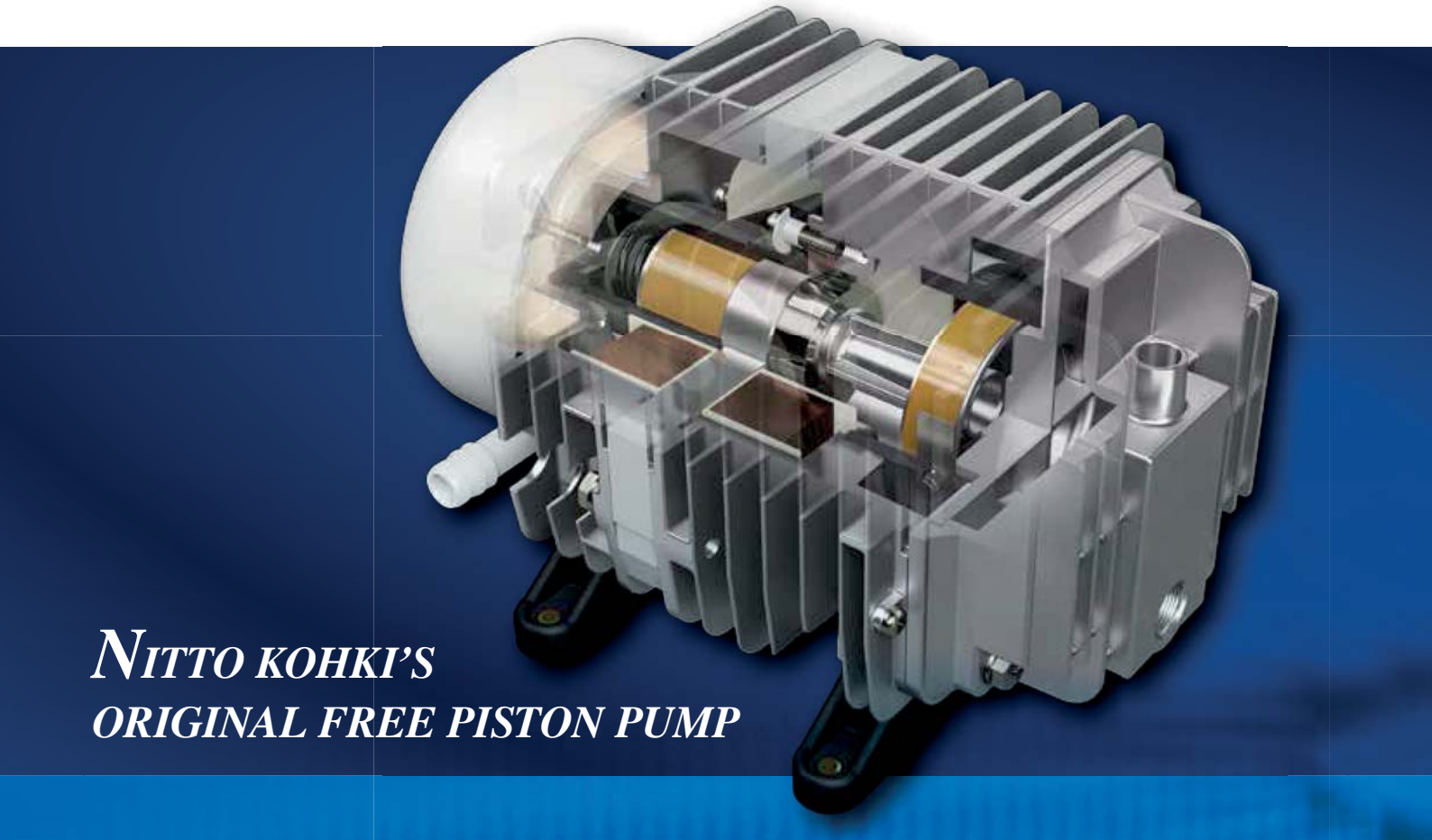
AIR COMPRESSOR, VACUUM PUMP & LIQUID PUMP

LINEAR PRODUCTS OVERVIEW



NITTO KOHKI'S ORIGINAL FREE PISTON PUMP

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 alternatively 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.

