

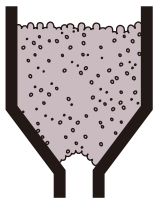


# EXXEN

## FLOW AID SYSTEM

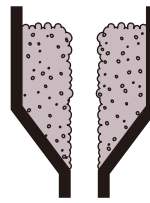
BLASTER / KNOCKER / PNEUMATIC BALL VIBRATOR /  
PISTON VIBRATOR / VIBRATION MOTOR

## TROUBLE PHENOMENON



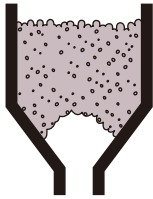
### BRIDGING

Bridging occurs when material clings to the wall or compacts above the discharge opening at hopper bottom, and material flow in upper area is interrupted.



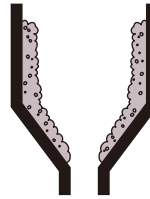
### RATHOLING

Ratholing occurs when material flows only above the discharging opening and forms a tube besides the hopper wall leaving the hopper filled with "dead" material which will not be discharged.



### ARCHING

Arching occurs when material in hopper bottom flows out from the discharging opening and an arch is formed which is strong enough to support entire headload in the hopper.



### ADHERENCE TO WALL

Material which is easy to cling or influenced by moisture/temperature adheres to hopper wall and refuses to flow.



Air Knocker



Pneumatic Vibrator

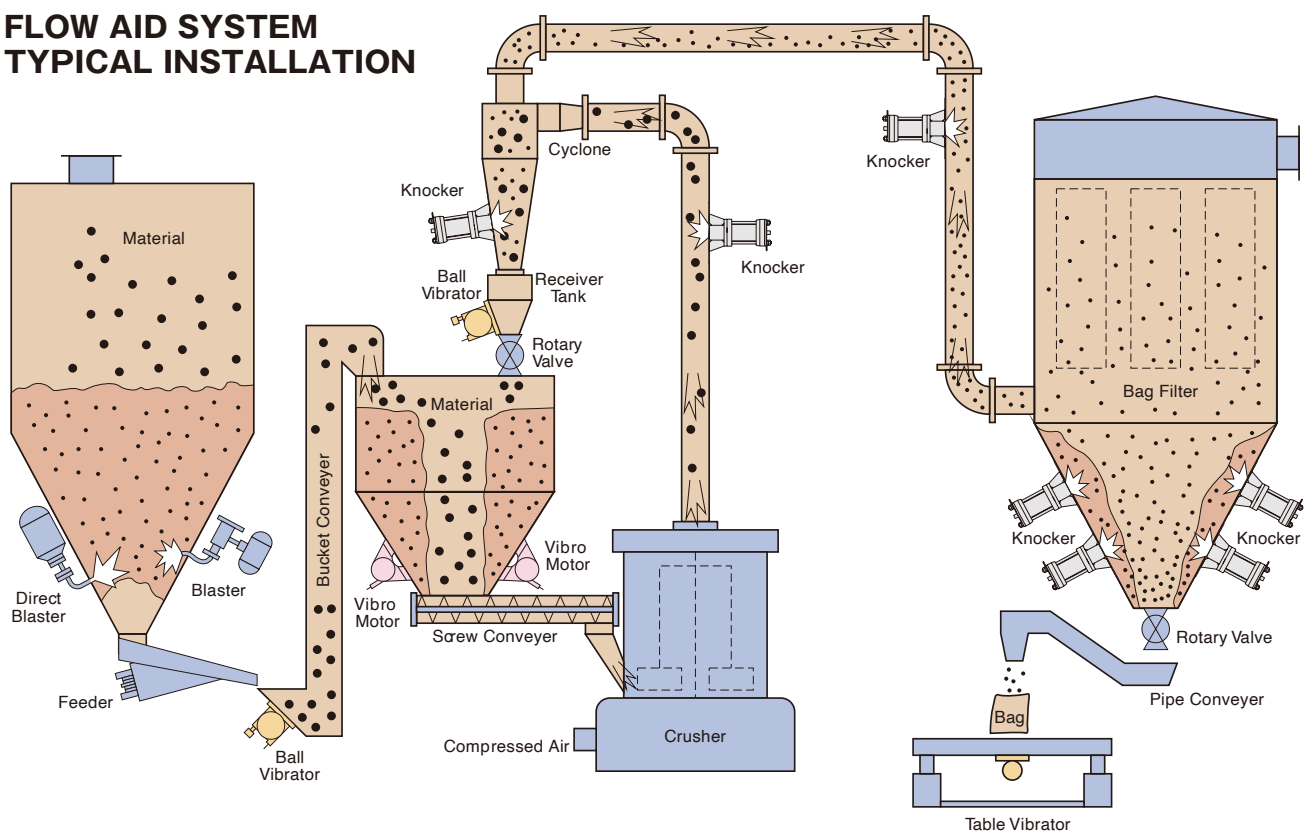


Direct Blaster



Electric Vibrator

## FLOW AID SYSTEM TYPICAL INSTALLATION





## Automatic hammering device with adjustable impact force

The air knocker is a unique equipment in which the force of compressed air makes the piston to energetically strike the base surface (or the hopper wall surface directly) and eliminates the adhesion or clogging of powder. In addition, this air knocker is excellent in safety and economical because it runs only by compressed air, and even suitable to use for a powder that has a characteristic to compacts or shows adhesion when receives centrifugal vibration.

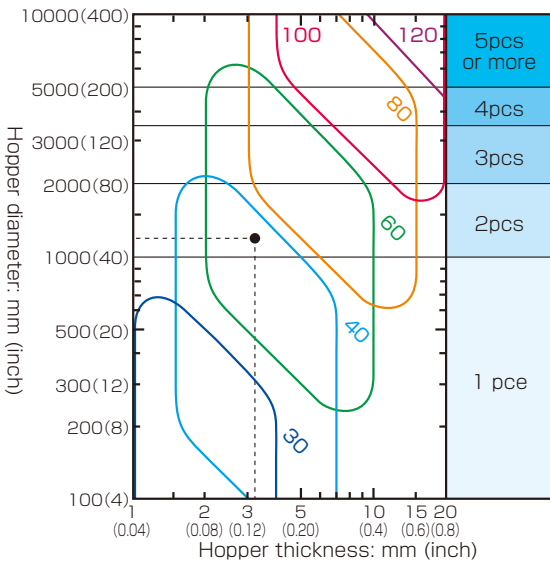


### FEATURES

- 1 Impact force of air knocker is adjustable by controlling the supply air pressure.
- 2 Able to operate multiple units with relay piping method.
- 3 Excellent durability, simple structural design and easy maintenance.
- 4 Simple working principle does not require a complicated operational circuit.



With pipe mounting base



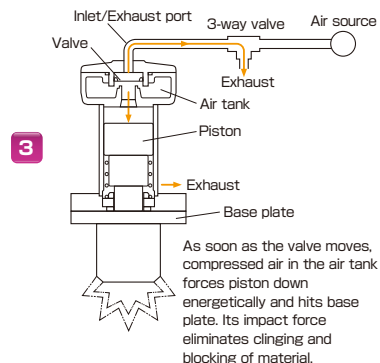
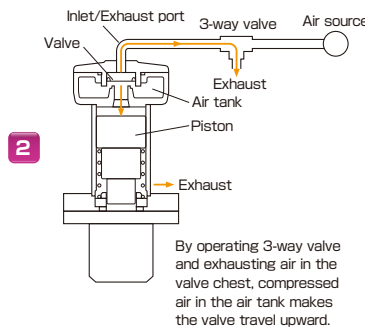
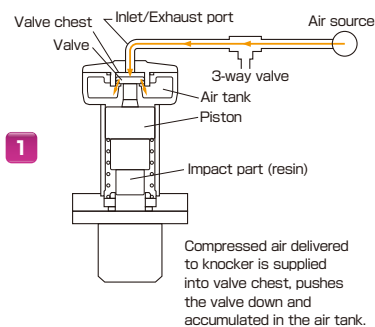
### Model Selection Guide

Model and quantity of air knocker which provides the optimum result is selected according to the shape, size and material of hopper as well as clinging condition and work material stored in hopper. For instance, when installing on the conical hopper of 1,200mm dia. and 3.2mm thickness, find the point of intersection X. As the point X is within the range of RKV40 x 2 pcs and RKV60 x 2 pcs, select RKV40 x 2 pcs for weak clinging strength, and RKV60 x 2 pcs for strong clinging strength.

### Hint

The large hopper tends to create segregation easier and also causes a dead stock in hopper corner easier. In this case, installing more number of smaller size unit rather than installing less number of larger size unit is recommended.

### Operating principle



★Stainless steel model and heat-resistant model are also available.



# Air knocker RKV series

Installed directly on hoppers, silos and chutes to eliminate blockages.

KNOCKER



**RKV20P**



**RKV30PB**



**RKV40PB**



For flat surface

**RKV60PB**



**RKV80PA**



**RKV100PA**



The base of RKV60PBR, RKV80PAR, and RKV100PAR is designed for round surface.

For round surface

**RKV60PBR**

**RKV80PAR**

**RKV100PAR**

**Specification (Metric)** \*Reinforcing rib is included in RKV60PB and larger model only, and fall prevention wire and shackle are included in all models.

Model	Working Pressure (MPa)	Stroke Cycle (time/min)	Air Consumption (L/time) (ANR)	Stroke Energy (N·m)	Impulsive Force		Weight (kg)
					(kg·m/s)	Converts into Hammer pound (lb)	
RKV20P	0.3~0.7	1~60	0.04~0.10	4.3~8.3	0.6~0.8	0.6以下	0.8
RKV30PB			0.05~0.13	5.5~13.1	1.2~1.8	1.0以下	1.0
RKV40PB			0.15~0.37	9.2~22.3	2.6~4.0	1.0~1.5	2.5
RKV60PB/ PBR			0.33~0.77	20.6~49.0	6.9~10.6	1.5~3.0	7.0/7.1
RKV80PA/ PAR			0.60~1.40	45.1~109	15.2~23.7	3.0~8.0	14.5/14.6
RKV100PA/ PAR			0.98~2.28	82.4~201	30.0~46.9	6.0~15.0	34.0/34.3

\* weight(kg)Includes base

**Specification (Imperial)** \*Reinforcing rib is included in RKV60PB and larger model only, and fall prevention wire and shackle are included in all models.

Model	Working Pressure (PSI)	Stroke Cycle (time/min)	Air Consumption (cf/time)	Stroke Energy (lbf ·ft)	Impulsive Force		Weight (lb)
					(lb-ft/s)	Converts into Hammer pound (lb)	
RKV20P	44~102	1~60	0.001~0.004	3.2~6.1	4.3~5.8	Below 0.6	1.8
RKV30PB			0.002~0.005	4.1~9.7	8.7~13.0	Below 1.0	2.2
RKV40PB			0.005~0.013	6.8~16.4	18.8~28.9	1.0~1.5	5.5
RKV60PB/ PBR			0.012~0.027	15.2~36.1	49.9~76.7	1.5~3.0	15.4 / 15.7
RKV80PA/ PAR			0.021~0.049	33.3~80.4	109.9~171.4	3.0~8.0	32.0 / 32.2
RKV100PA/ PAR			0.035~0.081	60.8~148.3	217.0~339.2	6.0~15.0	75.0 / 75.6

\* weight(lb)Includes base



**RKV120P**(with bolt set)

**Base**  
(with reinforcing ribs)

**Specification (Metric)**

Model	Working Pressure (MPa)	Stroke Cycle (time/min)	Air Consumption (L/time) (ANR)	Stroke Energy (N·m)	Impulsive Force		Weight (kg)
					(kg·m/s)	Converts into Hammer pound (lb)	
RKV120P	0.3~0.7	1~6	3.22~6.64	131~321	52.0~84.0	2 times of RKV100PA	51.8

\* weight(kg)Includes base

**Specification (Imperial)**

Model	Working Pressure (PSI)	Stroke Cycle (time/min)	Air Consumption (cf/time)	Stroke Energy (lbf ·ft)	Impulsive Force		Weight (lb)
					(lb-ft/s)	Converts into Hammer pound (lb)	
RKV120P	44~102	1~6	0.114~0.234	96.6~236.8	376.1~607.6	2 times of RKV100PA	114.2

\* weight(lb)Includes base

\* Weight includes base and reinforcing ribs.  
 \* Fall prevention chain is not fixed to RKV120P when shipping out from factory. Please fix it securely before use.  
 \* RKV120P base comes with reinforcing ribs. Weld the ribs to the base on site.

