No. NP 38-07-2E

PISCO®

Rotary Vacuum Pump

Patent no. 4796891

CE RoHS compliant

RPV06

- ☑ In-line twin rotor
- ☑ Parallel twin rotor
- ☑ Parallel triple rotor
- ☑ Parallel quad rotor

New Line Up

>>> http://en.pisco.co.jp/

Features

Contribute to energy saving

- Monthly electrical consumption is 46% less than equivalent other brand pump.(*)
- The top level high efficiency in the industry is realized for the pumping speed per motor power 1(W).
  ➥1.0/1.2 [pumping speed (l/min)/motor power (W)] (50/60Hz)

* According to our investigation using RPV062-60T200 by 24 hours operaion. It is only a reference value since it differs by operational conditions.

Light weight ▶ Max weight: about 10.5Kg

Compact ▶ Max. dimension: 125 x 397.6 x 181mm (width x depth x height)

- Space saving is realized by adoption of the special rotor form.

※.Max weight and max. dimension are of 120L type RPV064-120V200.

Low heat generation

- About 20ºC lower than equivalent other brand model, and it suppresses the temperature rise in the room (or within equipment). (※ our investigation)
- Low generation of heat is realized by adoption of forced air-cooling system.
- No sliding of the rotaty shaft seal by adoption of magnet-coupling results in no heat generation by seal.

Low driving noize ▶ Silent : ≦58dB[50Hz]。

Low vibration ▶ About 1/10 of equivalent other brand models. (*)

- Low noize operation and low vibration are realized by full balancing design for rotary part.

* Our investigation. Same level as air conditioner or quiet car

Long life ▶ Maintenace free for nearly 30000 hours operation. (* Depending on the operational conditions)

- High durability is realized by adopting of super engineering plastic, which is excellent in self-lubricity and wear resistance, and special surface treatment.
- Providing minimum clearance between rotor and cylinder wall, realize the fundamentally contactless structure and minimization of sliding parts.
- Adoption of magnet-coupling, no sliding seal required.
  ➥No maintenance necessary by seal abrasion
  ➥Support to longer operation life of motor by minimizing load to the motor shaft part.

Low generation of dust ▶ Contamination to surrouding area is controlled.

- Lubrication is unnecessary by adoption of the excellent clean vacuum grease for low dust and low volatile.
- Low dust generation is realized by minimization of sliding parts.
  Suppress environmental pollution such as abrasion powder created by vane pump.

Contribute to environment ▶ RoHS compliance

Safe design ▶ CE marking corresponding

Variety of options

- Not only a pump but also push-in fittings and exhaust cleaners (exhaust mufflers) are prepared.
- Additionally, compression fitting, which is suitable for medium vacuum model (RPV06A model) that emphasize airtightness, is added.

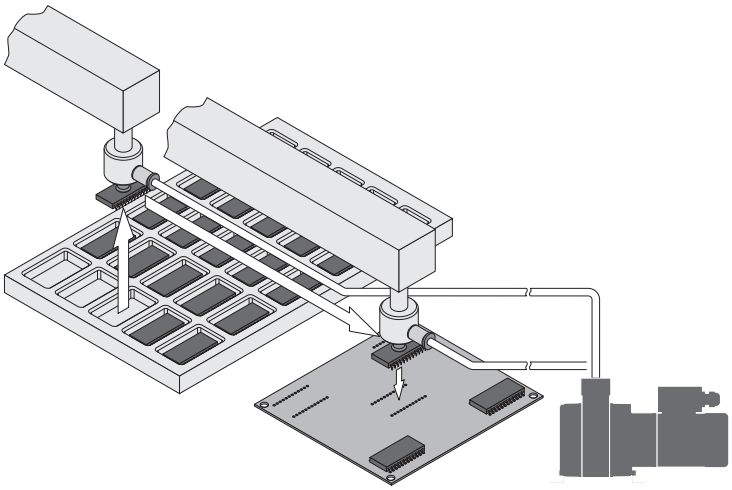
Additional models

- The built-in power switch models for single phase 100VAC pumps (twin in-line & parallel layout pumps) are introduced. Just plug-in the power plug in to 100VAC outlet to operate.

Applications

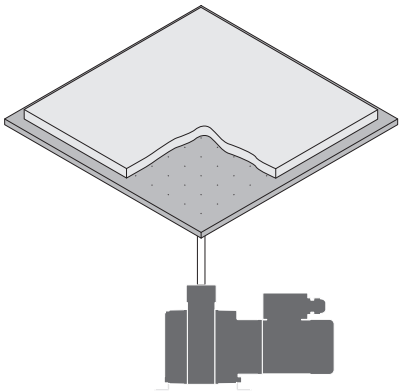
Suction transport

From a small and light work like a semiconductor chip to a large and heavy work like a solar panel is vacuum suctioned and transferred. Of course, it is the best also for factory automation line.



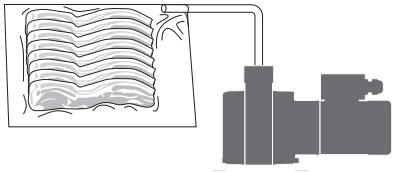
Vacuum chuck

Distortion and thermal deformation of a work hardly occur, and processing accuracy is stabilized. Additionally, the fixing operation of work is easy.



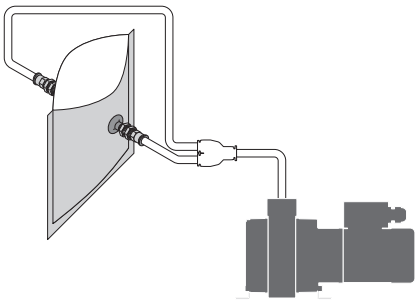
Vacuum packing

Make the vacuum state in the bag, and then packing the products, including food.



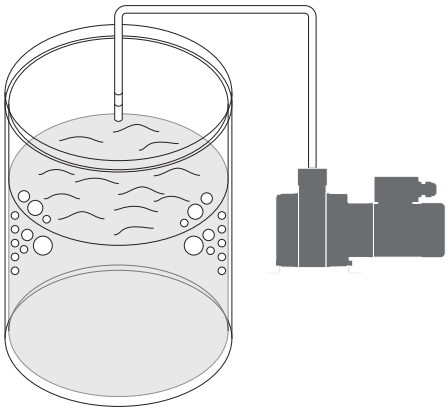
Bagging

It is suitable for a process disliking a diffusion of oil and abrasion powder scattering to surrounding environments such as opening candy bag or paper pack.



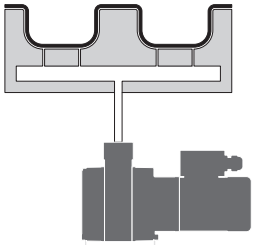
Defoaming/deaeration

Removing air bubbles and air contained in adhesives, cosmetics (cream), distilled water, etc.

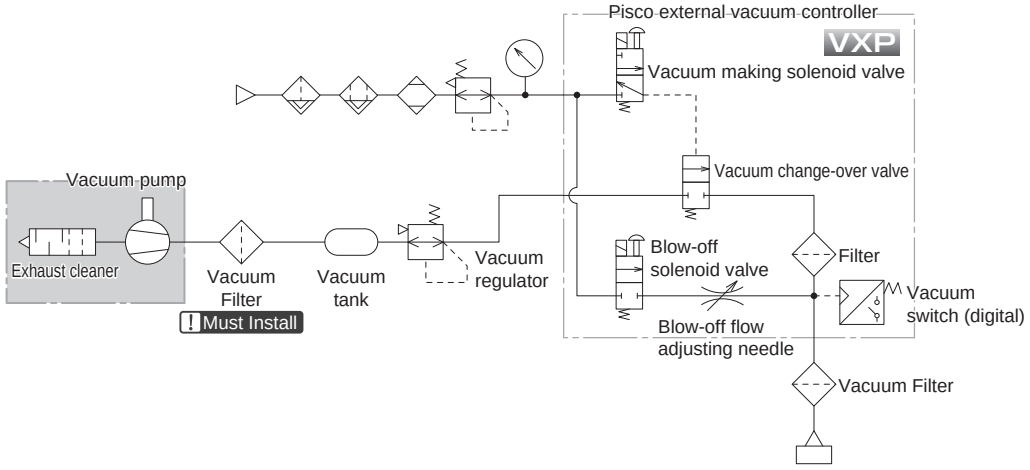


Vacuum forming

Form by sucking air between mold and sheet to make the sheet stick together to the mold.

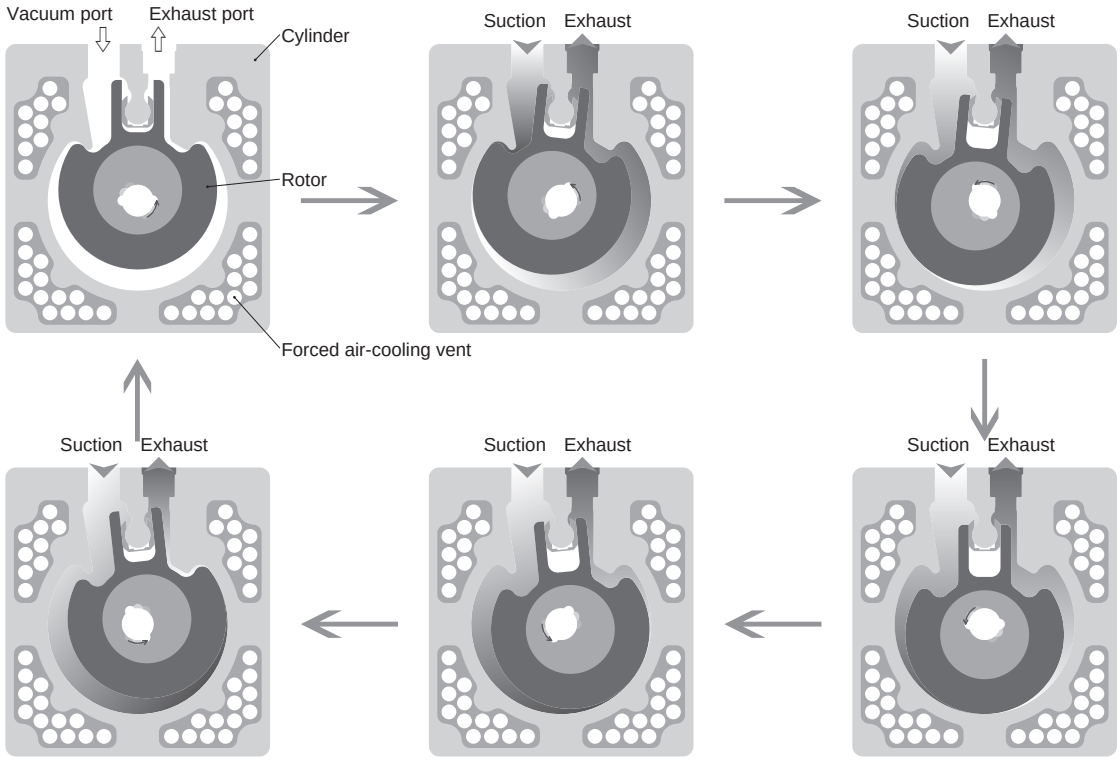


Schematic diagram (example) when using suction transport



*1 Related products mentioned above are introduced in page 31 and the details of the exhaust cleaner is listed in page 20.
*2 The rotary vacuum pump is a precision machine. Do not let moisture, debris and dust flow into the pump by always installing a vaccum filter to an upstream piping.

Operating principle



① The eccentric rotor is placed in the space formed by the cylinder and plates which sandwich the cylinder.
② When the rotor carries out eccentric rotations, air is inhaled by the pressure difference to atmospheric pressure with increasing capacity of the space formed between the rotor of vacuum port side and cylinder. At the same time, air is discharged with decreasing capacity of the space formed in the rotor of exhaust port side and cylinder.
③ By performing this operation continuously, the air transfer from the vacuum port to the exhaust port is realized.

Model designation (example)

RPV06 ① 2-60 ② T200 ③ - 12 ④ - 30 ⑤ - 6 ⑥

①. Rotary Vacuum Pump

⑥.Exhaust cleaner (with fittings)

Combination \ Tube O.D.(mm)		ø10 (*1)	ø12	ø16
Code	Exhaust cleaner only	0		
	Exhaust cleaner & straight fitting	5		
	Exhaust cleaner & elbow fitting	6		
	No exhaust cleaner & fittings	No code		

*1. ø10mm fitting cannot be selecable for RPV064-120
*2. Same tube OD fitting is provided when selecting built-in fitting model.
*3. Connection thread size of exhaust cleaner is Rc1/2.

