



PISTON VIBRATOR OPERATION MANUAL



PSB • PLB

EXEN CORPORATION

☆ SAFETY PRECAUTIONS

- ☆ This product is an air piston vibrator used widely in various industries such as a vibrator for precast concrete product, blockage prevention and vibration feeder, vibration screen and other vibration source. The product should not be used for other intended use.
- ☆ Be sure to read and understand this operation manual carefully before using the product so that it can be operated safely and efficiently. Improper machine use may result in injury or machine failure. Keep this manual for further reference.
- ☆ The following symbols are DANGER, WARNING, and CAUTION instruction for the use of this product so that the product will not cause harm or damage to users or others.



DANGER

【DANGER】 indicates an imminent dangerous situation which may lead to death or serious injury.



WARNING

【WARNING】 refers to a hazard that may cause death or serious injury.



CAUTION

【CAUTION】 refers to a hazard that may cause minor or moderate injury.



WARNING

(To prevent death)



After installing the piston vibrator, make sure to attach a wire to it to prevent it from falling due to vibration during operations.



In the event that the product falls by any chance, be sure to replace it even if there is no abnormality in appearance on the fall prevention wire.



In using the exclusive holder, please insert the vibrator in the holder thoroughly. If insertion is inadequate, it separates from the holder and there is possibility of falling.



The exclusive holder of this product is attached by welding.

If there is too little welding penetration, or if the welding is not even, cracks may occur due to vibration and impact, which may lead to unexpected accidents.



CAUTION

(To prevent injury or damages)



Do not use this product at other than the specified air pressure. When the pressure is lower than the specified air pressure, this leads to start up failures. When the pressure is too high, this leads to damage to parts, so adjust to the specified air pressure with a regulator.

■ Specified air pressure: 0.3 to 0.6 MPa



If the board thickness in the mounting part is thin, weld a reinforcing plate onto it to prevent the mounting part from being damaged as a result of vibration during operations.

○ INTRODUCTION

Thank you for purchasing this pneumatic Piston Vibrator.

Be sure to read this operation manual before use.

Be sure to read and understand this operation manual carefully before using the product until it can be operated safely and efficiently. Handle and maintain the product appropriately for safety operation. Keep this manual in a safe place.

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○ SAFETY



(For personal protection during operation)

- Put on a safety helmet, safety gloves, safety shoes, and safety harness, before installing the piston vibrator.



Safety helmet



Safety gloves



Safety shoes



Safety harness

- When fixing the fall prevention wire with the shackle, be sure to prevent the shackle screw from loosening with a wire. The screws may be loosened by the vibration during operation.
- Be sure to gain footholds in a safe environment when installing this product.



(For longer service life)

- Install a lubricator in the middle of the piping and adjust the oil supply so that 2 to 3 drops of oil are supplied per minute. If used in dry air, the piston may lock and malfunction due to wear of the sliding surfaces and heat generation in the body for a short period of time.
- Be sure to Install and reinforce the product securely to avoid resonance and irregular vibration. Otherwise, resonance or irregular vibration may damage the mounting or loosen the bolts.
- When piping, install an air filter of 5 micrometers or less in front of the solenoid valve. If dirt or dust gets into the solenoid valve, it may cause malfunction.
- Perform flushing by blowing air at 0.3MPa or higher into the pipe to remove foreign matter, machining dust, and burr.
- To extend the life of this product, we recommend installing an oiler (lubricator) midway in the piping and using oil mist air containing 2 to 3 drops/minute with turbine oil class 1 ISOVG 32 equivalent products. When the outside temperature is low, the vibrator may have trouble starting, so replace with low viscosity turbine oil. Use in oil mist air containing virtually no oil or moisture will shorten the product life. (Avoid use in completely dry air.)
- Use a normally closed 2-way valve for starting and stopping control.
■ Recommend solenoid valve AB 31-02-6 (CKD)
- The apparatus with direction should pipe to unite IN side of the direction of the flow of fluid and IN port displayed on the product.
- Regarding the use of sealing tape, please be sure not to get caught the tape inside the piping and not to cause air leak. When applying the sealing tape onto thread portions, avoid the 2-3 top threads. When applying liquid sealing material onto thread portions, avoid the 2-3 top threads and don't apply the excess amount. Avoid applying liquid sealing to female thread.
- In cold district use, take the suitable measures against freeze. (Air should not freeze.)
- Please use neither in the atmosphere of corrosive gas, nor the atmosphere of explosive gas.
- Please do not make valve into a scaffold or do not put heavy material.

