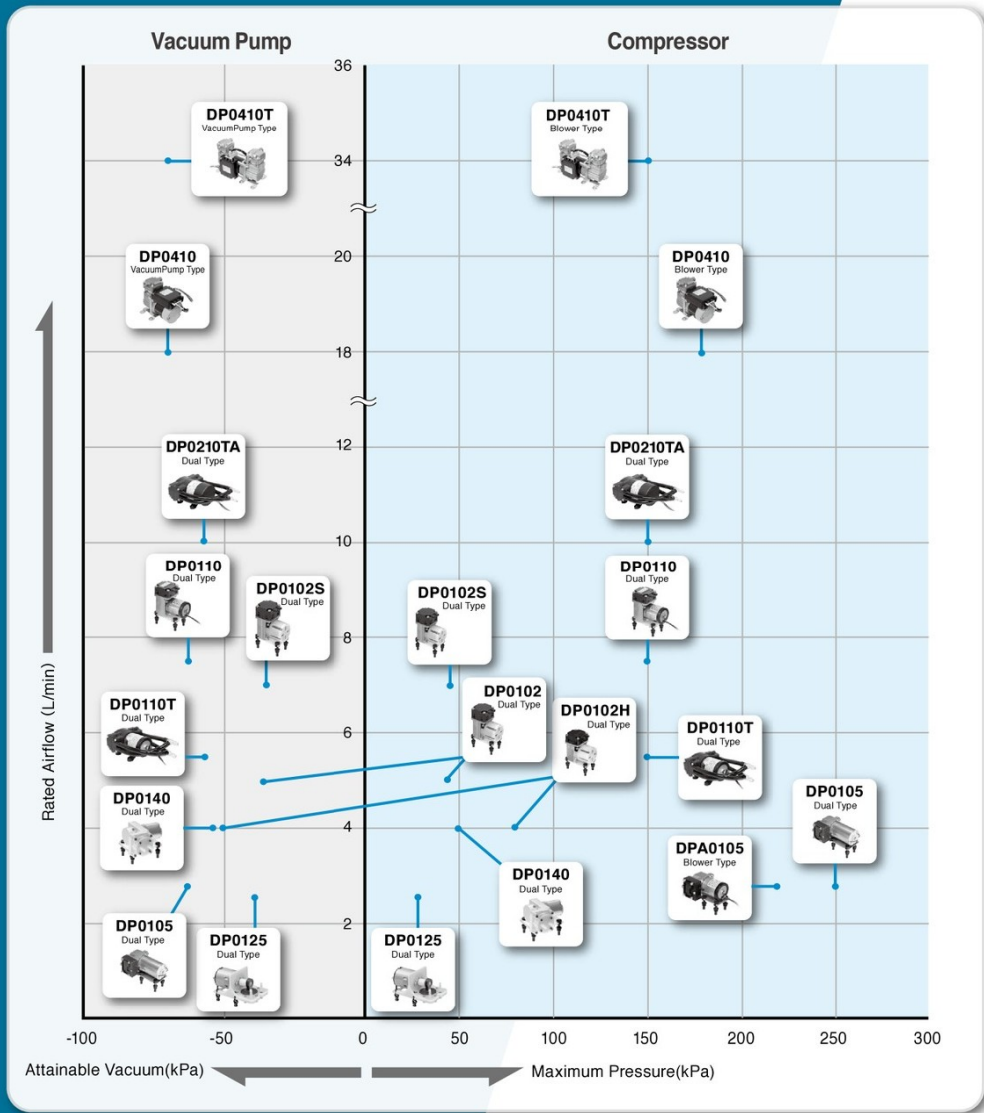


DC Motor Driven  
Piston Pump  
Diaphragm Pump

# PISTON PUMP DIAPHRAGM PUMP

DP series



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Piston Pump

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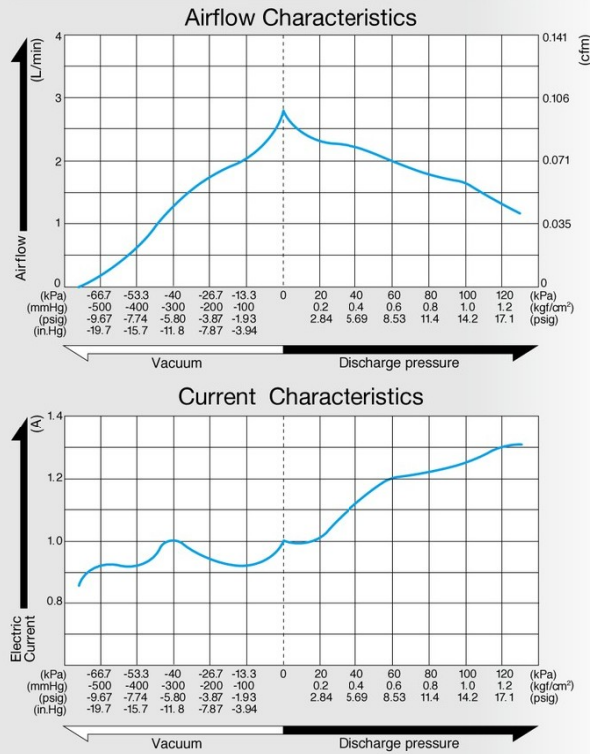
# Compressor and Vacuum Pump

## Model **DP0105-X1**

Brush DC Motor 12 V DC



### Airflow & Power Consumption

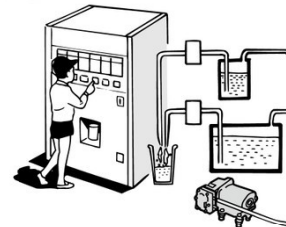


### Specifications

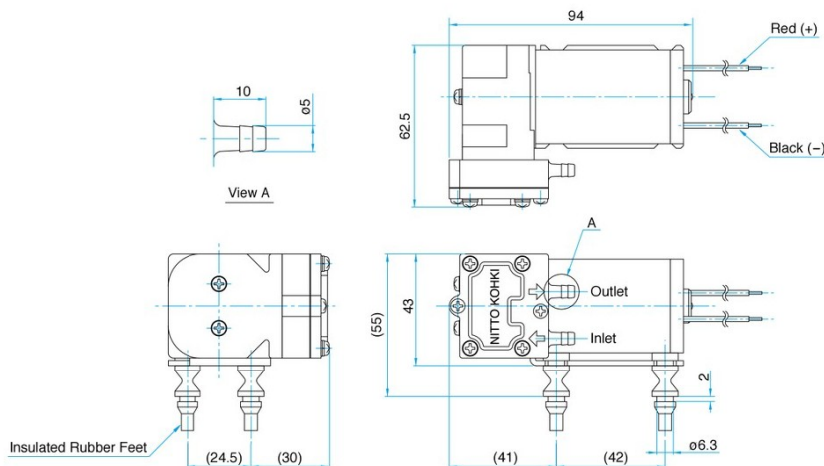
Attainable Vacuum	-66.7 kPa (-500 mmHg) -667 mbar -19.7 in.Hg
Free Air Displacement	2.8 L/min 0.099 cfm
Rated Voltage	12 V DC
Maximum Pressure	250 kPa (2.5 kgf/cm <sup>2</sup> ) 2.5 bar 35.6 psig
Maximum Current	1.9 A
Duty Cycle	30 minutes
Working Pressure Range	-66.7 to 100 kPa (-500 mmHg to 1 kgf/cm <sup>2</sup> ) -667 mbar to 1 bar -19.7 in.Hg to 14.2 psig
Rated Performance (MTTF)	2,000 hours
Inlet	5 mm O.D. straight barb
Outlet	5 mm O.D. straight barb
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	42 (L) x 24.5 (W) mm 1-21/32" (L) x 1-31/32" (W)
Weight	0.36 kg 0.79 Lbs
Leadwire Length	360 mm 14-11/64"

### Application Examples

#### Vending Machines



### Dimensional Outline Drawing (Unit: mm)

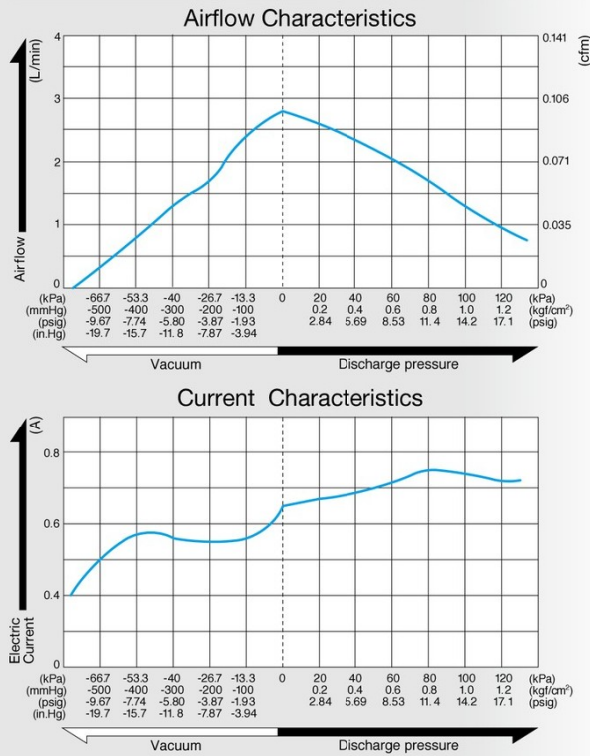


# Compressor and Vacuum Pump

## Model **DP0105-Y1** Brush DC Motor 24 V DC



### Airflow & Power Consumption

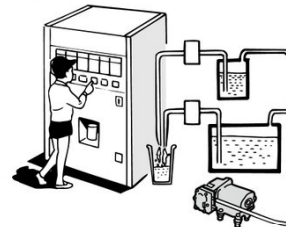


### Specifications

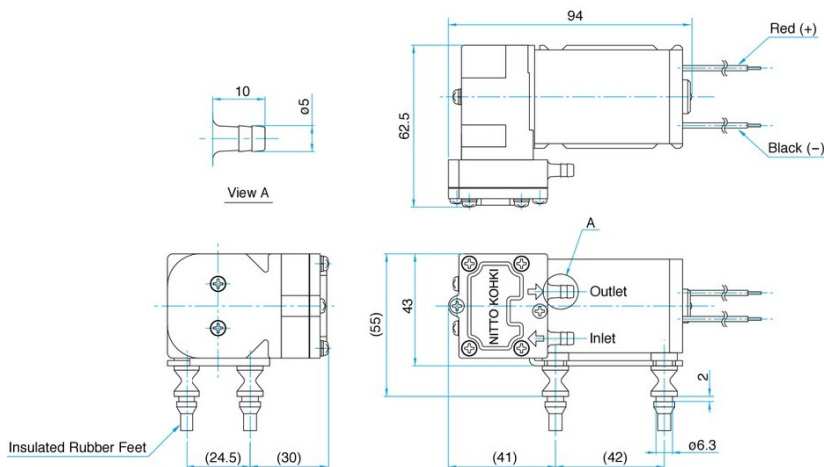
Attainable Vacuum	-66.7 kPa (-500 mmHg) -667 mbar -19.7 in.Hg
Free Air Displacement	2.8 L/min 0.099 cfm
Rated Voltage	24 V DC
Maximum Pressure	250 kPa (2.5 kgf/cm <sup>2</sup> ) 2.5 bar 35.6 psig
Maximum Current	0.95 A
Duty Cycle	30 minutes
Working Pressure Range	-66.7 to 100 kPa (-500 mmHg to 1 kgf/cm <sup>2</sup> ) -667 mbar to 1 bar -19.7 in.Hg to 14.2 psig
Rated Performance (MTTF)	2,000 hours
Inlet	5 mm O.D. straight barb
Outlet	5 mm O.D. straight barb
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	42 (L) x 24.5 (W) mm 1-21/32" (L) x 1-31/32" (W)
Weight	0.36 kg 0.79 Lbs
Leadwire Length	360 mm 14-11/64"

### Application Examples

#### Vending Machines



### Dimensional Outline Drawing (Unit : mm)



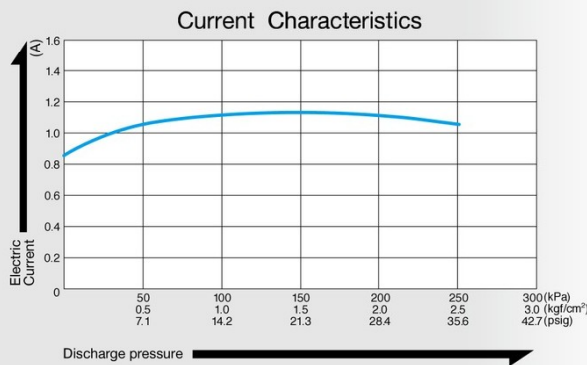
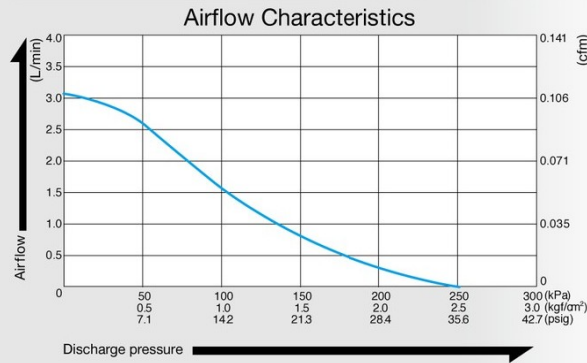
# Compressor

