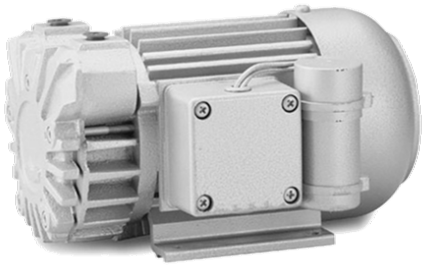
CONVUM®
VACUUM TECHNOLOGY

【Instruction manual】
Vacuum pump
Model: CDV-3V, 5V



- Thank you for purchasing the CDV rotary-type vacuum pump.
- Please read this instruction manual carefully before use.
- Keep this manual in a place where it can be referred to at any time and look after it carefully.

(V2.00)

Myotoku Ltd.

For using it safely.

The following safety precautions are provided to prevent damage and danger to personnel and to provide instructions on the correct usage of this product.

These precautions are classified into 3 categories; **DANGER**, **WARNING**, and **CAUTION**, according to the degree of possible injury or damage and the degree of impedence of such injury or damage.

⚠ **DANGER**	Indicates an impending hazardous situation which may arise due to improper handling or operation and could result in serious bodily injury or death.
⚠ **WARNING**	Indicates a potentially hazardous situation which may arise due to improper handling or operation and could result in serious bodily injury or death.
⚠ **CAUTION**	Indicates a potentially hazardous situation which may arise due to improper handling or operation and could result in bodily injury or property-damage only accidents.

① ⚠ **DANGER**

① Do not use in flammable and/or explosive atmosphere. It may cause fire.

② Do not put flammable solvent or inflammables around a pump. It may cause fire.

③ Do not put any obstacle that may disturb the ventilation around a pump. It may cause overheating and can be the source of burnings and/or fire.

⚠ **CAUTION**

① Make sure to disconnect the electrical supply before installation or maintenance of the pump.

Do not touch the electrical wiring to avoid electric shock if the pump starts operating suddenly.

② Make sure the earth ground connection is properly made in order to avoid electric shock or pump failure. We recommend to install an earth leakage circuit breaker.

③ Supply the correct rated voltage to the pump motor. Apply over rated voltage may cause motor damage or failure and/or fire of the motor.

④ Do not put your finger or anything else into the motor orifice. It may cause electric shock,

injury or fire.

⚠WARNING

About setting and operating

① Make sure the ambient temperature range is within 7 ~ 40℃ when the pump is operating. .
② Make sure that no corrosive gas, water or oil gets sucked into the pump vacuum port.
(Avoid the suction of air with high temperature or high humidity)
③ Avoid places with lot of dust.
④ Install indoor and make sure to ensure sufficient ventilation around the pump.
⑤ Install in a place with no explosive gas.
⑥ Do not expose to direct sunlight.
⑦ Install it in a place without danger of ignition
⑧ Make sure to use your both hand when carrying the pump.
⑨ Blade abrasion particles are blown through the exhaust port due to the blade friction when the pump is operating. Set the piping with outdoor exhaust if necessary.
⑩ When the pump is operating, never touch the fan, the motor or other part of the pump. It causes injury.
⑪ Use the pump within the operating vacuum pressure range.
(See below table for reference)

Model	**Operating vacuum pressure range**
CDV-3V	-89 kPa ～ 0 (Atmospheric pressure)
CDV-5V	

⑫ The pump temperature increases when operating and is still high after stop of operation. As it causes burns, never touch the pump when it is operating or just after operating.
⑬ For safety reasons, install an overcurrent protective device and an earth leakage circuit breaker.

⚠CAUTION

About maintenance / repair

① When the pump stops unusually, wait until the pump cools down before. Make sure the temperature is low enough to perform any checking.
② Assembly and disassembly of the pump requires technical knowledge.
③ Make sure to disconnect the electrical supply before installation or maintenance of the pump. Do not touch the electrical wiring to avoid electric shock if the pump starts operating suddenly.

TABLE OF CONTENTS

1. PRECAUTIONS BEFORE USING THE PUMP

1) Pump appearance inspection

Perform a visual inspection of the pump and check whether there is any damaged part or screw loose, etc.

2） Preparation

A) Site installation

① Install in a place without danger of ignition.

② Install in a place/environment that would not affect the proper operation of the pump (no gas, no chemicals, etc.)

③ Install in a place with no water drop, no oil drop or any other liquid drop. Do not expose to direct sunlight.