⑤.Exhaust port

Combination \ Tube O.D.(mm)			ø10 (*1)		ø12		ø16 (*2)	
Code	Push-in fitting	Straight	30		32		36	
		Elbow	40		42		46	
	Compression fitting	Straight	C0	D0	C2	D2	C6	D6
		Tube ID (mm)	ø6.5	ø7	ø8	ø9	ø11	ø13
	No fitting (*3)		No code					

*1. ø10mm fitting cannot be selectable for RPV064-120
*2. ø16mm fitting cannot be selectable for RPV064A-40
*3. ②The thread sizes of pump's port are different depending on the no. of cylinder and its layout and combining motor power. Please refer to Table-1 below.

④.Vacuum port

Combination \ Tube O.D.(mm)			ø10 (*1)		ø12		ø16	
Code	Push-in fitting	Straight	10		12		16	
		Elbow	20		22		26	
	Compression fitting	Straight	A0	B0	A2	B2	A6	B6
		Tube ID (mm)	ø6.5	ø7	ø8	ø9	ø11	ø13
	No fitting (*2)		No code					

*1. ø10mm fitting cannot be selectable for RPV064-120
*2. ②The thread sizes of pump's port are different depending on the no. of cylinder and its layout and combining motor power. Please refer to Table-1 below.
*3. Push-in fitting allow some leaks. If you have a problem in your applicaion, use compression fitting.

③.Motor type

Code	S100	S100SW	T200	V200
Type	Single phase 100VAC induction motor	Single phase 100VAC induction motor with a built-in power switch	3 phase 200/220/230VAC induction motor	3 phase 200VAC induction motor
RPV06A-40	○	○	○	n/a
RPV062-60	○	○	○	n/a
RPV063-90	n/a	n/a	○	n/a
RPV064-120	n/a	n/a	n/a	○

* For S100SW model, a 1.5 m electrical power cable, a 3-prong to 2-prong electrical adapter, and a tubular fuse are enclosed.

②.Rotor numbers and layout, motor power output

Code	2-60	3-90	4-120	A-40
Combination	Parallel twin, 60W motor	Parallel triple, 90W motor	Parallel quad, 120W motor	In-line twin, 40W motor
Final vacuum (50Hz / 60Hz)	≦3,500Pa abs / ≦3,000Pa abs			≦350Pa abs / ≦300Pa abs
	≦-97.8kPa G / ≦-98.3kPa G			≦-100.95kPa G / ≦-101.0kPa G

● Table-1. Thread size of vacuum & exhaust port

Thread size	Vacuum port						Exhaust port					
	G3/8			G1/2			G1/4			G3/8		
Tube outer diameter (mm)	ø10	ø12	ø16	ø10	ø12	ø16	ø10	ø12	ø16	ø10	ø12	ø16
RPV06A-40□	○	○	○	—	—	—	○	○	—	—	—	—
RPV062-60□	—	—	—	○	○	○	—	—	—	○	○	○
RPV063-90T200	—	—	—	○	○	○	—	—	—	○	○	○
RPV064-120V200	—	—	—	—	○	○	—	—	—	—	○	○

Note 1).The pump without a built-in power switch does not come with electrical power cables for motor. Please properly connect cables by checking the wiring diagram on page 9 and safety instructions on page 27.
Note 2).For S100 motor (single-phase 100VAC induction motor) without a built-in power switch, attachment of the power supply box, which is referred as the recommended circuit (motor wiring diagram on page 9), with an electric socket plug can be provided. For details, please consult with Pisco.

Specification

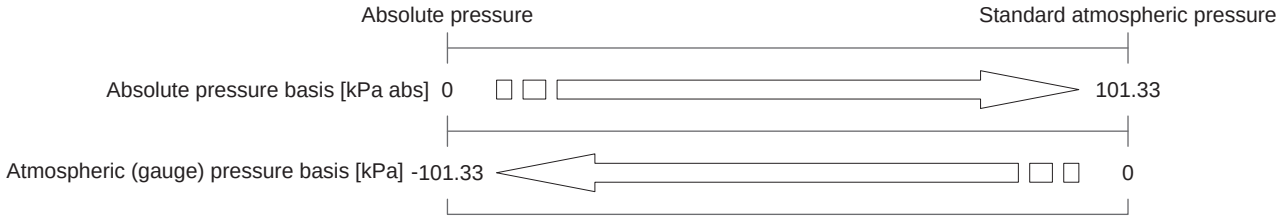
Type		Medium vacuum, 30L	
Configulation		RPV06A-40T200	RPV06A-40S100 (S100SW(*2))
Number of rotor		Twin (2)	
Rotor layout		 In-line layout	
Pumping speed (L/min)	50Hz	30.0	
	60Hz	36.0	
Final vacuum (Pa abs)	50Hz	≦350	
	60Hz	≦300	
Final vacuum (kPa G)	50Hz	≦-100.95	
	60Hz	≦-101.0	
Max. vacuum pressure		Atmospheric pressure	
Ambient temp. (indoor) (ºC)		5~40	
Ambient humidity (indoor)		Maximum 85%RH (no dew condensation)	
Gas (inhaled gas)		No corrosive / exposable gas	
Vibration of installation site		Max 4.9m/s^2 (10~60Hz)	
Altitude of installation site		1000meter or less above sea level	
Install orientation		Horizontal installation of the motor axis	
Motor	Output (W)	40	
	Type	3 phase motor built-in thermal protector, Heat proof class 130(B)	Capacitor-start single phase induction motor built-in thermal protector, Heat proof class 130(B)
	Voltage (V)	200	100
	Rated current (A) 50Hz	0.31	0.83
	Rated current (A) 60Hz	0.29	0.7
	Rated rotation speed (min^{-1}) 50Hz	1,350	1,250
	Rated rotation speed (min^{-1}) 60Hz	1,625	1,600
	Striking current (A) 50Hz	0.9	1.7
	Striking current (A) 60Hz	0.82	1.5
Operation noise (dB(A)) (*1)	50Hz	≦58	
	60Hz	≦63	
Vacuum port size		G3/8	
Exhaust port size		G1/4	
Dimensions (width x depth x height) (mm)		125×284.6×166.5 (S100SW(*2):125×289.6×180.7)	
Weight (kg)		7.2 (S100SW(*2): 7.6 (* including attachments))	
Cooling system		Forced air cooling	

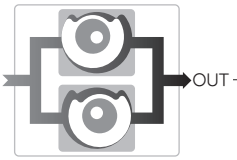
*1). The operation noise was measured when creating maximum vacuum with excluding inhaling and exhausting noises by centralized piping. Since it differs depending on operating conditions, it is not a guaranteed value.

*2). A model with a built-in power switch. Not corresponding to CE marking.

About vacuum pressure indication

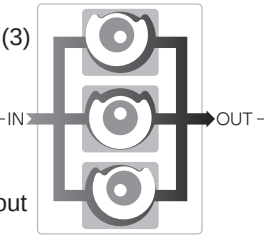
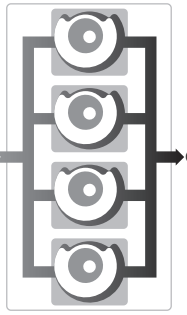
■Absolute pressure (kPa abs or Pa abs) and gauge pressure (kPa G) are used in Pisco's vacuum pump catalogue. Please be careful not to make a mistake in a unit when selecting a pump.



Type			Low vacuum, 60L	
Configulation			RPV062-60T200	RPV062-60S100 (S100SW(*2))
Number of rotor			Twin (2)	
Rotor layout			Parallel layout 	
Pumping speed (L/min)		50Hz	60.0	
		60Hz	72.0	
Final vacuum (Pa abs)		50Hz	≦ 3,500	
		60Hz	≦ 3,000	
Final vacuum (kPa G)		50Hz	≦ -97.8	
		60Hz	≦ -98.3	
Max. vacuum pressure			Atmospheric pressure	
Ambient temp. (indoor) (ºC)			5~40	
Ambient humidity (indoor)			Maximum 85%RH (no dew condensation)	
Gas (inhaled gas)			No corrosive / exposable gas	
Vibration of installation site			Max 4.9m/s^2 (10~60Hz)	
Altitude of installation site			1000meter or less above sea level	
Install orientation			Horizontal installation of the motor axis (shaft)	
Motor	Output (W)		60	
	Type		3 phase motor built-in thermal protector, Heat proof class 130(B)	Capacitor-start single phase induction motor built-in thermal protector, Heat proof class 130(B)
	Voltage (V)		200	100
	Rated current (A)	50Hz	0.45	1.3
		60Hz	0.41	1.2
	Rated rotation speed (min^{-1})	50Hz	1,350	1,250
		60Hz	1,625	1,575
	Striking current (A)	50Hz	1.3	2.4
		60Hz	1.2	2.3
Operation noise (dB(A)) (*1)		50Hz	≦ 58	
		60Hz	≦ 63	
Vacuum port size			G1/2	
Exhaust port size			G3/8	
Dimensions (width x depth x height) (mm)			125×299.6×176 (S100SW(*2):125×299.6×180.7)	
Weight (kg)			7.5 (S100SW(*2): 7.9 (* including attachments))	
Cooling system			Forced air cooling	

*1). The operation noise was measured when creating maximum vacuum with excluding inhaling and exhausting noises by centralized piping. Since it differs depending on operating conditions, it is not a guaranteed value.

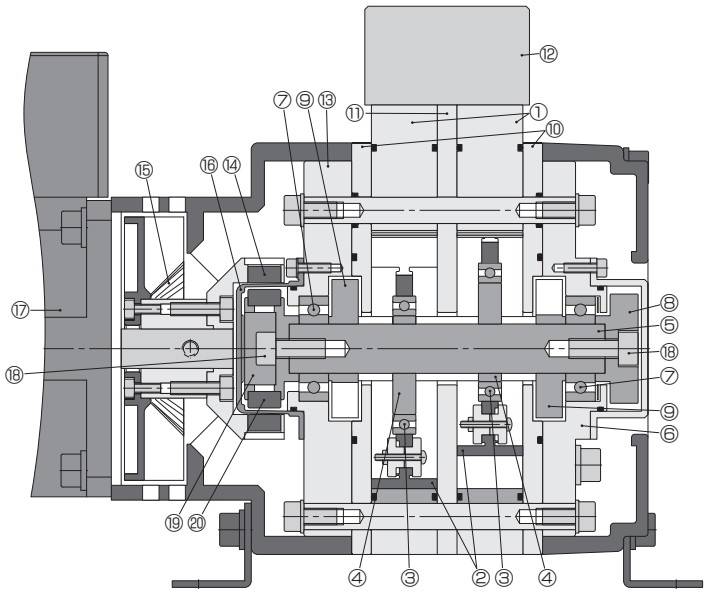
*2). A model with a built-in power switch. Not corresponding to CE marking.

Type			Low vacuum, 90L	Low vacuum, 120L
Configulation			RPV063-90T200	RPV064-120V200
Number of rotor			Triple (3)	Quad (4)
Rotor layout			Parallel layout 	Parallel layout 
Pumping speed (L/min)		50Hz	90.0	120.0
		60Hz	108.0	144.0
Final vacuum (Pa abs)		50Hz	≦ 3,500	
		60Hz	≦ 3,000	
Final vacuum (kPa G)		50Hz	≦ -97.8	
		60Hz	≦ -98.3	
Max. vacuum pressure			Atmospheric pressure	
Ambient temp. (indoor) (ºC)			5~40	
Ambient humidity (indoor)			Maximum 85%RH (no dew condensation)	
Gas (inhaled gas)			No corrosive / exposable gas	
Vibration of installation site			Max 4.9m/s^2 (10~60Hz)	
Altitude of installation site			1000meter or less above sea level	
Install orientation			Horizontal installation of the motor axis (shaft)	
Motor	Motor Output (W)		90	120
	Type		3 phase motor built-in thermal protector, Heat proof class 130(B)	
	Voltage (V)		200	200
	Rated current (A)	50Hz	0.62	0.74
		60Hz	0.56	0.68
	Rated rotation speed (min^{-1})	50Hz	1,350	1,350
		60Hz	1,625	1,600
	Striking current (A)	50Hz	2.0	2.6
		60Hz	1.8	2.4
Operation noise (dB(A)) (*1)		50Hz	≦ 58	
		60Hz	≦ 63	
Vacuum port size			G1/2	
Exhaust port size			G3/8	
Dimensions (width x depth x height) (mm)			125×340.6×181	125×397.6×181
Weight (kg)			9.0 (*2)	10.5 (*2)
Cooling system			Forced air cooling	

*1). The operation noise was measured when creating maximum vacuum with excluding inhaling and exhausting noises by centralized piping. Since it differs depending on operating conditions, it is not a guaranteed value.

*2). Weight includes attached 2 blank plugs.

