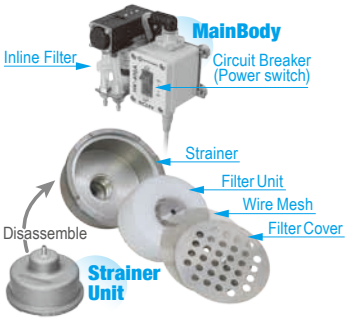
Rated Voltage		24 V DC
Maximum current (*1, Operating pressure range, Fluid: Water 25°C)		450 mA
Flow rate (*1, *3, *4, open discharge (0 kPa), Fluid: Water 25°C)		400 mL/min 0.0141 cfm
Operating pressure range (*1, *2, Fluid: Water 25°C)		0 to 100 kPa (0 to 1 kgf/cm²) 0 to 1 bar 0 to 14.2 psig
Self-priming pressure (*1, *3, Fluid: Air 20°C)		40 kPa (0.4 bar) 5.69 psig
Duty cycle (Fluid: Water 25°C)		Continuous
Rated performance (*5)		6000 hours (MTTF)
Circuit breaker rated current		1 A
Circuit Breaker Box protection grade		IP65
Applicable fluid		Cutting oil (water-soluble and water-insoluble)
Recommended fluid viscosity (*4, *6)		30 mPa•s or less
Place of use		Indoors
External dimensions		119 mm (L)×118 mm (W)×81 mm (H) 4-11/16"(L) x 4-41/64"(W) x 3-3/16
Weight	Main Body (Pump Unit, Circuit Breaker Box)	0.6 kg (1.32 Lbs)
	Power Cable	0.3 kg (0.66 Lbs)
	Strainer Unit	0.3 kg (0.66 Lbs)

*1: Conditions are for rated voltage, cool unit, and initial operation.
*2: The product cannot be restarted from the closed pressure state or used beyond the working pressure range.
*3: When the fluid reaches a low temperature, the check valve hardens and the flow rate and self-suction power will decrease.
*4: When highly viscous cutting oil (2 mPa•s or more) is collected, the flow rate decreases. Especially when using with water-insoluble cutting oil, the fluid viscosity fluctuates significantly according to temperature change, so check whether the pump can be used under actual operating conditions.
*5: Refer to the following formula for conversion from kinematic viscosity [mm²/s] to viscosity [mPa•s].
Viscosity [mPa•s] = Kinematic viscosity [mm²/s] × Density [g/cm³]
(Kinematic viscosity: 1 mm²/s = 1 cSt Viscosity: 1 mPa•s=1 cP)
*6: Refer to the following formula for conversion from kinematic viscosity [mm²/s] to viscosity [mPa•s].
Viscosity [mPa•s] = Kinematic viscosity [mm²/s] × Density [g/cm³]
(Kinematic viscosity: 1 mm²/s = 1 cSt Viscosity: 1 mPa•s=1 cP)

Installation examples



*Hose is not included.
Recommended hose:
Silicone hose ø3 mm×ø9 mm

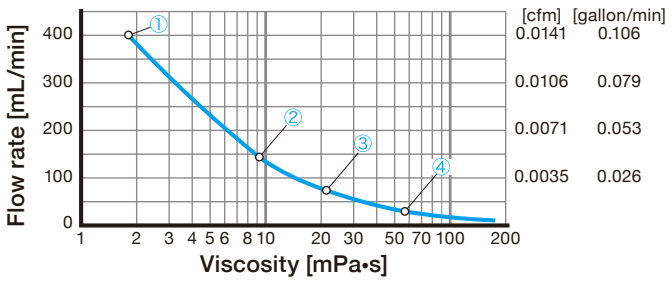


Cutting oil collecting capability

*Refer to the characteristic diagram and conversion formula below and consider whether the product can be used or not.