④ The allowable ambient air temperature range for this pump is 7～40℃.

In the case there is heating source close to the pump, make sure the ambient air temperature does not exceed 40℃.

⑤ Use in a confined space may cause operation failure due to the heat generated by the pump. Make sure to ensure sufficient ventilation around the pump and be careful not to exceed the allowable ambient temperature.

⑥ Install in a place where it is not exposed to humidity or dust.

⑦ Please install in a place with sufficient space for check and maintenance.

B) Pump installation

① Please install the pump horizontally and in a stable place.

② As the pump makes vibrations during operation, install rubber cushion.

③ Do not drop the pump when carrying it.

C) Pump placement

Make sure to always keep enough space around the fan cover. Provide at least 10 cm free space between the wall and the fan cover for heat dissipation.

D) Piping

① Remove foreign debris from the piping by using air blow if any.

④ Shorten the piping as much as possible without stress on piping connections.

⑤ Make sure that no oil or other kind of liquid will be sucked into the piping. In the case there is oil or moisture in the operating environment, install an oil mist separator to prevent malfunction of the pump.

⑥ Depending on operating environment, install a precision filter (30

micrometers or less)

⑦ When the pump stops, if a reverse phenomenon occur, install a check valve at vacuum or exhaust port.

3）Pump motor operation and protection

A) The rotation direction is shown on the pump cover.

B) Protection device preparation: there is no overheat control device (thermal protector) installed on the pump; install an overcurrent protective device and an earth leakage circuit breaker.

4）Pump start-up, operation and stopping procedures

A) Set the vacuum at the minimum value (atmospheric pressure) before switching the power on.

B) When operating, the temperature of the pump increases; this is a normal phenomenon.

C) Set the vacuum at the minimum value (atmospheric pressure) before stopping the pump.

5）Pump storage

After purchasing and using the pump, when you do not use it temporarily, be careful of the following matters.

A) Cover and save indoors.

B) Avoid places containing oil and water.

C) Do not store in place with high humidity. Store in place where the temperature is under 40℃.

2. TROUBLE SHOOTING OF PUMP

1）The vacuum pressure cannot be adjusted to a high vacuum

Cause: suction flow decrease due to clogging of filter.

- Countermeasure: remove the filter and perform an air blow to remove oil. If oil cannot be removed this way, replace with a new filter.

Cause: the blade does not rotate because of chip, dirt, liquid etc.

- Countermeasure: follow the disassembly procedure steps, remove the debris or substance.

Cause: the blade does not rotate due to rusting from water intrusion.

- Countermeasure: Disassemble the pump, remove the rust.

Cause: leakage from the piping

- Countermeasure: change the piping

Cause: screw loosening

- Countermeasure: re-tighten the screw.

Cause: Slow speed rotation because of motor failure.

- Countermeasure: repair the motor.

Cause：blade is broken.

- Countermeasure: replace the blade with a new one.

Cause: blade size difference.

- Countermeasure: replace with correct sized blade.

Cause: blade wearing

- Countermeasure: replace the blade with a new one.

2）Abnormal noise

Cause: screw loosening.

- Countermeasure: re-tighten the screw.

Cause: blade damaged by foreign matter.

- Countermeasure: Disassemble the pump, clean it and replace the blades.

3）Stop of a pump

Cause: blade damaged by foreign matter.

- Countermeasure: disassemble the pump, clean it and replace the blades.

Cause: Friction of rotor and/or other parts when pump is operating under over pressure.

Countermeasure: disassemble the pump, replace the parts.

