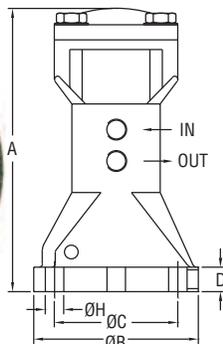




## Series APV Piston Vibrator

### Specifications - Installation and Operating Instructions



Model	A	øB	øC	D	øH	Connection
APV-C1, I1	5.43" (138 mm)	3.15" (80 mm)	2.36" (60 mm)	0.47" (12 mm)	0.79" (20 mm)	1/8"
APV-C2, I2	6.54" (166 mm)	3.94" (100 mm)	2.95" (75 mm)	0.63" (16 mm)	0.94" (24 mm)	1/4"
APV-C3, I3	8.19" (208 mm)	5.51" (140 mm)	4.13" (105 mm)	0.63" (16 mm)	0.94" (24 mm)	1/4"

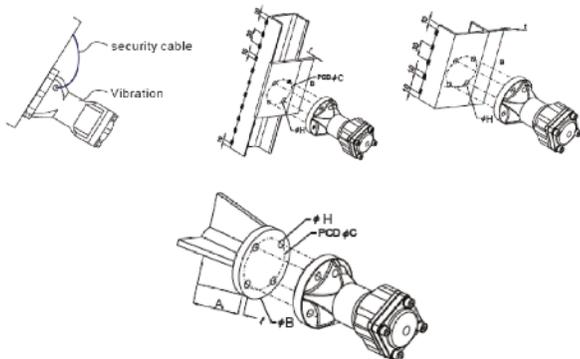
**Series APV Piston Vibrators** that are air cushioned help to provide low noise character. This makes it suitable for quiet area application. It is a good solution to prevent clogs on tank walls and material delivery problems. Piston impact types also can help to get rid of rust and material accumulated inside pipes. Direct impact on a tank with low specific gravity and high moisture material inside will help prevent material build-up and pipe clog or rust.

#### WORKING PRINCIPLE APV-C

There are air-breathing tubes located in both ends of the cylinder. Compressed air pushes the piston from one side to the other side. Vibration power arises as the piston moves back and forth in the body. Air cushion at both ends produced by the to-and-fro compression will keep the piston from striking the body. Therefore, the piston will not produce much noise.

#### WORKING PRINCIPLE APV-I

There are air-breathing tubes located in both sides of the cylinder. Compressed air pushes the piston away from one side and to the other side. Vibration arises when the piston moves back and forth in the body. Air cushion at the top end is produced by the to-and-fro compression. This will keep the piston from striking onto the body top. The piston will strike directly on the bottom side of the body to produce a strong impact.



#### SPECIFICATIONS

**Temperature Limit:** 212°F (100°C).

**Noise Level Range:** APV-C: 60-75 dBA; APV-I: 80-115 dBA.

**Supply Pressure:** 29 to 87 psi (2 to 6 bar).

**Air Consumption:** See model chart.

**Air Connection:** 1/8" BSPT female with 1/4" OD push to connect adapter on APV-C1 and APV-I1; 1/4" BSPT female with 1/4" OD push to connect adapter on APV-C2, APV-C3, APV-I2 and APV-I3. Also includes muffler for exhaust port.

**Housing Material:** Aluminum.

#### INSTALLATION

Vibration force transmits more efficiently in a conical hopper tank as opposed to a rectangular hopper. It is recommended that you install two vibrators in rectangular hoppers.

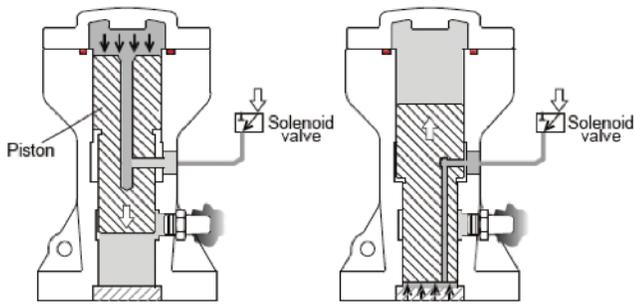
1. Vibrator force can be transmitted more efficiently by using "U" shape steel supports. It can help materials run smoother in the tank or pipe. It also reduces tank damage accidents.
2. To avoid tank wall amplitude caused by the vibrator moving in a left or right direction, use "U" shape steel.
3. Reinforced board is required between "U" shape steel and a thin tank wall.
4. To increase vibration fields in a big hopper tank, criss-cross "U" shape steel.