- The bolting torque at the time of piping should be referred to the following table.

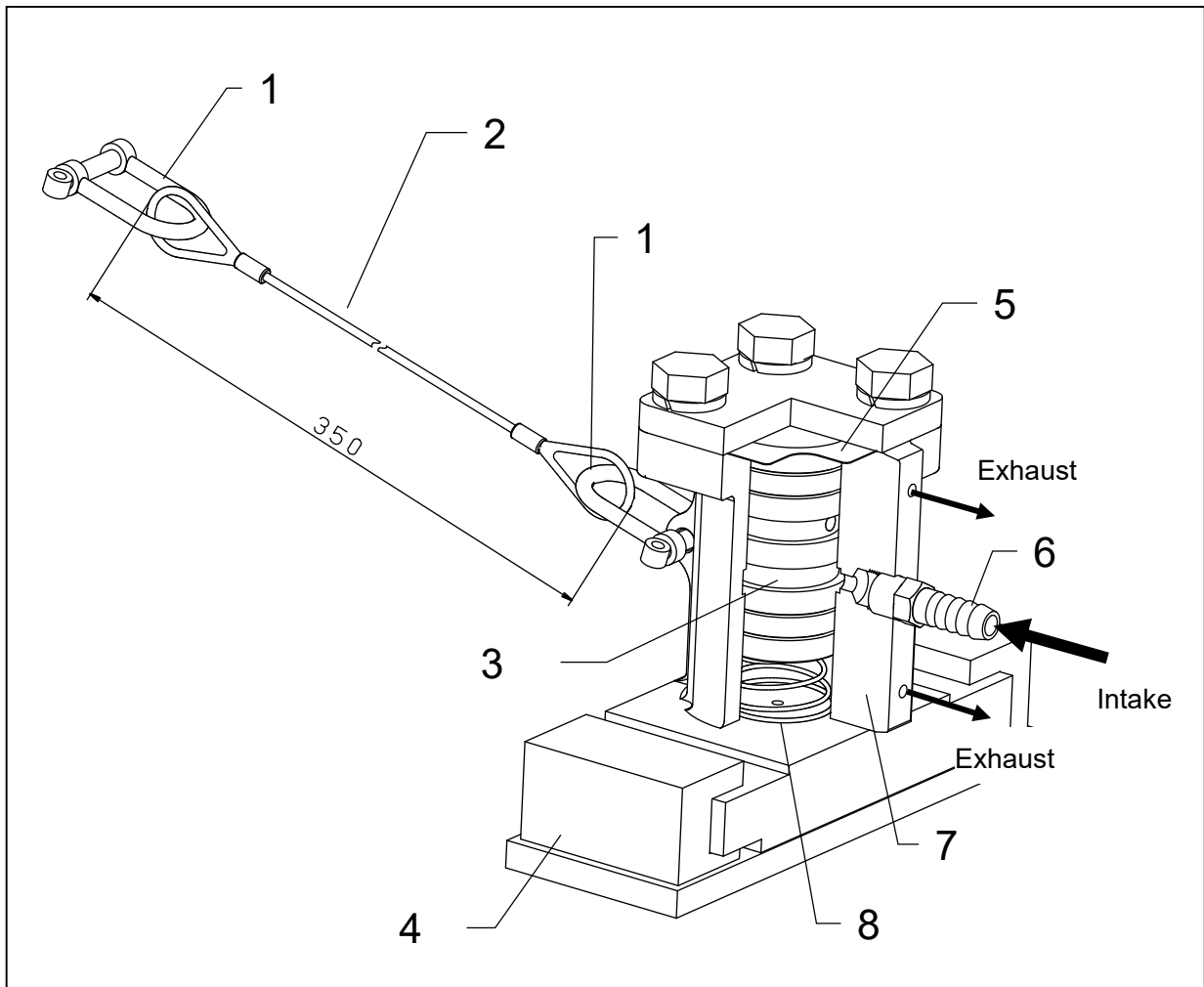
When the main part material is aluminum

Diameter of piping	Recommended bolting torque for piping (N·m)
Rc1/8	7~9
Rc1/4	12~14
Rc3/8	22~24
Rc1/2	28~30
Rc3/4	31~33