Operating Principle

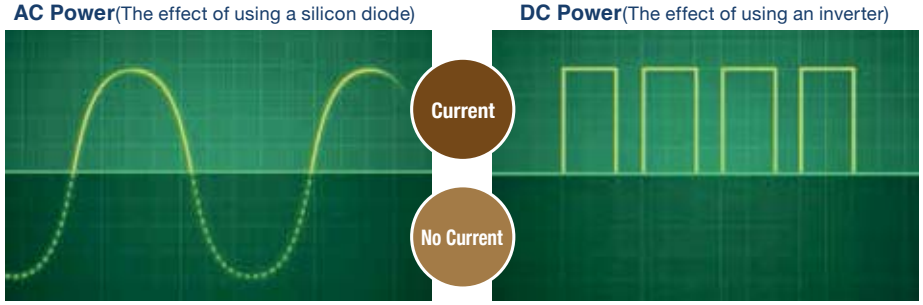
*1) Incorporated in AC models *2) Incorporated in DC models

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.

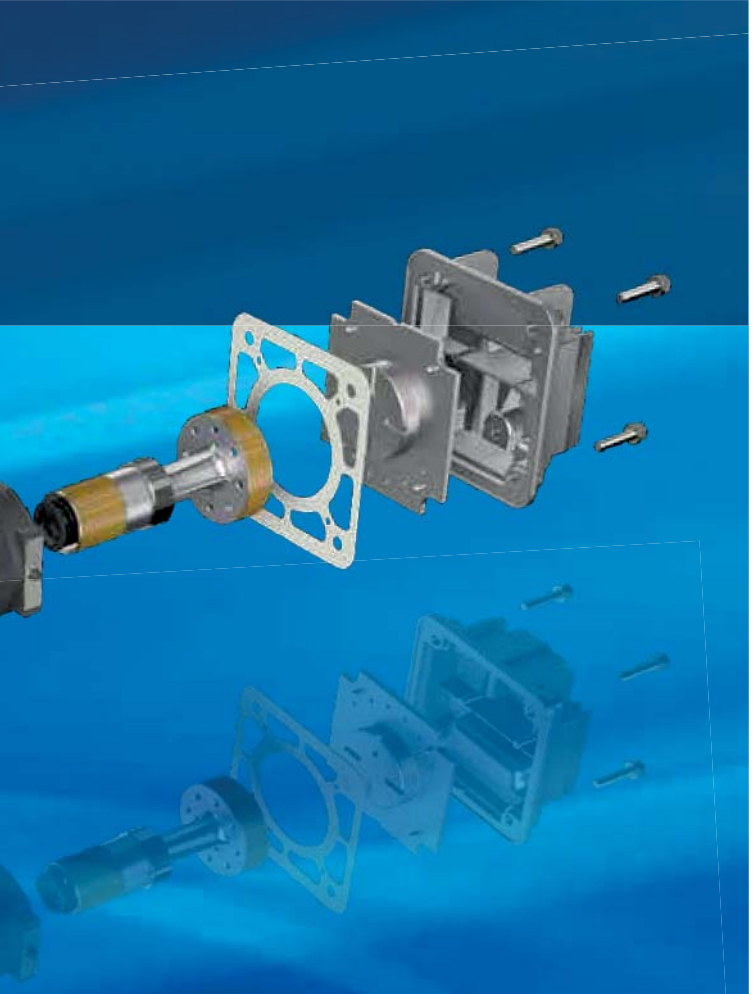
AC Power(The effect of using a silicon diode) **DC Power**(The effect of using an inverter)



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.

Contents

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.

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

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).
Storage environment temperature:	-10 to 60 °C
Storage environment humidity:	10 to 90 % non-condensing

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 zero vacuum (within three (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

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.

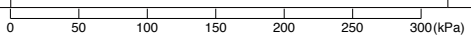
This catalog will give the guidelines needed to determine the appropriate model for your application(s). However, in certain cases you may need further detailed information, which will be provided in the form of a specifications sheet for each model/version by our technical staff who will further assist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

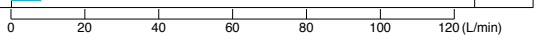
Specifications and designs are subject to change at any time without notice.
It is recommended that OEM customers confirm the required specifications in writing before placing orders.

Series Selection

AC Linear Free Piston Compressor

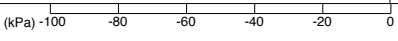
Model	Rated Pressure kPa	Rated Pressure psig	Max. Pressure kPa	Max. Pressure psig	Rated Pressure & Max. Pressure	Rated Airflow L/min	Rated Airflow cfm	Rated Airflow	Page
AC0102	20	2.84	40	5.69		5	0.177		9
AC0201A	10	1.42	20	2.84		20	0.71		9
AC0301A	10	1.42	30	4.27		28	0.99		9
AC0401A	10	1.42	35	4.98		35	1.24		9
AC0602	15	2.13	35	4.98		40	1.41		9
AC0901	10	1.42	40	5.69		80	2.83		9
AC0902	20	2.84	45	6.40		55	1.94		9
AC0105	50	7.11	80	11.4		2.5	0.088		10
AC0110	100	14.2	120	17.1		0.8	0.028		10
AC0207	70	9.96	100	14.2		3.5	0.124		10
AC0210	100	14.2	120	17.1		3.5	0.124		10
AC0410A	100	14.2	130	18.5		5	0.177		10
AC0610/AC0610A	100	14.2	150	21.3		8	0.283		10
AC0910	100	14.2	150	21.3		16	0.57		10
AC0920	200	28.4	300	42.7		8	0.283		10