## Model **DPA0105-X1**

Brushless DC Motor 12 V DC



### Airflow & Power Consumption

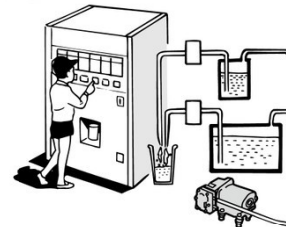


### Specifications

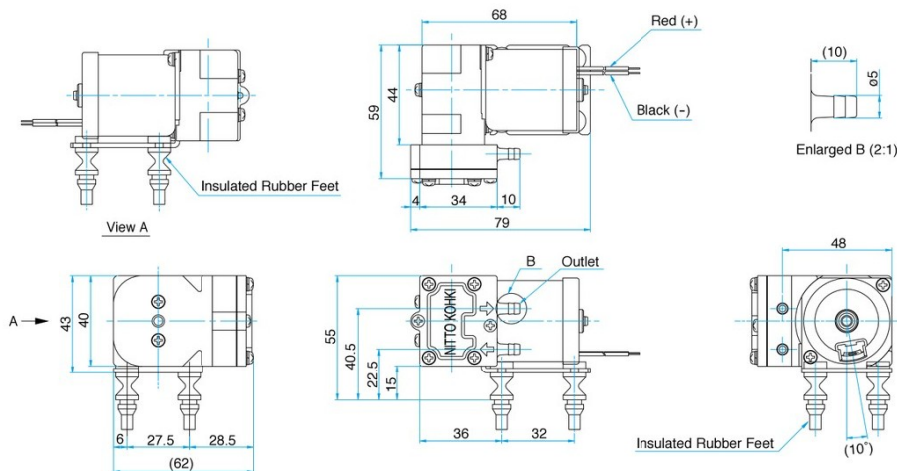
Free Air Displacement	2.8 L/min 0.099 cfm
Rated Voltage	12 V DC
Maximum Pressure	220 kPa (2.2 kgf/cm <sup>2</sup> ) 2.2 bar 31.3 psig
Maximum Current	1.4 A
Duty Cycle	Continuous
Working Pressure Range	0 to 100 kPa (0 to 1 kgf/cm <sup>2</sup> ) 0 to 1 bar 0 to 14.2 psig
Rated Performance (MTTF)	5,000 hours
Inlet	5 mm O.D. straight barb
Outlet	5 mm O.D. straight barb
Coil Insulation Class	A or its equivalent (JETL)
Mounting Dimensions	32 (L) x 27.5 (W) mm 1-9/32" (L) x 1-5/64" (W)
Weight	0.3 kg 0.66 Lbs
Leadwire Length	360 mm 14-11/64"

### Application Examples

#### Vending Machines



### Dimensional Outline Drawing (Unit: mm)





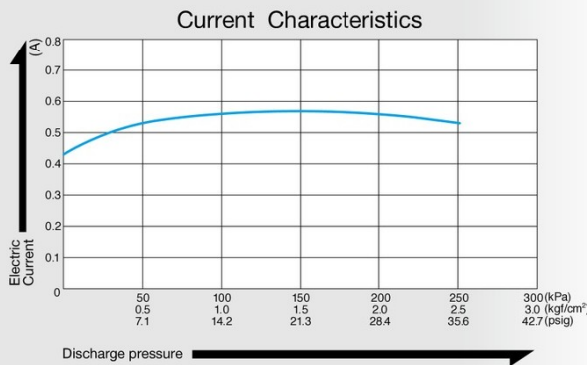
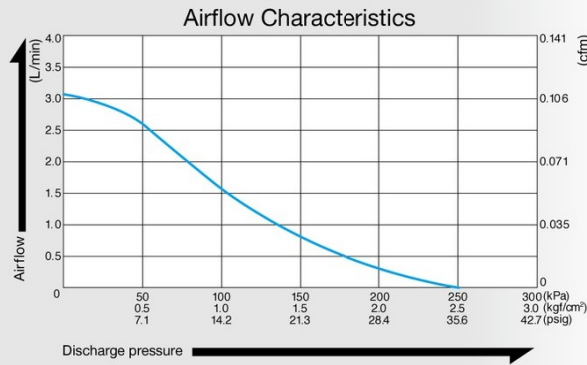
# Compressor

## Model **DPA0105-Y1**

Brushless DC Motor 24 V DC



### Airflow & Power Consumption

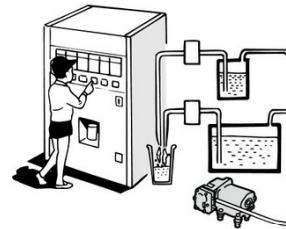


### Specifications

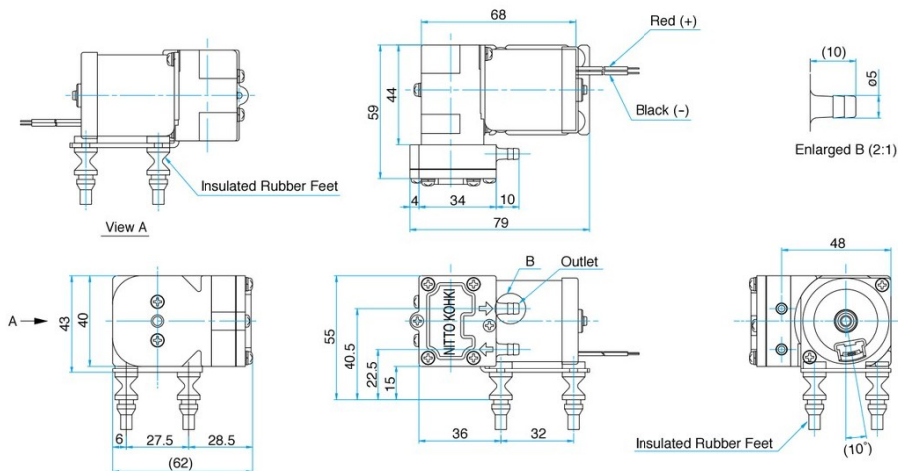
Free Air Displacement	2.8 L/min 0.099 cfm
Rated Voltage	24 V DC
Maximum Pressure	220 kPa (2.2 kgf/cm <sup>2</sup> ) 2.2 bar 31.3 psig
Maximum Current	0.7 A
Duty Cycle	Continuous
Working Pressure Range	0 to 100 kPa (0 to 1 kgf/cm <sup>2</sup> ) 0 to 1 bar 0 to 14.2 psig
Rated Performance (MTTF)	5,000 hours
Inlet	5 mm O.D. straight barb
Outlet	5 mm O.D. straight barb
Coil Insulation Class	A or its equivalent (JETL)
Mounting Dimensions	32 (L) x 27.5 (W) mm 1-9/32" (L) x 1-5/64" (W)
Weight	0.3 kg 0.66 Lbs
Leadwire Length	360 mm 14-11/64"

### Application Examples

#### Vending Machines



### Dimensional Outline Drawing (Unit: mm)



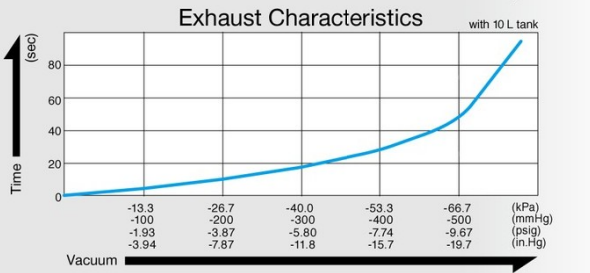
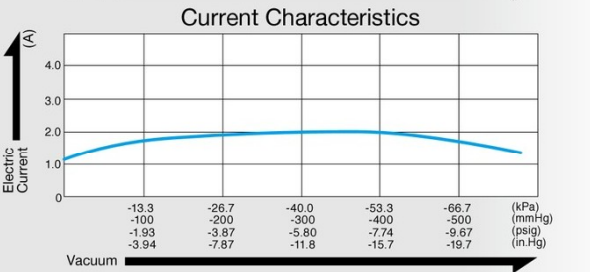
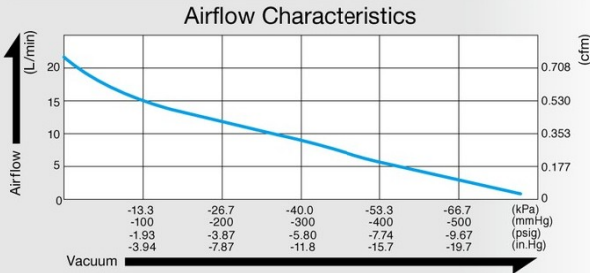
# Vacuum Pump

## Model **DPO410-X1**

Brushless DC Motor 12 V DC



### Airflow & Power Consumption

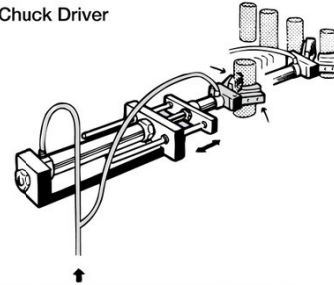


### Specifications

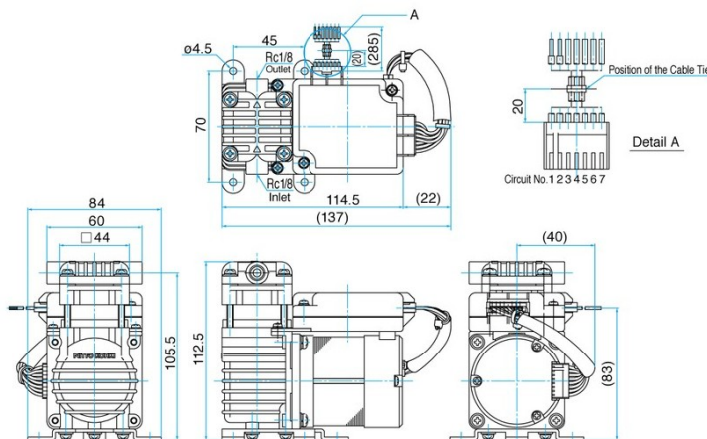
Attainable Vacuum	-77.3 kPa (-580 mmHg) -773 mbar -22.8 in.Hg
Free Air Displacement	18 L/min 0.64 cfm
Rated Voltage	12 V DC
Maximum Current	2.5 A or less
Duty Cycle	Continuous
Rated Performance (MTTF)	10,000 hours
Inlet	Rc1/8
Outlet	Rc1/8
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	70 (L) x 45 (W) mm 2-3/4" (L) x 1-49/64" (W)
Weight	1.1 kg 2.4 Lbs
Leadwire Length	285 mm 11-7/32"

### Application Examples

Air Cylinder/Chuck Driver



### Dimensional Outline Drawing (Unit: mm)



### Connection Table

Circuit No.	Power Source		Control Signal				
	1	2	3	4	5	6	7
Cord Color	Red	Black	Brown	Orange	Yellow	Green	Gray
Function	V+	V-	DRIVE/FREE	PULSE	ALARM	SPEED	SGND
Option	Function Off	ON			OFF		
	Function On	ON			ON		
Cord Size	AWG20			AWG22			
Line Type							UL1007

\*Control function is "OFF" by default.

- Be sure to secure the lead wires with a cable tie. (See the detail A.) If they are not secured, poor contact of the connector may occur and result in failure.
- For the details of wiring, please see the user's instructions.





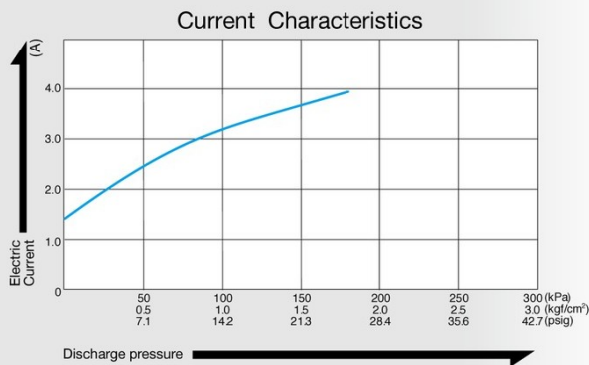
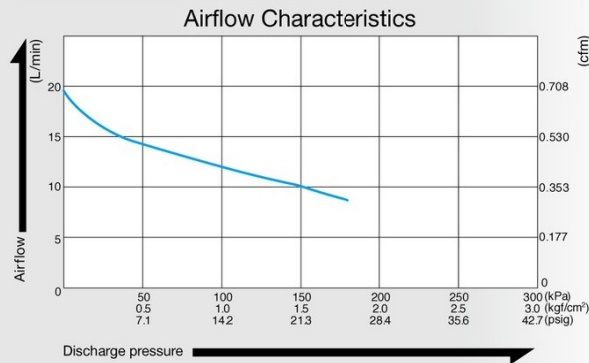
# Compressor

## Model **DPO410-X2**

Brushless DC Motor 12 V DC



### Airflow & Power Consumption

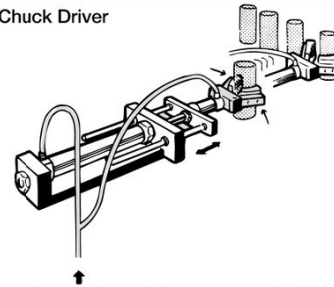


### Specifications

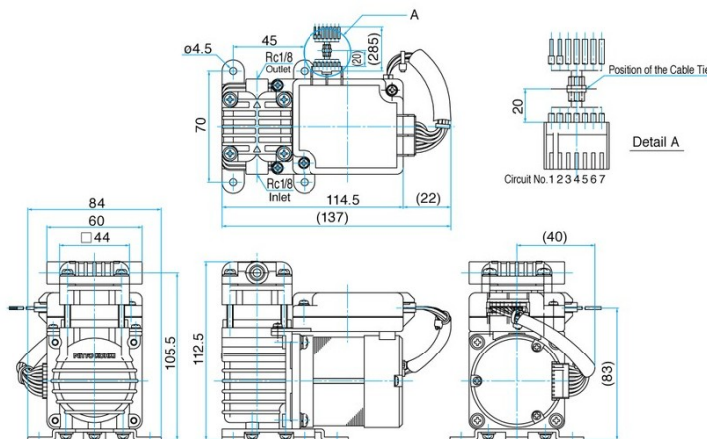
Free Air Displacement	18 L/min 0.64 cfm
Rated Voltage	12 V DC
Maximum Pressure	180 kPa (1.8 kgf/cm <sup>2</sup> ) 1.8 bar 25.6 psig
Maximum Current	5.0 A
Duty Cycle	Continuous
Working Pressure Range	0 to 180 kPa (0 to 1.8 kgf/cm <sup>2</sup> ) 0 to 1.8 bar 0 to 25.6 psig
Rated Performance (MTTF)	10,000 hours
Inlet	ISO RC 1/8
Outlet	ISO RC 1/8
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	70 (L) x 45 (W) mm 2-3/4" (L) x 1-49/64" (W)
Weight	1.1 kg 2.4 Lbs
Leadwire Length	285 mm 11-7/32"

### Application Examples

Air Cylinder/Chuck Driver



### Dimensional Outline Drawing (Unit: mm)



### Connection Table

Circuit No.	Power Source		Control Signal				
	1	2	3	4	5	6	7
Cord Color	Red	Black	Brown	Orange	Yellow	Green	Gray
Function	V+	V-	DRIVE/FREE	PULSE	ALARM	SPEED	SGND
Option	Function Off	ON			OFF		
	Function On	ON			ON		
Cord Size	AWG20			AWG22			
Line Type	UL1007						

\*Control function is "OFF" by default.