Structure (e.g. parallel twin - 60W motor type: RPV062-60)

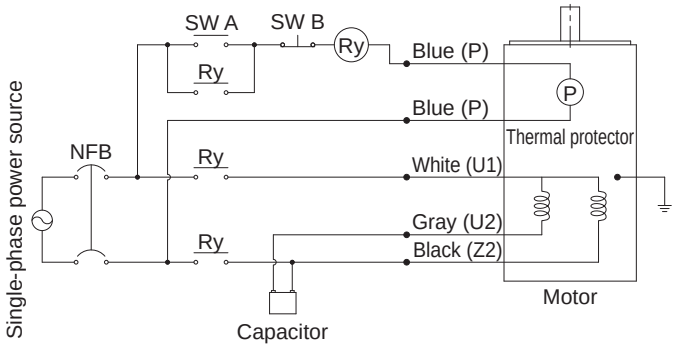


No.	Part description	Material
①	Cyliner	Aluminum alloy
②	Rotor	PPS resin
③	Bearing	Stainless steel
④	Crank plate	Stainless steel
⑤	Main shaft	Stainless steel
⑥	Side block E	Aluminum alloy
⑦	Bearing	Stainless steel
⑧	Blancer E	Stainless steel
⑨	Blancer R	Stainless steel
⑩	Side plate	Aluminum alloy
⑪	Center plate	Aluminum alloy
⑫	Manifold	Aluminum alloy
⑬	Side block M	Aluminum alloy
⑭	Magnet	Neodymium magnet
⑮	Cooling fan	PPS resin
⑯	Sealing cup	PPS resin
⑰	Motor	Aluminum alloy
⑱	Cap screw	Stainless steel
⑲	Inner coupling	Stainless steel
⑳	Magnet	Neodymium magnet

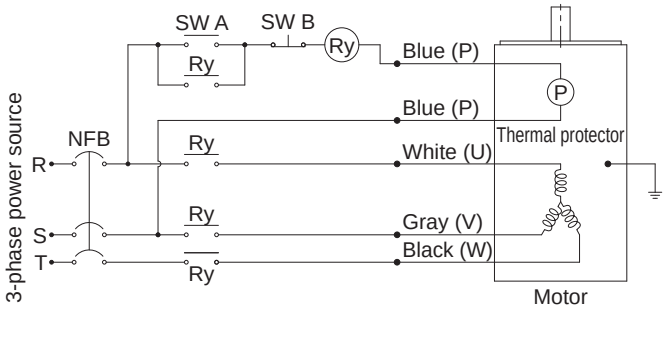
* All seal rubber is made of FKM.

Motor Wiring diagram

■ Single phase motor wiring diagram (RPV06A-40, RPV062-60)

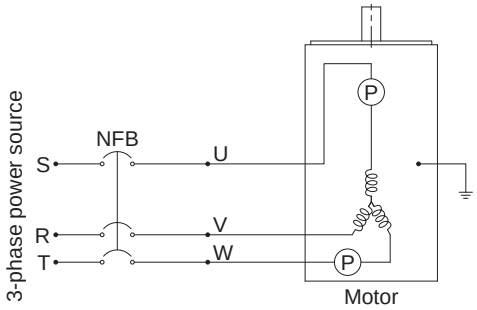


■ 3 phase motor wiring diagram (RPV06A-40, RPV062-60, RPV063-90)



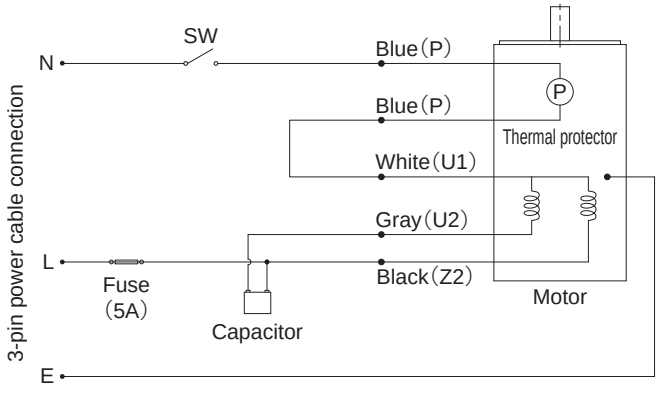
Note: Thermal protector is automatic resume type. In order to prevent a risk by restart, make wiring as above diagram.
● Thermal protector activation temperature : Open (motor stop) ▶130 ± 5ºC, Close (motor restart) ▶90 ± 15ºC

■ 3-phase motor wiring diagram (RPV064-120)



Note: Therefore, in the case of the circuit (left figure) given in the handling instruction of motor, after activation of thermal protector, operation will be resumed automatically when motor temperature falls.
In order to prevent a risk by unexpected reboot, please take safety measures when operating the pump, such as making a self-hold circuit using relays and switches.
● Thermal protector activation temperature
Open (motor stop) ▶130 ± 5ºC, Close (motor restart) ▶86 ± 20ºC

■ Single phase motor with a built-in power switch wiring diagram (RPV06A-40S100SW, RPV062-60S100SW)

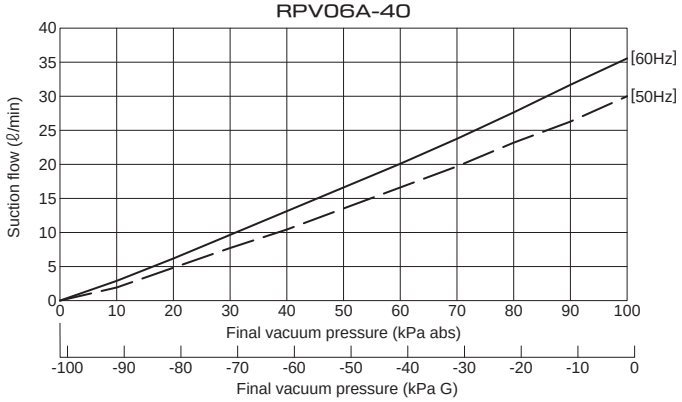


Note: Therefore, in the case of the circuit (left figure) given in the handling instruction of motor, after activation of thermal protector, operation will be resumed automatically when motor temperature falls.
In order to prevent a risk by unexpected reboot, please take safety measures when operating the pump, such as making a self-hold circuit using relays and switches.
● Thermal protector activation temperature
Open (motor stop) ▶130 ± 5ºC, Close (motor restart) ▶90 ± 15ºC