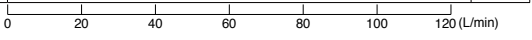




AC Linear Free Piston Vacuum Pump

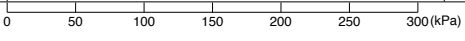
Model		Attainable Vacuum	Attainable Vacuum kPa	Attainable Vacuum in.Hg	Free Air Displacement L/min	Free Air Displacement cfm	Free Air Displacement	Page
VP0125			-33.3	-9.84	7	0.247		11
VP0140			-53.3	-15.7	3	0.106		11
VP0435A			-46.7	-13.8	25	0.88		11
VP0450			-66.7	-19.7	18	0.64		11
VP0625			-33.3	-9.84	40	1.41		11
VP0660			-80	-23.6	25	0.88		11
VP0925A			-33.3	-9.84	80	2.83		12
VP0940			-53.3	-15.7	60	2.12		11
VP0940T			-53.3	-15.7	120	4.24		11
VP0645			-60	-17.7	10	0.35		12
VP0945			-60	-17.7	12	0.42		12
VP0660x2	Series		-93.3	-27.6	25	0.88		12
	Parallel		-80	-23.6	50	1.77		12





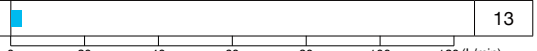
DC Linear Free Piston Compressor

Model	Rated Pressure kPa	Rated Pressure psig	Max. Pressure kPa	Max. Pressure psig	Rated Pressure & Max. Pressure	Rated Airflow L/min	Rated Airflow cfm	Rated Airflow	Page
DAH102-X1	20	2.84	50	7.11		5	0.177		13
DAH102-Y1	20	2.84	50	7.11		5	0.177		13
DAH105-X1	50	7.11	80	11.4		2.5	0.088		13
DAH105-Y1	50	7.11	80	11.4		2.5	0.088		13
DAH110-X1	100	14.2	120	17.1		1.0	0.035		13
DAH110-Y1	100	14.2	120	17.1		1.0	0.035		13



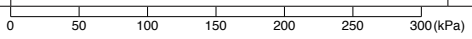
DC Linear Free Piston Vacuum Pump

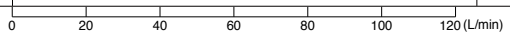
Model	Attainable Vacuum	Attainable Vacuum kPa	Attainable Vacuum in.Hg	Free Air Displacement L/min	Free Air Displacement cfm	Free Air Displacement	Page
DVH130-X1		-40	-11.8	7	0.247		13
DVH130-Y1		-40	-11.8	7	0.247		13
DVH145-X1		-60	-17.7	3	0.106		13
DVH145-Y1		-60	-17.7	3	0.106		13



AC Linear Diaphragm Pump (Blower Type)

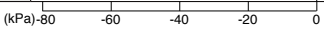
Model	Rated Pressure		Max. Pressure		Rated Pressure & Max. Pressure	Rated Airflow		Rated Airflow	Page
	kPa	psig	kPa	psig		L/min	cfm		
VC0100	4	0.57	16	2.28		6	0.212		14
VC0101	10	1.42	20	2.84		10	0.35		14
VC0101E	10	1.42	20	2.84		15	0.53		14
VC0101S	5	0.71	26	3.70		15	0.53		15
VC0201B	10	1.42	18	2.56		20	0.71		15
VC0301B	10	1.42	20	2.84		25	0.88		15

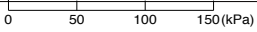


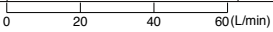


AC Linear Diaphragm Pump (Dual Type)

Model	Attainable Vacuum		Attainable Vacuum		Rated Pressure		Max. Pressure		Rated Pressure & Max. Pressure	Rated Airflow		Rated Airflow	Page
			kPa	in.Hg	kPa	psig	kPa	psig		L/min	cfm		
VC0100			-14.7	-4.33	4	0.57	16	2.28		6	0.212		14
VC0101 120 V			-18.7	-5.51	10	1.42	18	2.56		10	0.35		14
VC0101 230 V			-10	-2.95	10	1.42	15	2.13		10	0.35		14
VC0101E			-18.7	-5.51	10	1.42	20	2.84		15	0.53		14
VC0101S			-24	-7.09	5	0.71	26	3.70		15	0.53		15
VC0201B			-18.7	-5.51	10	1.42	18	2.56		20	0.71		15
VC0301B			-21.3	-6.30	10	1.42	20	2.84		25	0.88		15
VCK0120 (Vacuum only)			-26.7	-7.87						18*	0.64*		15