# Air knocker RKD series

While the RKV series transmits impact force indirectly through the knocker base, RKD series transmits impact force directly to the object by the piston.



**RKD30PB**



**RKD40PB**



**RKD60PB**



**RKD80PA**



**RKD100PA**

KNOCKER

■ Specification (Metric)

\*Reinforcing rib, fall prevention wire and shackle are included in all models.

Model	Working Pressure (MPa)	Stroke Cycle (time/min)	Air Consumption (L/time) (ANR)	Stroke Energy (N·m)	Impulsive Force		Weight (kg)
					(kg·m/s)	Converts into Hammer pound (lb)	
RKD30PB	0.3~0.7	1~60	0.05~0.13	5.5~13.1	1.2~1.8	Below 1.0	1.7
RKD40PB			0.15~0.37	9.2~22.3	2.6~4.0	1.0~1.5	4.8
RKD60PB			0.33~0.77	20.6~49.0	6.9~10.6	1.5~3.0	10.7
RKD80PA			0.60~1.40	45.1~109.0	15.2~23.7	3.0~8.0	18.4
RKD100PA			0.98~2.28	82.4~201.0	30.0~46.9	6.0~15.0	35.5

\* weight(kg)Includes base

■ Specification (Imperial)

\*Reinforcing rib, fall prevention wire and shackle are included in all models.

Model	Working Pressure (PSI)	Stroke Cycle (time/min)	Air Consumption (cf/time)	Stroke Energy (lbf ·ft)	Impulsive Force		Weight (lb)
					(lb·ft/s)	Converts into Hammer pound (lb)	
RKD30PB	44~102	1~60	0.002~0.005	4.1~9.7	8.7~13.0	Below 1.0	3.7
RKD40PB			0.005~0.013	6.8~16.4	18.8~28.9	1.0~1.5	10.6
RKD60PB			0.012~0.027	15.2~36.1	49.9~76.7	1.5~3.0	23.6
RKD80PA			0.021~0.049	33.3~80.4	109.9~171.4	3.0~8.0	40.6
RKD100PA			0.035~0.081	60.8~148.3	217.0~339.2	6.0~15.0	78.3

\* weight(kg) Includes base.



**RKD120P** (with bolt set)

**Base**  
(with reinforcing ribs)

■ Specification (Metric)

Model	Working Pressure (MPa)	Stroke Cycle (time/min)	Air Consumption (L/time) (ANR)	Stroke Energy (N·m)	Impulsive Force		Weight (kg)
					(kg·m/s)	Converts into Hammer pound (lb)	
RKD120P	0.3~0.7	1~6	3.22~6.64	131~321	52.0~84.0	2 times of RKD100PA	52.6

\* weight(kg)Includes base

■ Specification (Imperial)

Model	Working Pressure (PSI)	Stroke Cycle (time/min)	Air Consumption (cf/time)	Stroke Energy (lbf ·ft)	Impulsive Force		Weight (lb)
					(lb·ft/s)	Converts into Hammer pound (lb)	
RKD120P	44~102	1~6	0.114~0.234	96.6~236.8	376.1~607.6	2 times of RKD100PA	116

\* weight(lb)Includes base

\* Weight includes base and reinforcing ribs.

\* Fall prevention chain is not fixed to RKV120P when shipping out from factory. Please fix it securely before use.

\* RKV120P base comes with reinforcing ribs. Weld the ribs to the base on site.



# Stainless steel knocker

Body, base, mounting bolts and other parts of RKVS series are made of stainless steel and suitable for food, chemical, and pharmaceutical industries where corrosion resistance and sanitation are required. Also, this model is suitable for industry related to rechargeable battery.



**RKVS15**



**RKVS20**



**RKVS30**



**RKVS40**



**RKVS60**

### Hygienic knocker (Sanitary Tri-clamp)



**RKVS15-F**



**RKVS20F**



**Tri-clamp**  
(standard accessory)

#### ■ Specification (Metric)

Model	Working Pressure (MPa)	Stroke Cycle (time/min)	Air Consumption (L/time) (ANR)	Stroke Energy (N·m)	Impulsive Force		Weight (kg)
					(kg·m/s)	Converts into Hammer pound (lb)	
RKVS15	0.3~0.7	1~60	0.03~0.06	2.7~5.9	0.3~0.5	Mini Hammer	0.43
RKVS15-F							0.94
RKVS20			0.04~0.10	4.3~8.3	0.6~0.8	Below0.6	0.80
RKVS20F							0.90
RKVS30			0.05~0.13	5.5~13.1	1.2~1.8	Below1.0	1.60
RKVS40			0.15~0.37	9.2~22.3	2.6~4.0	1.0~1.5	4.20
RKVS60			0.33~0.77	20.6~49.0	6.9~10.6	1.5~3.0	10.40

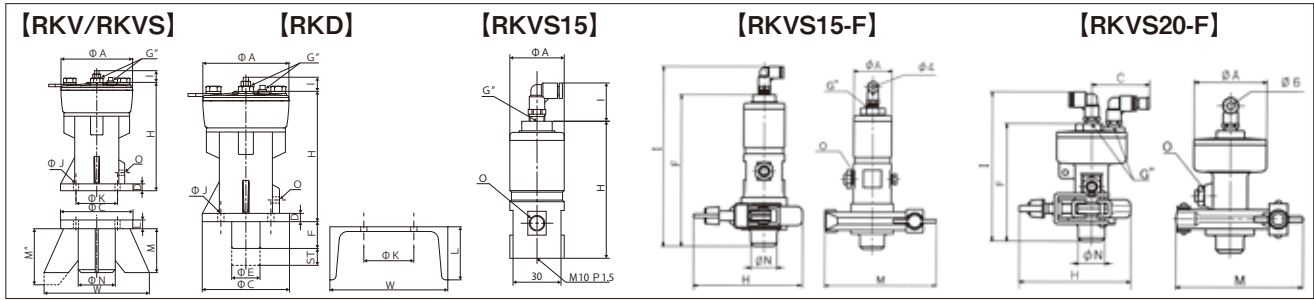
#### ■ Specification (Imperial)

Model	Working Pressure (PSI)	Stroke Cycle (time/min)	Air Consumption (cf/time)	Stroke Energy (lbf·ft)	Impulsive Force		Weight (kg)(lb)
					(ft·lbf/s)	Converts into Hammer pound (lb)	
RKVS15	44~102	1~60	0.001~0.002	2.0~4.4	2.2~3.6	Mini Hammer	0.9
RKVS15-F							2.1
RKVS20			0.001~0.004	3.2~6.1	4.3~5.8	Below0.6	1.8
RKVS20F							2.0
RKVS30			0.002~0.005	4.1~9.7	8.7~13.0	Below1.0	3.5
RKVS40			0.005~0.013	6.8~16.4	18.8~28.9	1.0~1.5	9.3
RKVS60			0.012~0.027	15.2~36.1	49.9~76.7	1.5~3.0	22.9

\* Reinforcing rib is included in RKVS60 only, and fall prevention wire and shackle are included in RKVS20-60.

\* F-type includes tri-clamp and stainless steel.

\* Fall prevention wire for RKVS15-F and RKVS20F is optional.



■ Dimensions (mm)

Model	φA	φC	D	φE	F	G*	H	I	φJ	φK	ST	L	M	M'	φN	O	W	Tube size
RKVS15	34	—	—	—	—	Rp1/8	86	(24)	—	—	—	—	—	—	—	Rp1/8	—	φ4×φ2
RKVS15-F		—	—	—	127		(91)	(151)	—	—	—	—	—	(100)	—		21.7	—
RKV20P	57	57	6.5	—	—	Rp1/8	70	(26)	6.5	44	—	6	28	—	22	Rp1/4	—	φ6×φ4
RKVS20		—	—	—	—		(91)	(121.5)	—	—	—	—	—	(100)	—		21.7	—
RKVS20F	—	47	—	—	95.5	—	—	—	—	—	—	—	—	—	—	—	—	—
RKV30PB	62	70	8	—	—	Rp1/8	90	(25)	9	55	—	8	35	—	27.5	Rp1/4	—	—
RKVS30	66						8.5		70						8			
RKV40PB	78	95	12	—	—	Rp1/8	134	(25)	13	70	—	13	60	—	34	Rp1/4	—	—
RKVS40	86						12.5		70						13			
RKV60PB	105	138	14	—	—	Rp1/8	171	(25)	15	110	—	15	80	—	80	Rp3/8	(196)	—
RKV60PBR							120		76						120			
RKVS60	115	—	—	—	—	—	183	—	14.5	—	—	—	—	125	—	—	—	—
RKV80PA	146	148	16	—	—	Rp1/4	222	(28)	17	120	—	18	90	—	90	Rp1/2	(216)	—
RKV80PAR							115		76.3						115			
RKV100PA	175	208	20	—	—	Rp1/4	270	(28)	21	170	—	23	115	—	114.3	Rp3/4	(308)	—
RKV100PAR							135		114.3						135			
RKV120P	220	235	21	—	—	—	326	—	17.5	198	—	—	100	120	133	2-Rp3/4	(313)	—
RKD30PB	62	70	8	17	38	Rp1/8	90	(25)	9	55	17	50	—	—	—	Rp1/4	100	—
RKD40PB	78	95	12	25	55		134		13	70	25	75					50	150
RKD60PB	105	138	14	35	65	—	171	—	15	110	35	90	—	—	—	Rp3/8	200	—
RKD80PA	146	148	16	47.5	60	Rp1/4	222	(28)	17	120	40	90	—	—	—	Rp1/2	—	—
RKD100PA	175	208	20	54.5	50		270		21	170	50					50	250	
RKD120P	220	235	21	68	43	—	326	—	17.5	198	74	—	—	—	—	2-Rp3/4	300	—

■ Dimensions (inch)

Model	φA	φC	D	φE	F	G*	H	I	φJ	φK	ST	L	M	M'	φN	O	W	Tube size
RKVS15	1-11/32	—	—	—	—	Rp1/8	3-25/64	(15/16)	—	—	—	—	—	—	—	Rp1/8	—	φ4×φ2
RKVS15-F		—	—	—	5		(3-37/64)	(5-15/16)	—	—	—	—	—	(3-15/16)	—		55/64	—
RKV20P	2-1/4	2-1/4	1/4	—	—	Rp1/8	2-3/4	(1-1/32)	1/4	1-47/64	—	15/64	1-7/64	—	55/64	Rp1/4	—	φ6×φ4
RKVS20		—	—	—	—		(4-25/32)	—	—	—	—	—	—	(3-15/16)	—		55/64	—
RKVS20F	—	1-27/32	—	—	3-49/64	—	(3-37/64)	—	—	—	—	—	(3-15/16)	—	55/64	—	—	—
RKV30PB	2-7/16	2-3/4	5/16	—	—	Rp1/8	3-35/64	(63/64)	23/64	2-11/64	—	5/16	1-3/8	—	1-5/64	Rp1/4	—	—
RKVS30	2-19/32						21/64		2-11/64						5/16			
RKV40PB	3-5/64	3-47/64	15/32	—	—	Rp1/8	5-9/32	(63/64)	33/64	2-3/4	—	33/64	2-23/64	—	1-11/32	Rp1/4	—	—
RKVS40	3-25/64						31/64		2-3/4						33/64			
RKV60PB	4-9/64	5-7/16	35/64	—	—	Rp1/8	6-47/64	(63/64)	19/32	4-21/64	—	19/32	3-5/32	—	3-5/32	Rp3/8	(7-23/32)	—
RKV60PBR	4-17/32						7-13/64		37/64						4-21/64			
RKVS60	—	—	—	—	—	—	—	—	—	—	—	—	—	4-59/64	—	—	—	—
RKV80PA	5-3/4	5-53/64	5/8	—	—	Rp1/4	8-47/64	(1-7/64)	43/64	4-23/32	—	45/64	3-35/64	—	3-35/64	Rp1/2	(8-1/2)	—
RKV80PAR							4-17/32		3						4-17/32			
RKV100PA	6-57/64	8-3/16	25/32	—	—	Rp1/4	10-5/8	(1-7/64)	53/64	6-11/16	—	29/32	4-17/32	—	5-5/16	Rp3/4	(12-1/8)	—
RKV100PAR							5-5/16		4-1/2						5-5/16			
RKV120P	8-21/32	9-1/4	53/64	—	—	—	12-53/64	—	11/16	7-51/64	—	—	3-15/16	4-23/32	5-15/64	2-Rp3/4	(12-21/64)	—
RKD30PB	2-7/16	2-3/4	5/16	43/64	1-1/2	Rp1/8	3-35/64	(63/64)	23/64	2-11/64	43/64	1-31/32	—	—	—	Rp1/4	3-15/16	—
RKD40PB	3-5/64	3-47/64	15/32	63/64	2-11/64		5-9/32		33/64	2-3/4	63/64	2-61/64					1-31/32	5-29/32
RKD60PB	4-9/64	5-7/16	35/64	1-3/8	2-9/16	—	6-47/64	—	19/32	4-21/64	1-3/8	—	—	—	—	Rp3/8	7-7/8	—
RKD80PA	5-3/4	5-53/64	5/8	1-7/8	2-23/64	Rp1/4	8-47/64	(1-7/64)	43/64	4-23/32	1-37/64	3-35/64	—	—	—	Rp1/2	—	—
RKD100PA	6-57/64	8-3/16	25/32	2-9/64	1-31/32		10-5/8		53/64							6-11/16	1-31/32	1-31/32
RKD120P	8-21/32	9-1/4	53/64	2-43/64	1-11/16	—	12-53/64	—	11/16	7-51/64	2-29/32	—	—	—	—	2-Rp3/4	11-13/16	—