- Be sure to secure the lead wires with a cable tie. (See the detail A.) If they are not secured, poor contact of the connector may occur and result in failure.
- For the details of wiring, please see the user's instructions.



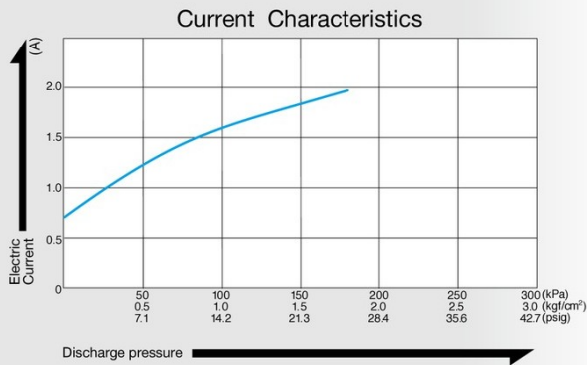
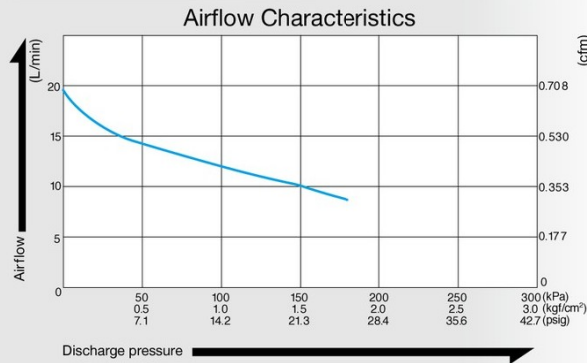
# Compressor

## Model **DPO410-Y2**

Brushless DC Motor 24 V DC



### Airflow & Power Consumption

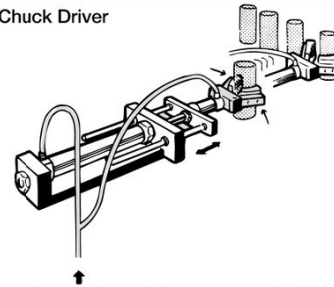


### Specifications

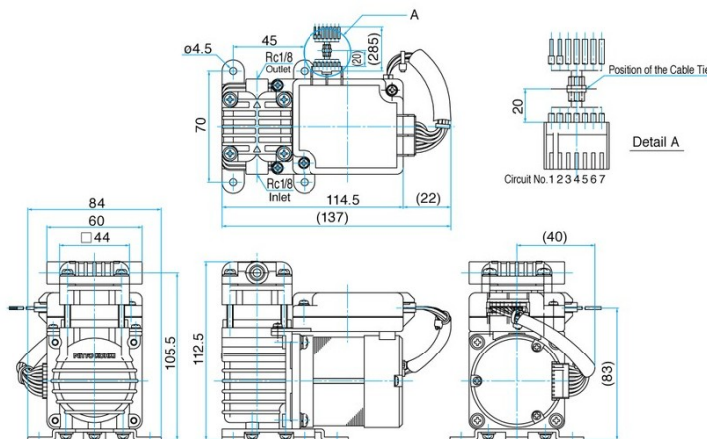
Free Air Displacement	18 L/min 0.64 cfm
Rated Voltage	24 V DC
Maximum Pressure	180 kPa (1.8 kgf/cm <sup>2</sup> ) 1.8 bar 25.6 psig
Maximum Current	2.7 A
Duty Cycle	Continuous
Working Pressure Range	0 to 180 kPa (0 to 1.8 kgf/cm <sup>2</sup> ) 0 to 1.8 bar 0 to 25.6 psig
Rated Performance (MTTF)	10,000 hours
Inlet	ISO RC 1/8
Outlet	ISO RC 1/8
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	70 (L) x 45 (W) mm 2-3/4" (L) x 1-49/64" (W)
Weight	1.1 kg 2.4 Lbs
Leadwire Length	285 mm 11-7/32"

### Application Examples

Air Cylinder/Chuck Driver



### Dimensional Outline Drawing (Unit: mm)



### Connection Table

Circuit No.	Power Source		Control Signal				
	1	2	3	4	5	6	7
Cord Color	Red	Black	Brown	Orange	Yellow	Green	Gray
Function	V+	V-	DRIVE/FREE	PULSE	ALARM	SPEED	SGND
Option	Function Off	ON	OFF				
	Function On	ON	ON				
Cord Size	AWG20			AWG22			
Line Type	UL1007						

\*Control function is "OFF" by default.

- Be sure to secure the lead wires with a cable tie. (See the detail A.) If they are not secured, poor contact of the connector may occur and result in failure.
- For the details of wiring, please see the user's instructions.

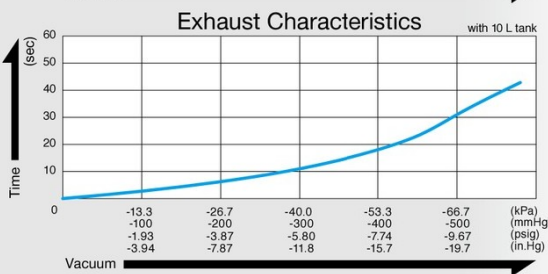
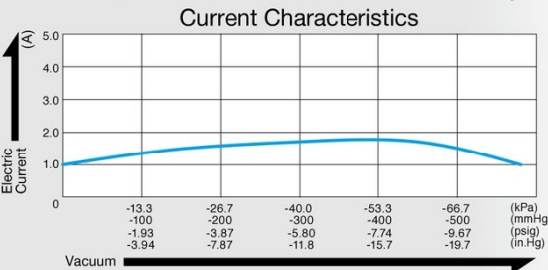
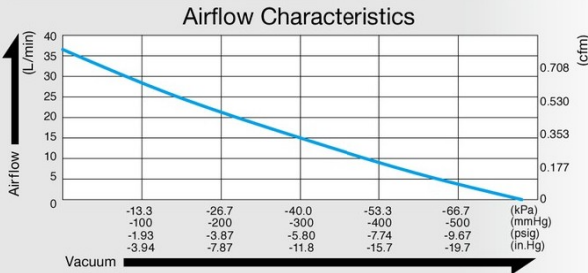
# Vacuum Pump

## Model **DPO410T-Y1**

Brushless DC Motor 24 V DC



### Airflow & Power Consumption

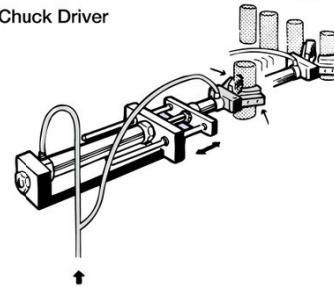


### Specifications

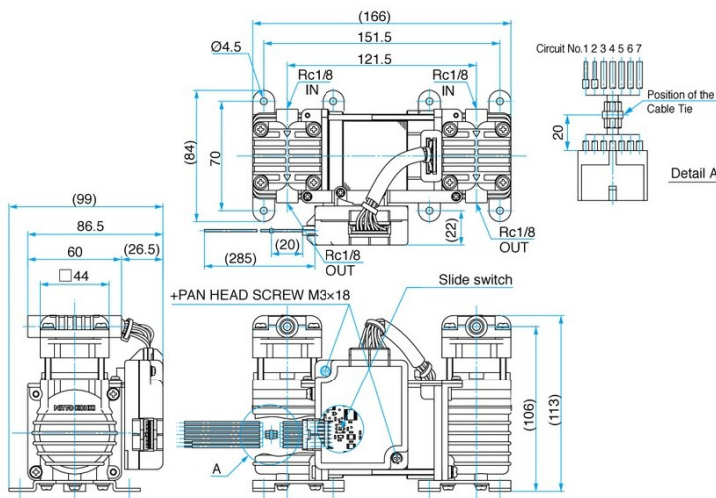
Attainable Vacuum	-77.3 kPa (-580 mmHg) -773 mbar -22.8 in.Hg
Free Air Displacement	34 L/min 1.2 cfm
Rated Voltage	24 V DC
Maximum Current	2.5 A
Duty Cycle	Continuous
Rated Performance (MTTF)	5,000 hours
Inlet	Rc1/8
Outlet	Rc1/8
Coil Insulation Class	E or its equivalent (For DC motor)
Mounting Dimensions	166 (L) x 84 (W) mm 6-17/32" (L) x 3-5/16" (W)
Weight	1.6 kg 3.5 Lbs
Leadwire Length	285 mm 11-7/32"

### Application Examples

Air Cylinder/Chuck Driver



### Dimensional Outline Drawing (Unit: mm)



### Connection Table

Circuit No.	Power Source		Control Signal				
	1	2	3	4	5	6	7
Cord Color	Red	Black	Brown	Orange	Yellow	Green	Gray
Function	V+	V-	DRIVE/FREE	PULSE	ALARM	SPEED	SGND
Option	Function Off	ON			OFF		
	Function On	ON			ON		
Cord Size	AWG20			AWG22			
Line Type							UL1007

\*Control function is "OFF" by default.

- Be sure to secure the lead wires with a cable tie. (See the detail A.) If they are not secured, poor contact of the connector may occur and result in failure.
- For the details of wiring, please see the user's instructions.

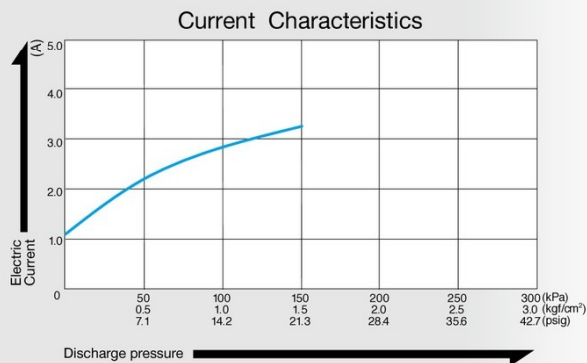
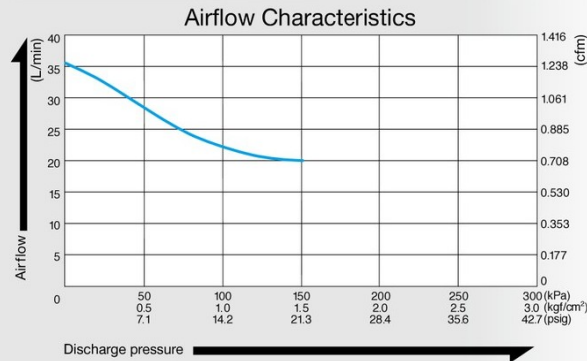
# Compressor

## Model **DPO410T-Y2**

Brushless DC Motor 24 V DC



### Airflow & Power Consumption

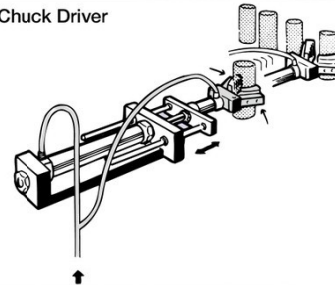


### Specifications

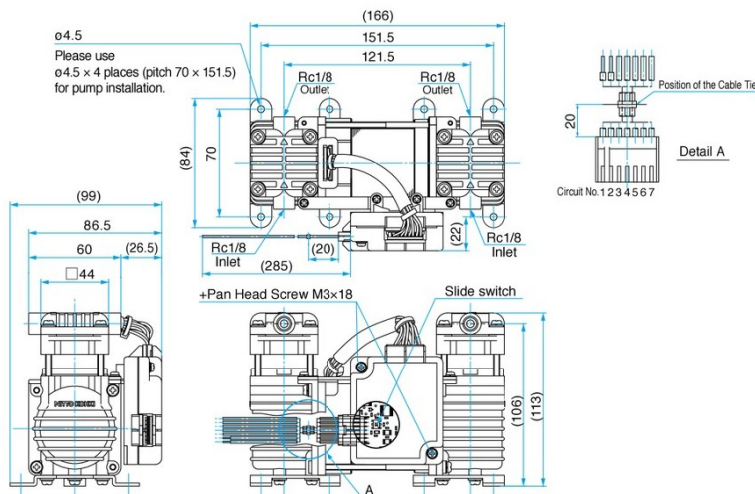
Free Air Displacement	34 L/min 1.2 cfm
Rated Voltage	24 V DC
Maximum Pressure	150 kPa (1.5 kgf/cm <sup>2</sup> ) 1.5 bar 21.3 psig
Maximum Current	4.0 A
Duty Cycle	Continuous
Working Pressure Range	0 to 150 kPa (0 to 1.5 kgf/cm <sup>2</sup> ) 0 to 1.5 bar 0 to 21.3 psig
Rated Performance (MTTF)	5,000 hours
Inlet	RC 1/8
Outlet	RC 1/8
Coil Insulation Class	E or its equivalent (For DC motor)
Mounting Dimensions	166 (L) x 84 (W) mm 6-17/32" (L) x 3-5/16" (W)
Weight	1.6 kg 3.5 Lbs
Leadwire Length	285 mm 11-7/32"

### Application Examples

Air Cylinder/Chuck Driver



### Dimensional Outline Drawing (Unit: mm)



### Connection Table

Circuit No.	Power Source		Control Signal				
	1	2	3	4	5	6	7
Cord Color	Red	Black	Brown	Orange	Yellow	Green	Gray
Function	V+	V-	DRIVE FREE	PULSE	ALARM	SPEED	SGND
Option	Function Off	ON				OFF	
	Function On	ON				ON	
Cord Size	AWG20		AWG22				
Line Type	UL1007						

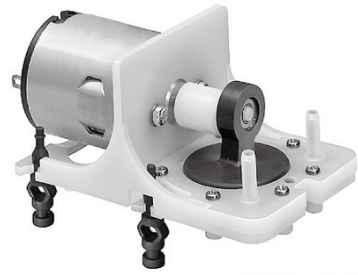
\*Control function is "OFF" by default.