When the main part materials are metal other than aluminum

Diameter of piping	Recommended bolting torque for piping (N·m)
Rc1/8	18~20
Rc1/4	23~25
Rc3/8	31~33
Rc1/2	41~43
Rc3/4	62~65

○ NAMES OF PARTS



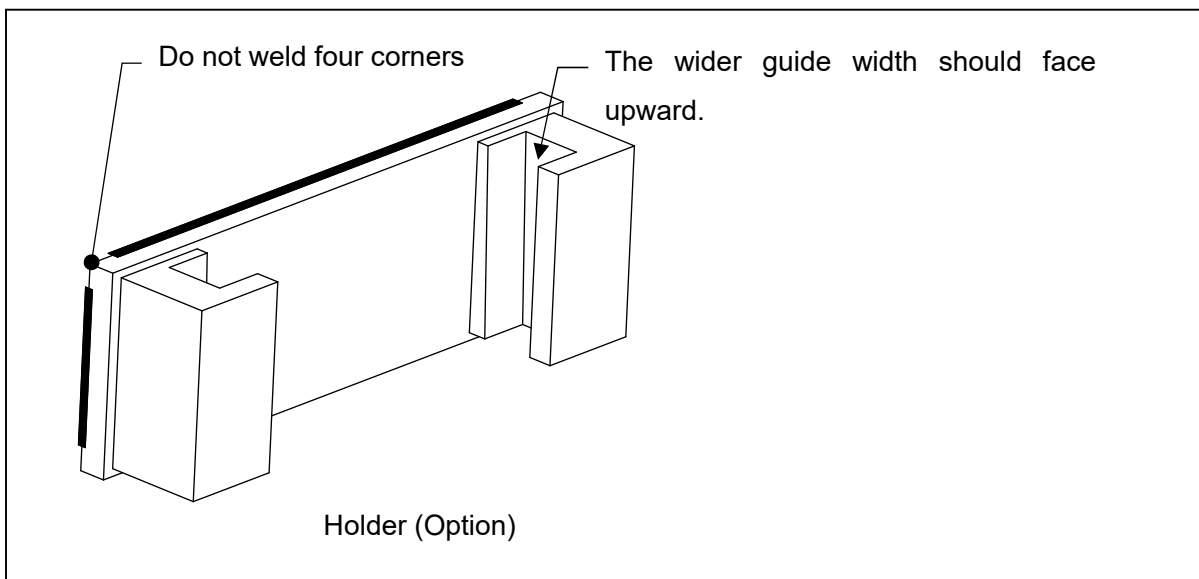
1	Shackle M6 ※	5	Packing
2	Fall Prevention Wire ※	6	Hose Coupling
3	Piston	7	Cylinder
4	Holder ※	8	Spring

Note : ※ indicates optional parts.

○ INSTALLATION

Welding when using holder

- ⚠ **When mounting the holder on the formwork, the wider side of the holder's guide should face upward. If the narrower side is installed facing up, the unit may fall, resulting in accidents or injury.**
- ⚠ **Use welding rod JIS Z3211 E4319 or above. (Kobe Steel welding rod B-17 or above).**
Note : Do not weld the four corners of the holder for air bleeding.
- ⚠ **Do not allow weld spatter to stick to the guide portion of the holder during welding.**
If weld spatter gets on the guide section, the unit may not be installed properly and may fall during use.
- ⚠ **A remarkable vibration is added to a weld zone at the time of an operation. In order to avoid emergency breakage and falling, please be sure to result in great weld bead as possible.**