\* Also available in NPT.







**AOC-1B**

### AOC-1B Controller

Controls air knocker only with compressed air (no electricity required).  
Knocker's operation interval can be changed easily by the speed controller.  
Operates up to 3 air knockers with relay piping.

#### ■ Specification (Metric)

Model	Installation scope	Power supply	Working pressure (MPa)	Working fluid Temperature (°C)	Working times Per/min.	Approx Dimensions (LXWXH)(mm)	Weight (kg)
AOC-1B	Indoor,Outdoor	Air control	0.3~0.7	5~50	12~60	171×67×204	1.4

#### ■ Specification (Imperial)

Model	Installation scope	Power supply	Working pressure (MPa)	Working fluid Temperature (°C)	Working times Per/min.	Approx Dimensions (LXWXH)(inch)	Weight (lb)
AOC-1B	Indoor,Outdoor	Air control	44~102	41~122	12~60	(6-47/64 x 2-41/64 x 8-1/32)	3.1

\*Number of hammering may slightly vary as this model is pneumatically controlled.  
\*Required supply air pressure for relay piping is different from normal piping. Please see PB "Pipe length and supply air pressure for relay piping".  
\*This model can not use for RKV/RKD120P.



**KSE1**

### KSE1 Controller (for indoor use)

Electric control allows accurate operation interval.  
2 solenoid valves can be controlled simultaneously (Solenoid valve is not included).  
Operatable with external signal.

#### ■ Specification (Metric)

Model	Protection class	Input Voltage (V)	On Setting	Timer's set time		Stroke cycle	Output Voltage (V)	Approx dimensions (LXWXH) (mm)	Weight (kg)
				M (min)	H (hour)				
KSE1	IP65 (Indoor use)	Single phase AC100-240	0.5 sec	S (sec)	0.5/1~99	1-99, Infinity	Same as input voltage	194×167×101	1.2
				M (min)	1~99				
				H (hour)	1~99				

#### ■ Specification (Imperial)

Model	Protection class	Input Voltage (V)	On Setting	Timer's set time		Stroke cycle	Output Voltage (V)	Approx dimensions (LXWXH) (inch)	Weight (lb)
				M (min)	H (hour)				
KSE1	IP65 (Indoor use)	Single phase AC100-240	0.5 sec	S (sec)	0.5/1~99	1-99, Infinity	Same as input voltage	7-41/64×6-37/64×3-31/32	2.65
				M (min)	1~99				
				H (hour)	1~99				

\*Input voltage for solenoid valve must be same as that of KSE1. \*DC24V type is also available upon request (made-to-order).



**HKA5000A**

### HKA5000A

Controls air knocker only with compressed air (no electricity required).  
Multiple air knockers can be operated by 2 control systems.

#### ■ Specification (Metric)

Model	Protection class	Power supply	Timer's set time	Working pressure (MPa)	Number of the units can be operated	Approx dimensions (LXWXH) (mm)	Weight (kg)
HKA5000A	IP44	Air Control	On timer 10sec-180sec.	0.3~0.7	15 10units. 20-30 8units. 40-60 6units. 80-100 4units. (1system)	450×390 ×219	12.00
			Off timer 0.1sec-30sec				

#### ■ Specification (Imperial)

Model	Protection class	Power supply	Timer's set time	Working pressure (PSI)	Number of the units can be operated	Approx dimensions (LXWXH) (inch)	Weight (lb)
HKA5000A	IP44	Air Control	On timer 10sec-180sec.	44~102	15 10units. 20-30 8units. 40-60 6units. 80-100 4units. (Per 1 system)	17-23/32× 15-23/64× 8-5/8	26.46
			Off timer 0.1sec-30sec				

\*Any other specification is also available upon request (made-to-order). \*Please see PB "Piping references" for number of operable air knocker.



**EKE5000**

### EKE5000

Electric control allows accurate operation interval (solenoid valve is included).  
Multiple air knockers can be operated by 2 control systems.  
Operatable with external signal.

#### ■ Specification (Metric)

Model	Protection class	Input Voltage (V)	Timer's set time	Stroke cycle	Working pressure (MPa)	Number of the units can be operated	Approx dimensions (LXWXH) (mm)	Weight (kg)
EKE5000	IP44	Single phase AC100-240	On Setting 0.5sec	1~99, Infinity	0.3~0.7	15 10units. 20-30 8units. 40-60 6units. 80-100 4units. (Per 1 system)	450×390 ×219	13.7
			OFF Setting 1sec-99hrs					

#### ■ Specification (Imperial)

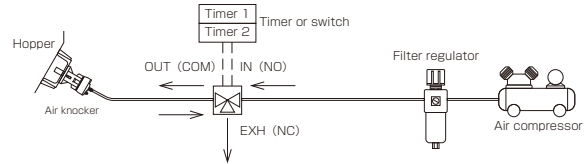
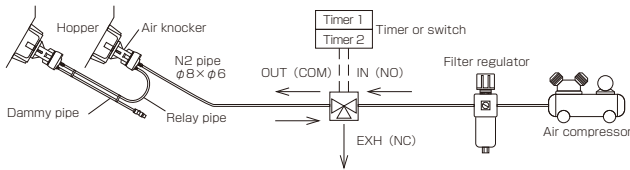
Model	Protection class	Input Voltage (V)	Timer's set time	Stroke cycle	Working pressure (PSI)	Number of the units can be operated	Approx dimensions (LXWXH) (inch)	Weight (lb)
EKE5000	IP44	Single phase AC100-240	On Setting 0.5sec	1~99, Infinity	44~102	15 10units. 20-30 8units. 40-60 6units. 80-100 4units. (Per 1 System)	17-23/32× 15-23/64× 8-5/8	30.20
			OFF Setting 1sec-99hrs					

\*DC24V type, or any other specification is also available upon request (made-to-order).

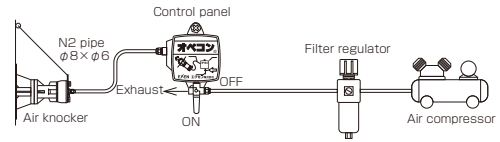
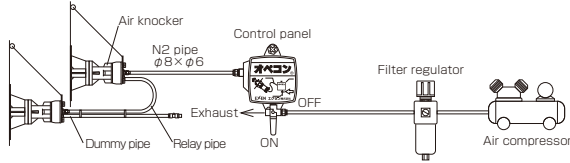


# Piping references

## Using 3-way solenoid valve AG44 (Maximum 5 knockers)

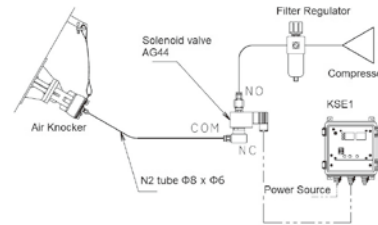
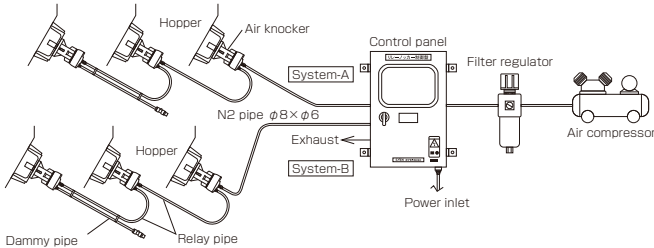


## Using AOC-1B controller (Maximum 3 knockers)



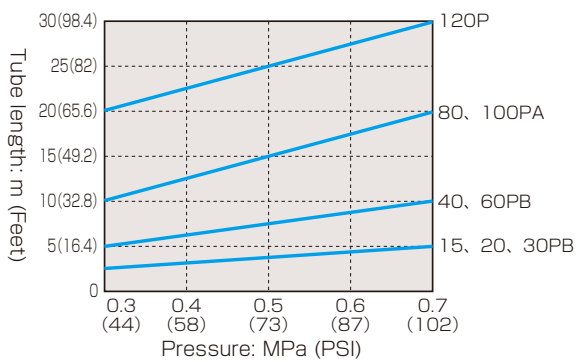
\*Knocker can control automatically by installing solenoid valve (AG43-02-4-02G) before AOC-1B.

## Using control panel HKA5000A+HKE5000 (Maximum 10 knockers)

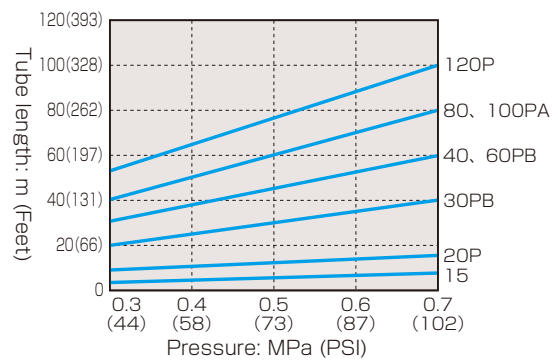


- ⚠ Please set tube length as short as possible to prevent impact force deterioration and/or impacting malfunction.
- ⚠ Impact force may drop by 10 - 20% when use air knocker with maximum tube length. The maximum tube length varies by model and air pressure.
- ⚠ Please keep the same tube length between the knockers as much as possible to maintain the equal impact force between each knocker.
- ⚠ Using a dummy tube of the same length for the last knocker is recommended to maintain the equal impact force between each knocker.

When using solenoid valve AG44-02-3



When using control panel HKA and EKE(per system)



### Maximum tube length between AOC-1B and Knocker

Model RKV/RKD/RKVS	Tube length Meter (Feet)	Tube size mm	
15	2 (6.56)	φ4xφ2	
20		φ6xφ4	
30		φ8xφ6	
40			3 (9.84)
60			8 (26.25)
80	10 (32.81)		
100			
120	Can not be used		

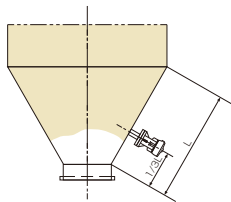
### Tube length and supply air pressure for relay piping

Model RKV/RKD/RKVS	Tube length Meter (Feet)	Working pressure MPa (PSI)
20P	1 (3.28) or less	0.30 (44) or below
30PB		
40PB	5 (16.40) or less	0.40 (58) or below
60PB		0.50 (73) or below
80PA	10 (32.81) or less	0.50 (73) or below
100PA		0.55 (80) or below
120P		0.65 (94) or below

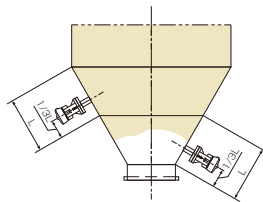


Be sure to follow the instruction manual when installing the air knocker.