- Be sure to secure the lead wires with a cable tie. (See the detail A.) If they are not secured, poor contact of the connector may occur and result in failure.
- For the details of wiring, please see the user's instructions.

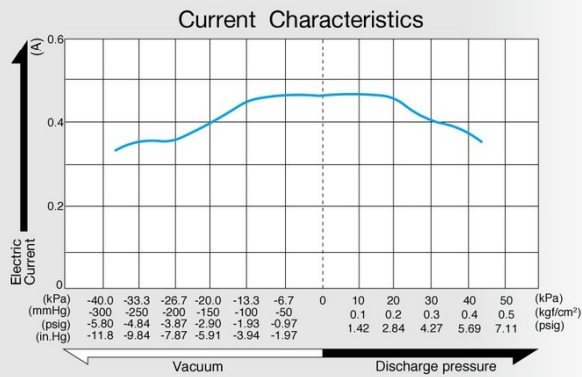
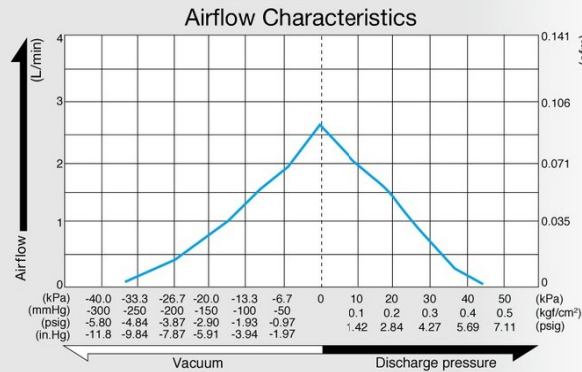


# Compressor and Vacuum Pump

Model **DP0125**  
Brush DC Motor 12 V DC



## Airflow & Power Consumption



## Specifications

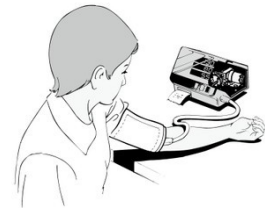
Attainable Vacuum	-33.3 kPa (-250 mmHg) -333 mbar -9.84 in.Hg
Free Air Displacement	2.5 L/min 0.088 cfm
Rated Voltage	12 V DC
Maximum Pressure	30 kPa (0.3 kgf/cm <sup>2</sup> ) 0.3 bar 4.27 psig
Maximum Current	0.5 A
Duty Cycle	Continuous
Rated Performance (MTTF)	400 hours
Inlet	3 mm O.D. straight barb
Outlet	3 mm O.D. straight barb
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	32 (L) x 32.5 (W) mm 1-17/64" (L) x 1-9/32" (W)
Weight	0.08 kg 0.18 Lbs

## Application Examples

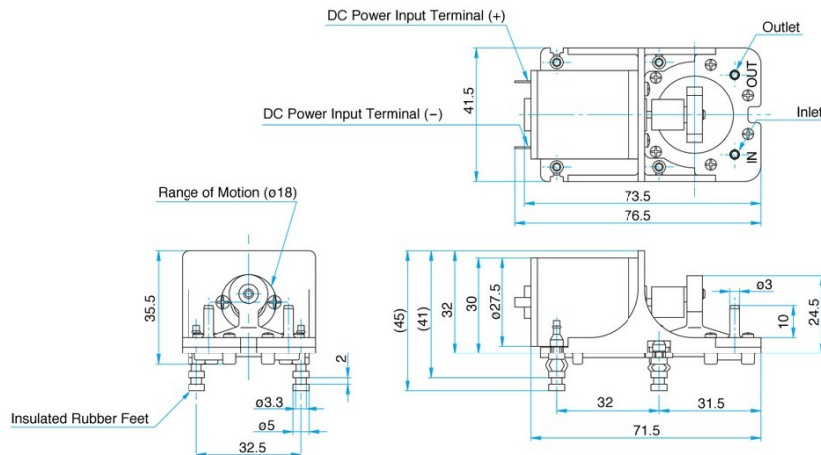
Vacuum Sucking Pen



Blood Pressure Tester



## Dimensional Outline Drawing (Unit: mm)







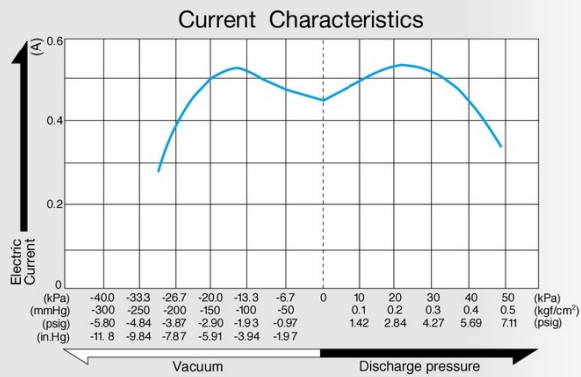
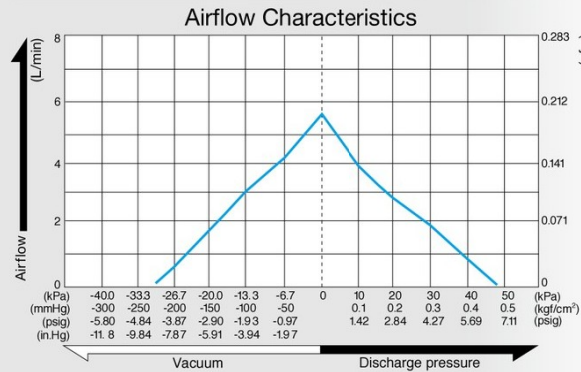
# Compressor and Vacuum Pump

## Model **DP0102**

Brushless DC Motor 12 V DC



### Airflow & Power Consumption



### Specifications

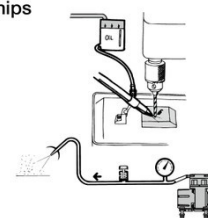
Attainable Vacuum	-26.7 kPa (-200 mmHg) -267 mbar -7.87 in.Hg
Free Air Displacement	5.0 L/min 0.177 cfm
Rated Voltage	12 V DC
Maximum Pressure	45 kPa (0.45 kgf/cm <sup>2</sup> ) 0.45 bar 6.4 psig
Maximum Current	0.7 A
Duty Cycle	Continuous
Working Pressure Range	-26.7 kPa to 45 kPa (-200 mmHg to 0.45 kgf/cm <sup>2</sup> ) -267 mbar to 0.45 bar -7.87 in.Hg to 6.4 psig
Rated Performance	5,000 hours
Inlet	6 mm O.D. straight barb
Outlet	6 mm O.D. straight barb
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	50 (L) x 30 (W) mm 1-31/32" (L) x 1-3/16" (W)
Weight	0.25 kg 0.55 Lbs
Leadwire Length	400 mm 15-3/4"

### Application Examples

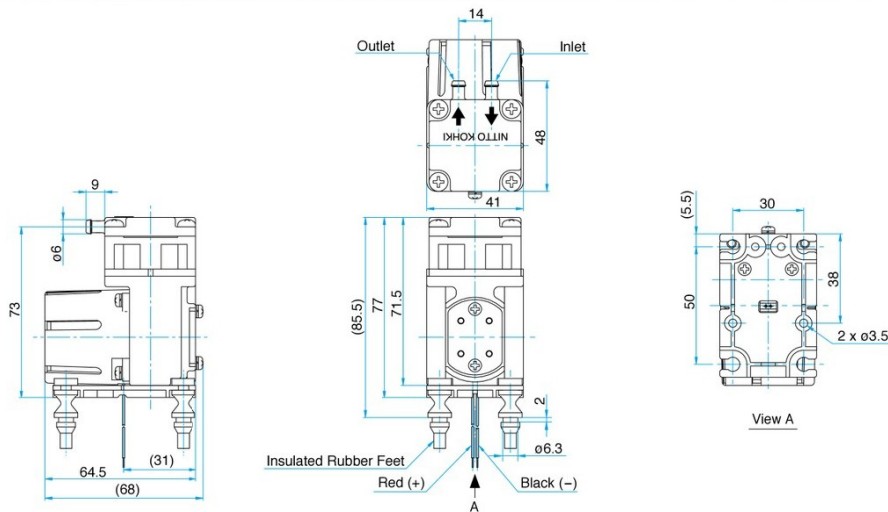
#### Endoscopes



#### Removal of micromachining chips



### Dimensional Outline Drawing (Unit: mm)

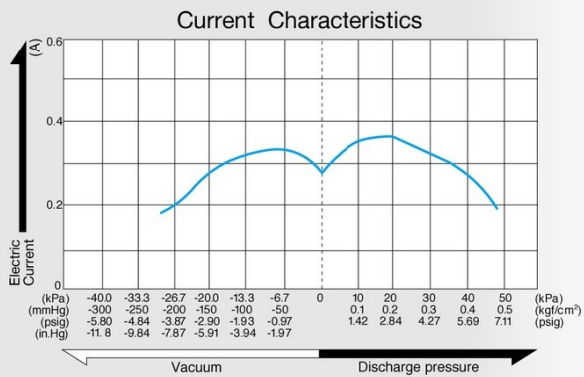
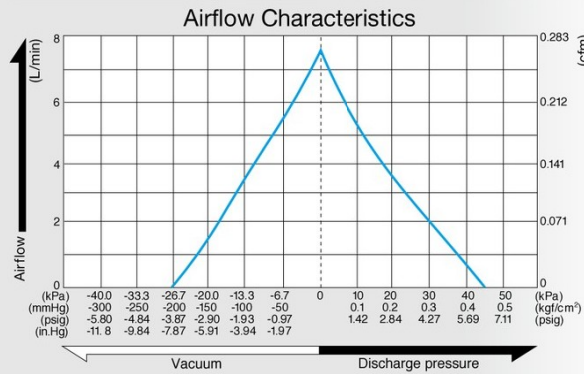


# Compressor and Vacuum Pump

## Model **DPO102S** Brushless DC Motor 24 V DC



### Airflow & Power Consumption



### Specifications

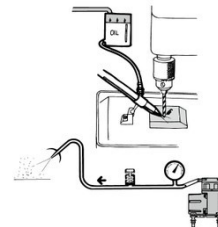
Attainable Vacuum	-26.7 kPa (-200 mmHg) -267 mbar -7.87 in.Hg
Free Air Displacement	7.0 L/min 0.247 cfm
Rated Voltage	24 V DC
Maximum Pressure	45 kPa (0.45 kgf/cm <sup>2</sup> ) 0.45 bar 6.4 psig
Maximum Current	0.5 A
Duty Cycle	Continuous
Working Pressure Range	-26.7 kPa to 45 kPa (-200 mmHg to 0.45 kgf/cm <sup>2</sup> ) -267 mbar to 0.45 bar -7.87 in.Hg to 6.4 psig
Rated Performance	5,000 hours
Inlet	6 mm O.D. straight barb
Outlet	6 mm O.D. straight barb
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	50 (L) x 30 (W) mm 1-31/32" (L) x 1-3/16" (W)
Weight	0.25 kg 0.55 Lbs
Leadwire Length	400 mm 15-3/4"