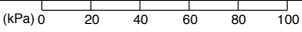


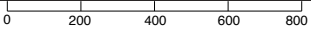


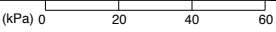
*Free Air Displacement

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		18
DPE-400	0 to 100	0 to 14.2		400		40	5.69		18
DPE-400BL	0 to 100	0 to 14.2		400		40	5.69		18
DPE-800	0 to 100	0 to 14.2		800		40	5.69		18







*Test conditions: Water at 25 degrees C

DC Linear Compressor and Vacuum Pump (Dual Type)

Model	Attainable Vacuum	Attainable Vacuum		Max. Pressure		Max. Pressure	Free Air Displacement		Free Air Displacement	Page
		kPa	in.Hg	kPa	psig		L/min	cfm		
DP0125		-33.3	-9.84	30	4.27		2.5	0.088		16
DP0140		-53.3	-15.7	50	7.11		4	0.141		16
DP0102		-26.7	-7.87	45	6.40		5	0.177		16
DP0102S		-26.7	-7.87	45	6.40		7	0.247		16
DP0102H-X1		-50.7	-15.0	80	11.4		4	0.141		16
DP0110-X1		-66.7	-19.7	150	21.3		7.5	0.265		16
DP0110-Y1		-66.7	-19.7	150	21.3		7.5	0.265		16
DP0110-X3		-66.7	-19.7	150	21.3		7.5	0.265		16
DP0110T-X1		-60	-17.7	150	21.3		5.5	0.194		16
DP0110T-Y1		-60	-17.7	150	21.3		5.5	0.194		16
DP0210TA-Y1		-60	-17.7	150	21.3		10	0.35		16
DP0105-X1		-66.7	-19.7	250	35.6		2.8	0.099		17
DP0105-Y1		-66.7	-19.7	250	35.6		2.8	0.099		17

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

DC Linear Compressor only

Model	Attainable Vacuum	Attainable Vacuum		Max. Pressure		Max. Pressure	Free Air Displacement		Free Air Displacement	Page
		kPa	in.Hg	kPa	psig		L/min	cfm		
DP0102H-X2				80	11.4		4	0.141		16
DPA0105-X1				220	31.3		2.8	0.099		17
DPA0105-Y1				220	31.3		2.8	0.099		17
DP0410-X2				180	25.6		18	0.64		17
DP0410-Y2				180	25.6		18	0.64		17
DP0410T-Y2				150	21.3		34	1.2		17

(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		Max. Pressure		Max. Pressure	Free Air Displacement		Free Air Displacement	Page
		kPa	in.Hg	kPa	psig		L/min	cfm		
DP0410-X1		-77.3	-22.8				18	0.64		17
DP0410-Y1		-77.3	-22.8				18	0.64		17
DP0410T-Y1		-77.3	-22.8				34	1.2		17

(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.

AC LINEAR

Free Piston Compressor

AC Linear Piston Compressor
Low pressure series

AC0102

AC0201A 115V is made to order

AC0301A / AC0401A

AC0602

AC0901 115V is made to order
AC0902

Specifications

Model	AC0102	AC0201A
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 0.71 cfm
Maximum Pressure	40 kPa(0.4 kgf/cm²) 0.4 bar 5.69 psig	20 kPa(0.2 kgf/cm²) 0.2 bar 2.84 psig
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
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)

Model	AC0301A	AC0401A
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/cm²) 0.3 bar 4.27 psig	35 kPa(0.35 kgf/cm²) 0.35 bar 4.98 psig
Rated Voltage	115 V AC or 230 V AC	120 V AC or 230 V AC
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)

Model	AC0602	AC0901
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/cm²) 0.35 bar 4.98 psig	40 kPa(0.4 kgf/cm²) 0.4 bar 5.69 psig
Rated Voltage	115 V AC or 230 V AC	120 V AC or 230 V AC
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)

Model	AC0902
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/cm²) 0.45 bar 6.4 psig
Rated Voltage	115 V AC or 230 V AC
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