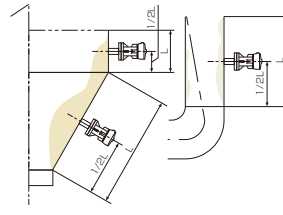
## Installation



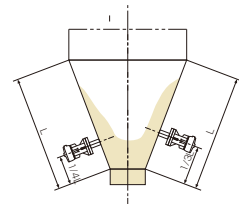
For small cone, pyramid hopper



For large cone, pyramid hopper



For adherence to the wall or pipe.



In case of poor fluidity.

## Installation

### All knockers

⚠ When fix knocker unit and base with bolt set, pay attention to tightening torque. If tightening torque insufficient, the bolt may be loosened by knocker's own impact.

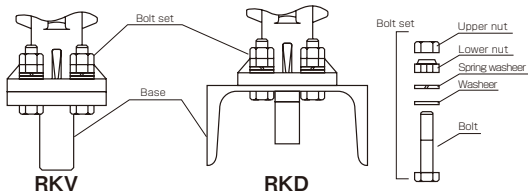
■ Tightening torque(N·m) \*Exclude RKVS15

Nut size		* M6	M8	M10	M12	M14	M16	M20
Tightening torque	Lower nut	* 4.8	10.8	20.6	35.3	56.9	84.3	167
	Upper nut	* 4.8	7.6	14.4	24.7	39.8	59.0	117

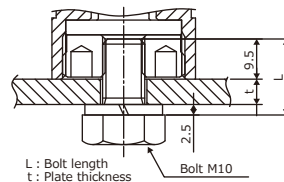
■ Tightening torque(lbf.ft) \*Exclude RKVS15

Nut size		* M6	M8	M10	M12	M14	M16	M20
Tightening torque	Lower nut	* 3.54	7.97	15.19	26.04	41.97	62.18	123.17
	Upper nut	* 3.54	5.61	10.62	18.22	29.35	43.52	86.3

⚠ Hang and fix the knocker with fall prevention wire and shackle to prevent it from falling.



Fix RKVS15 with M10 bolt.



Length of threaded section

Thickness(mm)	Installation bolt
Less than 4 * 1	M10X14
4 or more - less than 6	M10X16
6 or more - less than 8	M10X18

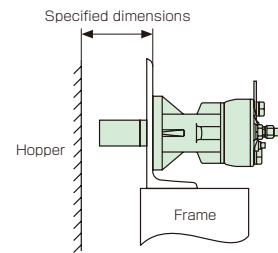
Thickness(inch)	Installation bolt
Less than 5/32 * 1	M10 X 35/64
5/32 or more - less than 15/64	M10 X 5/8
15/64 or more - less than 5/16	M10 X 45/64

Tightening torque  
\* Adjustment by flat washer is required for 1-2mm plate thickness (washer thickness 2.0mm)

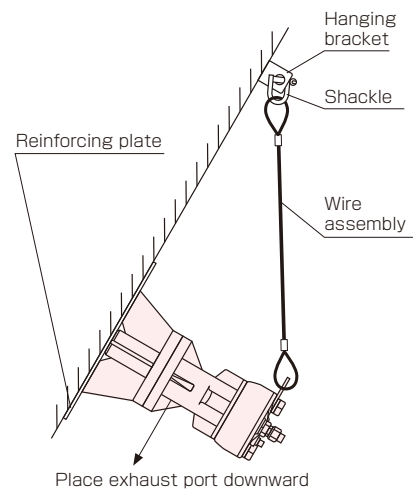
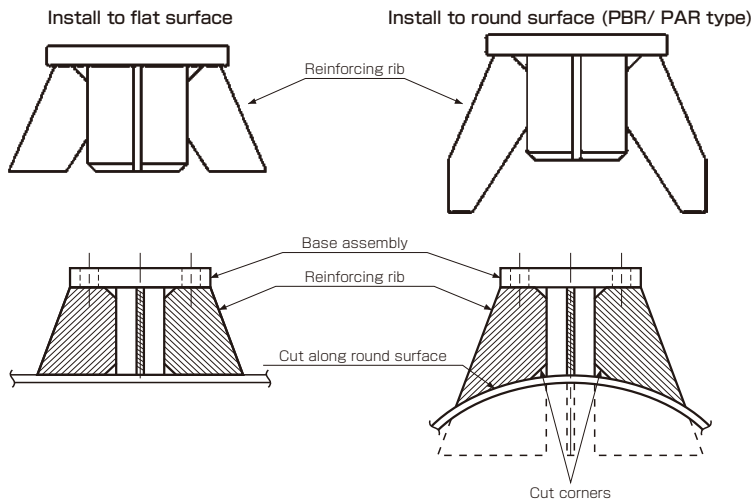
⚠ If not using the base assembly provided, make sure to follow designated distance as per below table.

Model	Designated dimension (mm)
RKD30PB	50±2
RKD40PB	75±2
RKD60PB-80-100PA-120P	90±2

Model	Designated dimension (inch)
RKD30PB	1-31/32 ±5/64
RKD40PB	2-61/64 ±5/64
RKD60PB-80-100PA-120P	3-35/64 ±5/64



## Knocker RKV series, Installation of Reinforcing Rib



## Welding the reinforcing plate

- ⚠ Weld reinforcing plate when installing air knocker on thin plate. Apply all-around welding so that no gap arises between the hopper and the reinforcing plate. Leave one spot without welding for air bleeding. It may create an air-cushion which drops impact force if no spot is left.
- ⚠ Huge impact is given to welded zone during air knocker operation. In order to prevent weld-breakage, be sure to take sufficient weld bead.

### Reinforcing plate size(mm)

Model	Square Type	Round Type	φA	φB	C
RKV/RKD/(RKVS)30PB	□150×t3.2(3.0)	φ150×t3.2(3.0)	15	20	52
RKV/RKD/(RKVS)40PB	□200×t3.2(3.0)	φ200×t3.2(3.0)			80
RKV/RKD/(RKVS)60PB	□300×t4.5(4.0)	φ300×t4.5(4.0)			90
RKV/RKD80PA	□400×t4.5(4.0)	φ400×t4.5(4.0)	55	25	120
RKV/RKD100PA	□500×t6.0(6.0)	φ500×t6.0(6.0)			140
RKV/RKD120P	□600×t9.0(9.0)	φ600×t9.0(9.0)	95	30	160

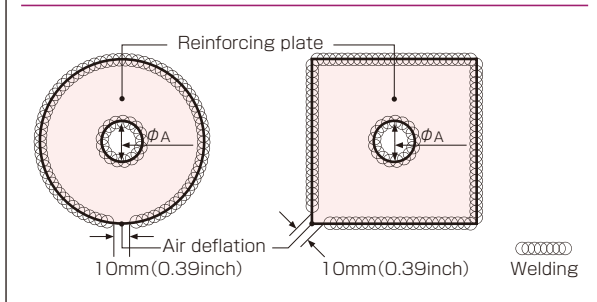
\* ( )Stainless steel material

### Reinforcing plate size(inch)

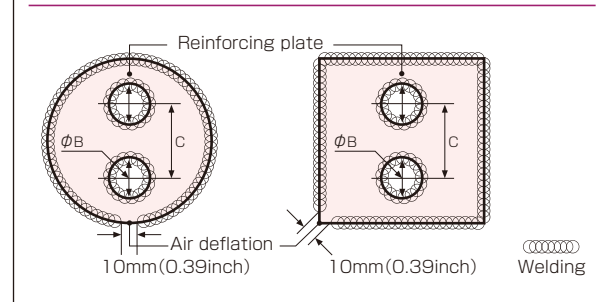
Model	Square Type	Round Type	φA	φB	C
RKV/RKD/(RKVS)30PB	□6×t0.126 (0.118)	φ6×t0.126(0.118)	19/32	25/32	2-3/64
RKV/RKD/(RKVS)40PB	□8×t0.126 (0.118)	φ8×t0.126(0.118)			3-5/32
RKV/RKD/(RKVS)60PB	□12×t0.177 (0.157)	φ12×t0.177(0.157)	2-11/64	63/64	3-35/64
RKV/RKD80PA	□16×t0.177 (0.157)	φ16×t0.177(0.157)			4-23/32
RKV/RKD100PA	□20×t0.236 (0.236)	φ20×0.236 (0.236)	3-11/32	1-3/16	5-33/64
RKV/RKD120P	□24×t0.35 (0.35)	φ24×0.35 (0.35)	3-47/64		6-19/64

\* ( )Stainless steel material

### Welding reinforcing plate (RKV series)



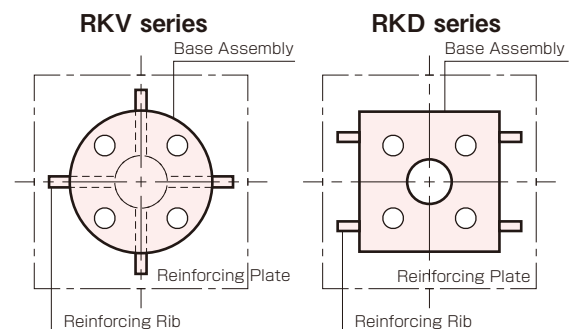
### Welding reinforcing plate (RKD series)



### Installation of base assembly and reinforcing rib

- ⚠ Make sure the exhaust port is facing down, and apply all-around welding.
- ⚠ Cut the reinforcing rib in accordance with the installation surface, put it symmetrically and apply all-around welding (for models RKD60PB and above).

\* For RKV120P, the reinforcing ribs are not set on base assembly. Please weld on site.



# Electro magnetic knocker EK series

The electromagnetic knocker eliminates blockage trouble of various powders and granules only with electric power (no air supply is required). Since it does not emit oil mist, it is suitable for use in clean environments.



<b>EK5A</b>	<b>EK10A</b>	<b>EK20A</b>
<b>EK5SA</b>	<b>EK10SA</b>	<b>EK20SA</b>

■ Specification (Metric)

Model	Power source	Impact cycle (sec)	Currency (average) (A)	Impact energy (N·m)	Impulsive force (kg·m/s)	Converts into hammer pound (lb.)	Unit weight (kg)	Overall weight (kg)
EK5A	DIGIOPE EKC200 Input voltage AC200V	1~60	1.3	13.8	3.2	1.0	8.3	10.7
EK5SA				7.1	2.2	0.7		
EK10A			1.8	28.4	6.6	2.0	15.6	19.1
EK10SA				13.8	4.6	1.5		
EK20A			3.4	48.6	11.9	4.0	23.7	28.8
EK20SA				24.2	8.4	3.0		

■ Specification (Imperial)

Model	Power source	Impact cycle (sec)	Currency (average) (A)	Impact energy (lbf·ft)	Impulsive force (ft·lbf/s)	Converts into hammer pound (lb.)	Unit weight (lb)	Overall weight (lb)
EK5A	DIGIOPE EKC200 Input voltage AC200V	1~60	1.3	10.18	23.15	1.0	18.3	23.59
EK5SA				5.24	15.91	0.7		
EK10A			1.8	20.95	47.74	2.0	34.39	42.11
EK10SA				10.18	33.27	1.5		
EK20A			3.4	35.85	86.07	4.0	52.25	63.49
EK20SA				17.85	60.76	3.0		

\*The weight includes 5m of cable (1.0kg). \*Reinforcing ribs are set on the base assembly.  
 \*When operates the knocker continuously with impact cycle of 1 second, please do not run more than 1 hour. When continuous operation more than 1 hour is required, please provide cooling time equivalent to the operating time. (Example: Switch-off the knocker for 30 minutes after 30 minutes of operation). If the knocker needs to operate continuously for 1 hour or more, please set the impact cycle for more than 2 seconds.