Viscosity vs. Flow Rate Characteristics

- Input power..... 24 V DC Brown wire: +24 V Blue wire: GND
- Piping conditions... Silicone hose Inner diameter: ø3 mm, length: 4 m No lifting load



	Liquid type	Kinematic viscosity [cSt] [mm²/s] (40°C)	Viscosity [mPa•s] (24±1°C)	Flow rate [mL/min] (24±1°C)
①	Water	-	1.9	400
②	Sample A	7.0	9.4	145
③	Sample B	15.0	21.9	74
④	Sample C	32.5	56.8	27

Viscosity conversion formula
Viscosity [mPa•s] = Kinematic viscosity [mm²/s] × Density [g/cm³]
(Kinematic viscosity: 1 mm²/s = 1 cSt Viscosity: 1 mPa•s = 1 cP)

- Viscosity is measured with the digital viscometer VISCO Low Viscosity Sample Adapter (ULA) manufactured by Atago Co., Ltd.
- Refer to the above formula for conversion from kinematic viscosity to viscosity. For the kinematic viscosity and density of the cutting oil used, contact the cutting oil manufacturer.
- Characteristic diagrams are for reference only and are not guaranteed values.
- The above performance may not be attained depending on the operating conditions (operating environment, liquid type, piping material). Especially when using water-insoluble cutting oil, the fluid viscosity fluctuates significantly depending on the temperature change, so please judge whether the pump can be used or not under actual operating conditions.

Linicon (Vacuum Pump)

Model LV-125A

-Application Examples-
YouTube

CE 230 V | UKCA 230 V

Oil-less Compressor

- **AC linear free piston vacuum pump**
- **Equipped with fuse and removable power cable**
- **Compact and lightweight**
- **Low noise level**
- **Oil-less construction**

Specifications

Rated Voltage	115 V AC	230 V AC
Rated Frequency	60 Hz	50 Hz
Power Consumption	14 W	15 W
Maximum Vacuum	-33.3 kPa (-250 mm Hg, -333 mbar, -9.84 in. Hg)	
Dimensions	135 (L) x 91 (W) x 146 (H) mm (5 - 5/16" x 3 - 37/64" x 5 - 3/4")	
Duty Cycle	Continuous	ON: 10 min, OFF: 10 min or ON: 15 min, OFF: 20 min
Coil Insulation Class	Class B equivalent	Class E equivalent
Weight	1.5 kg (3.3 Lbs)	

Vacuum Pick-Up Set

If the following options are prepared together with Model LV-125A, the Vacuum Pick-Up Set can be arranged.

① LB07629 Vacuum pen assembly
② LQ01267 Tube 3 x 5 x 2000
③ LA71242 Needle 1 x 1.5 x 40 (6 pcs/set)
④ LA71251 Pad 6 mm dia.
⑤ LA71249 Pad 4 mm dia.
⑥ LA71143 Pen stand

The needle can be bent in accordance with applications.
***LA71069 P-100 includes** ① - ⑤

High Adsorption Power

In the case that the depth of vacuum is -33.3 kPa (-250 mmHg) and the surface to be vacuumed is flat.

Pad Diameter	A Suction power when the adsorption face is placed horizontally and moved upward.	B Suction power when the adsorption face is placed vertically and moved laterally.
4 mm	20 g	10 g
6 mm	50 g	25 g

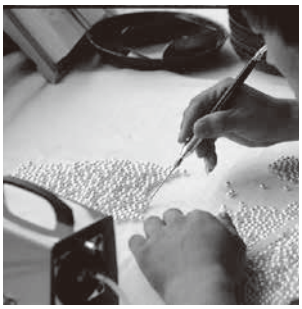
Adsorption power: W (g) = D^2 x 7.85 x 250/736

A is calculated by multiplying the safety rate of 0.5 to the above equation, and then rounded.

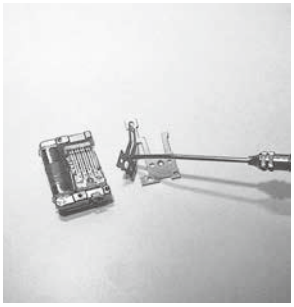
B is calculated by multiplying the safety rate of 0.25 to the above equation, and then rounded.

Application Examples

Transferring spherical objects such as balls

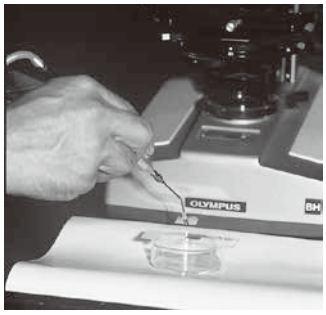


Assembling precision parts



Moving tiny parts

Transferring uneven parts



Most suitable for handling electronic parts such as ICs and LSIs. Also small parts, micro parts such as those in watches and chemicals.

Air Compressor, Vacuum Pump & Liquid Pump

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