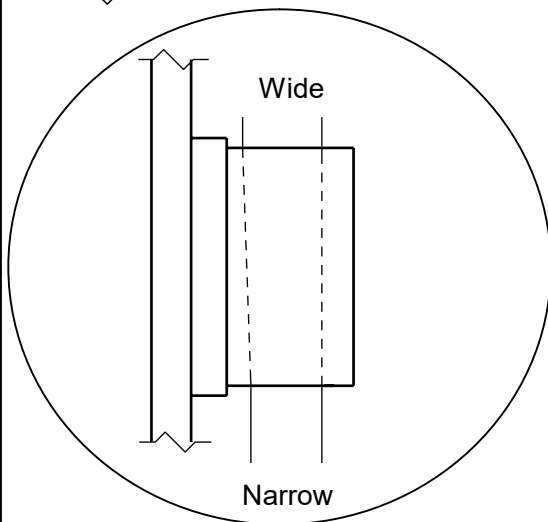
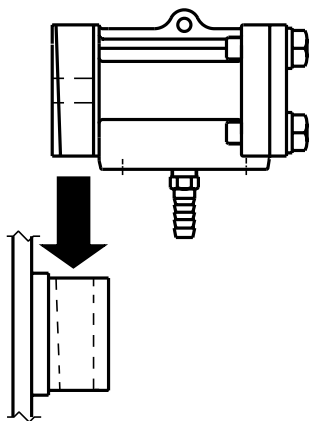


Mounting the piston vibrator

■ Installation with holder

- ⚠ **Insert the holder into the wider guide section of the holder, starting with the narrower taper of the unit.**
- ⚠ **After insertion, strike the vibrator with a rubber hammer to ensure that the holder is securely fixed.**
- ⚠ **Please take measures to prevent falling by using a fall prevention wire and a shackle.**
At the screw part of the shackle, please make sure to use wire to prevent it from loosening.

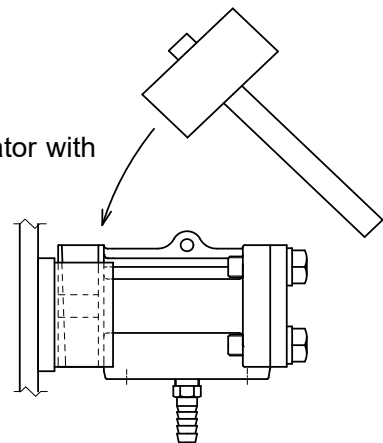
①



Enlarged View

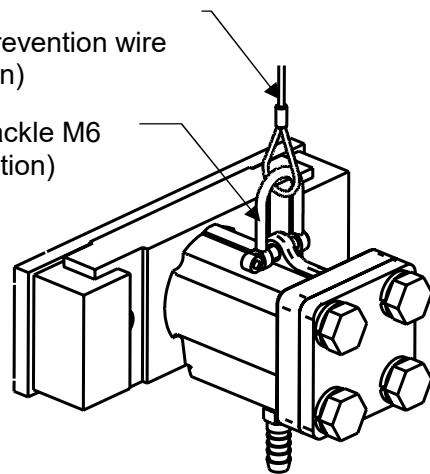
②

Hit the piston vibrator with a rubber hammer



Fall prevention wire
(Option)

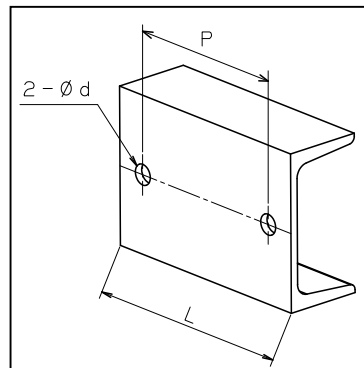
Shackle M6
(Option)



■ Installation with not use holder

- When mounting the vibrator with bolts, refer to the dimensional drawing below.