■ Dimensions (mm)

Model	φA	φC	D	H	I	φJ	φK	L	M	N
EK5A/5SA	92	130	19.5	235.5	24	11	108	9	70	(164)
EK10A/10SA	118	165	22.0	287.5		13	138	10	85	(214.7)
EK20A/20SA	134	190	25.0	321.5		17	160	12	105	(244.6)

■ Dimensions (inch)

Model	φA	φC	D	H	I	φJ	φK	L	M	N
EK5A/5SA	3-5/8	5-1/8	49/64	9-17/64	15/16	7/16	4-1/4	23/64	2-3/4	(6-29/64)
EK10A/10SA	4-1/64	6-1/2	55/64	11-5/16		33/64	5-7/16	25/64	3-11/32	(8-29/64)
EK20A/20SA	5-9/32	7-31/64	63/64	12-21/32		43/64	6-19/64	15/32	4-9/64	(9-5/8)



# Control panel

Dedicated controller for electromagnetic knocker EKC200



EKC200

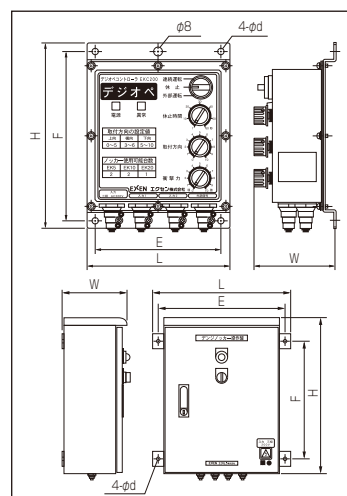
Control panel EKC5000 series (EKC200 built-in type)



EKC5201



EKC5202



KNOCKER

■ Specification (Metric) \* Made-to-order product

Model	Structure	Input voltage (V)	Max. Input (A)	Output voltage (V)	Timer set	Weight (kg)	Number of knockers operation		
							EK5A/5SA	EK10A/10SA	EK20A/20SA
EKC200	Indoor	3Φ AC200V 50/60Hz	4.0	DC300	N/A	2.2	2	2	1
EKC5201*	Indoor/		4.1		ON/OFF	19.0			
EKC5202*	Outdoor		8.1		0.1s - 6h	24.0	4	4	2

■ Specification (Imperial) \* Made-to-order product

Model	Structure	Input voltage (V)	Max. Input (A)	Output voltage (V)	Timer set	Weight (lb)	Number of knockers operation		
							EK5A/5SA	EK10A/10SA	EK20A/20SA
EKC200	Indoor	3Φ AC200V 50/60Hz	4.0	DC300	N/A	4.85	2	2	1
EKC5201*	Indoor/		4.1		ON/OFF	41.89			
EKC5202*	Outdoor		8.1		0.1s - 6h	52.91	4	4	2

\*EKC5201/5202 is available with other input voltages.

■ Dimensions (mm)

Model	L	W	H	E	F	φd
EKC200	170	100	224	150	204	6.5
EKC5201	480	215	515	440	400	11.0
EKC5202	580			540		

■ Dimensions (inch)

Model	L	W	H	E	F	φd
EKC200	6-11/16	3-15/16	8-13/16	5-29/32	8-1/32	1/4
EKC5201	18-57/64	8-15/32	20-9/32	17-21/64	15-3/4	7/16
EKC5202	22-53/64			21-17/64		



■ Piston vibrator

## Excellent durability EPV series

Piston vibrator EPV series is a pneumatic vibrator that produces a stable and uni-directional vibration by vertical movement of piston. This is used mainly for prevention of blockage or filling of powder in hopper, tank, or piping chute, and as vibration source of Vibration table, vibration feeder and vibration screen.



EPV12A



EPV18



EPV25



EPV35



EPV18L



EPV35L

### FEATURES

- ① The frequency and vibration force are adjustable by supply air pressure.
- ② Exen's original wear resistance treatment is given to piston which achieved excellent durability.
- ③ Applicable for vibration feeder and filling equipment because of its uni-directional vibration.
- ④ Exhaust muffler having both of filter and silencer function cuts an oil mist and noise at the same time - Eco friendly.
- ⑤ Only one bolt is required for installation - Simple and easy installation.

## Ultra-compact piston vibrator ELV8

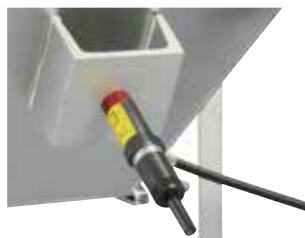
Unlike the conventional piston vibrator EPV series, linear type piston vibrator ELV series has a different structure in which high amplitude can be obtained in high-stroke operation because the piston protrudes outside of cylinder. It provides two kinds of amplitudes by installing direction (cylinder-fix or piston-fix).



ELV8

### FEATURES

- ① Vibration frequency and vibratory force are adjustable by supply air pressure
- ② Two kinds of amplitude is selectable by installing direction
- ③ Optional dust cover protects the slide surface in dusty environment



Cylinder-fix



Piston-fix

### Optional item



Dust cover

### ■ Specification (Metric)

Model	Working Pressure (MPa)	Frequency (Hz)	Centrifugal Force (N)	Air Consumption (L/min (ANR))	Diameter (mm)	Height (mm)	Bolt size (mm)	Weight (kg)
ELV8	0.2~0.6	Installation piston	25~36	13~40	4~48	8	M5	0.10
		Installation cylinder	34~54	14~41	8~76	23		

### ■ Specification (Imperial)

Model	Working Pressure (PSI)	Frequency (VPM)	Centrifugal Force (lbf)	Air Consumption (CFM)	Diameter (inch)	Height (inch)	Bolt size (inch)	Weight (lb)
ELV8	29~87	Installation piston	1500~2160	2.92~8.99	0.14-1.69	5/16	3-25/32 - 4-7/8	0.22
		Installation cylinder	2040~3240	3.15~9.22	0.28-2.68	29/32		

■Piston vibrator

# Easy desorption by single wing bolt, EPV-F series

Small piston vibrator series with tri-clamp is suitable for hygienic applications in food and pharmaceutical industry.



EPV12A-F



EPV18-F



Tri-clamp (standard accessory)

Fall prevention wire (option)

**FEATURES**

- ① EPV-F series is easy to attach/detach due to tri-clamp fixation. This feature allows user to wash and maintain cleanliness of their facility by removing EPV-F series instantly from the facility.
- ② Excellent corrosion resistance because of Exen's unique hard-surface-treated aluminum body and tri-clamp made of stainless steel.
- ③ Exhaust muffler having both of filter and silencer function cuts an oil mist and noise at the same time - Eco friendly.

■Specification(Metric)

Model	Working Pressure (MPa)	Frequency (Hz)	Centrifugal Force(N)	Air Consumption (L/min(ANR))	Diameter x Height (mm)	Bolt size (mm)	Weight (kg)	
EPV12A	With Silencer 0.2~0.6	106~164	29~82	9~24	φ27x98	M8×10+a(Thickness)	0.14	
EPV18		102~149	66~186	17~62	φ38x116	M10×11+a(Thickness)	0.34	
EPV18L		58~94	82~265	15~54	φ38x153		0.48	
EPV25		75~108	147~374	75~153	φ43.5x137	M12×12+a(Thickness)	0.58	
EPV35		79~117	304~778	45~145	φ56x138		1.03	
EPV35L		51~73	347~921	44~125	φ56x184		1.47	
EPV12A-F			106~164	29~82	9~24	φ27x154	Ferrule clamp IDF/ISO-1.5S	0.74
EPV18-F			102~149	66~186	17~62	φ38x157		0.85

\* Above figures are measured under our own standard with silencer. \* Working temperature range 0~60°C

\* Oil free means general service air which hardly contains oil.

■Specification(Imperial)

Model	Working Pressure (PSI)	Frequency (VPM)	Centrifugal Force(lbf)	Air Consumption (CFM)	Diameter x Height (inch)	Bolt size (Inch)	Weight (lb)	
EPV12A	With Silencer 29-87	6,360-9,840	6.52-18.43	0.32-0.85	Φ1-1/16 x 3-55/64	5/16 x 25/64+a(Thickness)	0.31	
EPV18		6,120-8,940	14.84-41.81	0.60-2.19	Φ1-1/2 x 4-9/16	25/64 x 7/16a(Thickness)	0.75	
EPV18L		3,480-5,640	18.43-59.57	0.53-1.91	Φ1-1/2 x 6-1/32		1.06	
EPV25		4,500-6,480	33.05-84.08	2.65-5.40	Φ1-23/32 x 5-25/64	15/32 x 15/32+a(Thickness)	1.28	
EPV35		4,740-7,020	68.34-174.90	1.59-5.12	Φ2-13/64 x 5-7/16		2.27	
EPV35L		3,060-4,380	78.01-207.05	1.55-4.41	Φ2-13/64 x 7-1/4		3.24	
EPV12A-F			6,360-9,840	6.52-18.43	0.32-0.85	Φ1-1/16 x 6-1/16	Ferrule clamp IDF/ISO-1.5S	1.43
EPV18-F			6,120-8,940	14.84-41.81	0.60-2.19	Φ1-1/2 x 6-3/16		1.87

\* Above figures are measured under our own standard with silencer. \* Working temperature range 0~60°C

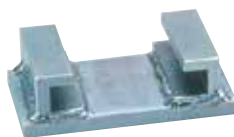
\* Oil free means general service air which hardly contains oil.

## Easy relocation because of compact body and simple structure, PSB/PLB

This pneumatic piston vibrator has been used for many years as a formwork vibrator for concrete placement at tunnel sites because of its robust structure. It has also been used for many years to prevent blockage of measuring hoppers in secondary concrete product factories (concrete fabricators) and ready-mixed concrete factories.



PSB



PS holder



PLB



PL holder

■Specification(Metric)

Model	Working Pressure (MPa)	Frequency (Hz)	Centrifugal Force(N)	Air Consumption (L/min) ANR	Size (mm)	Fitting size	Weight (kg)
					L x W x H		
PSB	0.3~0.6	80~110	160~280	120~260	110 x 65 x 105	Hose stem 1/4B	1.4
PLB		52~70	400~710	200~420	190 x 65 x 147		4.1

■Specification(Imperial)

Model	Working Pressure (PSI)	Frequency (VPM)	Centrifugal Force(lbf)	Air Consumption (CFM)	Size (inch)	Fitting size	Weight (lb)
					L x W x H		
PSB	44 - 87	4,800 - 6,600	36 - 63	4.24 - 9.18	4-21/64 X 2-9/16 X 4-9/64	Hose stem 1/4B	3.09
PLB		3,120 - 4,200	90 - 160	7.06 - 14.83	7-31/64 X 2-9/16 X 5-25/32		9.04

\* The above dimensions includes holder and weight excludes holder. \* It may differ from the above specifications by the mounting conditions.

\* Operating temperature range: 0-80°C



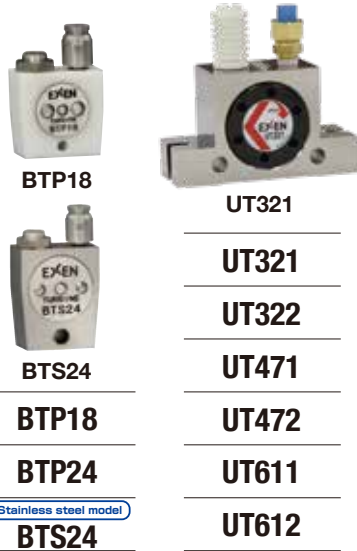
## Turbine vibrator

### UT series, ultra compact BT series

This is an easy-to-use pneumatic oil-free vibrator that operates simply by supplying compressed air like a conventional ball vibrator (lubrication to supply air is strictly prohibited). The high speed rotating turbine does not contact the casing so that the noise level is very small, and environment friendly.

#### FEATURES

- 1 No lubricant required (lubrication is strictly prohibited)
- 2 Quiet operation due to no-contact between casing and rotation parts as well as high performance muffler.
- 3 BTP series use polyacetal resin for casing and stainless steel for other parts (BTS series use stainless steel for casing too) so these models are highly durable and can be used safely in food, pharmaceutical and chemical industries.
- 4 The frequency and centrifugal force are adjustable by supply air pressure.