Cause: failure of the electrical system

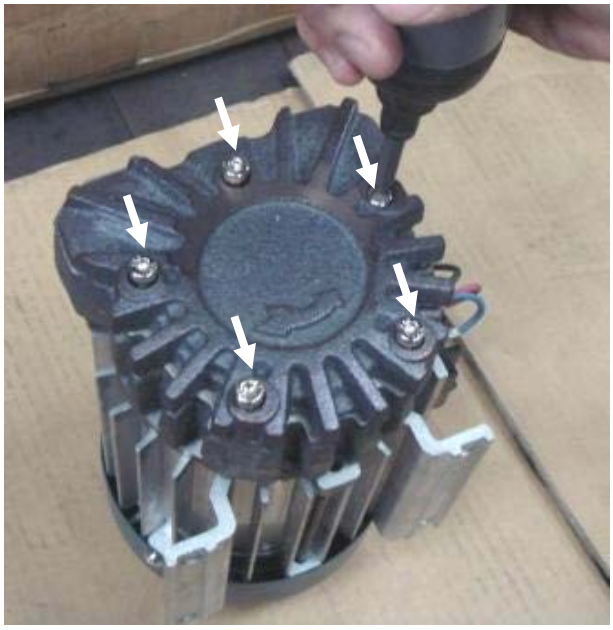
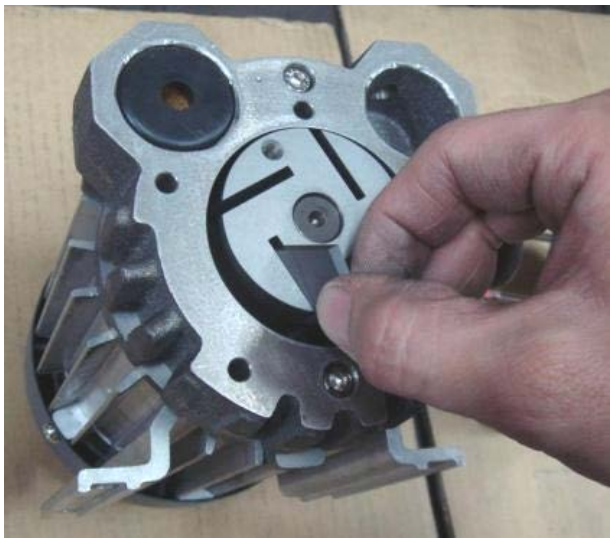
Countermeasure: check the state of wire and connecting terminals, and repair in case of poor contact and/or disconnection.

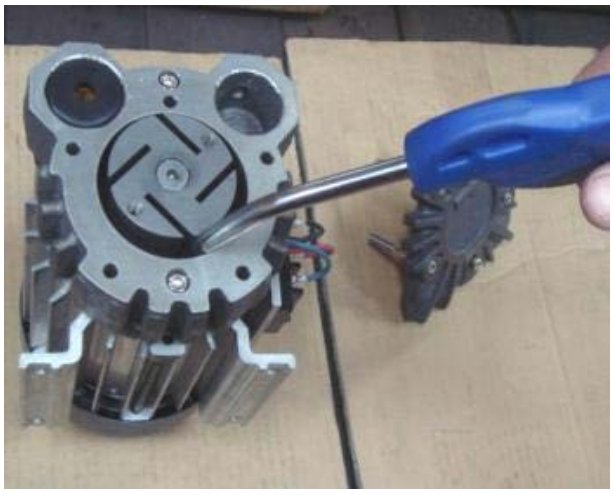
CAUTION

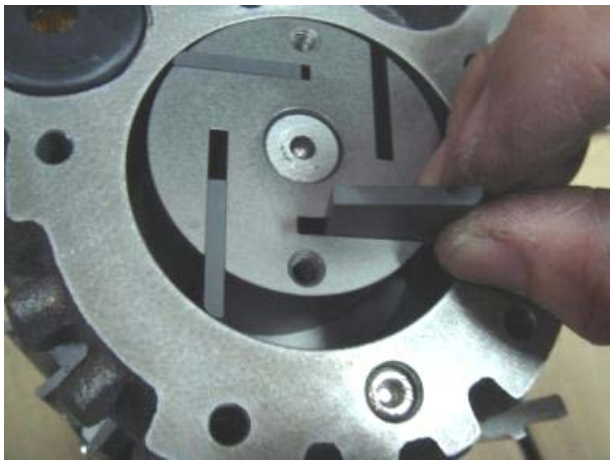
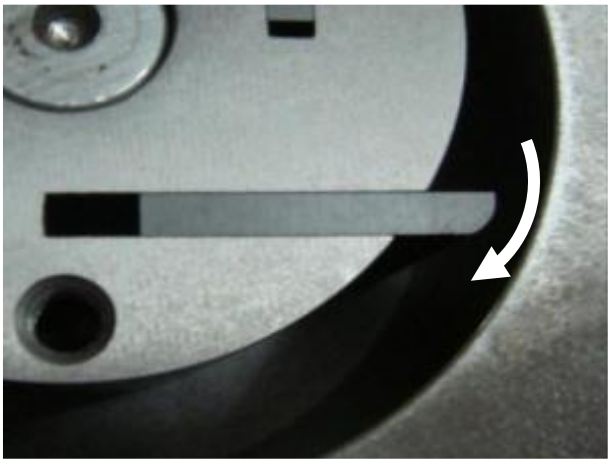
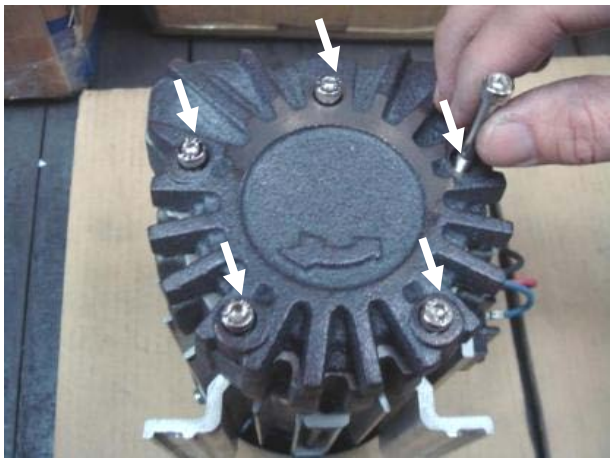
3. DISASSEMBLY AND ASSEMBLY PROCEDURES
(Exchange of a blades, and removal of debris/foreign substance)