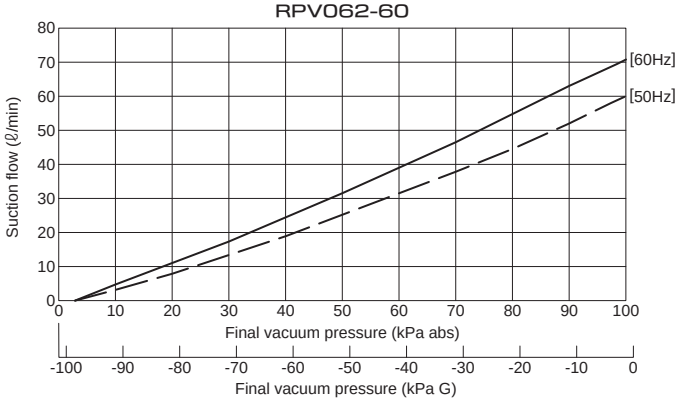
Characteristics

Flow rate

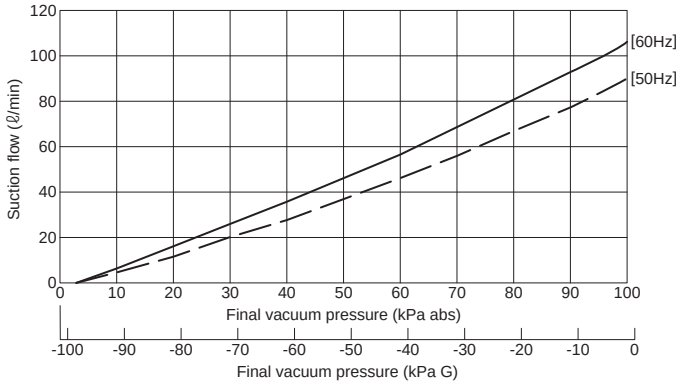
RPV06A-40



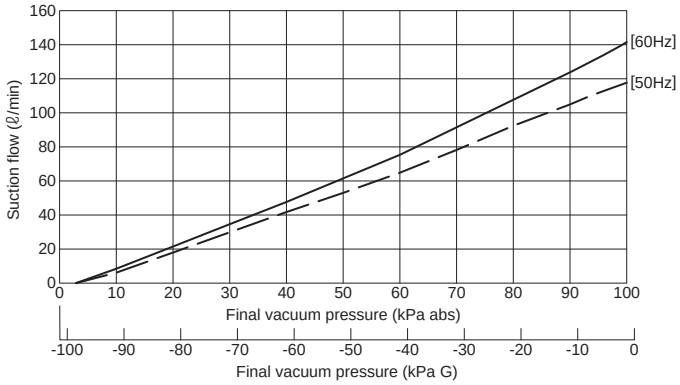
RPV062-60



RPV063-90

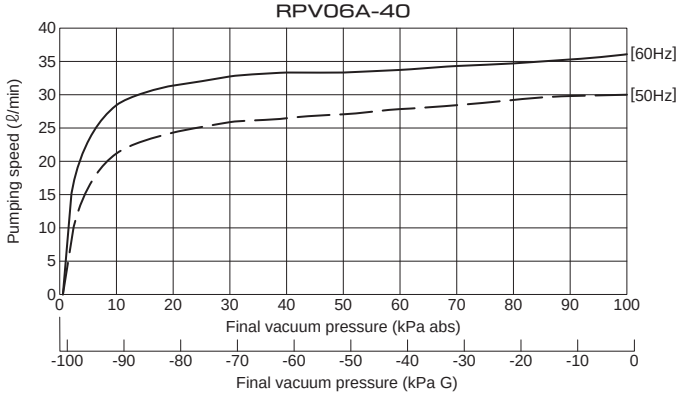


RPV064-120

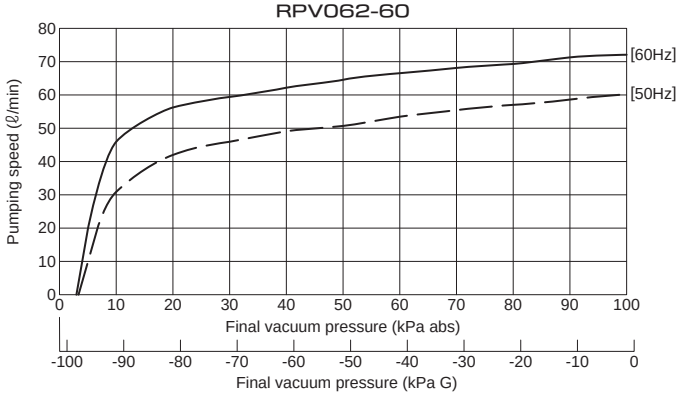


Pumping exhaust speed

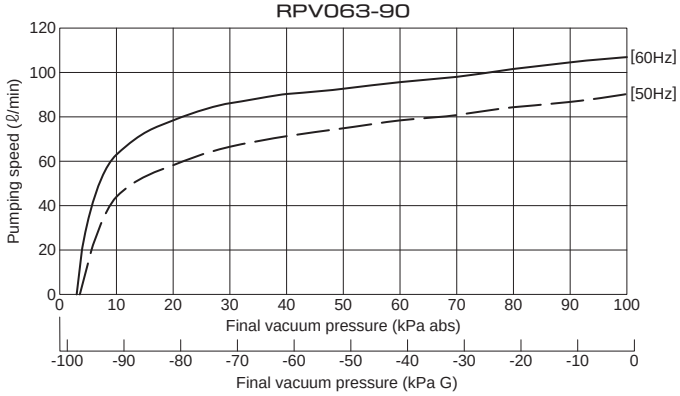
RPV06A-40



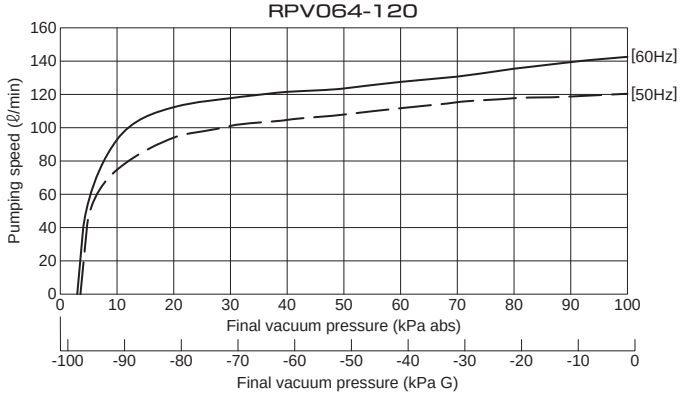
RPV062-60



RPV063-90



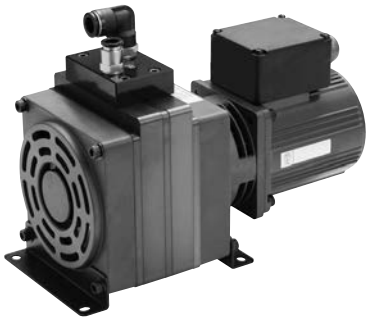
RPV064-120

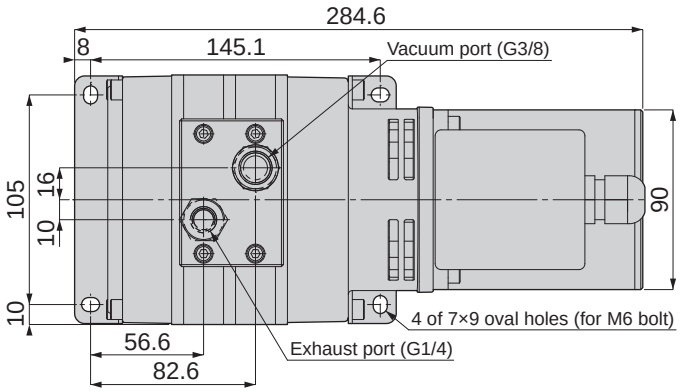


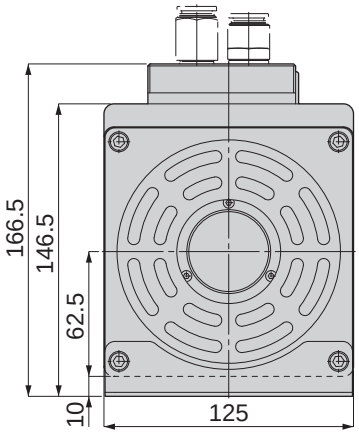
Appearance dimensions

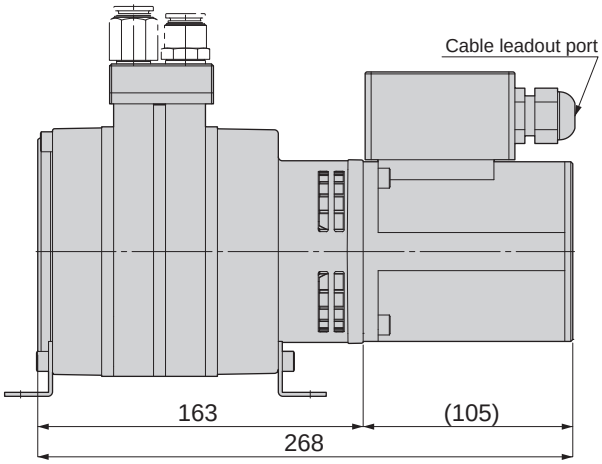
Model type : RPV06A-40③-④-⑤-⑥ Medium vacuum, 30L type CAD 2D&3D

Unit : mm



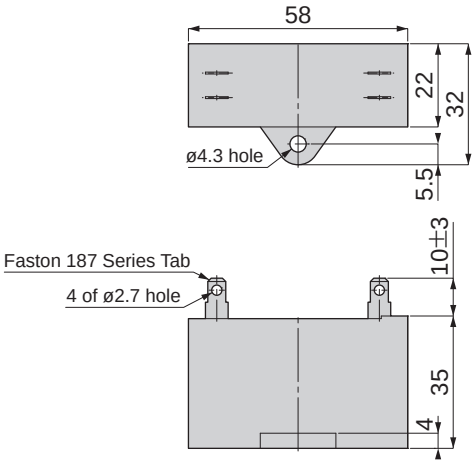


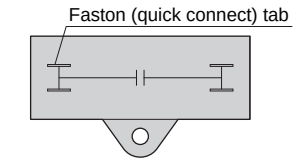




Appearance dimensions of attachment parts

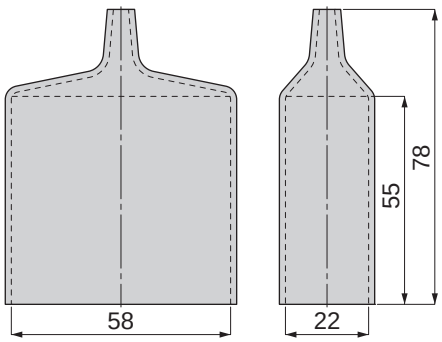
* When selecting the motor type S100 (single phase 100VAC induction motor) in ③ of model designation, the following capacitor and capacitor cap are encluded.





Capacitor Pinout Diagram

Capacitor capacity 12μF

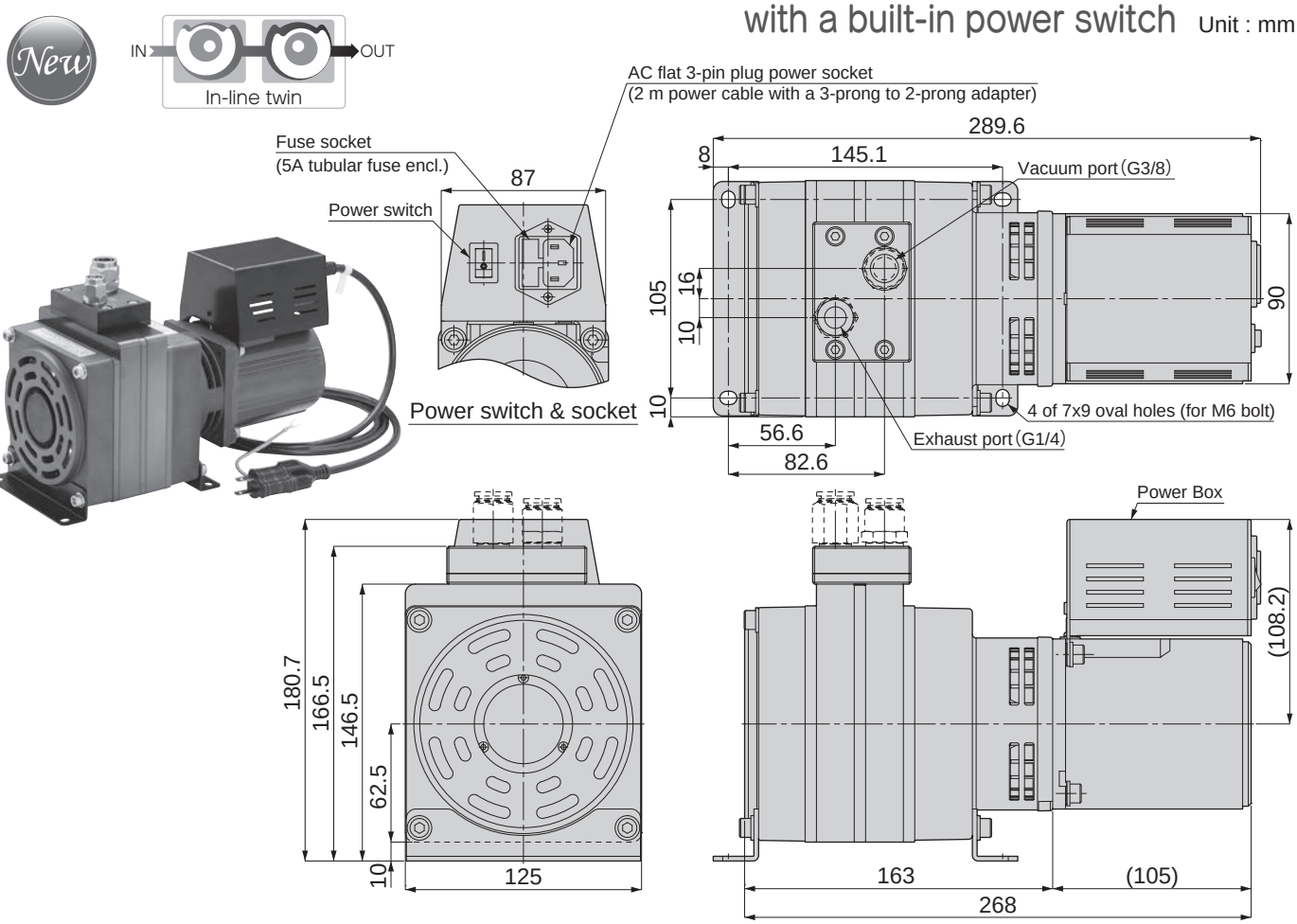


Optional parts appearance dimensions

* Please refer to page 14.

Model type : RPV06A-40S100SW-④-⑤-⑥ Medium vacuum, 30L type with a built-in power switch CAD 2D&3D

Unit : mm



Detail of attachment parts

* Built-in capacitor (not separately enclosed). A 1.5 m electrical power cable, a 3-prong to 2-prong electrical adapter, and a 5A tubular fuse are enclosed.

Optional parts appearance dimensions

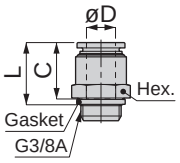
* Please refer to the next page.

Optional parts appearance dimensions for RPV062-60, RPV063-90 & RPV064-120

Configuration of push-in fitting of vacuum port (G3/8) for RPV06A-40

Straight

CAD 2D&3D

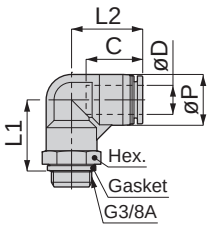


Unit : mm

Fitting model code	Pump's designation code in 4	Tube OD øD	C	L	WAF Hex.	Weight (g)
PC10-G3	10	10	20.7	19.6	19	25
PC12-G3	12	12	23.3	25.7	21	38
PC16-G3	16	16	24.8	31.5	22	49

Elbow

CAD 2D&3D



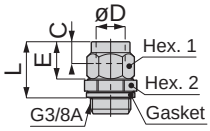
Unit : mm

Fitting model code	Pump's designation code in 4	Tube OD øD	C	L1	L2	øP	WAF Hex.	Weight (g)
PL10-G3	20	10	20.2	27.4	26.2	17.5	19	42
PL12-G3	22	12	23.4	29.4	29.4	21	21	45
PL16-G3	26	16	24.1	38.4	33.1	25	23.8	77

Configuration of compression fitting of vacuum port (G3/8) for RPV06A-40

Straight

CAD 2D&3D



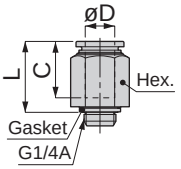
Unit : mm

Fitting model code	Pump's designation code in 4	Tube ODxID øD	C	L	E	WAF Hex. 1	WAF Hex. 2	Weight (g)
NBC1065-G3	A0	10×6.5	9	22.6	14.8	16	19	41
NBC1075-G3	B0	10×7.5	9	22.6	14.8	19	21	41
NBC1280-G3	A2	12×8	9	23.2	15.4	17	19	43
NBC1290-G3	B2	12×9	9	23.2	15.4	17	19	43
NBC1611-G3	A6	16×11	9.5	26	16.2	23	24	50
NBC1613-G3	B6	16×13	9.5	26	16.2	23	24	77

Configuration of push-in fitting of exhaust port (G1/4) for RPV06A-40

Straight

CAD 2D&3D

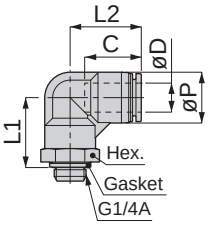


Unit : mm

Fitting model code	Pump's designation code in 5	Tube OD øD	C	L	WAF Hex.	Weight (g)
PC10-G2	30	10	20.7	24.1	17	22
PC12-G2	32	12	23.3	29.3	21	51

Elbow

CAD 2D&3D



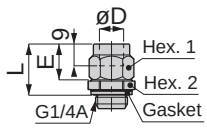
Unit : mm

Fitting model code	Pump's designation code in 5	Tube OD øD	C	L1	L2	øP	WAF Hex.	Weight (g)
PL10-G2	40	10	20.2	26.9	26.2	17.5	17	32
PL12-G2	42	12	23.4	28.9	29.4	21	21	51

Configuration of compression fitting of exhaust port (G1/4) for RPV06A-40

Straight

CAD 2D&3D



Unit : mm

Fitting model code	Model 5	Tube ODxID øD	L	E	WAF Hex. 1	WAF Hex. 2	Weight (g)
NBC1065-G2	C0	10×6.5	21.1	14.8	16	17	34
NBC1075-G2	D0	10×7.5	21.1	14.8	16	17	34
NBC1280-G2	C2	12×8	21.7	15.4	17	17	36
NBC1290-G2	D2	12×9	21.7	15.4	17	17	36

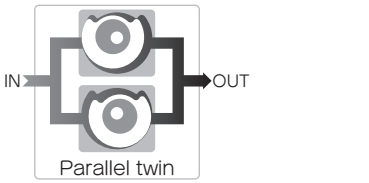
*1. Refering to the model designation on page 5 to select appropriate codes for 3, 4, 5, and 6. For motor type 3 refers to ③, vacuum port 4 refers to ④, exhaust port 5 refers to ⑤, and exhaust cleaner 6 refers to ⑥ of model designation on page 5.