**Attention:** Vibration has to be fixed by a high tension bolt, washer, and spring washer. Connect with a security cable if the vibrator is installed onto a hopper.

Model	Frequency (V.P.M.) Pressure Input			Force lbf (N) Pressure Input			Air Consumption	Weight
	29 psi (2 bar)	58 psi (4 bar)	87 psi (6 bar)	29 psi (2 bar)	58 psi (4 bar)	87 psi (6 bar)	(l/min)	lb (kg)
APV-C1	1765	2308	2857	44 (195)	85 (380)	126 (560)	8.12 (230)	1.98 (0.9)
APV-C2	1333	1677	1875	62 (275)	119 (531)	161 (715)	8.79 (249)	4.19 (1.9)
APV-C3	1000	1200	1340	91 (404)	175 (780)	231 (1030)	9.50 (269)	9.92 (4.5)
APV-I1	1973	2885	3571	1818 (8086)	3044 (13542)	3996 (17776)	8.8 (250)	2.2 (1.0)
APV-I2	1744	2459	3000	3245 (14443)	4934 (21948)	6048 (26904)	9.5 (270)	4.6 (2.1)
APV-I3	1277	1875	1973	3470 (15434)	7799 (34692)	8276 (36816)	10.6 (300)	10.6 (4.8)

V.P.M. = vibrations per minute

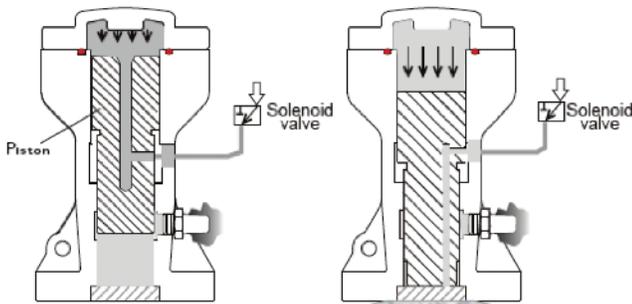
## APV-C SERIES



(1) Compressed air via one air breathing tube pushes piston moving forward. Some air on the other side will be exhausted by outlet hole.

(2) And thus compressed air via the other end pushes piston moving back. The movement repeats from step (1)

## APV-I SERIES



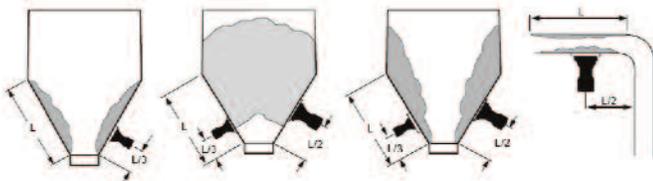
(1) Compressed air via top air-breathing tube pushes piston moving forward. Air on the down will be exhausted via outlet hole.

(2) And thus compressed air via down air-breathing tube pushes piston moving back. The movement repeats from step (1)

## NOTES:

Various tanks are based on application requirement. Customers choose appropriate vibrator types to meet with various application demands (tank shape, material, applied material, etc). Suitable vibrators will not only prevent obstruction problems but won't damage the tank walls.

Large amplitude and low frequency piston types fit in granule with small S.G. applied material. It is recommended to use multiple vibrators in serious clog situations or large tank surroundings.



According to various clog situations, required vibrations and suitable install positions (usually 1/2 L or 1/3 L) are shown above.

## VIBRATION FORCE CALCULATION

Taking the accumulated situation into consideration, the appropriate vibrator will give 0.2~0.5 G accelerated vibration onto the target object.

$$F=0.2-0.4GW$$

F: Vibration force (N)

G: Acceleration of gravity

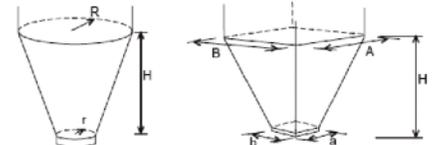
W: Material weight (KG)

## MATERIAL WEIGHT CALCULATION

W: Material weight (KG)

V: Chute volume (M<sup>3</sup>)

$\gamma$ : Specific gravity



$$W=1000V\gamma$$

$$V=\frac{\pi H}{3}(R^2+Rr+r^2)$$

$$V=\frac{H}{6}[A \times B+(A+a)(B+b)+a \times b]$$

Generally speaking, the hopper portion of the tank should be taken into consideration.

## MAINTENANCE

Upon final installation of the Series APV Piston Vibrator, no routine maintenance is required. A periodic check of the system calibration is recommended. The Series APV is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return good authorization number before shipping.