### Application Examples

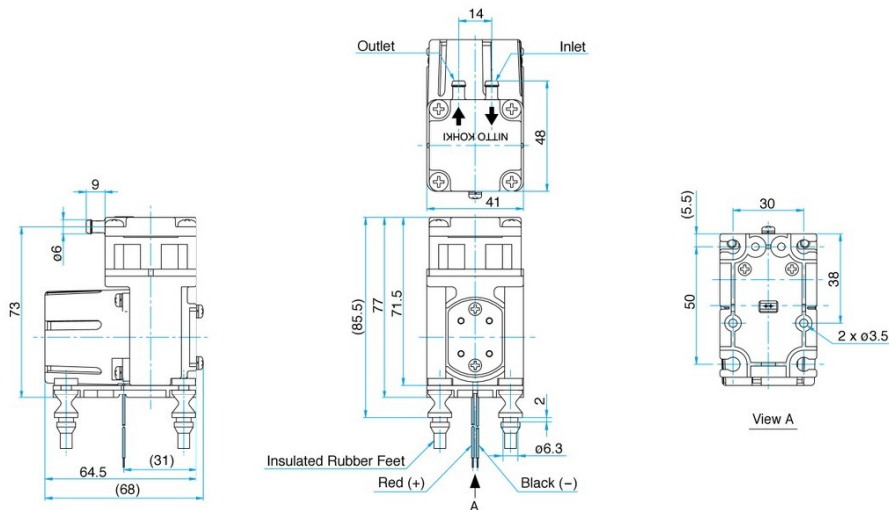
#### Endoscopes



#### Removal of micromachining chips



### Dimensional Outline Drawing (Unit: mm)



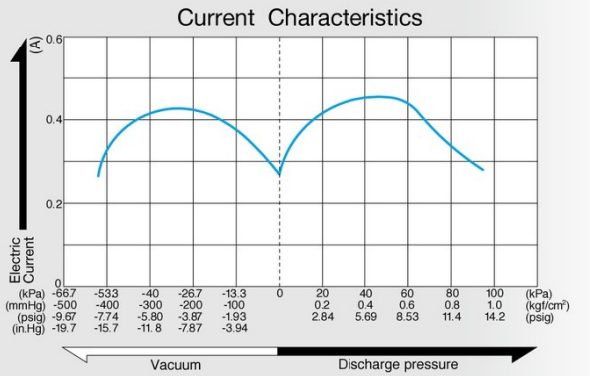
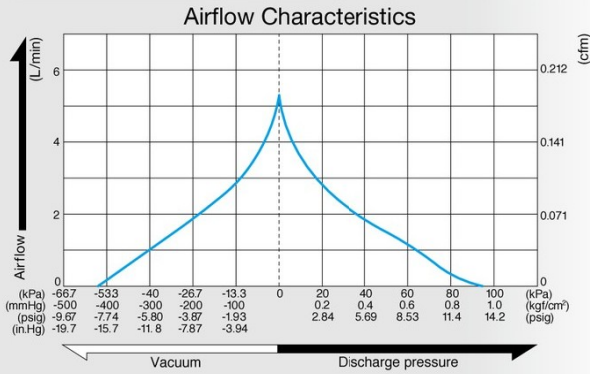
# Compressor and Vacuum Pump

## Model **DPO102H-X1**

Brushless DC Motor **12 V DC**



### Airflow & Power Consumption



### Specifications

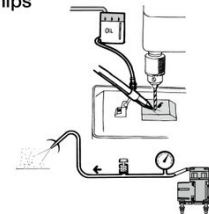
Attainable Vacuum	-50.7 kPa (-380 mmHg) -507 mbar -15 in.Hg
Free Air Displacement	4.0 L/min 0.141 cfm
Rated Voltage	12 V DC
Maximum Pressure	80 kPa (0.8 kgf/cm <sup>2</sup> ) 0.8 bar 11.4 psig
Maximum Current	0.7 A
Duty Cycle	Continuous
Working Pressure Range	-50.7 kPa to 80 kPa (-380 mmHg to 0.8 kgf/cm <sup>2</sup> ) -507 mbar to 0.8 bar -15 in.Hg to 11.4 psig
Rated Performance	3,000 hours
Inlet	6 mm O.D. straight barb
Outlet	6 mm O.D. straight barb
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	50 (L) x 30 (W) mm 1-31/32" (L) x 1-3/16" (W)
Weight	0.25 kg 0.55 Lbs
Leadwire Length	400 mm 15-3/4"

### Application Examples

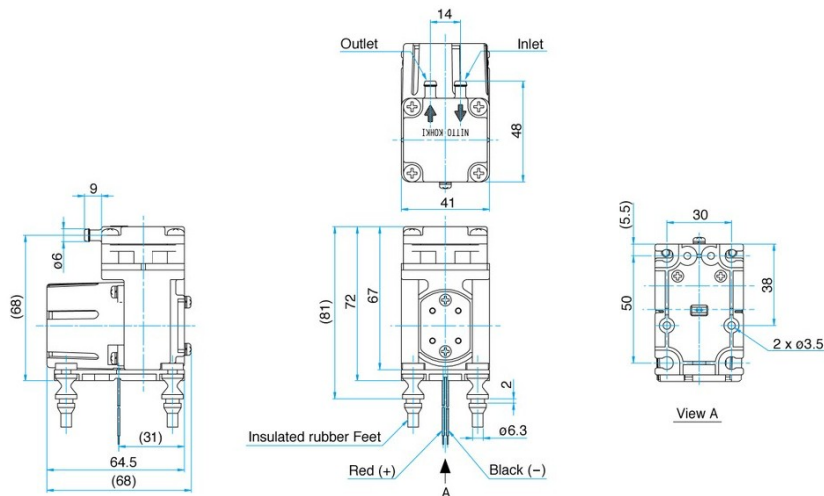
Vacuum pick up and place devices for CD & DVD



Removal of micromachining chips



### Dimensional Outline Drawing (Unit: mm)





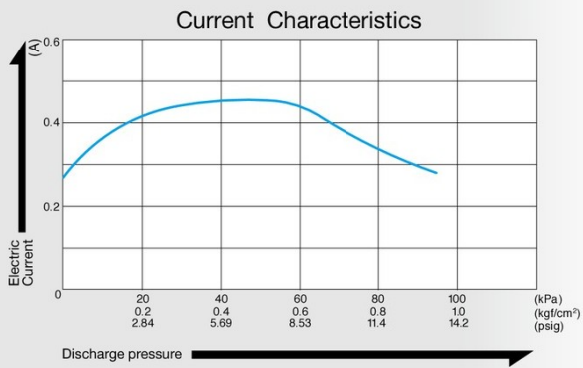
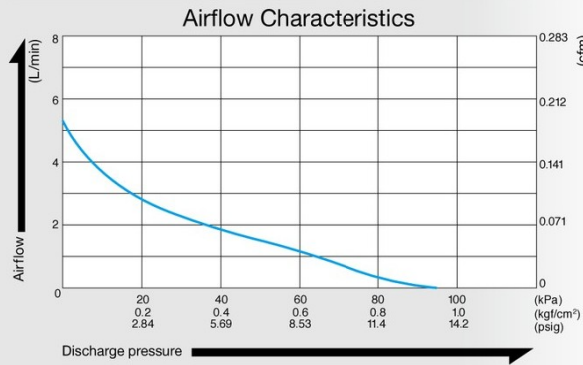
# Compressor

## Model **DPO102H-X2**

Brushless DC Motor 12 V DC



### Airflow & Power Consumption

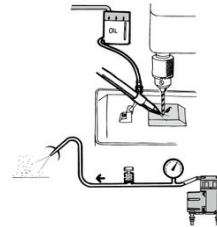


### Specifications

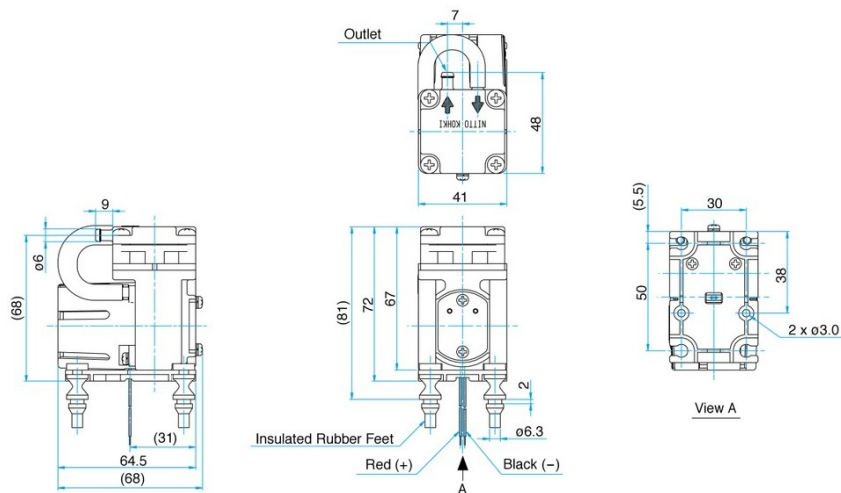
Free Air Displacement	4.0 L/min 0.141 cfm
Rated Voltage	12 V DC
Maximum Pressure	80 kPa (0.8 kgf/cm <sup>2</sup> ) 0.8 bar 11.4 psig
Maximum Current	0.7 A
Duty Cycle	Continuous
Working Pressure Range	0 to 80 kPa (0 to 0.8 kgf/cm <sup>2</sup> ) 0 to 0.8 bar 0 to 11.4 psig
Rated Performance	3,000 hours
Inlet	6 mm O.D. straight barb
Outlet	6 mm O.D. straight barb
Coil Insulation Class	E or its equivalent (JETL)
Mounting Dimensions	50 (L) x 30 (W) mm 1-31/32" (L) x 1-3/16" (W)
Weight	0.25 kg 0.55 Lbs
Leadwire Length	400 mm 15-3/4"

### Application Examples

Removal of micromachining chips



### Dimensional Outline Drawing (Unit : mm)



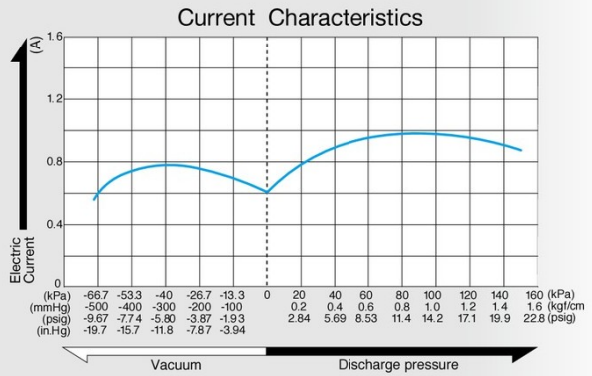
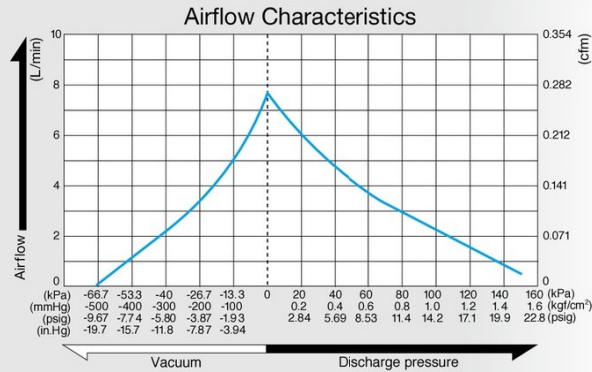
# Compressor and Vacuum Pump

## Model **DP0110-X1**

Brushless DC Motor 12 V DC



### Airflow & Power Consumption



### Specifications

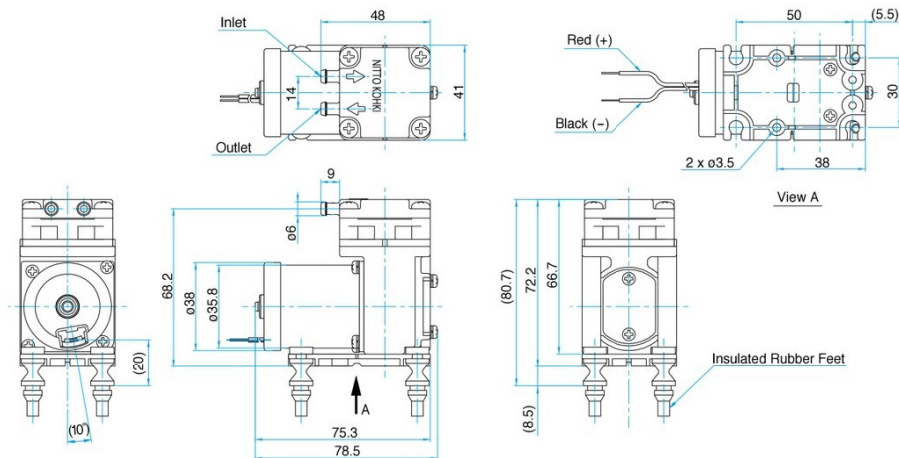
Attainable Vacuum	-66.7 kPa (-500 mmHg) -667 mbar -19.7 in.Hg
Free Air Displacement	7.5 L/min 0.265 cfm
Rated Voltage	12 V DC
Maximum Pressure	150 kPa (1.5 kgf/cm <sup>2</sup> ) 1.5 bar 21.3 psig
Maximum Current	1.2 A or less
Duty Cycle	Continuous
Rated Performance (MTTF)	5,000 hours
Inlet	6 mm O.D. straight barb
Outlet	6 mm O.D. straight barb
Coil Insulation Class	A or its equivalent (JETL)
Mounting Dimensions	50 (L) x 30 (W) mm 1-31/32" (L) x 1-3/16" (W)
Weight	0.30 kg 0.66 Lbs
Leadwire Length	360 mm 14-11/64"