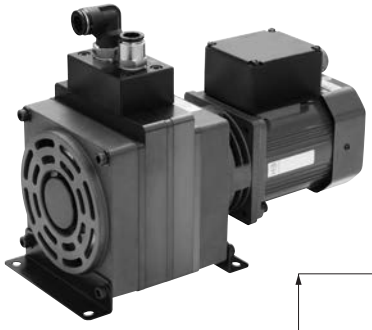
*2. Push-in fitting allow some leaks. If you have a problem in your applicaion, use compression fitting.

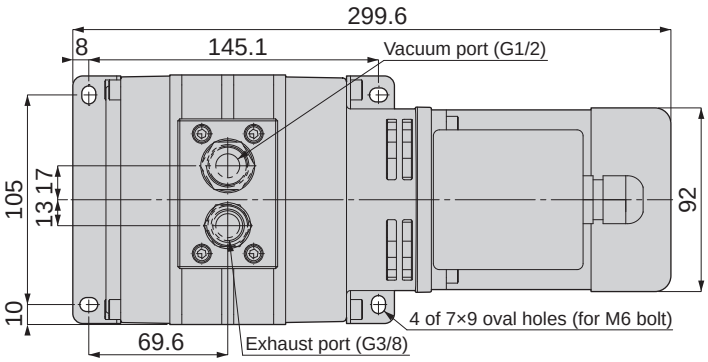
*3. WAF means "width across flat"

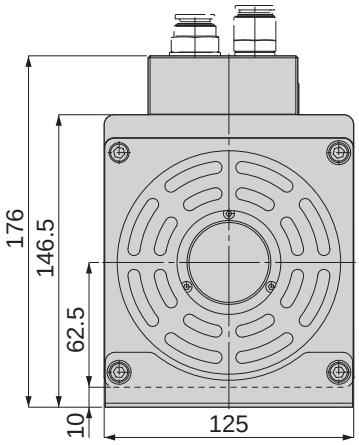
Model type : RPV062-60③-④-⑤-⑥ Low vacuum, 60L type CAD 2D&3D

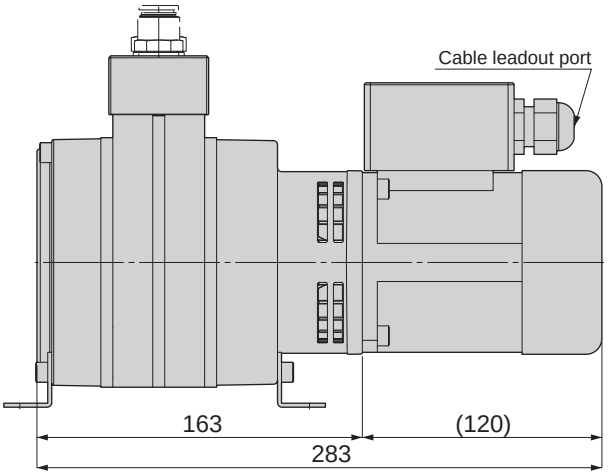
Unit : mm





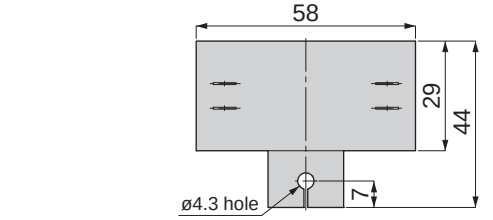


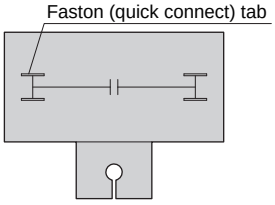


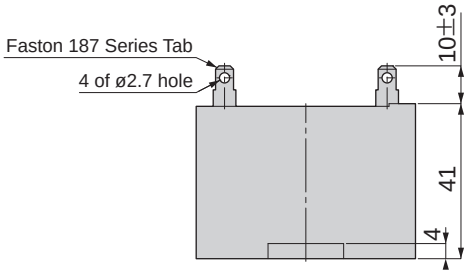


Appearance dimensions of attachment parts

* When selecting the motor type S100 (single phase 100VAC induction motor) in ③ of model designation, the following capacitor and capacitor cap are encluded.

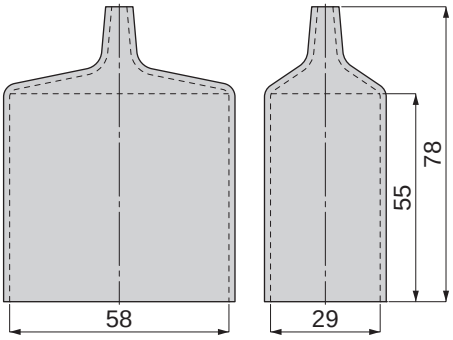






Capacitor Pinout Diagram

Capacitor capacity 20μF

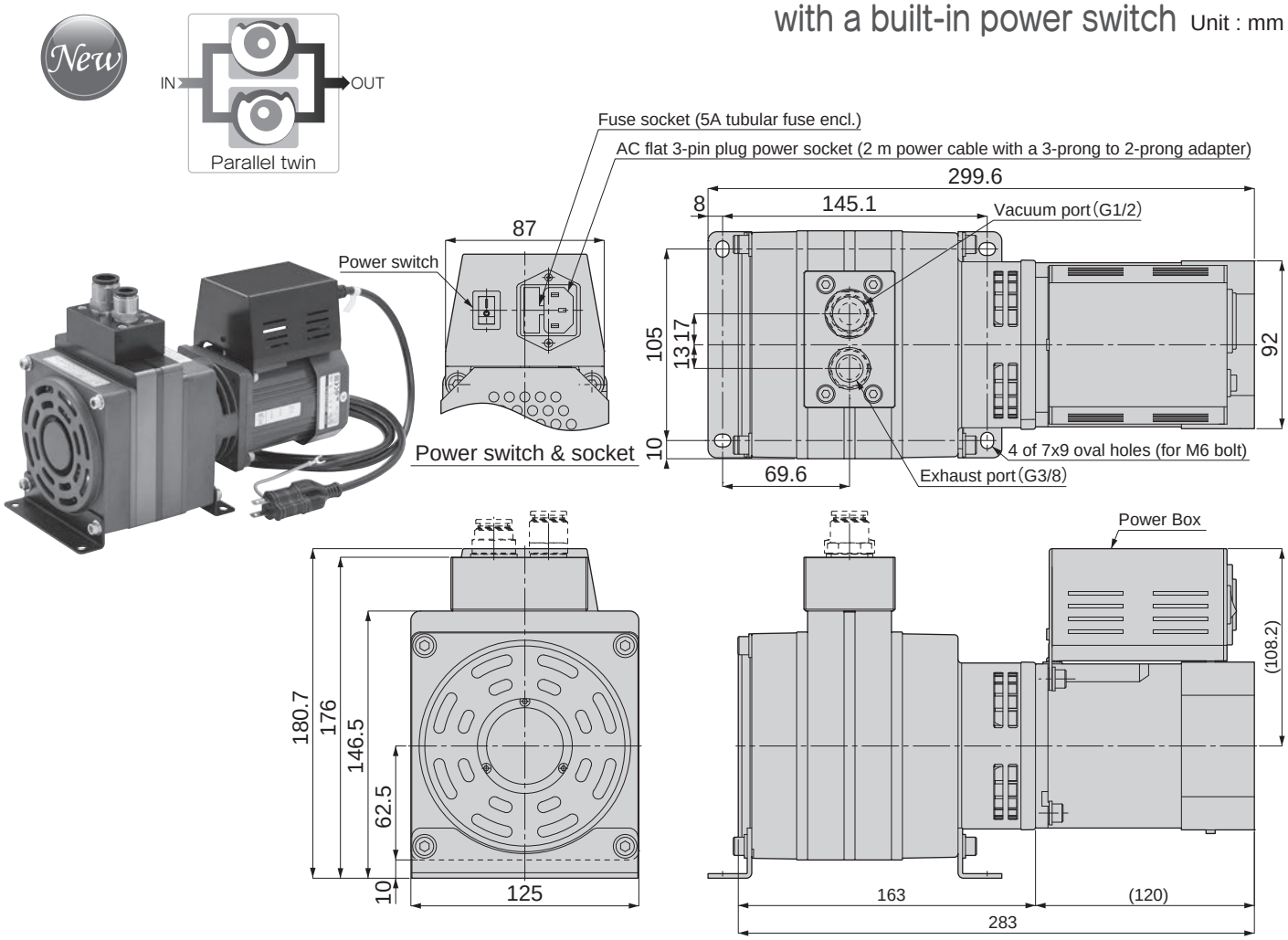


Optional parts appearance dimensions

* Please refer to page 19.

Model type : RPV062-60S100SW-4-5-6

Low vacuum, 60 L type CAD 2D&3D
with a built-in power switch Unit : mm



Detail of attachment parts

* Built-in capacitor (not separately enclosed). A 1.5 m electrical power cable, a 3-prong to 2-prong electrical adapter, and a 5A tubular fuse are enclosed.

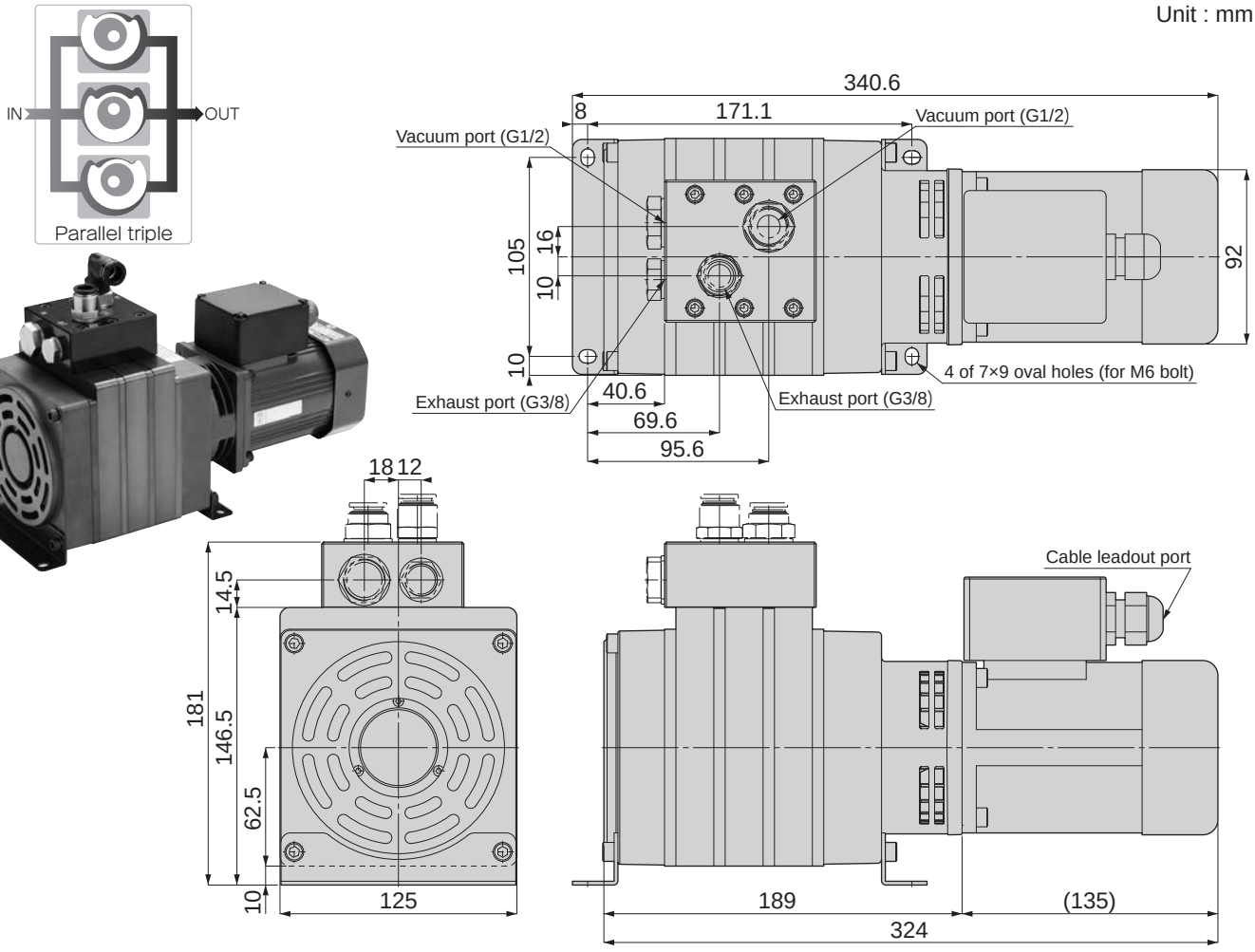
Optional parts appearance dimensions

* Please refer to page 19.