Model	P	ϕd	L
PSB	62	12	90~
PLB	110	14	150~



<Reference>

PSB Channel steel 75×40×5

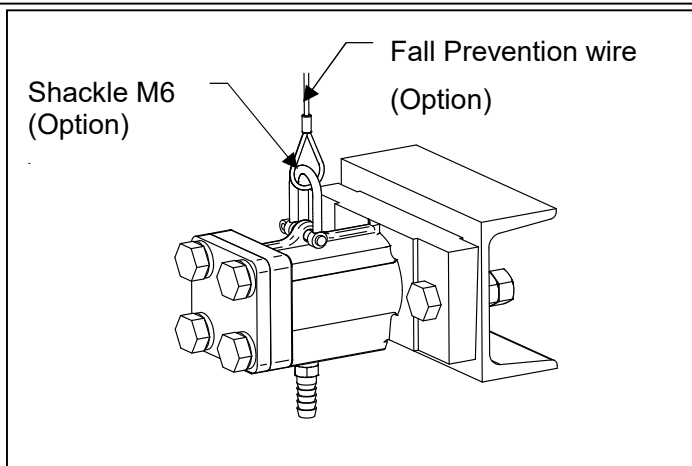
PLB Channel steel 100×50×5

⚠ **When installing this product using bolts, use high tensile bolts and install securely with a spring washer and double nut.**
If the tightening torque is insufficient, the bolt may be loosened by vibration of the vibrator.
Note : Refer to the following table for mounting bolts and tightening torque.

■ Tightening torque

Model	Bolt size	Tightening torque (N·m)
PSB	M10×45	62
PLB	M12×55	109

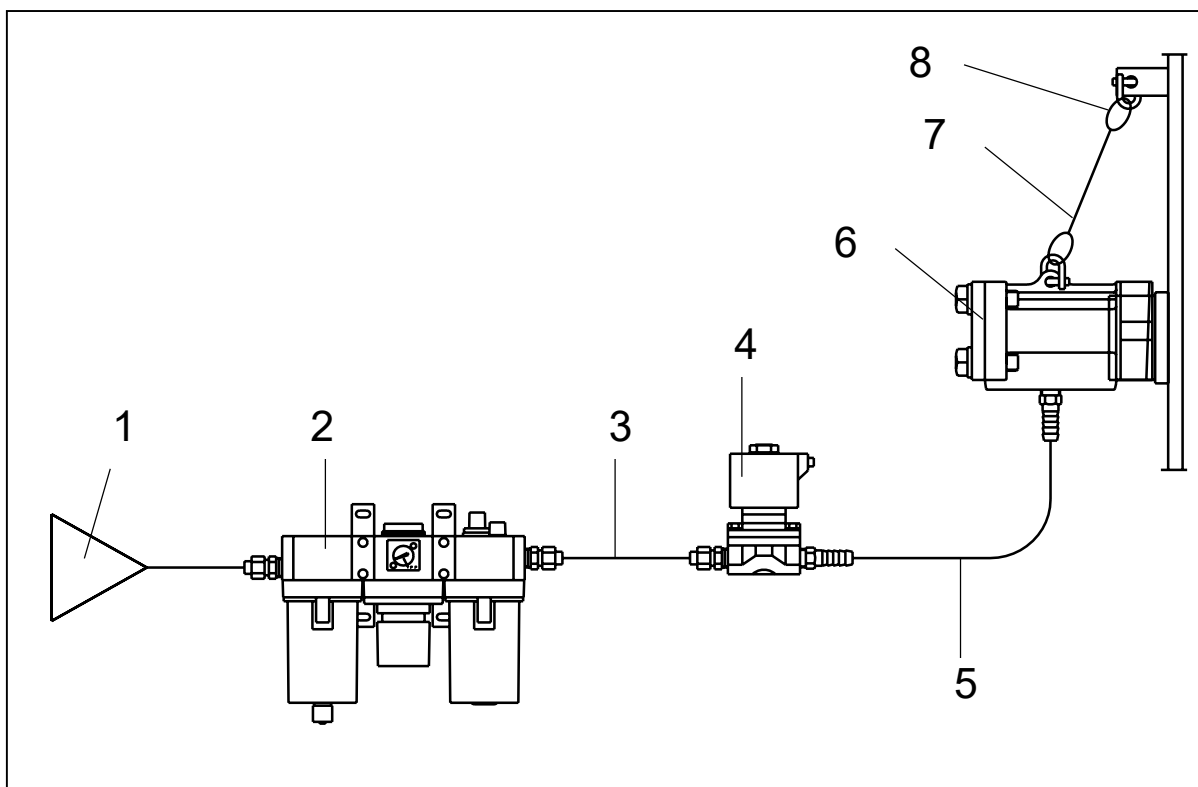
⚠ **Please take measures to prevent falling by using a fall prevention wire and a shackle.**
At the screw part of the shackle, please make sure to use wire to prevent it from loosening.