115 V is made to order

AC0207
AC0210 Made to order

AC0410A 115 V is made to order

AC0610
AC0610A Made to order

AC0910 / AC0920

Specifications

Model	AC0105	AC0110
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/cm²) 0.8 bar 11.4 psig	120 kPa(1.2 kgf/cm²) 1.2 bar 17.1 psig
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
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	AC0207	AC0210
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/cm²) 1.0 bar 14.2 psig	120 kPa(1.2 kgf/cm²) 1.2 bar 17.1 psig
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
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)

Model	AC0410A	AC0610/AC0610A
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/cm²) 1.3 bar 18.5 psig	150 kPa(1.5 kgf/cm²) 1.5 bar 21.3 psig
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
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)

Model	AC0910	AC0920
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/cm²) 1.5 bar 21.3 psig	300 kPa(3.0 kgf/cm²) 3.0 bar 42.7 psig
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
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)

AC LINEAR

Free Piston Vacuum Pump

AC Linear Piston Vacuum Pump

VP0125 / VP0140

VP0435A

VP0450

VP0625

VP0660

VP0940

VP0940T 115 V is made to order

Specifications

Model	VP0125	VP0140
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
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
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
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
Rated Voltage	115 V AC or 230 V AC	120 V AC or 230 V AC
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
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
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
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)

Model	VP0940	VP0940T
Attainable Vacuum	-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
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
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)

AC LINEAR

Free Piston Vacuum Pump

AC Linear Piston Vacuum Pump

VP0645 Made to order

VP0945 Made to order

VP0660x2 Made to order

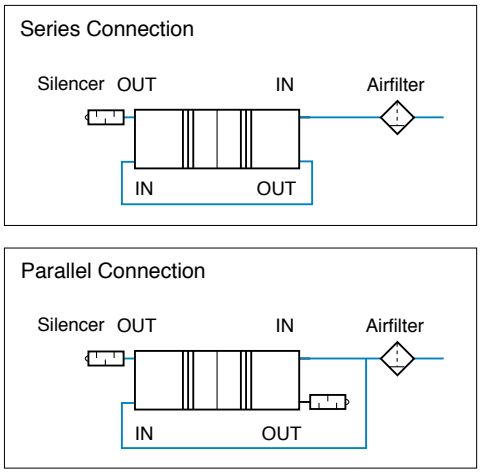
VP0925A Made to order

Specifications

Model	VP0645	VP0945
Attainable Vacuum	-60 kPa -450 mmHg -600 mbar -17.7 in.Hg	
Free Air Displacement	10 L/min 0.35 cfm	12 L/min 0.42 cfm
Rated Voltage	115 V AC or 230 V AC	115 V AC or 230 V AC
Weight	3.2 kg 7.1 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)

Model	VP0660x2 (Series Connection)	VP0660x2 (Parallel Connection)
Attainable Vacuum	-93.3 kPa -700 mmHg -933 mbar -27.6 in.Hg	-80 kPa -600 mmHg -800 mbar -23.6 in.Hg
Free Air Displacement	25 L/min 0.88 cfm	50 L/min 1.77 cfm
Rated Voltage	115 V AC or 230 V AC	
Weight	10 kg 22 Lbs	10 kg 22 Lbs
Mounting Dimensions	280 mm(L) × 130 mm(W) 11-1/32"(L) × 5-1/8"(W)	280 mm(L) × 130 mm(W) 11-1/32"(L) × 5-1/8"(W)

[VP0660x2 Application Examples]



* Air line connection is required by the user.

Model	VP0925A
Attainable Vacuum	-33.3 kPa -250 mmHg -333 mbar -9.84 in.Hg
Free Air Displacement	80 L/min 2.83 cfm
Rated Voltage	115 V AC or 230 V AC
Weight	4.5 kg 9.9 Lbs
Mounting Dimensions	102 mm(L) × 130 mm(W) 4-1/64"(L) × 5-1/8"(W)

DC LINEAR

Free Piston Compressor

DC Linear Piston Compressor

DAH102

DAH105

DAH110

Specifications

Model	DAH102-X1	DAH102-Y1
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/cm²) 0.5 bar 7.11 psig	
Rated Voltage	12 V DC	24 V DC
Weight	0.91 kg 2.01 Lbs	
Mounting Dimensions	76 mm(L) × 70 mm(W) 2-63/64"(L) x 2-3/4"(W)	

Model	DAH105-X1	DAH105-Y1
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/cm²) 0.8 bar 11.4 psig	
Rated Voltage	12 V DC	24 V DC
Weight	0.91 kg 2.01 Lbs.	
Mounting Dimensions	76 mm(L) × 70 mm(W) 2-63/64"(L) x 2-3/4"(W)	