#### Specification (Metric)

Model	Working Pressure (MPa)	Frequency (HZ)	Centrifugal Force (N)	Air Consumption (L/min) ANR	Demention (mm) L x W x H	Weight (kg)
BTP18	0.2~0.6	153~414	8~61	7~16	32×17×48.6	0.05
BTP24		119~351	16~142	20~48	34×20×59.6	0.09
BTS24	0.3~0.6	110~290	15~100	19~33	34×20×61.6	0.20
UT321	0.2~0.6	454~641	490~974	39~88	85×33×79	0.25
UT322		321~492	444~1044			0.26
UT471		322~493	1032~2410	130~294	90×43×103	0.56
UT472		239~349	1120~2381	129~294		0.58
UT611		195~304	1116~2730	160~371	104×56×118	1.15
UT612		146~222	1234~2870			1.16

#### Specification (Imperial)

Model	Working Pressure (PSI)	Frequency (VPM)	Centrifugal Force (lbf)	Air Consumption (CFM)	Demention (inch) L x W x H	Weight (lb)
BTP18	29 - 87	9,180 - 24,840	1.80 - 13.71	0.25 - 0.56	1-17/64 X 43/64 X 1-29/32	0.11
BTP24		7,140 - 21,060	3.60 - 31.92	0.71 - 1.69	1-11/32 X 25/32 X 2-11/32	0.2
BTS24	44 - 87	6,600 - 17,400	3.37 - 22.48	0.67 - 1.17	1-11/32 X 25/32 X 2-27/64	0.44
UT321	29 - 87	27,240 - 38,460	110.16 - 218.96	1.38 - 3.11	3-11/32 X 1-19/64 X 3-7/64	0.55
UT322		19,260 - 29,520	99.82 - 234.70			0.57
UT471		19,320 - 29,580	232.00 - 541.79	4.59 - 10.38	3-35/64 X 1-11/16 X 4-1/16	1.23
UT472		14,340 - 20,940	251.79 - 535.27	4.56 - 10.38		1.28
UT611		11,700 - 18,240	250.89 - 613.73	5.65 - 13.10	4-3/32 X 2-13/64 X 4-41/64	2.54
UT612		8,760 - 13,320	277.41 - 645.20			2.56

\*The above are the results under our measuring standards and conditions. The value may vary by the installation conditions. \*Operating temperature range

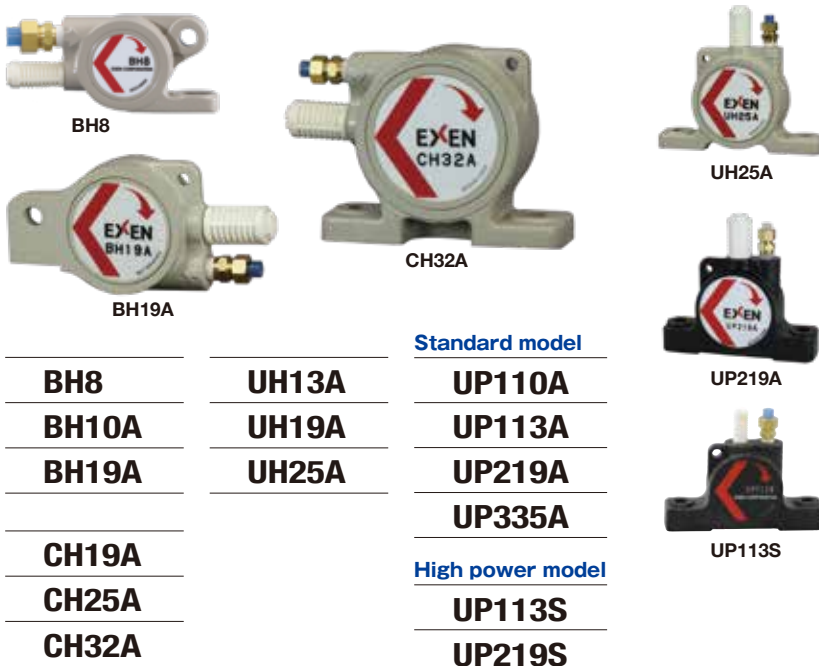
## Ball vibrator

### Effective for narrow area and places require a small vibration - BH/CH/UH series Plastic body with excellent corrosion resistance - UP series

A steel ball that rotates at high speed inside the casing with compressed air generates optimum centrifugal vibration. Simple structure allows variable vibration frequency and centrifugal force by supply air pressure

\*Use a lubricator to maintain its performance.

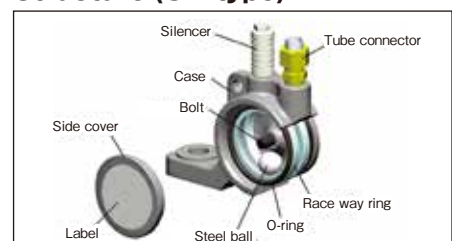
\*Use at an ambient temperature of 80°C/176°F (60°C/140°F for the UP series) or lower.



#### FEATURES

- 1 Various shapes are available according to the object to be installed, and vibration frequency/centrifugal force are adjustable by supply air pressure.
- 2 The compact body and simple structure allows installation in narrow spaces and easy maintenance.
- 3 Corrosion-resistant resin casing enhances applicability to humid places, salty environment or rain exposure.

#### Structure (UH type)





Dimensional table

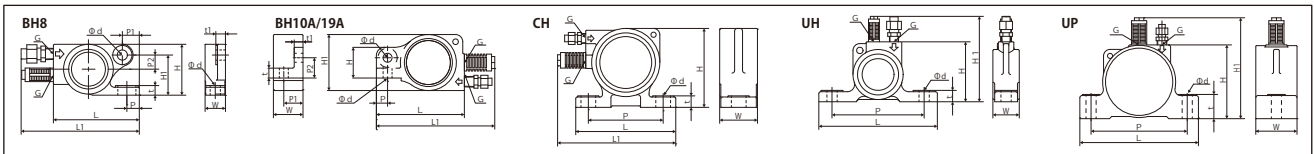
Specification (Metric)

Model	Required to start (MPa)		Frequency (Hz) · Centrifugal force (kN) · Air Consumption (m <sup>3</sup> /min(ANR))															Weight (kg)
			0.2MPa			0.3MPa			0.4MPa			0.5MPa			0.6MPa			
	Vert.	Horz.	Hz	kN	m <sup>3</sup> /min(ANR)	Hz	kN	m <sup>3</sup> /min(ANR)	Hz	kN	m <sup>3</sup> /min(ANR)	Hz	kN	m <sup>3</sup> /min(ANR)	Hz	kN	m <sup>3</sup> /min(ANR)	
BH8	0.02	0.01	322	0.09	0.04	348	0.13	0.06	432	0.17	0.08	471	0.20	0.09	499	0.22	0.10	0.3
BH10A	0.03		285	0.13	0.07	324	0.17	0.10	377	0.23	0.12	418	0.28	0.14	451	0.33	0.17	0.5
BH19A	0.06	0.02	174	0.60	0.14	204	0.83	0.19	227	1.02	0.25	245	1.19	0.31	259	1.33	0.37	1.1
CH19A			162	0.52	0.13	189	0.71	0.18	211	0.89	0.24	228	1.03	0.29	240	1.15	0.35	1.2
CH25A	0.11	0.02	110	0.79	0.17	129	1.09	0.23	144	1.36	0.30	155	1.57	0.37	164	1.76	0.43	2.6
CH32A	0.20		—	—	—	104	1.22	0.22	118	1.56	0.28	129	1.87	0.34	137	2.11	0.40	2.4
UH13A	0.03	0.01	264	0.30	0.11	310	0.41	0.15	341	0.50	0.19	366	0.57	0.23	383	0.63	0.28	0.7
UH19A	0.06	0.02	163	0.53	0.13	192	0.73	0.18	214	0.91	0.23	231	1.06	0.29	246	1.20	0.34	1.2
UH25A	0.13		110	0.67	0.11	127	0.90	0.15	140	1.09	0.19	152	1.28	0.24	162	1.46	0.28	1.9
UP110A	0.03	0.03	273	0.15	0.12	323	0.21	0.16	361	0.27	0.21	391	0.31	0.26	418	0.36	0.30	0.24
UP113A			238	0.24		282	0.34		316	0.43		344	0.50		0.25	367		0.57
UP219A	0.07	0.04	139	0.38	0.14	163	0.53	0.19	185	0.67	0.24	201	0.79	0.29	213	0.90	0.35	0.45
UP335A	0.23	0.03	101	0.94	0.19	119	1.31	0.26	135	1.69	0.33	147	1.99	0.41	157	2.27	0.48	1.2
UP113S	0.06	0.04	185	0.28	0.12	220	0.40	0.16	247	0.50	0.21	266	0.58	0.26	281	0.65	0.30	0.25
UP219S	0.11		109	0.46	0.14	133	0.68	0.19	151	0.87	0.24	165	1.03	0.29	174	1.16	0.35	0.48

Specification (Imperial)

Model	Required to start (PSI)		Frequency (VPM) · Centrifugal force (lbf) · Air Consumption(CFM)															Weight (lb)
			39PSI			44PSI			58PSI			73PSI			87PSI			
	Vert.	Horz.	VPM	lbf	CFM	VPM	lbf	CFM	VPM	lbf	CFM	VPM	lbf	CFM	VPM	lbf	CFM	
BH8	2.9	1.45	19,320	20.23	1.41	20,880	29.23	2.12	25,920	38.22	2.83	28,260	44.96	3.18	29,940	49.46	3.53	0.66
BH10A	4.35		17,100	29.23	2.42	19,440	38.22	3.53	22,620	51.71	4.24	25,080	62.95	4.94	27,060	74.19	6.00	1.10
BH19A	8.7	2.90	10,440	134.89	4.94	12,240	186.59	6.71	13,620	229.31	8.83	14,700	267.52	10.95	15,540	299.00	13.07	2.43
CH19A			9,720	116.90	4.59	11,340	159.61	6.36	12,660	200.08	8.48	13,680	231.55	10.24	14,400	258.53	12.36	2.65
CH25A	15.95	2.90	6,600	177.60	6.00	7,740	245.04	8.12	8,640	305.74	10.59	9,300	352.95	13.07	9,840	395.66	15.19	5.73
CH32A	29.01		-	-	-	6,240	274.27	7.77	7,080	350.70	9.89	7,740	420.39	12.01	8,220	474.35	14.13	5.29
UH13A	4.35	1.45	15,840	67.44	3.88	18,600	92.17	5.30	20,460	112.40	6.71	21,960	128.14	8.12	22,980	141.63	9.89	1.54
UH19A	8.70	2.90	9,780	119.15	4.59	11,520	164.11	6.36	12,840	204.58	8.12	13,860	238.30	10.24	14,760	269.77	12.01	2.65
UH25A	18.85		6,600	150.62	3.88	7,620	202.33	5.30	8,400	245.04	6.71	9,120	287.76	8.48	9,720	328.22	9.89	4.19
UP110A	4.35	4.35	16,380	33.72	4.24	19,380	47.21	5.65	21,660	60.70	7.42	23,460	69.69	9.18	25,080	80.93	10.59	0.53
UP113A			14,280	53.95		16,920	76.44		18,960	96.67		20,640	112.40		22,020	128.14		25,020
UP219A	10.15	5.80	8,340	85.43	4.94	9,780	119.15	6.71	11,100	150.62	8.48	12,060	177.60	10.24	12,780	202.33	12.36	0.99
UP335A	33.36	4.35	6,060	211.32	6.71	7,140	294.50	9.18	8,100	379.93	11.65	8,820	447.37	14.48	9,420	510.32	16.95	2.65
UP113S	8.70	5.80	11,100	62.95	4.24	13,200	89.92	5.65	14,820	112.40	7.42	15,960	130.39	9.18	16,860	146.13	10.59	0.55
UP219S	15.95		6,540	103.41	4.94	7,980	152.87	6.71	9,060	195.58	8.48	9,900	231.55	10.24	10,440	260.78	12.36	1.06

\* Above figures are the result of our inhouse test and it may vary by installation condition. \* Air pressure required to start may slightly higher than normal operation. \* Vertical means installing vibrator in a direction which the ball rotates vertically and horizontal means horizontally. Higher air pressure is required for the vertical than other direction in general.