Example of piping

- ⚠ **Please take measures to prevent falling by using a fall prevention wire and a shackle.**
At the screw part of the shackle, please make sure to use wire to prevent it from loosening.
- ⚠ **Please give little flexion to the safety wire.**

- In order to supply air quickly, use of a solenoid valve or an air operation valve is recommended. In a hand operation valve, air may not be supplied in an instant and vibrator may not start.
- Please pipe from a lubricator to a vibrator in less than 5m distance. If piping is too long, lubricating oil will not reach to the vibrator, but the poor operation of the vibrator by the shortage of lubricating oil may be caused.



- ▶ 1. Compressor 2. FRL unit (Air Filter, Regulator and Lubricator)
3. Tube (Inner diameter ϕ 8 or more) 4. 2-way valve (Normally Closed) 5. Air hose
6. Piston vibrator 7. Fall prevention wire 8. Shackle M6

○ TEST OPERATION

- After mounting and piping the piston vibrator, run a test operation and complete the settings in accordance with the following procedure.
 - 1. Check that the air valve is closed.
 - 2. Connect the air hose to the hose coupling of the vibrator.
Note : Outside diameter of attached hose coupling is 11mm.
 - 3. Be sure to secure the air hose with a band.
 - 4. Set the air pressure to 0.3MPa.
 - 5. Open the air valve to vibrate.
Note : Adjust the vibration frequency by adjusting the working pressure.
Note : The working pressure is 0.3 to 0.6MPa.
 - 6. Check if the irregular vibration sound has occurred.
 - 7. Adjust the lubricating oil amount of supply to 2 to 3 drops per minute.

○ INSPECTION

- Be sure to check the followings periodically to prevent any trouble as much as possible during use.
 - 1. Is any nut or bolt loosening?
 - 2. Is the vibration sound normal?
 - 3. Is the spring not broken?
 - 4. Isn't the piston or the cylinder worn out?
 - 5. Is neither a tear nor a blockade in the air hose?
 - 6. Please blow off the fine powder adhering to the inside of the cylinder and the piston with air and wipe off it with cloth carefully.
 - 7. When reassembly, please apply lubricating oil thinly into the cylinder.
 - 8. Inspection of fall prevention the wire

○ REPLACEMENT PERIOD FOR CONSUMABLES

○ Replace consumables as set out in the following table.

Consumables	Replacement period. (visual and auditory check)	Replacement frequency (in hours)
Cylinder	Drop in vibrations or sound during operations (auditory/visual)	Upon found
Tapered Spring		
Piston		

Note : The replacement time for consumables is just the approximated time.

Since it depends on the usage condition, it is recommended to replace in the earlier time.

○ TROUBLESHOOTING

Phenomenon	Sign	Cause	Solution
Vibration	Weak vibration	The air pressure is low	Raise air pressure
		Broken taper spring	Replace taper spring
		Foreign matter has got into the cylinder	Cleaning and removal of cylinder
		Broken air hose	Repair or replace air hose
No Vibration	No vibration	The air pressure is low	Raise air pressure
		Broken taper spring	Replace taper spring
		Foreign matter has got into the cylinder	Cleaning and removal of cylinder
		Broken air hose	Repair or replace air hose
		Worn piston	Replace piston
		Worn cylinder	Replace cylinder
		Lack of lubricating oil	Oilers (lubricators) oiling: 2 to 3 drops per minutes Distance between the vibrator and the lubricator should be 5m or less.