Model	DAH110-X1	DAH110-Y1
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/cm²) 1.2 bar 17.1 psig	
Rated Voltage	12 V DC	24 V DC
Weight	0.91 kg 2.01 Lbs.	
Mounting Dimensions	76 mm(L) × 70 mm(W) 2-63/64"(L) x 2-3/4"(W)	

DC Linear Piston Vacuum Pump

DVH130

DVH145

Model	DVH130-X1/-Y1	DVH145-X1/-Y1
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
Rated Voltage	12 V DC or 24 V DC	12 V DC or 24 V DC
Weight	0.91 kg 2.01 Lbs.	0.91 kg 2.01 Lbs.
Mounting Dimensions	76 mm(L) × 70 mm(W) 2-63/64"(L) x 2-3/4"(W)	

AC Linear Diaphragm Pump

★ Compressor ☆ Vacuum Pump

VC0100

Specifications

Model	VC0100 ★☆	VC0100 ★
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/cm²) 0.16 bar 2.28 psig	
Working Pressure Range	-14.7 to 16 kPa -110 mmHg to 0.16 kgf/cm² -147 mbar to 0.16 bar -4.33 in.Hg to 2.28 psig	0 to 16 kPa 0 to 0.16 kgf/cm² 0 to 0.16 bar 0 to 2.28 psig
Rated Voltage	120 V AC or 230 V AC	
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(120 V) ★☆	VC0101(230 V) ★☆	VC0101 ★
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/cm²) 0.18 bar 2.56 psig	15 kPa(0.15 kgf/cm²) 0.15 bar 2.13 psig	20 kPa(0.2 kgf/cm²) 0.2 bar 2.84 psig
Working Pressure Range	-18.7 to 18 kPa -140 mmHg to 0.18 kgf/cm² -187 mbar to 0.18 bar -5.51 in.Hg to 2.56 psig	-10 to 15 kPa -76 mmHg to 0.15 kgf/cm² -100 mbar to 0.15 bar -2.95 in.Hg to 2.13 psig	0 to 20 kPa 0 to 0.2 kgf/cm² 0 to 0.2 bar 0 to 2.84 psig
Rated Voltage	120 V AC	230 V AC	230 V AC
Weight	0.82 kg 1.81 Lbs		
Mounting Dimensions	66 mm(L) × 100 mm(W) 2-19/32"(L) × 2-15/16"(W)	66 mm(L) × 100 mm(W) 2-19/32"(L) × 2-15/16"(W)	66 mm(L) × 100 mm(W) 2-19/32"(L) × 3-15/16"(W)

VC0101E Made to order

Model	VC0101E ★☆	VC0101E ★
Rated Pressure	10 kPa 0.1 bar 1.42 psig	
Rated Airflow	15 L/min 0.53 cfm	
Maximum Pressure	20 kPa(0.2 kgf/cm²) 0.2 bar 2.84 psig	
Working Pressure Range	-18.7 to 20 kPa -140 mmHg to 0.2 kgf/cm² -187 mbar to 0.2 bar -5.51 in.Hg to 2.84 psig	0 to 20 kPa 0 to 0.2 kgf/cm² 0 to 0.2 bar 0 to 2.84 psig
Rated Voltage	120 V AC or 230 V AC	
Weight	0.82 kg 1.81 Lbs	
Mounting Dimensions	66 mm(L) × 100 mm(W) 2-19/32"(L) × 3-15/16"(W)	

AC LINEAR
Diaphragm Pump

AC Linear Diaphragm Pump

★ Compressor ☆ Vacuum Pump

VC0101S

★☆ Made to order

★ 120 V is made to order

Specifications

Model	VC0101S ★☆	VC0101S ★
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/cm²) 0.26 bar 3.70 psig	
Working Pressure Range	-24 to 26 kPa -180 mmHg to 0.26 kgf/cm² -240 mbar to 0.26 bar -7.09 in.Hg to 3.70 psig	0 to 26 kPa 0 to 0.26 kgf/cm² 0 to 0.26 bar 0 to 3.70 psig
Rated Voltage	120 V AC or 230 V AC	
Weight	0.83 kg 1.81 Lbs	
Mounting Dimensions	66 mm(L) × 100 mm(W) 2-19/32"(L) × 3-15/16"(W)	

VC0201B/VC0301B

★ 120 V is made to order

Model	VC0201B ★☆	VC0201B ★
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/cm²) 0.18 bar 2.56 psig	
Working Pressure Range	-18.7 to 18 kPa -140 mmHg to 0.18 kgf/cm² -187 mbar to 0.18 bar -5.51 in.Hg to 2.56 psig	0 to 18 kPa 0 to 0.18 kgf/cm² 0 to 0.18 bar 0 to 2.56 psig
Rated Voltage	120 V AC or 230 V AC	
Weight	1.7 kg 3.7 Lbs	
Mounting Dimensions	125 mm(L) × 56 mm(W) 4-59/64"(L) × 2-13/64"(W)	