・Disassembly and assembly process requires technical knowledge.
Installation and maintenance must be performed by knowledgeable personnel who understand how pneumatic and vacuum products are to be applied. Do not disassembly the pump is you do no hat sufficient knowledge about vacuum pumps.

・If required, proceed with disassembly of the pump by following below instructions.

1-1 Remove the 5 screws	
1-2 Remove the 4 blades.	

1-3 Remove any residue or foreign substance on the surface of the pump frame and lid.	 
1-4 Remove dust, particles or any foreign substance attached on the blade, pump cover and motor part by using an air blower.	

1-5 Insert the blade in the rotor’s slot. Make sure to insert the blade in the correct direction.	 
1-6 Fasten the pump cover（5 screws）	

WARNING

4. PERIODICAL INSPECTION

1) Filter cleaning

Perform a daily check of the filter condition.

When it becomes dirty, remove the dirt by using an air blower.

In the case the oil cannot be removed by this way, replace with a new filter.

2) Piping check

Check periodically and make sure there is no loose, damaged or broken piping.

3) Check of the pump

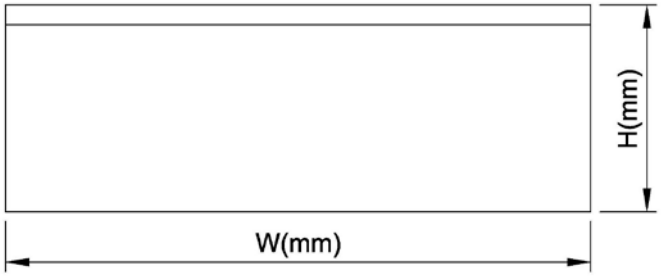
Check that the pump is operating correctly. Check that the performance of the pump is not decreasing.

Replacement of parts will be required in the case of abnormal sound generation. Contact your representative for maintenance parts purchasing and repair the pump.