Model type : RPV063-90T200-4-5-6

Low vacuum, 90 L type CAD 2D&3D

Unit : mm



Appearance dimensions of attachment parts

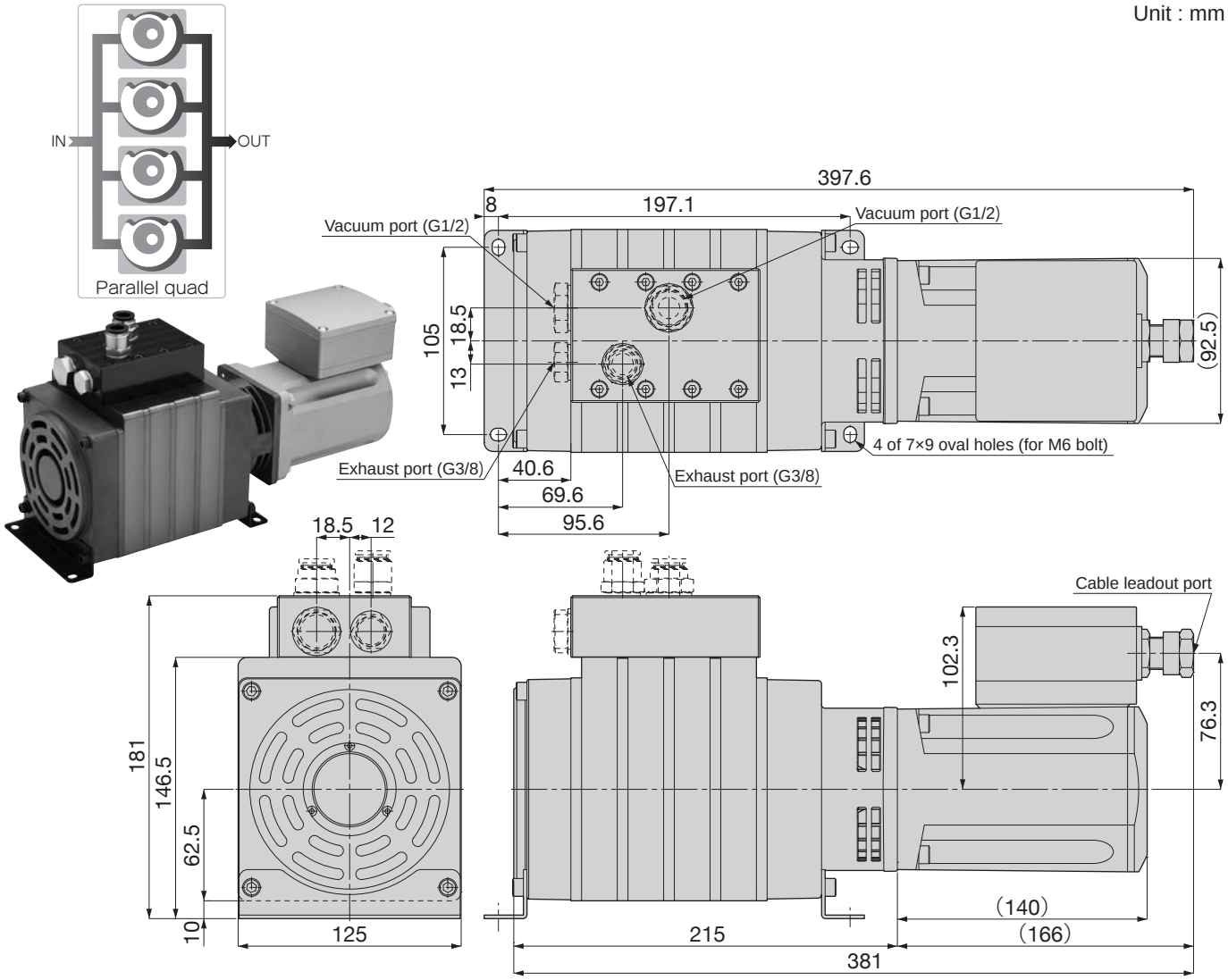
* Please refer to the next page.

Optional parts appearance dimensions

* Please refer to page 19.

Model type : RPV064-120V200-④-⑤-⑥ Low vacuum, 120L type CAD 2D&3D

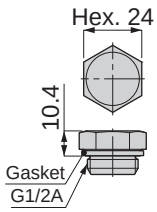
Unit : mm



* RPV064-120 has 2 vacuum and 2 exhaust ports. 1 set of plug is included to block a vacuum and an exhaust port.

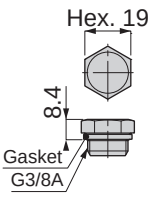
Appearance dimensions of attachment parts

CAD 2D&3D Unit : mm



RPV063-90 & RPV064-120 Plug for vacuum port

CAD 2D&3D Unit : mm



RPV063-90 & RPV064-120 Plug for exhaust port

Optional parts appearance dimensions

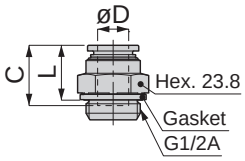
* Please refer to the next page.

Optional parts appearance dimensions for RPV062-60, RPV063-90 & RPV064-120

Configuration of push-in fitting of vacuum port (G1/2) for RPV062-60, RPV063-90 & RPV064-120

Straight

CAD 2D&3D

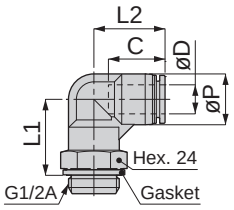


Unit：mm

Fitting model code	Pump's designation code in ④	Tube OD øD	C	L	Weight (g)
PC10-G4	10(※1)	10	20.7	19.2	51
PC12-G4	12	12	23.3	21.2	46
PC16-G4	16	16	24.8	28.5	53

Elbow

CAD 2D&3D



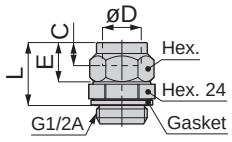
Unit：mm

Fitting model code	Pump's designation code in ④	Tube OD øD	C	L1	L2	øP	Weight (g)
PL10-G4	20(※1)	10	20.2	29.4	26.2	17.5	69
PL12-G4	22	12	23.4	31.4	29.4	21	70
PL16-G4	26	16	24.1	38.4	33.1	25	76

Configration of compression fitting of vacuum port (G1/2) for RPV062-60, RPV063-90 & RPV064-120

Straight

CAD 2D&3D



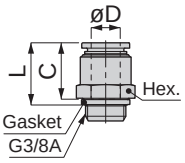
Unit：mm

Fitting model code	Pump's designation code in ④	Tube ODxID øD	C	L	E	WAF Hex.	Weight (g)
NBC1065-G4	A0(※1)	10×6.5	9	23.6	14.8	16	58
NBC1075-G4	B0(※1)	10×7.5	9	23.6	14.8	16	58
NBC1280-G4	A2	12×8	9	24.2	15.4	17	59
NBC1290-G4	B2	12×9	9	24.2	15.4	17	59
NBC1611-G4	A6	16×11	9.5	26	16.2	23	84
NBC1613-G4	B6	16×13	9.5	26	16.2	23	83

Configuration of push-in fitting of exhaust port (G3/8) for RPV062-60, RPV063-90 & RPV064-120

Straight

CAD 2D&3D

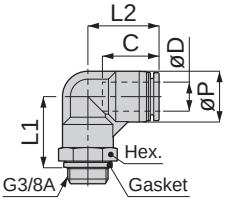


Unit：mm

Fitting model code	Pump's designation code in ⑤	Tube OD øD	C	L	WAF Hex.	Weight (g)
PC10-G3	30(※1)	10	20.7	19.6	19	25
PC12-G3	32	12	23.3	25.7	21	38
PC16-G3	36	16	24.8	31.5	22	49

Elbow

CAD 2D&3D



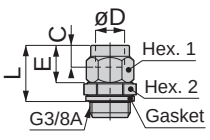
Unit：mm

Fitting model code	Pump's designation code in ⑤	Tube OD øD	C	L1	L2	øP	WAF Hex.	Weight (g)
PL10-G3	40(※1)	10	20.2	27.4	26.2	17.5	19	42
PL12-G3	42	12	23.4	29.4	29.4	21	21	45
PL16-G3	46	16	24.1	38.4	33.1	25	23.8	77

Configration of compression fitting of exhaust port (G3/8) for RPV062-60, RPV063-90 & RPV064-120

Straight

CAD 2D&3D



Unit：mm

Fitting model code	Pump's designation code in ⑤	Tube ODxID øD	C	L	E	WAF Hex. 1	WAF Hex. 2	Weight (g)
NBC1065-G3	C0(※1)	10×6.5	9	22.6	14.8	16	19	41
NBC1075-G3	D0(※1)	10×7.5	9	22.6	14.8	16	19	41
NBC1280-G3	C2	12×8	9	23.2	15.4	17	19	43
NBC1290-G3	D2	12×9	9	23.2	15.4	17	19	43
NBC1611-G3	C6	16×11	9.5	26	16.2	23	24	78
NBC1613-G3	D6	16×13	9.5	26	16.2	23	24	77

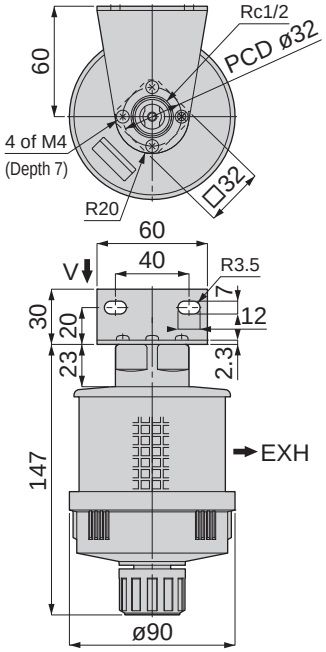
*1. ø10mm fitting cannot be selected for RPV064-120.

*2. Refering to the model designation on page 5 to select appropriate codes for ③, ④, ⑤, and ⑥. For motor type ③ refers to ③, vacuum port ④ refers to ④, exhaust port ⑤ refers to ⑤, and exhaust cleaner ⑥ refers to ⑥ of model designation on page 5.

*3. WAF means "width across flat"

Optional parts appearance dimensions

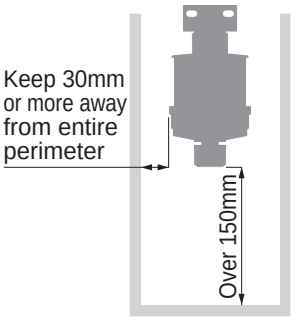
Model type : RPVF-04



Exhaust cleaner CAD 2D&3D

Unit : mm
Filtering rate : 1µm
Weight : 300g

● Spaces required for installation



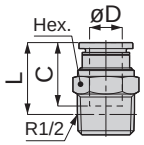
For element replacement, please give the space around the cleaner as in the left figure.

Appearance dimensions of push-in fitting for exhaust cleaner

Configuration of push-in fitting for exhaust cleaner

Straight

CAD 2D&3D

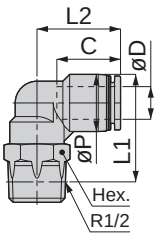


Unit：mm

Model type ⑥：5	Tube OD øD	C	L	WAF Hex.	Weight (g)
PC10-04(※1)	10	20.7	22.2	21	46
PC12-04	12	23.3	25.7	21	44
PC16-04	16	24.8	33.1	24	63

Elbow

CAD 2D&3D



Unit：mm

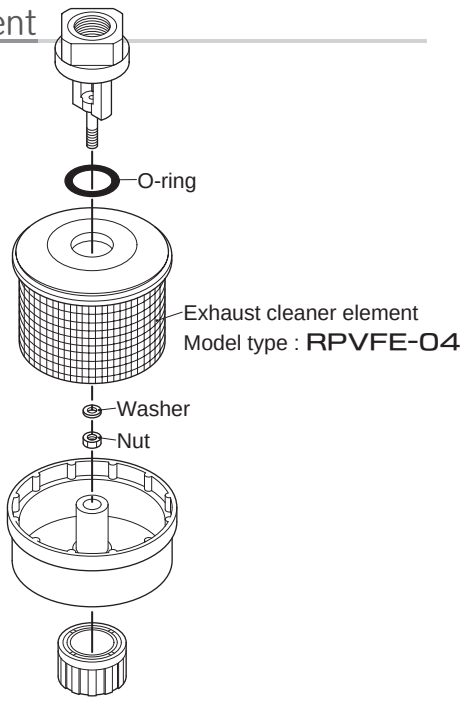
Model type ⑥：6	Tube OD øD	C	L1	L2	øP	WAF Hex.	Weight (g)
PL10-04(※1)	10	20.2	36.6	27.5	17.5	21	57
PL12-04	12	23.4	38.8	30.7	21	21	61
PL16-04	16	24.1	55.3	33.1	25	22	79

*1. ø10mm fitting cannot be selected for RPV064-120.
*2. Same tube OD fitting to exhaust port is provided when selecting built-in fitting model.
*3. When ordering only above push-in fitting of exhaust clear after purchasing our rotary vacuum pump, make sure to confirm the tube OD and place an order using above model type.