### Application Examples

Vacuum pick up and place devices for CD & DVD



### Dimensional Outline Drawing (Unit: mm)



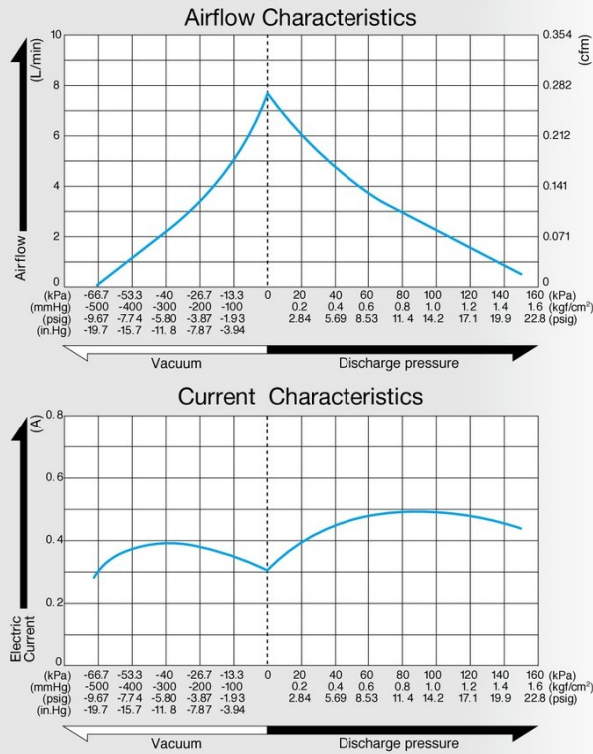
# Compressor and Vacuum Pump

## Model **DPO110-Y1**

Brushless DC Motor 24 V DC



### Airflow & Power Consumption



### Specifications

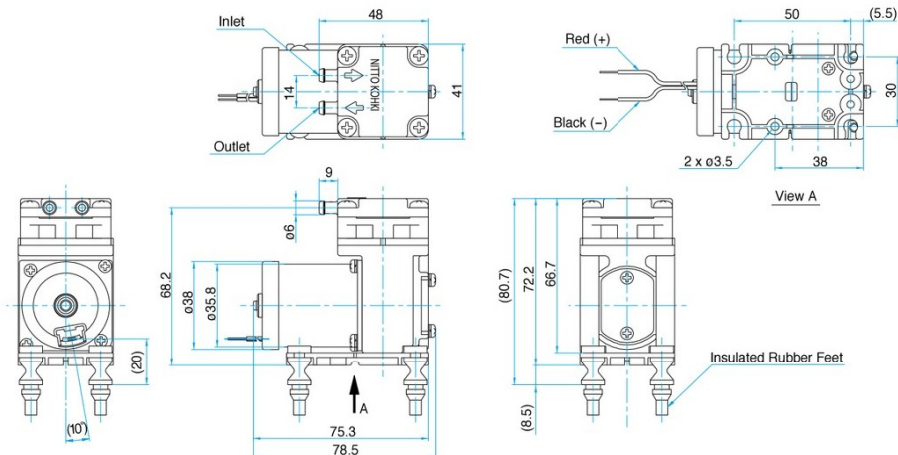
Attainable Vacuum	-66.7 kPa (-500 mmHg) -667 mbar -19.7 in.Hg
Free Air Displacement	7.5 L/min 0.265 cfm
Rated Voltage	24 V DC
Maximum Pressure	150 kPa (1.5 kgf/cm <sup>2</sup> ) 1.5 bar 21.3 psig
Maximum Current	0.6 A or less
Duty Cycle	Continuous
Rated Performance (MTTF)	5,000 hours
Inlet	6 mm O.D. straight barb
Outlet	6 mm O.D. straight barb
Coil Insulation Class	A or its equivalent (JETL)
Mounting Dimensions	50 (L) x 30 (W) mm 1-31/32" (L) x 1-3/16" (W)
Weight	0.30 kg 0.66 Lbs
Leadwire Length	360 mm 14-11/64"

### Application Examples

Vacuum pick up and place devices for CD & DVD



### Dimensional Outline Drawing (Unit: mm)



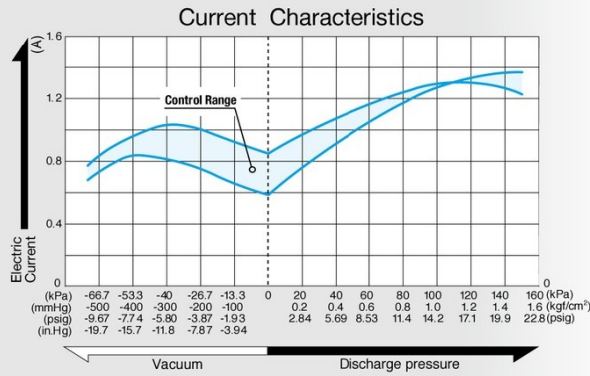
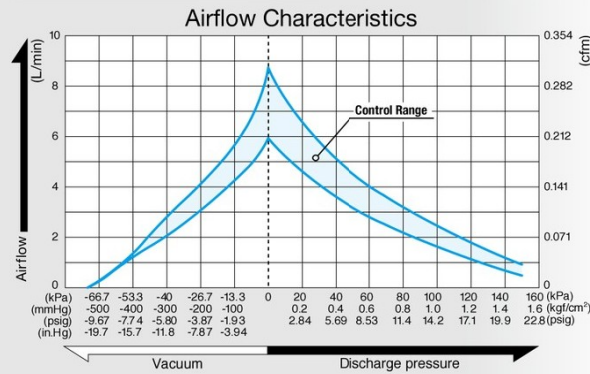
# Compressor and Vacuum Pump

## Model **DP0110-X3** Brushless DC Motor 12 V DC

PWM control possible



### Airflow & Power Consumption



### Specifications

Attainable Vacuum	-66.7 kPa (-500 mmHg) -667 mbar -19.7 in.Hg
Free Air Displacement	7.5 L/min 0.265 cfm
Rated Voltage	12 V DC
Maximum Pressure	150 kPa (1.5 kgf/cm <sup>2</sup> ) 1.5 bar 21.3 psig
Maximum Current	1.4 A or less
Duty Cycle	Continuous
Rated Performance (MTTF)	5,000 hours
Control(PWM)	2.5 - 5 V, 15-25 kHz, Duty cycle 80 - 100%
Inlet	6 mm O.D. straight barb
Outlet	6 mm O.D. straight barb
Coil Insulation Class	A or its equivalent (JETL)
Mounting Dimensions	50 (L) x 30 (W) mm 1-31/32" (L) x 1-3/16" (W)
Weight	0.30 kg 0.66 Lbs
Leadwire Length	180 mm 7-3/32"

### Application Examples

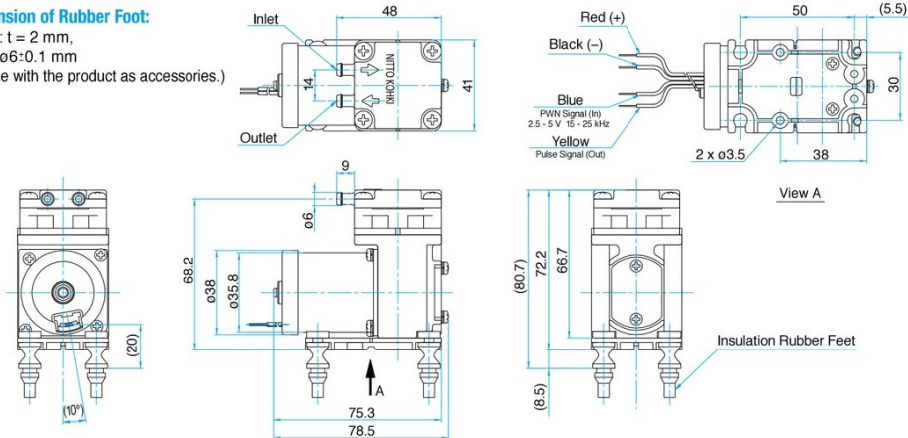
Vacuum pick up and place devices for CD & DVD



### Dimensional Outline Drawing (Unit : mm)

#### Mounting Dimension of Rubber Foot:

Plate thickness : t = 2 mm  
Hole diameter :  $\phi 6 \pm 0.1$  mm  
(Rubber feet come with the product as accessories.)



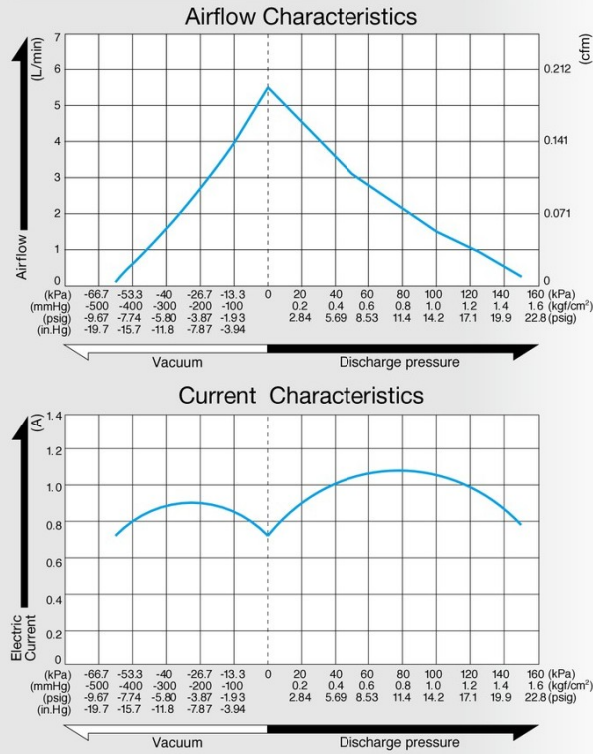


# Compressor and Vacuum Pump

## Model **DPO110T-X1** Brushless DC Motor 12 V DC



### Airflow & Power Consumption

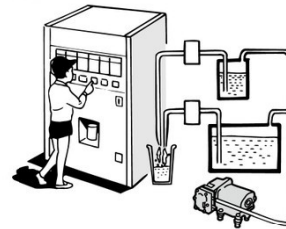


### Specifications

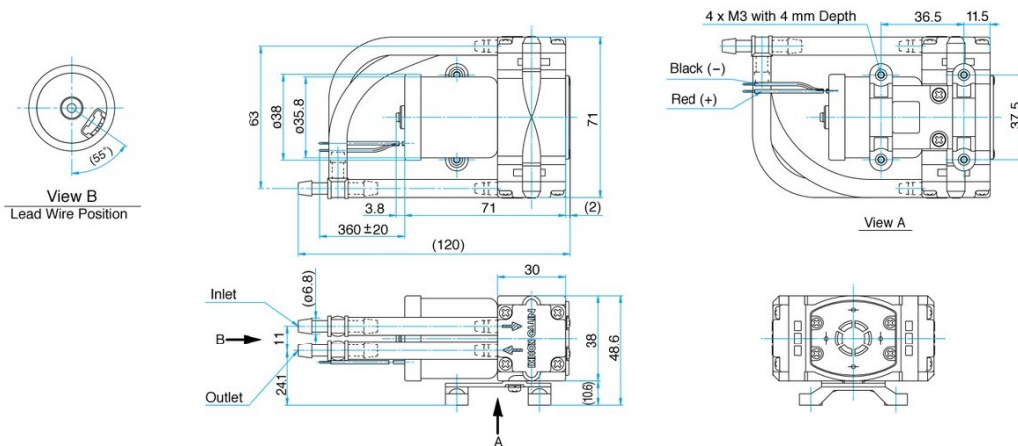
Attainable Vacuum	-60.0 kPa (-450 mmHg) -600 mbar -17.7 in.Hg
Free Air Displacement	5.5 L/min 0.194 cfm
Rated Voltage	12 V DC
Maximum Pressure	150 kPa (1.5 kgf/cm <sup>2</sup> ) 1.5 bar 21.3 psig
Maximum Current	1.2 A or less
Duty Cycle	Continuous
Rated Performance (MTTF)	5,000 hours
Inlet	6.8 mm O.D. straight barb
Outlet	6.8 mm O.D. straight barb
Coil Insulation Class	A or its equivalent (JETL)
Mounting Dimensions	36.5 (L) x 37.5 (W) mm 1-7/16" (L) x 1-15/32" (W)
Weight	0.27 kg 0.60 Lbs
Leadwire Length	360 mm 14-11/64"

### Application Examples

#### Vending Machines



### Dimensional Outline Drawing (Unit: mm)



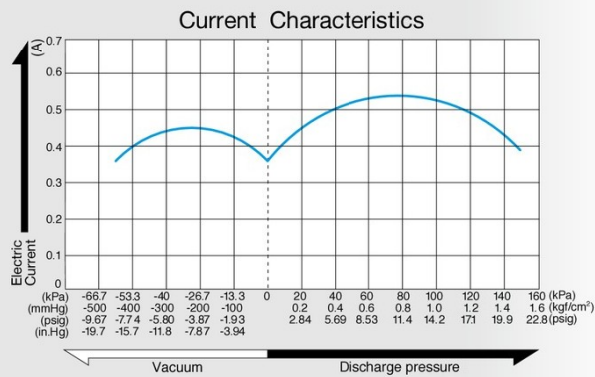
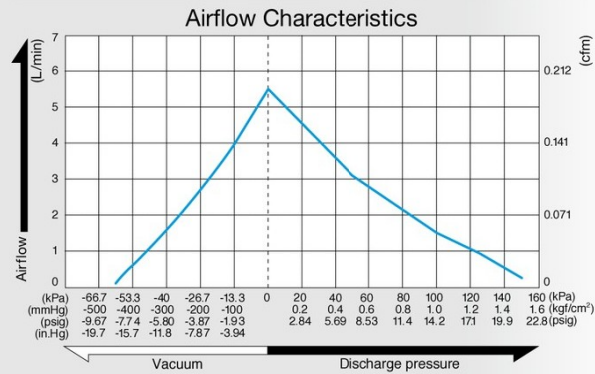
# Compressor and Vacuum Pump