Dimensions (mm)

Model	L	L1	H	H1	W	t	t1	P	P1	P2	φd	G
BH8	76	(105)	45.0	35.5	18	8.5	8.5	11	15	12.5	2-9(M8)	Rp1/8
BH10A	80	(109)	30.0	51	30	7.0	7	11	19	19.0	2-9(M8)	Rp1/8
BH19A	110	(148)	40.0	70	37	14.0	11	14	24	27.0	2-11(M10)	Rp1/4
CH19A	130	(148)	87.0	—	37	12.5	—	101	—	—	2-11(M10)	Rp1/4
CH25A	135	(159.5)	106.5	—	51	15.5	—	101	—	—	2-13(M12)	Rp1/4
CH32A	135	(159.5)	106.5	—	51	15.5	—	101	—	—	2-13(M12)	Rp1/4
UH13A	130	—	66.0	(95)	29	12.5	—	101	—	—	2-11(M10)	Rp1/8
UH19A	128	—	84.0	(122)	37	12.5	—	101	—	—	2-11(M10)	Rp1/4
UH25A	160	—	100.0	(138)	41	15.5	—	126	—	—	2-13(M12)	Rp1/4
UP110A	127	—	70.0	(99)	31	21.5	—	102	—	—	2-10(M8)	Rp1/8
UP113A	127	—	70.0	(99)	31	21.5	—	102	—	—	2-10(M8)	Rp1/8
UP113S	127	—	70.0	(99)	31	21.5	—	102	—	—	2-10(M8)	Rp1/8
UP219A	141	—	89.0	(127)	39	24.5	—	116	—	—	2-12(M10)	Rp1/4
UP219S	141	—	89.0	(127)	39	24.5	—	116	—	—	2-12(M10)	Rp1/4
UP335A	164	—	102.0	(140)	57	33.5	—	133	—	—	2-14(M12)	Rp1/4

Dimensions (inch)

Model	L	L1	H	H1	W	t	t1	P	P1	P2	φd	G
BH8	2 - 63/64	(4 - 9/64)	1 - 49/64	1 - 25/64	45/64	21/64	21/64	7/16	19/32	31/64	5/64 - 23/64 (M8)	Rp1/8
BH10A	3 - 5/32	(4 - 19/64)	1 - 3/16	2 - 1/64	1 - 3/16	9/32	9/32	7/16	3/4	3/4	5/64 - 23/64 (M8)	Rp1/8
BH19A	4 - 21/64	(5 - 53/64)	1 - 37/64	2 - 3/4	1 - 29/64	35/64	7/16	35/64	15/16	1 - 1/16	5/64 - 7/16 (M10)	Rp1/4
CH19A	5 - 1/8	(5 - 53/64)	3 - 27/64	—	1 - 29/64	31/64	—	3 - 31/32	—	—	5/64 - 7/16 (M10)	Rp1/4
CH25A	5 - 5/16	(6 - 9/32)	4 - 3/16	—	2 - 1/64	39/64	—	3 - 31/32	—	—	5/64 - 33/64(M12)	Rp1/4
CH32A	5 - 5/16	(6 - 9/32)	4 - 3/16	—	2 - 1/64	39/64	—	3 - 31/32	—	—	5/64 - 33/64(M12)	Rp1/4
UH13A	5 - 1/8	—	2 - 19/32	(3 - 47/64)	1 - 9/64	31/64	—	3 - 31/32	—	—	5/64 - 7/16 (M10)	Rp1/8
UH19A	5 - 3/64	—	3 - 5/16	(4 - 51/64)	1 - 29/64	31/64	—	3 - 31/32	—	—	5/64 - 7/16 (M10)	Rp1/4
UH25A	6 - 19/64	—	3 - 15/16	(5 - 7/16)	1 - 39/64	39/64	—	4 - 61/64	—	—	5/64 - 33/64(M12)	Rp1/4
UP110A	5	—	2 - 3/4	(3 - 57/64)	1 - 7/32	27/32	—	4 - 1/64	—	—	5/64 - 25/64 (M8)	Rp1/8
UP113A	5	—	2 - 3/4	(3 - 57/64)	1 - 7/32	27/32	—	4 - 1/64	—	—	5/64 - 25/64 (M8)	Rp1/8
UP113S	5	—	2 - 3/4	(3 - 57/64)	1 - 7/32	27/32	—	4 - 1/64	—	—	5/64 - 25/64 (M8)	Rp1/8
UP219A	5 - 35/64	—	3 - 1/2	(5)	1 - 17/32	31/32	—	4 - 9/16	—	—	5/64 - 15/32 (M10)	Rp1/4
UP219S	5 - 35/64	—	3 - 1/2	(5)	1 - 17/32	31/32	—	4 - 9/16	—	—	5/64 - 15/32 (M10)	Rp1/4
UP335A	6 - 29/64	—	4 - 1/64	(5 - 33/64)	2 - 1/4	1 - 5/16	—	5 - 15/64	—	—	5/64 - 35/64 (M12)	Rp1/4



## Control panel

CA1 is a simple controller for pneumatic ball, piston and turbine vibrator which requires air piping only.



**CA1**

### FEATURES

- 1 Operatable at any site where compressed air is available (no electricity required).
- 2 Vibration force/frequency are controllable since CA1 is equipped with pressure regulator.
- 3 Also suitable for trial/test operation since CA1 can control the devices randomly by manual valve.

### Specification

Model	Structure	Control method	Working pressure MPa (PSI)	Working flow rate l / min (CFM)	Approx Demention mm (inch)	Installation Demention mm (inch)	Weight kg (lb)
CA1	Indoor	Air control Manual valve	0.2-0.6 (29 - 87)	800 (28.25)	108 X 208 X 136 (4 - 1/4 X 8 - 3/16 X 5 - 23/64)	93 X 92 (3 - 21/32 X 3 - 5/8)	0.9 (1.98)

VSE1 is an electrical controller for pneumatic ball, piston and turbine vibrator which requires air piping only.



**VSE1**

### FEATURES

- 1 Electric control allows accurate operation interval.
- 2 2 solenoid valves can be controlled simultaneously (Solenoid valve is not included).
- 3 Operatable with external signal.

### Specification

Model	Structure	Input Voltage (V)	Timer setting				Output Voltage (V)	Approx dimension L X W X H mm (inch)	Weight kg (lb)
			ON Setting		OFF Setting				
VSE1	Indoor	Single phase AC100-240	S (sec)	1-99Unlimited	S (sec)	1-99	Same as input voltage	194 X 167 X 101 (7 - 41/64 X 6 - 37/64 X 3 - 31/32)	1.2 (2.65)
			M (min)	1-99Unlimited	M (min)	1-99			
			H (hour)	1-99Unlimited	H (hour)	1-99			

## PIPING ACCESSORIES (OPTION)

Solenoid valve (AG44) \_\_\_\_\_  
For electric operation of air knocker



5 port solenoid valve (4F310-08-P1) \_\_\_\_\_  
For multiple air knocker operation or long extension pipe.



Master valve (MV-1) \_\_\_\_\_  
For long extension pipe. (when air knocker performance is dropped)



Pressure regulator \_\_\_\_\_  
Impact force adjustment if air knocker and vibration speed and centrifual force of pneumatic vibrator.



N2 pipe  $\phi 8 \times \phi 6$



Union cheese



Service cheese



Elbow



Union connector

Please use extension pipe and push-one connector in accordance with the use.

## Vibration table

The principle of table vibrator is that external vibrator (e.g., vibration motor, pneumatic vibrator) mounted on the upper frame of table and the workpiece loaded on table is vibrated together. The purpose is to fill the workpiece into the container smoothly, defoaming, demolding, penetration enhancement, diffusion, mixing and so on, by using vibration.

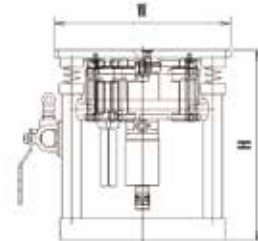
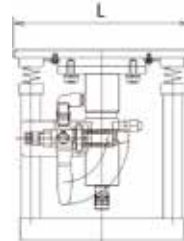


**TV300-MW** (Electric)

### FEATURES

- 1 Compact design – can be placed on work table etc.
- 2 The feeding and filling speed can be changed simply by adjusting the supply air pressure.
- 3 Stainless steel body (#400) is suitable for food, chemical and pharmaceutical factories.
- 4 No chance of electric leakage due to compressed air operation.

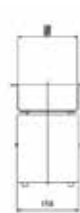
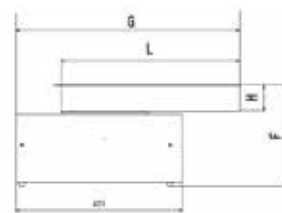
Table Model	Vibrator		Vibration motor specification						Permission Load kg (lb)	Weight kg (lb)	Structure
	model	unit	Voltage (V)	Output (W)	Current (A)	Input Frequency (Hz)	Frequency Hz (VPM)	Centrifugal force KN (lbf)			
TV300-MW	EKM1.1-2P	2	200 - 440 3 - Phases	11	0.05 - 0.12	50/60	45.5 - 57.0 (2,730 - 3,420)	0.07 - 0.11 (15.74 - 24.73)	10 (22.1)	14.4 (31.7)	Open
TV300C-MW										17.9 (39.5)	Enclose



### Specification

Table Model	Vibrator		Permission Load kg (lb)	Dimensions W X L X H mm (inch)	Weight (kg)	Structure
	model	unit				
TV200-P	EPV35L	1	10 (22.1)	200 X 200 X 215	6.5 (14.3)	Open
TV200C-P				(7-7/8 X 7-7/8 X 8 - 15/32)	9 (19.8)	Enclose
TV300-P			20 (44.1)	300 X 300 X 265	14.3 (31.5)	Open
TV300C-P				(11-13/16 X 11-13/16 X 10-7/16)	19.6 (43.2)	Enclose

\*It is possible to design according to your requirement. For the detail, please contact us.  
\*Other specifications are also available upon request.



### Specification

Model	Vibrator		Working Pressure MPa(PSI)	Frequency Hz(VPM)	Air consumption L/min (CFM)	Max amplitude mm(Inch)	Weight kg(lb)	Dimensions W X L X H mm (inch)	Material
	model	unit							
PF35L-1	EPV35L	1	0.2 - 0.6 (29 - 87)	51~73 (3,600 - 4,380)	44~125 (1.55 - 4.41)	1.3 (3/64)	11 (24.3)	80 X 700 X 45 X 720 X 236 (3-5/32 X 27-1/64 X 1-49/64 X 28-1/64 X 9-19/64)	SS304 #400
PF35L-2								120 X 550 X 60 X 619 X 251 (4-23/32 X 21-1/32 X 2-23/64 X 24-1/64 X 9-7/8)	
PF35L-3								150 X 450 X 65 X 565 X 256 (5-29/32 X 17-1/32 X 2-9/16 X 22-1/64 X 10-5/64)	

Product	Capacity kg/h (lb/h)	Product	Capacity kg/h (lb/h)
Damp salt	546 (1,204)	Resin pellet	200 (441)
Rock salt	500 (1,102)	Fermentation compost	280 (617)
Coffee bean	180 (397)	Magnesium carbonate	80 (176)
Powdered sugar	320 (705)	Sawdust	100 (220)
Rice cleaning	370 (816)	Potassium chloride	670 (1,477)
Bread crumbs	100 (220)	Baking soda	320 (705)
Flour	230 (507)	Melamine	280 (617)
Soda	550 (1,213)	Ferrous oxide	1365 (3,009)
Carbon black	150 (331)	Abrasive material	370 (816)
Particle silica	30 (66)	White carbon	20 (44)
Starch	230 (507)	Fluorite	50 (110)



# Direct Blaster EDB series

Infusing compressed air instantaneously into the silo restores flow problem of clinging material.



Incinerate plant silo



Cement silo



Wood chip hopper in thermal power plant



## FEATURES

- 1 Since energy source is compressed air, safety is assured and quality of stored material is not spoiled.
- 2 Intermittent operation minimizes air consumption.
- 3 The use of nitrogen gas instead of air prevents dust-explosion.
- 4 Easy to operate



## What is a BAD condition?

- 1 Powder and bulk which sticks to the wall regardless of its weight.
- 2 Powder and bulk with strong adhesion.
- 3 Powder and bulk, which is easily influenced by weather (moisture and temperature).
- 4 Powder and bulk, which becomes hard by long-term storage.
- 5 45 degree or less hopper angles, small exhaust port structure.