Model Designation of Exhaust Cleaner Alone

RPVF-04
①
→①.Exhaust cleaner

Replacing element



Memo

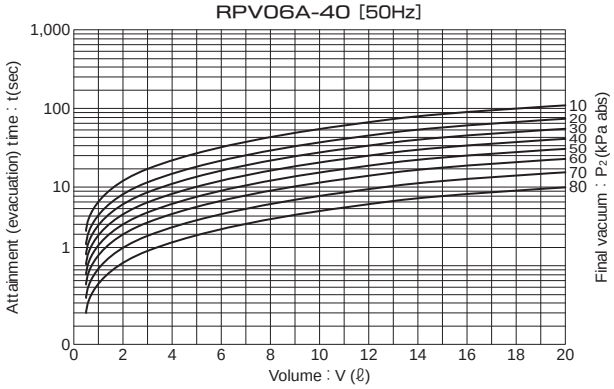
Final vacuum attainment (evacuation) time - Quick reference chart

■ The evacuation time from atmospheric pressure to desired vacuum pressure can be acquired by the following graphs.

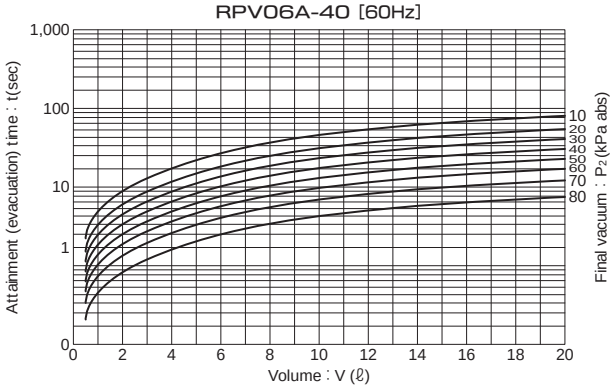
e.g.) The time requires to reduce the pressure in the 5 liters tank from atmospheric pressure to 10 kPa abs by usingRPV062-60[50Hz]
⇒ 16 seconds from the graph.

Note: If the initial pressure in the tank is lower than atmospheric pressure, calculate it using the formula in the next page.
Please take enough safety margin to select a model type because the evacuation time changes by the difference of operating environment such as pipe resistance or others.

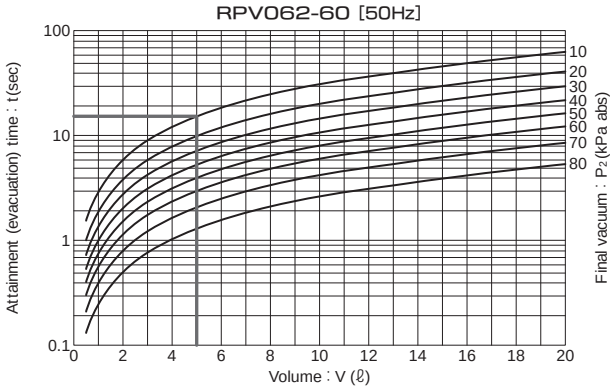
RPV06A-40 [50Hz]



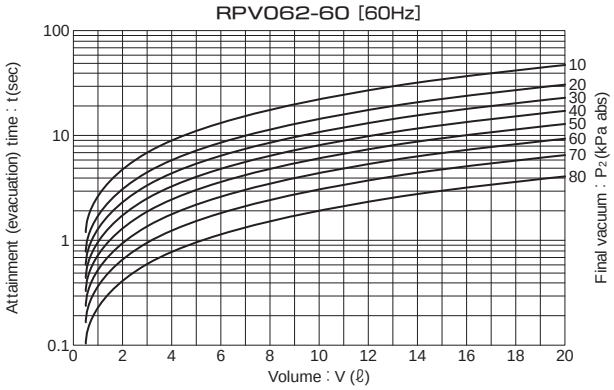
RPV06A-40 [60Hz]



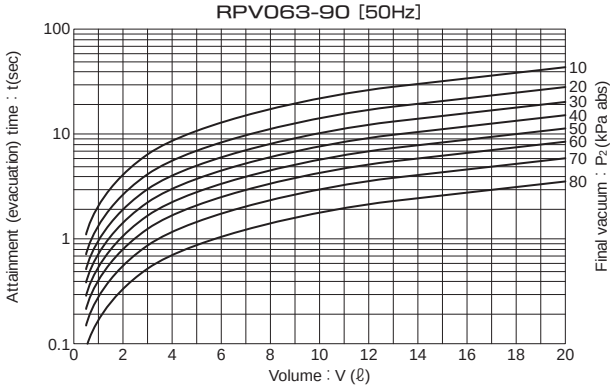
RPV062-60 [50Hz]



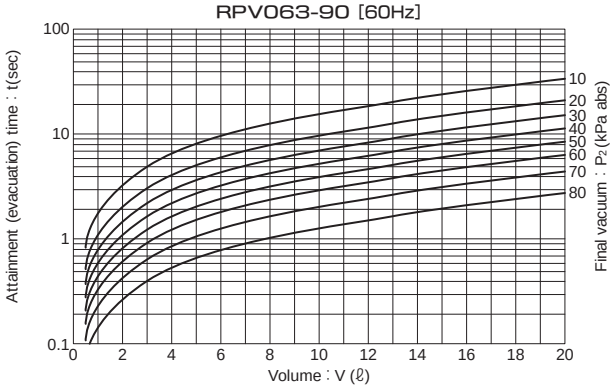
RPV062-60 [60Hz]



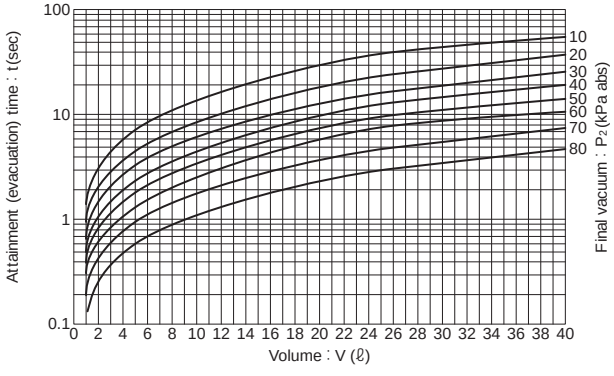
RPV063-90 [50Hz]



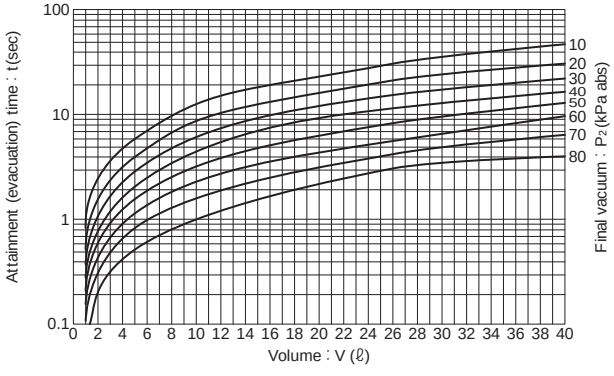
RPV063-90 [60Hz]



RPV064-120 [50Hz]



RPV064-120 [60Hz]



Selecting a Rotary Vacuum Pump RPV

To find the evacuation time from initial pressure to the end (final) pressure (targeted vacuum pressure) from sealed space (tank), it is calculated by the following formula.

$$t = \frac{V}{S} \times 2.3\log\frac{P_1}{P_2}$$

t : Evacuation (pumping) time (min)
V : Volume of space (tank) (ℓ)
S : Pumping speed (ℓ/min)
P_1 : Initial pressure (kPa abs)
P_2 : Final pressure (kPa abs)

When carrying out the above calculation, since pumping speed: S of the rotary vacuum pump changes by pressure ranges, first calculate each exhaust time : t_1, t_2, t_3, and -- by dividing the pressure range, and then calculate the sum : t_0.

$$t_0 = t_1 + t_2 + t_3 + \cdots$$

Example) Use of RPV062-60 at 50Hz. Calculate the evacuation time to achieve from atmospheric pressure to 30kPa abs. for the volume of 20 liters.

Calculate at each 10kPa precisely

$$t = \frac{V}{S} \times 2.3\log\frac{P_1}{P_2}$$

$$t_1 = \frac{20}{58} \times 2.3\log\frac{101.3}{90} = 0.041\text{min}$$

$$t_2 = \frac{20}{(57)} \times 2.3\log\frac{90}{[80]} = 0.041\text{min}$$

$$t_3 = \frac{20}{55} \times 2.3\log\frac{80}{70} = 0.049\text{min}$$

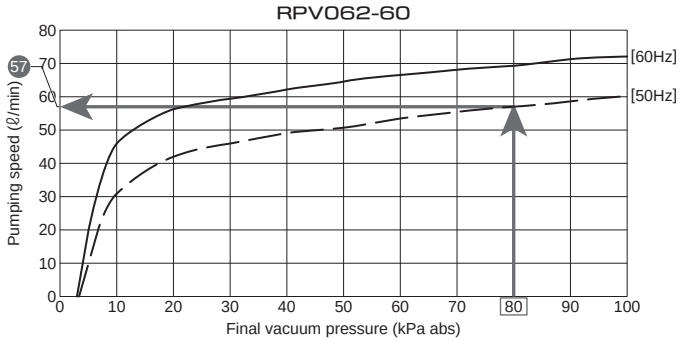
$$t_4 = \frac{20}{53} \times 2.3\log\frac{70}{60} = 0.058\text{min}$$

$$t_5 = \frac{20}{51} \times 2.3\log\frac{60}{50} = 0.072\text{min}$$

$$t_6 = \frac{20}{48} \times 2.3\log\frac{50}{40} = 0.093\text{min}$$

$$t_7 = \frac{20}{46} \times 2.3\log\frac{40}{30} = 0.125\text{min}$$

Vacuum Pressure : Graph reading value of effective pump exhaust speed at 80 kPa abs



$$t_0 = t_1 + t_2 + t_3 + t_4 + t_5 + t_6 + t_7 = 0.479\text{min}\ (= 28.7\text{sec})$$

* Note: Above calculation is just an example. It can be calculated by a few dozen depending on an application.

⚠ Safety Guide

The purpose of this safety guide is for proper use of PISCO products and avoiding personal injury and property damage. In use of the product, be sure to read the instruction manual accompanied. Be certain to follow ISO 4414 and JIS B 8370.

ISO 4414：Pneumatic fluid power…Recomendations for the application of equipment to transmission and control systems.

JIS B 8370 : Pneumatic fluid power -- General rules and safety requirements for systems and their components

This safety guide is classified into "Danger", "Warning" and "Caution" in accordance with the extent of danger or damages caused by improper use of PISCO products.

⚠ Danger	Hazardous conditions. It can cause death or serious personal injury.
⚠ Warning	Hazardous conditions depending on usages. Improper use of PISCO products can cause death or serious personal injury.
⚠ Caution	Hazardous conditions depending on usages. Improper use of PISCO products can cause personal injury or property damage.

⚠ Warning

1. Selection of pneumatic products
   ①.The user who is a pneumatic system designer or has enough experience and technical expertise needs to select PISCO products.
   ②.Due to wide variety of operating conditions and applications for PISCO products, carry out the analysis and test PISCO products by user side. The pneumatic system designer is solely responsible for assuring that the user's requirements are met and that the application presents no health or safety hazards. All designers are required to fully understand the specifications of PISCO products and constitute all systems by the latest catalog or information, considering any malfunctions.
2. Handle the pneumatic products by the user having enough knowledge and experience
3. Never operate machines / equipment or remove pneumatic products until safety can be assured.
   ①.Make sure that preventive measures against falling work-pieces or sudden movements of machines should be completed before inspection or maintenance of these machines.
   ②.Restart the machines after ensuring to take all preventive measures against sudden movements.