Model	VCK0120 ☆
Attainable Vacuum	-26.7 kPa(-200 mmHg) -267 mbar -7.87 in.Hg
Free Air Displacement	18 L/min 0.64 cfm
Rated Voltage	120 V AC or 230 V AC
Weight	1.9 kg 4.2 Lbs
Mounting Dimensions	152 mm(L) × 128 mm(W) 5-63/64"(L) × 5-3/64"(W)

VCK0120 Made to order

Model	VC0301B ★☆	VC0301B ★
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/cm²) 0.2 bar 2.84 psig	
Working Pressure Range	-21.3 to 20 kPa -160 mmHg to 0.2 kgf/cm² -213 mbar to 0.2 bar -6.3 in.Hg to 2.84 psig	0 to 20 kPa 0 to 0.2 kgf/cm² 0 to 0.2 bar 0 to 2.84 psig
Rated Voltage	120 V AC or 230 V AC	
Weight	1.7 kg 3.7 Lbs	
Mounting Dimensions	125 mm(L) × 56 mm(W) 4-59/64"(L) × 2-13/64"(W)	

DC MOTOR DRIVEN

Piston Pump

Compressor and Vacuum Pump

★ Compressor ☆ Vacuum Pump

Specifications

Model	DP0105-X1 ★☆	DP0105-Y1 ★☆	DPA0105-X1 ★	DPA0105-Y1 ★
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	
Rated Voltage	12 V DC	24 V DC	12 V DC	24 V DC
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	DP0410-X1 ☆	DP0410-Y1 ☆
Attainable Vacuum	-77.3 kPa(-580 mmHg) -773 mbar -22.8 in.Hg	
Free Air Displacement	18 L/min 0.64 cfm	
Maximum Pressure	————	
Rated Voltage	12 V DC	24 V DC
Weight	1.1 kg 2.4 Lbs	
Mounting Dimensions	70 mm(L) x 45 mm(W) 2-$^{3}/_{4}$"(L) x 1-$^{49}/_{64}$"(W)	

DP0410

Brushless Motor

Model	DP0410-X2 ★	DP0410-Y2 ★
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	
Rated Voltage	12 V DC	24 V DC
Weight	1.1 kg 2.4 Lbs	
Mounting Dimensions	70 mm(L) x 45 mm(W) 2-$^{3}/_{4}$"(L) x 1-$^{49}/_{64}$"(W)	

DP0410T-Y1

Brushless Motor

Model	DP0410T-Y1 ☆	DP0410T-Y2 ★
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
Rated Voltage	24 V DC	
Weight	1.6 kg 3.5 Lbs	
Mounting Dimensions	166 mm(L) x 84 mm(W) 6-$^{17}/_{32}$" (L) x 3-$^{5}/_{16}$"(W)	

DP0410T-Y2

Brushless Motor

DC MOTOR DRIVEN

Diaphragm Pump

★ Compressor ☆ Vacuum Pump

Compressor and Vacuum Pump

DP0125

DP0140

DP0110-X1 / -Y1 / -X3*

Brushless Motor

*PWM controlled model

DP0102 / DP0102S

Brushless Motor

DP0102H-X1 / -X2

Brushless Motor

Specifications

Model	DP0125 ★☆	DP0140 ★☆
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/cm²) 0.3 bar 4.27 psig	50 kPa(0.5 kgf/cm²) 0.5 bar 7.11 psig
Rated Voltage	12 V DC	12 V DC
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)

Model	DP0110-X1/-X3 ★☆	DP0110-Y1 ★☆
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/cm²) 1.5 bar 21.3 psig	
Rated Voltage	12 V DC	24 V DC
Weight	0.30 kg 0.66 Lbs	
Mounting Dimensions	50 mm(L) × 30 mm(W) 1-31/32"(L) × 1-3/16"(W)	