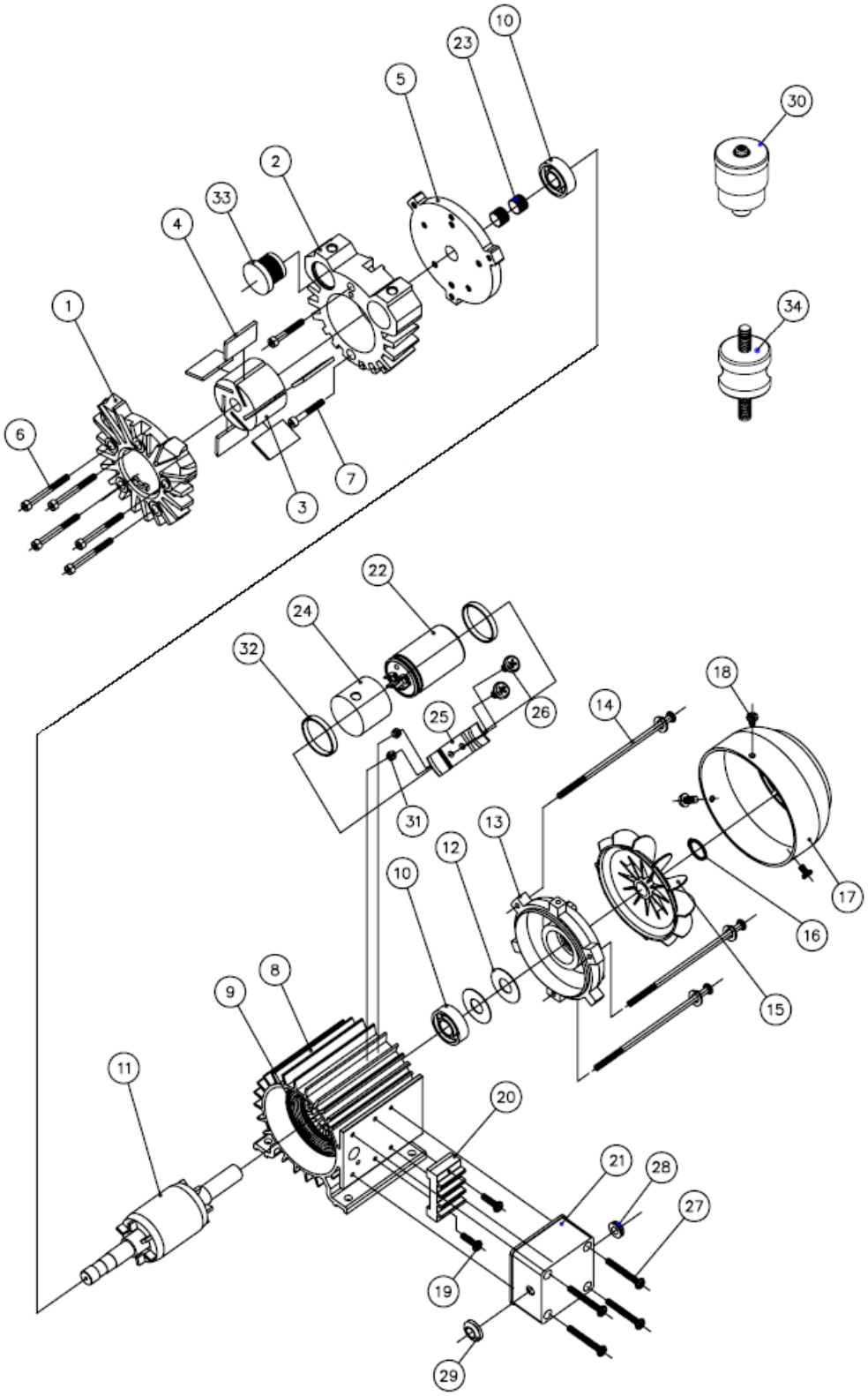
4) Blade maintenance and replacement

Replace the blade when the height reaches 14mm height.

Model	(W) Blade width	(H) Blade height (non-used)	(H) Minimum height
CDV-3V,5V	33 ㎜	22 ㎜	14 ㎜



EXPLODED VIEW



PARTS LIST

No.	Part No.	Name	Quantity
1	MS008-1	PUMP LID	1
2	MS009-1-1	FRAME	1
3	MS011-1-2	BLADE ROTOR	1
4	CDV-3V	BLADE(1set 5pcs）	1
	CDV-5V	BLADE(1set 4pcs)	1
5	MS010-1	MOTOR FRONT LID	1
6	M0008-04-3	SCREW	5
7	M0008-04-2	SCREW	2
8	MS012-1-1	MOTOR FRAME	1
9	E001-10	STATOR	1
10	M0003-2-1	BEARING	2
11	M0002-2	ROTOR	1
12	M0031	BEARING WASHER	2
13	MS007-1	MOTOR REAR LID	1
14	M0008-03-1-1	SCREW	3
15	M0025-1-1	FAN	1
16	M0032	SNAPRING	1
17	M0024-1	FAN COVER	1
18	M0008-02-1	SCREW	3
19	M0008-02-3	SCREW	21
20	M0044	TERMINAL BLOCK	1
21	M0026	TERMINAL BLOCK COVER	1
22	M0007-01	CAPACITOR	1
23	M0029-1	SPRING KEY	2
24	M0042-1	CAPACITOR BOOT	1
25	M0018	BRACKET	1
26	M0008-02-1	SCREW	2
27	M0008-02-6	SCREW	4
28	M0043-2	RUBBER BUSH	1
29	M0043-3	RUBBER BUSH	1
30	A0001-3	SILENCER	1
31	M0009-02	NUT	2
32	M0004-1	BAND	2
33	M0037-5	FILTER	1
34	M0022	CUSHION RUBBER	4