## Model **DPO110T-Y1**

Brushless DC Motor 24 V DC



### Airflow & Power Consumption

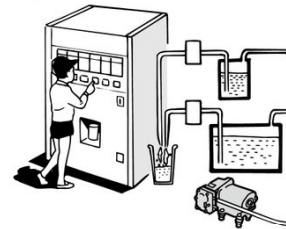


### Specifications

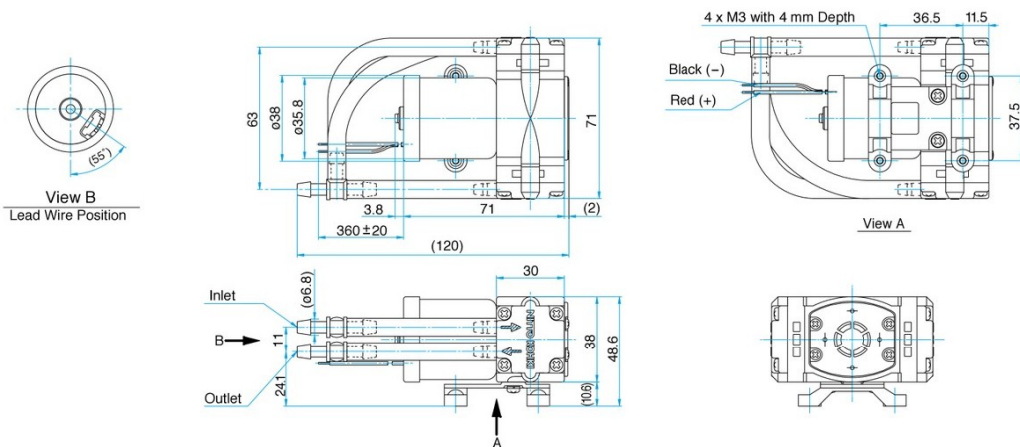
Attainable Vacuum	-60.0 kPa (-450 mmHg) -600 mbar -17.7 in.Hg
Free Air Displacement	5.5 L/min 0.194 cfm
Rated Voltage	24 V DC
Maximum Pressure	150 kPa (1.5 kgf/cm <sup>2</sup> ) 1.5 bar 21.3 psig
Maximum Current	0.6 A or less
Duty Cycle	Continuous
Rated Performance (MTTF)	5,000 hours
Inlet	6.8 mm O.D. straight barb
Outlet	6.8 mm O.D. straight barb
Coil Insulation Class	A or its equivalent (JETL)
Mounting Dimensions	36.5 (L) x 37.5 (W) mm 1-7/16" (L) x 1-15/32" (W)
Weight	0.27 kg 0.60 Lbs
Leadwire Length	360 mm 14-11/64"

### Application Examples

#### Vending Machines



### Dimensional Outline Drawing (Unit: mm)

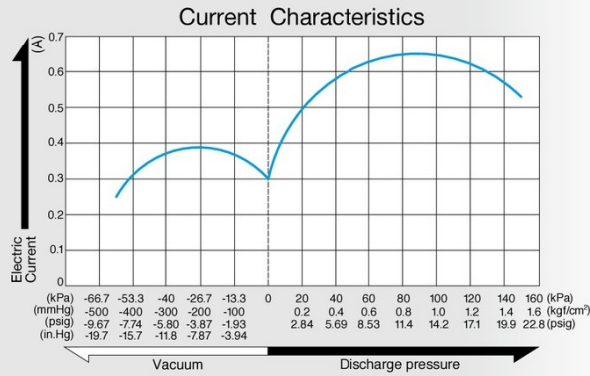
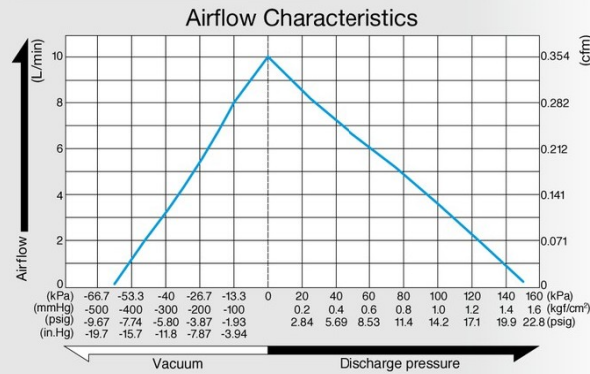


# Compressor and Vacuum Pump

**Model DPO210TA-Y1** PWM control possible  
**Brushless DC Motor 24 V DC**



### Airflow & Power Consumption

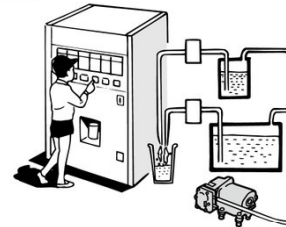


### Specifications

Attainable Vacuum	-60.0 kPa (-450 mmHg) -600 mbar -17.7 in.Hg
Free Air Displacement	10 L/min 0.35 cfm
Rated Voltage	24 V DC
Maximum Pressure	150 kPa (1.5 kgf/cm <sup>2</sup> ) 1.5 bar 21.3 psig
Maximum Current	0.8 A
Duty Cycle	Continuous
Rated Performance (MTTF)	5,000 hours
Inlet	6.8 mm O.D. straight barb
Outlet	6.8 mm O.D. straight barb
Coil Insulation Class	B or its equivalent
Mounting Dimensions	36.5 (L) x 37.5 (W) mm 1-7/16" (L) x 1-13/32" (W)
Weight	0.32 kg 0.71 Lbs
Leadwire Length	300 mm 11-13/16"

### Application Examples

#### Vending Machines

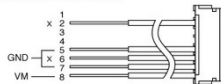


### Dimensional Outline Drawing (Unit : mm)

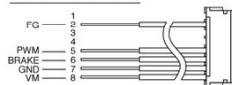
#### Connection Table

Circuit No.	1	2	3	4	5	6	7	8
Cord Color	—	Yellow	—	—	White	Blue	Black	Red
Connection Table	Control Signal				Power Source			
Function	—	FG	—	—	PWM	BRAKE	GND	VM
Cord Size	AWG28				AWG26			
Cord UL Style	UL1571							

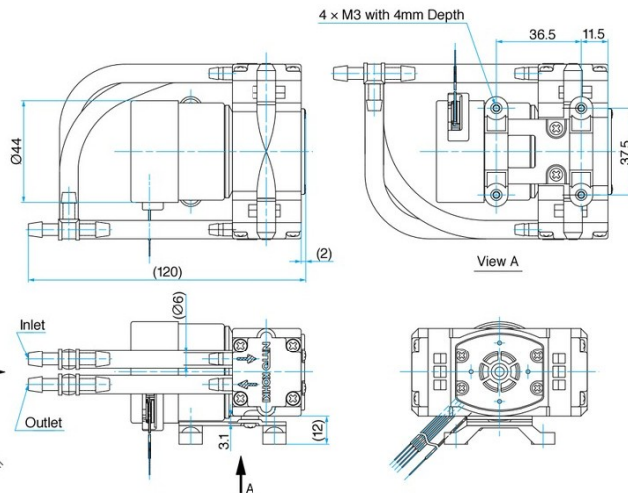
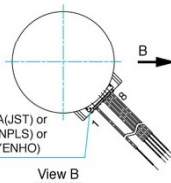
#### No control function



#### Use control function



S8B-ZR-SM4A(JST) or 1027-66208(CNPLS) or 15001WR-08A00(YENHO)







**LIQUID PUMP**  
Piezoelectric Pump  
DC Diaphragm Liquid Pump

# LIQUID PUMP

## Piezoelectric Pump

**BIMOR series**

## DC Diaphragm Liquid Pump

**DPE series**

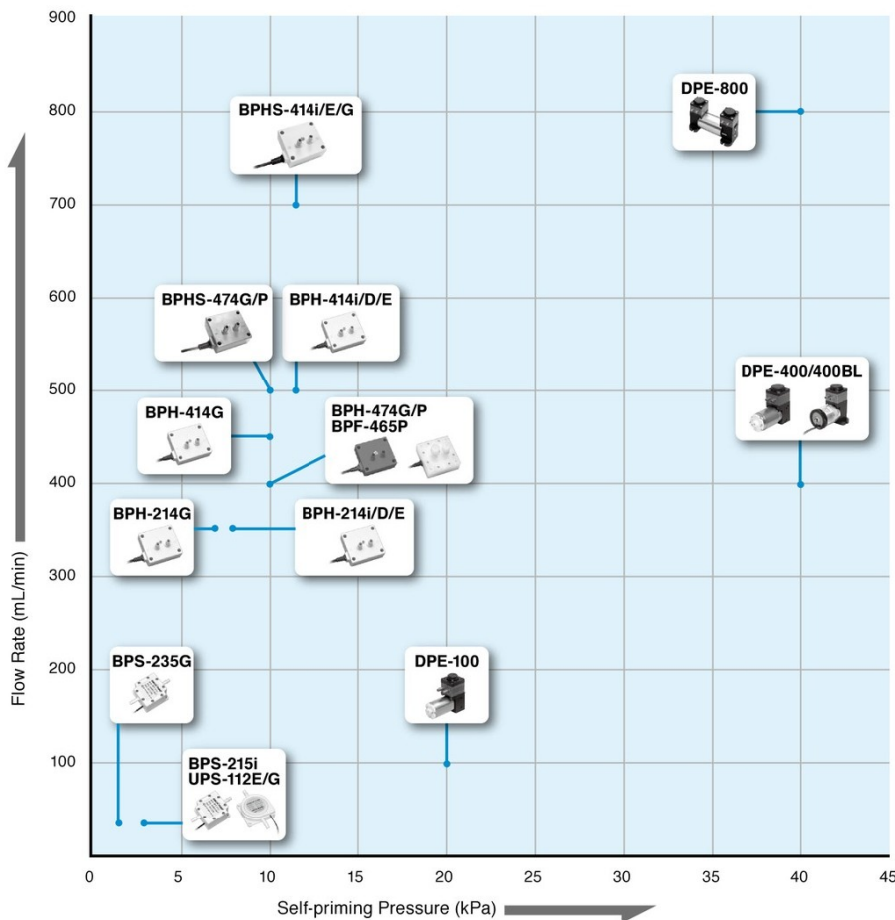
Page

BPS Type	
BPH Type	— 93
BPHS Type	
BPF Type	

DPE-100	— 89
DPE-400	— 90
DPE-400BL	— 91
DPE-800	— 92

**Liquid Pump series (100V/120V/230V AC/DC)**

\*The flow rate of 230 V pump is not same as 100/120 V.

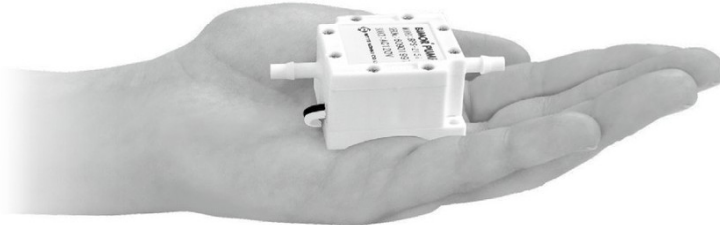


i : Butyl Rubber  
G : Fluorine Rubber  
D : Dimethyl rubber  
E : Ethylene Propylene Rubber  
P : Perfluor

# Piezoelectric Pump

## BIMOR PUMP

*Suitable for pumping liquids*



### Applications

- For supply and drainage
- For cooling circulation
- For medical injection
- For liquid sampling

### Compact, lightweight, durable & quiet

As the Bimorph has no motors or shafts or other troublesome mechanisms. We have achieved maintenance free continuous operation for 60 months.

### Low power consumption & electromagnetic noise

The Bimor is driven by low energy consuming piezoelectric elements. Consequently it costs very little to run and emits virtually no electromagnetic noise.

### Simple flow rate adjustment

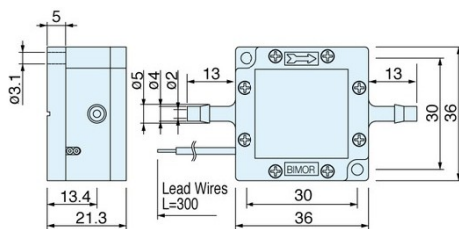
As the flow rate of the Bimor is proportional to the voltage and frequency, adjusting the flow rate is as simple as adjusting either one. You may use the product at the rated voltage or lower.

### Application versatility

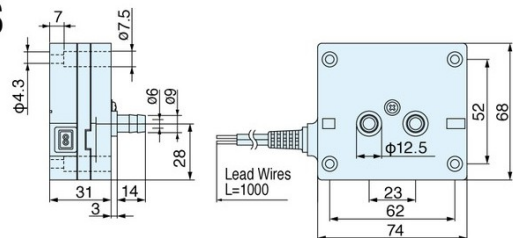
The parts can be made of several different materials, so you can select the material appropriate to your needs, be it a liquid application. The Bimor is currently employed in a variety of different fields including medicine, scientific research, and the PC and chemical industries.