Disclaimer

1. PISCO does not take any responsibility for any incidental or indirect loss, such as production line stop, interruption of business, loss of benefits, personal injury, etc., caused by any failure on improper use or application of PISCO products.
2. PISCO does not take any responsibility for the damages of PISCO products caused by natural disasters, fires not related to PISCO products, third parties, and intentional or accidental incorrect usage by user.
3. PISCO does not take any responsibility for any loss caused by using PISCO products with exceeding specification limit of or with methods other than the published instructions and catalogs.
4. PISCO does not take any responsibility of any loss caused by remodeling of PISCO products, other software systems, or combinational use with non-PISCO products.
5. The damages caused by the defect of Pisco products shall be covered but limited to the full amount of the user's purchase price of the products.

* Safety instructions are subject to change without advance notice.

⚠ Safety Instruction Manual

⚠ Danger

1.Do not use PISCO products for the following applications.
   ①.Equipment used on maintaining / handling people's life and body.
   ②.Equipment used on moving / transporting people.
   ③.Equipment specifically used on safety purposes.

⚠Warning

1. Do not use PISCO products under the following conditions.
   ①.Beyond the published specifications and conditions in the catalog.
   ②.Under the direct sunshine or outdoor.
   ③.Excessive vibrations and impacts.
   ④.Exposure / adhere to corrosive gas, inflammable gas, chemicals, seawater, water and vapor.
   * It can be used depending on the product in the above conditions, refer to each specification and condition in the catalog.
2. Do not disassemble or modify that related to the performance, function, and basic structure of the product.
3. Do not touch the release-ring of push-in fitting while compressed air is supplying. The lock may be released by the contact, and tube may slip out.
4. Avoid stress on PISCO products, such as excessive stretching, twisting and bending. There is a risk of causing damage to the products.
5. Turn off the power supplying to PISCO products, and make sure there is no residual air pressure in the pipes and equipment before maintenance. Follow the instructions below in order to ensure safety.
   ①.Make sure the safety of all systems related to PISCO products before maintenance.
   ②.Restart of operation after maintenance shall be proceeded with cautions after ensuring safety of the system by preventive measures against unexpected movements of machines and devices that are using pneumatic apparatuses.
   ③.Keep enough spaces for maintenance when designing a circuit.

⚠Caution

1. When inserting an ultra-soft tube into a push-in fitting, make sure to place an Insert Ring into the tubing end. There is a risk of causing the escape of tube and a fluid leakage without using an Insert Ring.
2. The product incorporating NBR as seal rubber material has a risk of malfunction caused by ozone crack. Ozone exists in high concentrations in static elimination air, clean-room, and near the high-voltage motors, etc. As a countermeasure, material change from NBR to HNBR or FKM is necessary. Consult with PISCO for more information.
3. In case of using non-PISCO brand tubes, make sure the tolerance of the outer tube diameter needs to be within the limits of Table 1.

● Table 1. Tube O.D. Tolerance

mm size	Nylon tube	Polyurethane tube
ø10mm	±0.1mm	±0.15mm
ø12mm	±0.1mm	±0.15mm
ø16mm	±0.1mm	±0.15mm

4-1. Instructions for Tube Installation (in case of push-in fitting)
   ①.Make sure that tubes need to be cut at right angle without a scratch on the tube surface and deformation.
   ②.When installing a tube, the tube needs to be inserted fully into the push-in fitting until the tube stops up to the tubing end of the fitting as the figure shown below. Otherwise, there is a risk of becoming leakage.
   ③.After installing the tube, make sure it is inserted properly and not to be escaped by pulling it moderately.
   * When installing tubes, Lock-claws may be hardly visible in the hole when observed from the front face of the release-ring. But it does not mean the tube is surely escape. Major causes of the tube escape are 1: shear drop of the lock-claws edge, and 2: the problem of tube diameter (usually small). Therefore, follow the above instructions from ① to ③, even lock-claws is hardly visible.

4-2. Instructions for Tube Installation (in case of compression fitting)
   ①.Make sure that tubes need to be cut at right angle without a scratch on inside and outside surfaces of the tube.
   ②.Install the tube through the cap nut onto till the end of barb. Then tighten the cap nut, having the tube through, by using a proper tool on the hexagonal flat.
   ③.Tightening the cap nut with a recommended tightening torque referencing the Table-1. It may become a cause of a leak by deformation or breakage of fitting part when tightening more than the recommended torque. In contrary, it may become a cause of leak or loosening nut when tightening less than the recommended torque.
   * To prevent co-rotation of tube when tightening the cap nut, hold the tube while tightening.
   ④.Make sure that the cap nut touches the fitting body. If not, remove the nut and pull out the tube. Then start it over again from ①.
   ⑤.After installing the tube, make sure it is installed properly and not to be escaped by pulling it moderately.

● Table-1 Recommended tightening torque of cap nut

Fitting size (tube OD)	Tightening torque
ø10mm	4N·m
ø12mm	5N·m
ø16mm	14N·m

5-1. Instruction of Tube Release (in case of push-in fitting)
   ①.Make sure there is no air pressure inside of the tube, before releasing it.
   ②.Push the release-ring of the fitting deeply and evenly to pull out the tube toward oneself. By insufficient pushing of the release-ring, the tube may not be pulled out or damaged by scratch, and tube shaving may remain inside of the fitting.

5-2. Instruction of Tube Removal (in case of compressrion fitting)
   ①.Make sure there is no air pressure inside of the tube, before releasing it.
   ②.Remove the cap nut using the appropriate tool on the hexagonal flat. Then remove the tube.

6. Instruction for Fitting Installation

①.When installing a fitting, use proper tools to tighten it on the hexagonal flat.

②.Refer to Table 2 which shows the recommendation of tightening torque. Do not exceed these limits to tighten thread. Excessive tightening may break the thread part or deform the gasket to cause a fluid leakage. Tightening thread lower than these limits may cause a loosening thread or a fluid leakage.

● Table-2 Recommended tightening torque

Thread type	Thread size	Tightening torque
G thread	G1/4	12 ~ 14N·m
	G3/8	22 ~ 24N·m
	G1/2	28 ~ 30N·m
Taper pipe thread	R1/2	28 ~ 30N·m

7. Removal of

①.When removing a fitting, use proper tools on the hexagonal flat to loosen it.

⚠ Safety Instruction of Rotary Vacuum Pump

Be sure to read before use. Please check the previous pages and this page for safety notice and safety instruction of the product.
Be sure to read the operation manual of motor enclosed in the product.

⚠ Danger

1. Never vacuum up inflammable, explosive gases. Never use the product in the potentially flammable atmosphere, such as inflammable or explosive gas. If not, it may cause explosion or fire.

⚠ Warning

1. Do not drive the pump with plumbing the pipe of the exhaust side. The motor stops by overloading, and it may causes a motor burnout, a burns, or a fire.
2. Do not disassemble or modify the pump. A pump operates abnormally and causes an injury, an electric shock, and a fire.
3. Do not lubricate or grease up the rotary vacuum pump.
4. Never touch the rotation part of the pump with a finger or an object. It results in injury or damage.
5. Do not insert a finger or object in the vacuum port of the pump. It results in injury or damage.
6. Turn off the power if there are abnormalities, such as noise, odor and smoke coming from the pump. Keep running the pump abnormally may causes an electrical shock or a fire.
7. Install the rotary vacuum pump so that the motor axis becomes horizontal.
8. This product is intended for indoor use only. When it is used outdoors and exposed to wind and rain, it causes insulation failure of a motor and may results in an electric shock or a fire.
9. Do not pour water on the pump or motor directly, or do not wash with water, etc. In addition, do not use where it is exposed to the liquid. It may results in an electric shock, a fire, or damage.
10. Do not touch the electric wiring part. It may causes of an electric shock or a fire.
11. Securely connect the ground wire. If the ground is incomplete, you may get an electric shock at the time of failure or short circuit.
12. Perform wiring on the motor of RPV06A-40, RPV062-60, and RPV063-90 correctly according to the operation manual attached to the product. Faulty wiring causes damage or a fire.
13. The power cable used for the pump with a built-in power switch shall be connected to 3-conductive electrical outlet. When using 3-prong to 2-prong electrical adapter, make sure to connect the ground wire to the ground terminal near the outlet.
14. The power cable used for t the pump with a built-in power switch shall be connected to AC flat 3-pin plug power socket on the side of the power box. After confirming the power switch is off position, connect the power cable to the electrical outlet.
15. Make sure to cut the main power supply before making inspection and maintenance. For the pump with a built-in power switch, make sure to disconnect the power cable from electrical outlet.
16. The motor of RPV064-120 should be wired using the self-hold circuit, which uses a relay and a switch, or etc. so that a pump does not restart automatically.
17. Do not damage, torture, pull, or bundle the power cable. Moreover, do not put a heavy object on the cable. The power cable is damaged, and it causes the electric shock and a fire.
18. Be sure to install an earth leakage breaker by a special contractor or a professional engineer. If it is not installed, it may causes an electric shock and a fire.

⚠ Caution

1. Do not operate the motor other than the rated power supply. Failure to do so will result in a damage and an accident.
2. Do not vacuum up the pressurized gas by the rotary pump. It results in damage.
3. The rotary vacuum pump is a precision machine. Do not vaccum up moisture, contaminant, dust. Since it becomes a cause of breakage when it draws in, be sure to install a filter on the upstream of the pump.
4. Do not give a shock. It results in a breakage.
5. Push-in fitting permits a leak. Please contact Pisco if there is a problem on usability.
6. When transporting the pump, do not hold the sealed connector part or power box on the pump. It causes damage to the pump.
7. The final vacuum and the effective pumping speed described in the specification are confirmed at the time of delivery inspection according to our standard. The performance after normal operation for a certain running period of time will be the following table possibly.

● Table. Final vacuum degree and effective pumping speed with running period

Model	Running period	Final vacuum degree		Effective pumping speed
RPV062 RPV063 RPV064	3 years	50Hz	12kPa abs -89.3kPa G	-20% from the specification value
		60Hz	10kPa abs -91.3kPa G	
RPV06A	1 year	50Hz	1.2kPa abs -100.1kPa G	-20% from the specification value
		60Hz	1.0kPa abs -100.3kPa G	

*Above value is expecting value with Pisco's operating condition. Life cycle of the pump is depending on the operating condition and sucked gas condition (debris, dust, moisture) and so on.

Memo

Related products

Vacuum Filter

VFR Large capacity union type

- Cyclone effect and element remove waterdrop and dust sucked by vacuum. Maintenance frequency can be reduced by large bowl.

VFU Union type

- Easily installed in the middle of piping. Stable operation realized by small pipe resistance.

Small Vacuum Regulator

RVV Union type
Digital display pressure sensor type

RVV Union type
ø30mm vacuum gauge type

RVV Union type
No pressure gauge type

- Ideal for controlling vacuum pressure from a small vacuum pump.
- Not to mention controlling vacuum source, control near the circuit end is also possible.

Large digital display pressure sensor (vacuum switch) type

VUS-30 Compound pressure type

- Rated pressure range: -100~100kPa

- A large LED display (11mm letter height) provides high visibility.
- All setting is done by 3 push buttons.

VUS-31 Compound pressure & vacuum only type

- Rated compound pressure range: -100~100kPa
- Rated vacuum range: -101.3~0kPa

- Easy to read 2 line tricolor display.
- Large cost reduction comparing to 30 series is realized.

Handy manometer

GPH-V
Compounding low gauge pressure type

- Rated pressure range: -100~100kPa

GPH-S
Compounding gauge pressure type

- Rated pressure range: -100~1,000kPa

GPH-B
Absolute pressure type

- Rated pressure range: 0~100kPa abs

- Usability and convenience are pursued by adopting the palmtop design.
- 3 types of pressure range.
- Easy to read large display (3 & 1/2 digits LCD display)
- Low power consumption design enables continuous use of approx. 1000 hours with commercially available 2 AAA dry batteries.

Digital Pressure Gauge

GPD-V for Vacuum

- Rated pressure range:-101~0kPa

- Easy to read digital pressure display by one push
- Runing on 1 dry cell requires no wiring.
- Built-in energy saving mode enables approximately 3 years battery life (at 5 measurement a day)

Air Tank

New

ATS

- Tank capacity: 0.4–20L

- Reducing the air and vacuum pressure fluctuations and pulsations.
- Tank Capacity is selectable from 6 variations.
- The tank is made of stainless steel.

ⓘ Please visit our website (http://en.pisco.co.jp/) or consult with Pisco for more details about related products.

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