○ SPECIFICATIONS

■ Specification

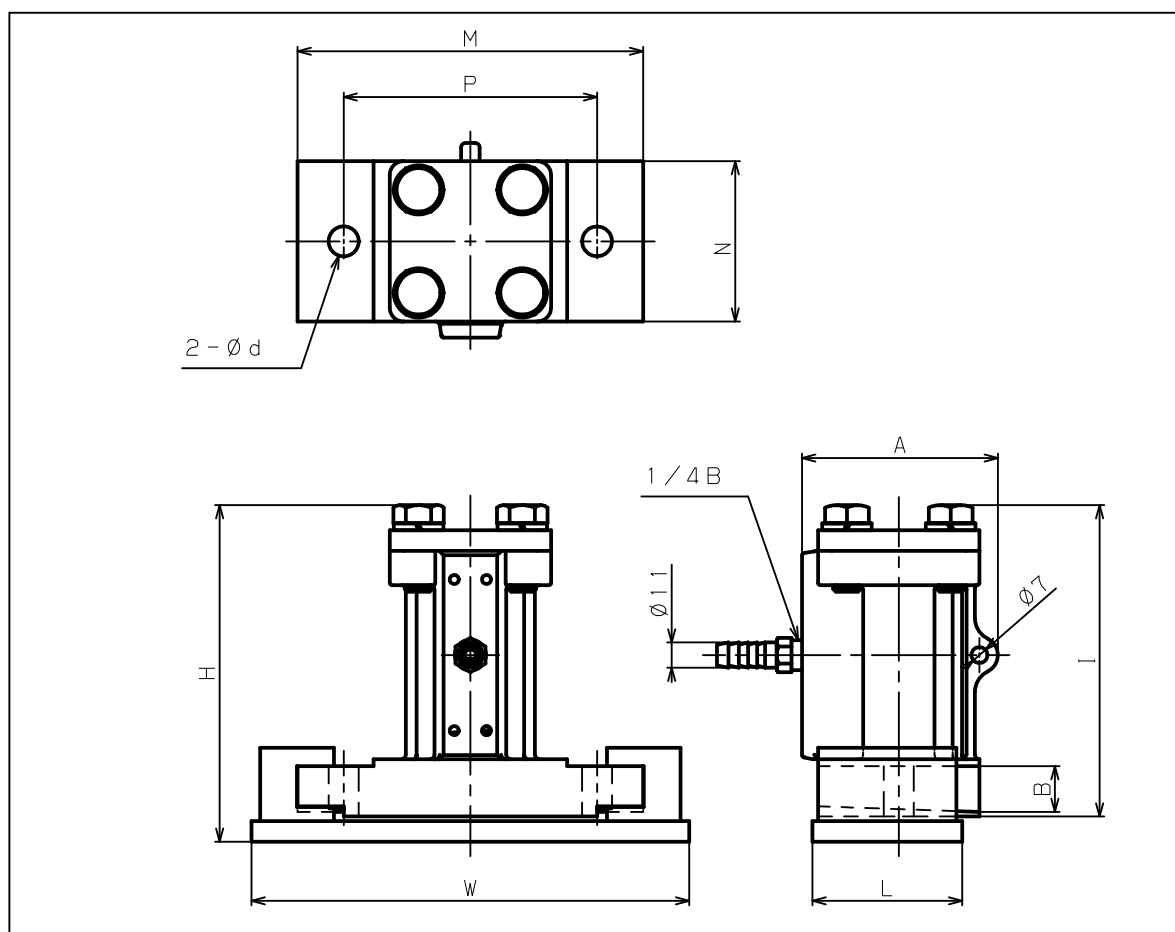
Model	Working pressure (MPa)	Vibration Frequency (Hz)	Centrifugal force (N)	Air consumption (L/min(ANR))	Installation method	Mass (kg)
PSB	0.3—0.6	80—110	160-280	120-260	with holder	1.4
PLB		52—70	400-710	200-420		4.1

■ Dimension table

(Unit : mm)

Model	A	B	M	N	I	W	L	H	P	ϕd
PSB	67	15	79	54	(92)	110	65	(105)	62	11
PLB	85	20	148	70	(136)	190	65	(147)	110	13

■ Dimension drawing



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