### Dimensional Outline Drawing (Unit: mm)

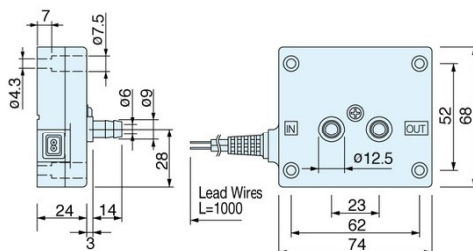
#### BPS type



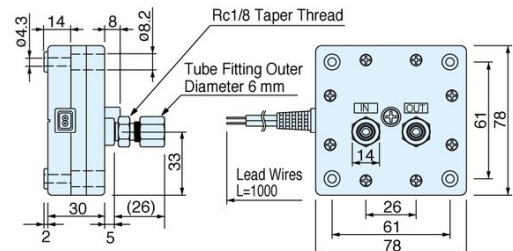
#### BPHS type



#### BPH type



#### BPF type





**Specifications**

Voltage(AC) — 120 V 60Hz					Voltage(AC) — 230 V 50Hz					Liquid Surface Materials			Weight (g)
Model	Current (mA)	Self-priming Pressure(kPa)	FlowRate (mL/min)	Discharge Pressure (kPa)	Model	Current (mA)	Self-priming Pressure(kPa)	FlowRate (mL/min)	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	15	7	220	18	PP	PP	EPDM	140
BPH-214G	—	7	—	17	BPH-214G	—	—	—	—	PP	PTFE	FKM	
BPH-414E	30	12	500	35	—	—	—	—	—	—	PP	EPDM	170
—	—	—	—	—	BPH-274G	15	7	250	35	PPS	PTFE	FKM	
—	—	—	—	—	BPH-274P	—	—	—	—	—	—	FFKM FEP	

Voltage(AC) — 100 V 60Hz					Liquid Surface Materials				Weight (g)
Model	Current (mA)	Self-priming Pressure(kPa)	FlowRate (mL/min)	Discharge Pressure (kPa)	Housing	Liquid Contact Sheet	Valve	O-ring	
BPHS-414i	—	—	—	—	—	—	IIR	—	150
BPHS-414E	—	12	700	—	PP	PP	EPDM	—	
BPHS-414G	30	—	—	35	—	—	FKM	—	
BPHS-474G	—	—	—	—	—	PTFE	FKM	—	
BPHS-474P	—	10	500	—	PPS	—	FFKM	FFKM FEP	

**Material Description**

- EPDM**  
Ethylene Propylene Rubber
- FEP**  
Fluoroethylene Propylene
- FFKM**  
Fluorine Rubber (Perfluoro)
- FKM**  
Fluorine Rubber
- IIR**  
Butyl Rubber
- PP**  
Polypropylene
- PTFE**  
Tetrafluororesin (Polytetrafluoroethylene)

**Condition of Use**

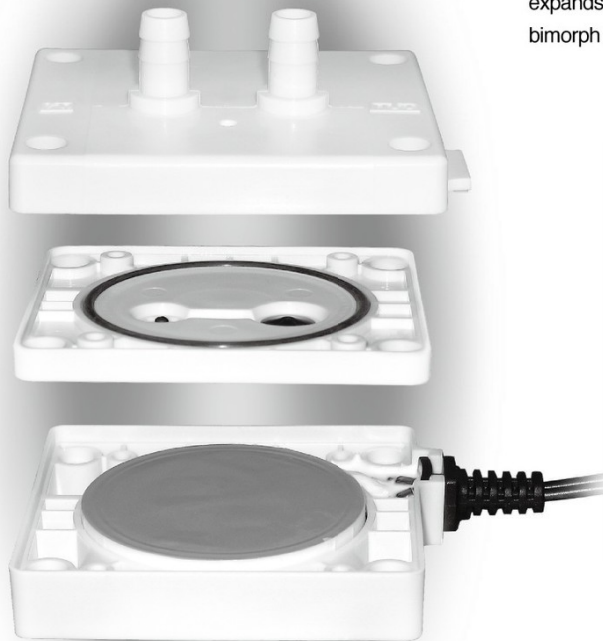
Ambient temperature	5~50°C *1
Ambient humidity	35~85% *2
Fluid temperature	5~50°C

\*1) No Freezing  
\*2) No condensation

**Suitable/unsuitable chemical liquids**

Model	Examples of suitable chemical liquids	Examples of unsuitable chemical liquids
<b>BPS-215i</b> <b>BPHS-414i</b>	Ethanol, Dilute hydrochloric acid, Sodium carbonate, Benzaldehyde, Formalin	Xylene, Mineral oil, Carbon tetrachloride, Trichloroethylene, Toluene, Benzene
<b>BPH-214E</b> <b>BPH-414E</b> <b>BPHS-414E</b>	Ammonia water, Ethanol, Hydrochloric acid, Caustic potash, Caustic soda, Methanol	
<b>BPH-214G</b> <b>BPHS-414G</b>	Ethanol, Dilute hydrogen peroxide, Mineral oil, Sodium hypochlorite	Acetone, Ammonia water, Glacial acetic acid, Hydrofluoric acid, Formalin
<b>BPH-274G</b> <b>BPHS-474G</b>	Ethanol, Xylene, Carbon tetrachloride, Silicone oil, Trichloroethylene	Acetone, Ammonia water, Chlorosulfonic acid, Glacial acetic acid, Hydrofluoric acid, Formalin
<b>BPH-274P</b> <b>BPHS-474P</b>	Ethanol, Chloroform, Glacial acetic acid, Benzene, Methyl ethyl ketone	Chlorosulfonic acid, Fluorine oil, CFC 112, CFC 113

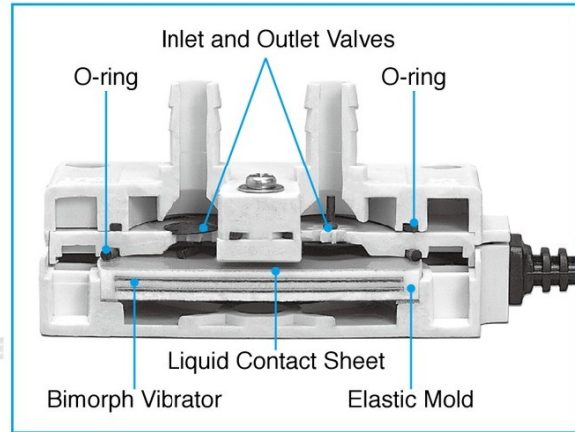
# The Next Step in Pump Miniaturization



## Revolutionary piezoelectric bimorph technology

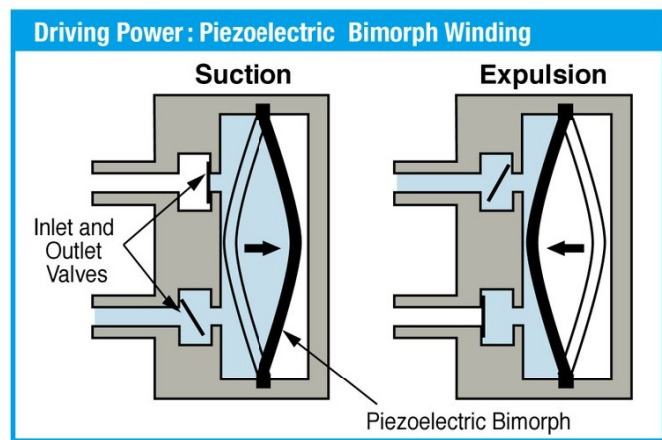
The Bimor's driving force, the bimorph, comprises two parallel piezoelectric wafers. Their nature is to expand or contract depending on the direction of the voltage. Therefore when an alternating current is applied, one wafer expands then contracts while the other contracts then expands, causing the bimorph to bend. Repeating the cycle creates the pumping action.

### Cross section



### Principle / Structure

"The Bimor pump" uses the displacement operation of the piezoelectric bimorph vibrator as the direct source of the pumping action.





# DC Liquid Pump

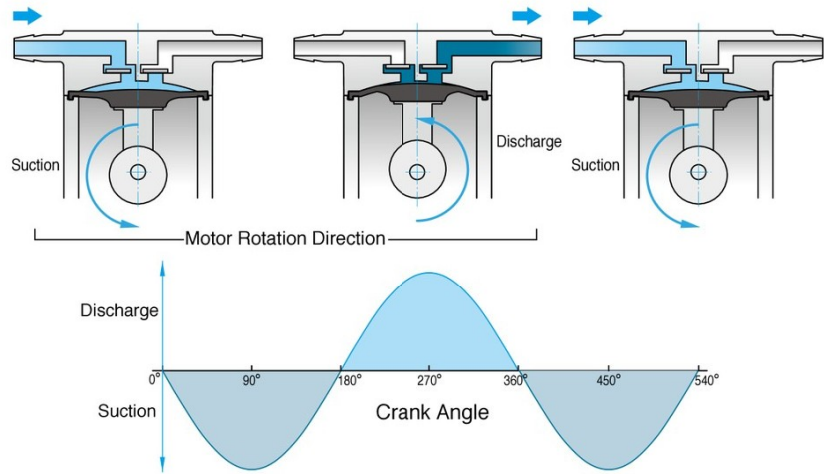
## DPE series



- **Built-in Pulse Absorption Chamber**
- **Many build material options for different liquids**
- **Self-priming type with air suction acceptable**

### Typical Conventional Pump without Pulse Absorption

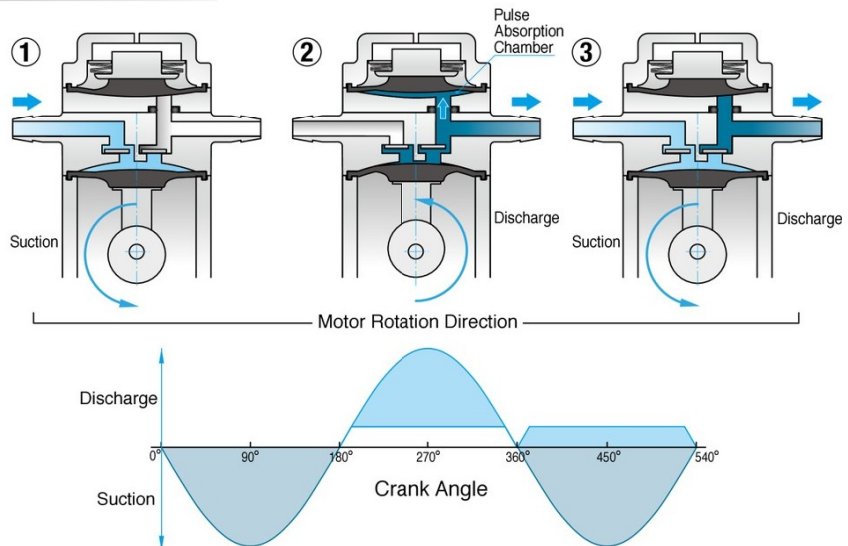
As liquid is transported through the suction and discharge passages of the pump and liquid circuit, high pulsations can be created which can cause cavitation, vibration in tubing, fittings, peak pulsing noises, and added stress and wear to pump mechanisms. These negative results are often increased through the use of small pumps having relatively high rotational speeds.



### Advanced design DPE Pump with Pulse Absorption

Provides pulse attenuation which helps to create steady state flow, reduced noise and vibration throughout the fluid circuit, and enhances life of the pump and other circuit components. It's designed in. . . No need for additional installation cost or space with pulsation dampers.

- 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.



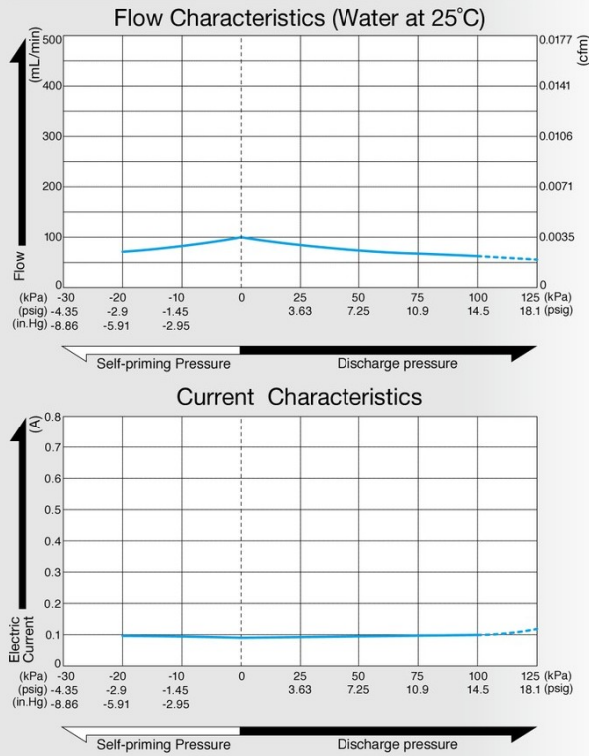
# DC Liquid Pump

## Model **DPE-100**

Brush DC Motor 24 V DC



### Flow & Electric Current



### Specifications

Rated Voltage	24 V DC
Flow Rate *1	100 mL/min 0.0035 cfm
Working Pressure Range	0 to 100 kPa 0 to 1 bar 0 to 14.2 psig
Maximum Pressure *2	300 kPa 3 bar 42.7 psig
Maximum Current	100 mA
Duty Cycle	Continuous
Rated Performance (MTTF)	500 hours
Self-priming Pressure *1	20 kPa 0.2 bar 2.84 psig
Inlet	4.7 mm O.D. straight barb
Outlet	4.7 mm O.D. straight barb
Insulation Classification	E class equivalent
Mounting Dimensions	9.5 (L) x 17 (W) mm 3/8" (L) x 43/64" (W)
Weight	67 g 0.148 Lbs
Motor	Brush DC Motor

\*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 and applicable fluids

Model	Cylinder Head	Head Cover	Diaphragm	Valve	O-ring	Applicable fluids
DPE-100-2E	PA Polyamide(Nylon)		PTFE Polytetrafluoroethylene	EPDM Ethylene-propylene rubber		Sodium hydroxide, Citric acid Ammonia water, Caustic potash
DPE-100-2G				FKM Fluoro rubber		Ethanol, Ethylene glycol Sodium carbonate, mineral oil
DPE-100-7G	PPS Polyphenylene sulfide		PTFE Polytetrafluoroethylene	FKM Fluoro rubber		Xylene, Carbon tetrachloride Trichloroethylene, Silicon oils
DPE-100-7P				FFKM Perfluoroelastomer		Chloroform, Benzene Glacial acetic acid, Methyl ethyl ketone

### Application Examples

- Liquid analytical instruments e.g. medical, food, water treatment & environmental.
- Liquid transport within filtration, sampling, sterilizers and washers.
- Ink transport within industrial ink-jet printers.

### Dimensional Outline Drawing (Unit : mm)