Model	DP0102 ★☆	DP0102S ★☆	DP0102H-X1 ★☆	DP0102H-X2 ★
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	4.0 L/min 0.141 cfm	
Maximum Pressure	45 kPa(0.45 kgf/cm²) 0.45 bar 6.40 psig		80 kPa(0.8 kgf/cm²) 0.8 bar 11.4 psig	
Working Pressure Range	-26.7 to 45 kPa -200 mmHg to 0.45 kgf/cm² -267 mbar to 0.45 bar -7.87 in.Hg to 6.40 psig		-50.7 to 80 kPa -380 mmHg to 0.8 kgf/cm² -507 mbar to 0.8 bar -15 in.Hg to 11.4 psig	0 to 80 kPa 0 to 0.8 kgf/cm² 0 to 0.8 bar 0 to 11.4 psig
Rated Voltage	12 V DC	24 V DC	12 V DC	
Weight	0.25 kg 0.55 Lbs		0.25 kg 0.55 Lbs	
Mounting Dimensions	50 mm(L) x 30 mm(W) 1-31/32"(L) x 1-3/16"(W)		50 mm(L) x 30 mm(W) 1-31/32"(L) x 1-3/16"(W)	

Model	DP0110T-X1 ★☆	DP0110T-Y1 ★☆	DP0210TA-Y1 ★☆
Attainable Vacuum	-60.0 kPa(-450 mmHg) -600 mbar -17.7 in.Hg		-60.0 kPa(-450 mmHg) -667 mbar -17.7 in.Hg
Free Air Displacement	5.5 L/min 0.194 cfm		10 L/min 0.35 cfm
Maximum Pressure	150 kPa(1.5 kgf/cm²) 1.5 bar 21.3 psig		150 kPa(1.5 kgf/cm²) 1.5 bar 21.3 psig
Rated Voltage	12 V DC	24 V DC	24 V DC
Weight	0.27 kg 0.60 Lbs		0.32 kg 0.71 Lbs
Mounting Dimensions	36.5 mm(L) × 37.5 mm(W) 1-7/16"(L) × 1-15/32"(W)		36.5 mm(L) × 37.5 mm(W) 1-7/16"(L) × 1-15/32"(W)

DP0110T

Brushless Motor

DP0210TA*

Brushless Motor

*PWM controllable

LIQUID PUMP

DC Diaphragm Liquid Pump

DPE series - DC Liquid Pump

DPE-100

DPE-400

DPE-400BL

Brushless Motor

DPE-800

Specifications

Model	DPE-100	DPE-400
Flow Rate *1	100 mL/min 0.0035 cfm	400 mL/min 0.0141 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
Rated Voltage	24 V DC	24 V DC
Weight	67 g 0.148 Lbs	187 g 0.412 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)

Model	DPE-400BL		DPE-800
Flow Rate *1	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	40 kPa 0.4 bar 5.69 psig		
Maximum Current	900 mA	450 mA	600 mA
Rated Voltage	12 V DC	24 V DC	24 V DC
Weight	230 g 0.507 Lbs		350 g 0.771 Lbs
Mounting Dimensions	41 mm(W) 1-$^{39}/_{64}$"(W)		74.5 mm(L) x 41 mm(W) 2-$^{15}/_{16}$"(L) x 1-$^{39}/_{64}$"(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.

Build materials

Model	Cylinder Head	Head Cover	Diaphragm	Valve	O-ring	Applicable fluids
DPE-○○-2E	PA		PTFE	EPDM		Sodium hydroxide, Citric acid, Ammonia water, Caustic potash
DPE-○○-2G				FKM		Ethanol, Ethylene glycol, Sodium carbonate, mineral oil
DPE-○○-7G	PPS					Xylene, Carbon tetrachloride, Trichloroethylene, Silicon oils
DPE-○○-7P				FFKM		Chloroform, Benzene, Glacial acetic acid, Methyl ethyl ketone

LIQUID PUMP

Piezoelectric Pump

BIMOR Pump - Piezoelectric Pump

BPS type


BPH type


BPF type


BPHS-414 type


BPHS-474 type

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 60 Hz					Voltage(AC) ⎓240 V 60 Hz					Material of Wetted Parts			
Model	Current (mA)	Self-priming Pressure (kPa)*1	Flow Rate (mL/min)*1	Discharge Pressure (kPa)	Model	Current (mA)	Self-priming Pressure (kPa)*1	Flow Rate (mL/min)*1	Discharge Pressure (kPa)	Housing	Liquid Contact Sheet	Valve / O-ring	Weight (g)
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 values in the specification shows the performance obtained using 25 °C of water at 60 Hz. When the pump is used at 50 Hz, the flow rate will decrease approximately 20%.
When the liquid temperature is low, the check valve will harden. As a result, the flow rate and the self-priming pressure will decrease.
Especially the flow rate of the pump with fluorine rubber will decrease by half at 5°C, so select with sufficient margin.
Since the flow rate will decrease with highly viscous liquids, please check the flow rate with an actual pump before use.
*2: 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, Hydrochloric acid, Caustic potash, Caustic soda, Methanol	
BPH-214G	Ethanol, Dilute 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)

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