## Model selection guide

Model/ Demention	Condition	1M (3 ft)	1.5M (5 ft)	3M (9 ft)	4.5M (14 ft)	6M (19 ft)	8.5M (27 ft)	10M (32 ft)	12M (39 ft)
EDB2.5-20	Good	1	3	6	●	●	●	●	●
	Bad	1	2	4	●	●	●	●	●
EDB2.5-30	Good	1	3	5	8	●	●	●	●
	Bad	1	2	3	5	●	●	●	●
EDB2.5-38	Good	1	3	5	8	●	●	●	●
	Bad	1	2	3	5	●	●	●	●
EDB4-60	Good	●	3	4	6	10	12	●	●
	Bad	●	2	3	4	5	6	●	●
EDB4-80	Good	●	3	4	6	10	12	●	●
	Bad	●	2	3	4	5	6	●	●
EDB4-130	Good	●	2	4	6	8	10	11	12
	Bad	●	1	2	3	4	5	6	7
EDB6-230	Good	●	●	2	4	6	8	9	10
	Bad	●	●	1	2	3	4	5	6

## Specification

Model	Outlet dia. Inch	Tank capacity Liter (gal)	Working pressure Mpa (PSI)	Available gas	Coating		Weight kg (lb)
					Outer surface	Inner surface	
EDB2.5-20	2.5	20 (5.28)	0.3-0.7 (44 - 102)	Compressed air or Nitrogen gas	Epoxy resin coating		38 (83.8)
EDB2.5-30		30 (7.93)					42 (92.6)
EDB2.5-38		38 (10.03)					50 (110.2)
EDB4-60	4	60 (15.85)					81 (178.6)
EDB4-80		80 (21.13)					103 (227.1)
EDB4-130		130 (34.34)					168 (370.4)
EDB6-230	6	230 (60.76)					57 (125.7)
EDB2.5-20T	2.5	20 (5.28)					58 (127.9)
EDB2.5-30T		30 (7.93)					114 (251.3)
EDB4-60T	4	60 (15.85)					134 (295.4)
EDB4-130T		130 (34.34)	231 (509.3)				
EDB6-230T	6	230 (60.76)					



# Mini Blaster EMB series

Compact body made of stainless steel is suitable for small tank, hopper and chute.



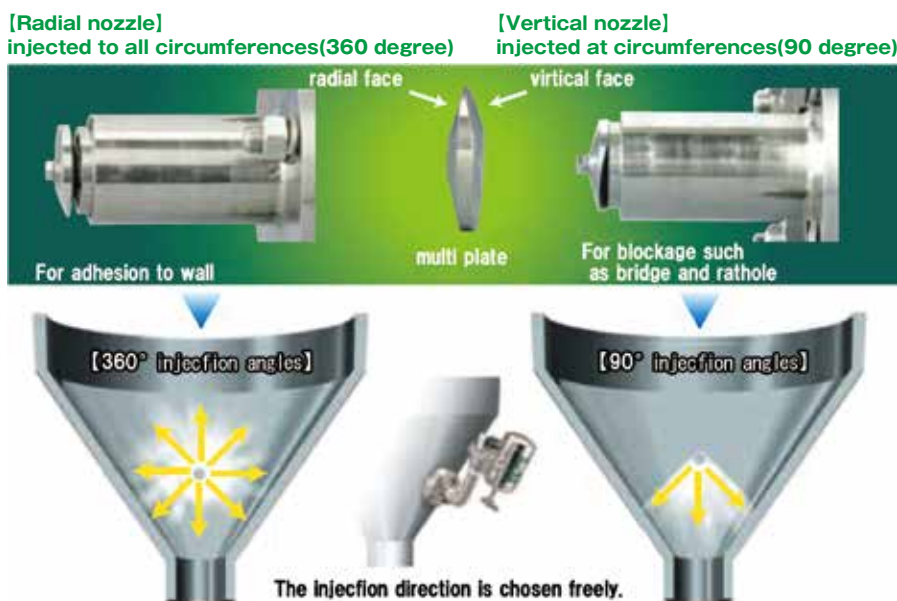
## FEATURES

- ① Using stainless steel as standard.
- ② High durability due to simple structure.
- ③ Compact design and lightweight.
- ④ Easy maintenance.

## Effect of multi-nozzle

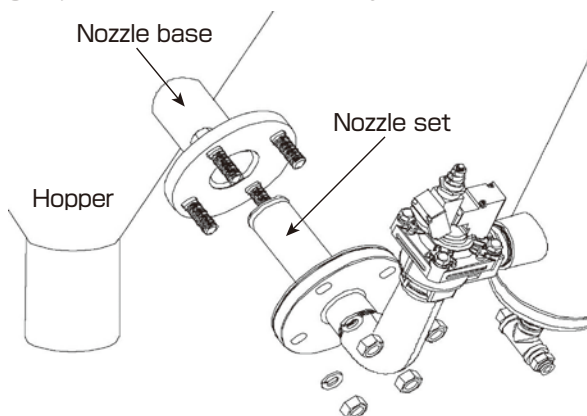
The direction of air injection is adjustable by changing "Multi Plate" direction according to adhesion or blockade condition.

All Mini Blasters are equipped with "Multi Plate" as a standard accessory.



## Installation

Weld "Nozzle Base" to installing object and set the main body with bolts.



## Specification

Model	Outlet dia. (Inch)	Valve port	Valve voltage	Working pressure MPa (PSI)	Available gas	Tank capacity L (gal)	Material		Weight kg (lb)
							Valve	Tank	
EMB1.5-3A	1.5	2port Pilot Type Poppet Structure Solenoid Valve	AC100-400V Single Phase	0.1-0.7 (15 - 102)	Compressed Air	3 (0.79)	ADC12	SS304	10.2 (22.5)
EMB1.5-6A						6 (1.59)			12.4 (27.3)
EMB1.5-10A						10 (2.64)			17.8 (39.2)

\*DC24V is also available.

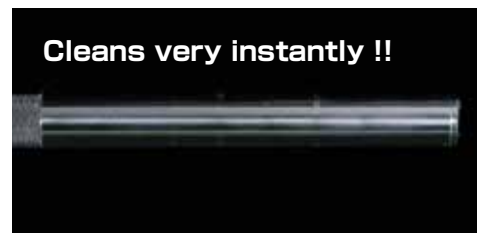
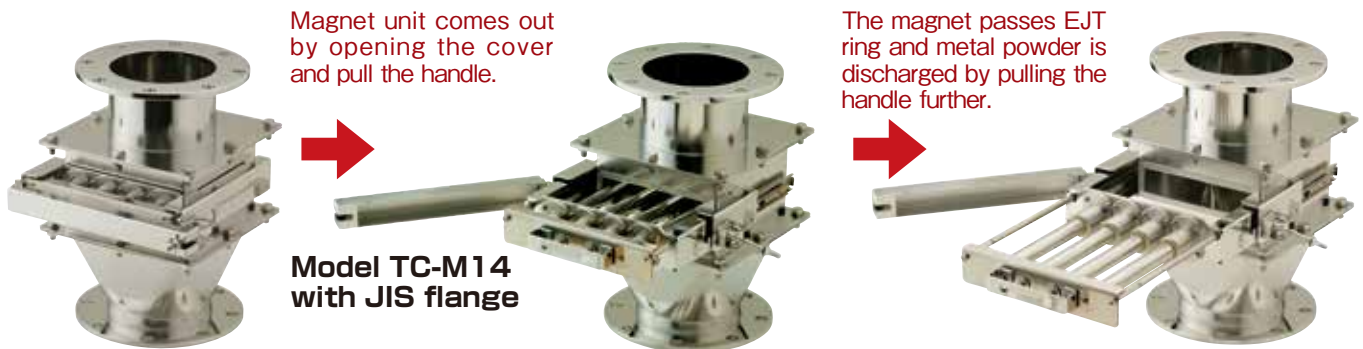
BLASTER



# High magnetic force, one touch cleaning system - TC-M Series

All below difficulties in magnetic separator are now solved by Exen magnetic separator equipped with patented EJT ring.

- \*Hectic work of removing metal powder from magnet pipe.
- \*Chance of scratching the magnet bar surface by manual scraping.
- \*Unexpected accident because of high magnetic force.
- \*Unhygienic conditions (touch the bar directly by hands)



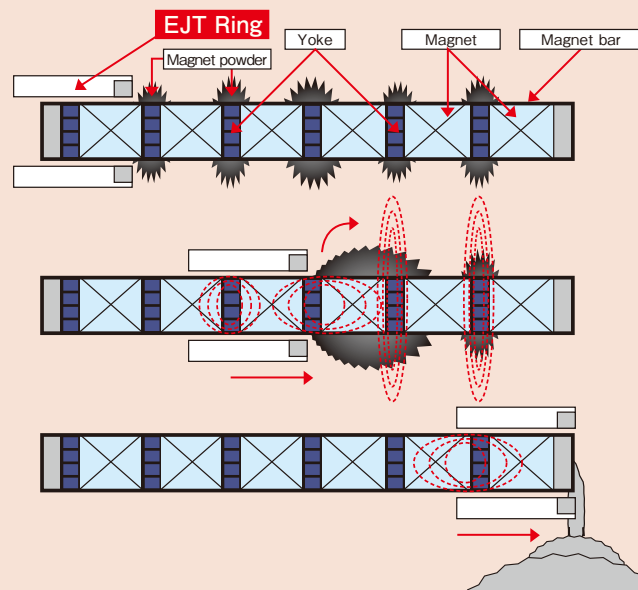
## FEATURES

- ① Fine iron powder unremovable by conventional metal detector can be removed.
- ② Achieved magnetic flux density of more than 10,000G at the pipe surface of magnet bar by adoption of neodymium permanent magnet.
- ③ One-touch cleaning by patented EJT ring allows removal of fine metal powder hygienically and safely.
- ④ Achieved long product life since EJT ring does not give a scratch on to the magnet bar surface.

### Principle of patented EJT ring

The metal powder adhered to magnetic flux line of magnet bar will be taken out easily when the bar goes through the EJT ring.

- ① EJT ring passes magnet bar surface circumferentially and EJT ring cuts the magnetic flux line. By sliding, the bar magnetic force keeps getting weak and metal powder will be gradually attracted by next yoke.
- ② At some moment, the magnetic flux line of the yoke will be completely shut out and all metal powder adhered to that yoke will be forwarded to next yoke completely. Since EJT ring is not scraping the magnet bar surface, there is no chance of making a scratch on the bar surface.
- ③ There is no magnetic flux line at the end of magnetic bar so that all metal powders are naturally fall down from the magnet bar.

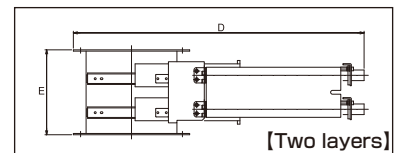
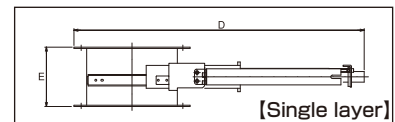
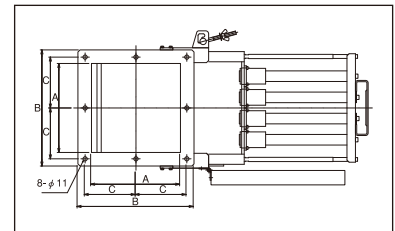


# For food and petrochemical industry - TC-M Series



\*Tray set to catch the removed metal powder is also available (Optional item)

- TC-M13
- TC-M14
- TC-M15
- TC-M25
- TC-M27
- TC-M29



**■ Specification**

Model	Magnet specification				Capacity (t/h) Bulk specific gravity:0.8	Weight kg (lb)	Dimension mm (inch)				
	Number of stages	Number of magnets	Surface MAX magnetic flux density	Maximum working temperature			A	B	C	D	E
TC-M13	1	3	0.9T (9,000G)	80°C	10	9.3 (20.5)	153 (6 - 1/32)	224 (8 - 13/16)	95 (3 - 47/64)	465 (18 - 5/16)	140 (5 - 33/64)
TC-M14		4			20	12.0 (26.5)	203 (7 - 63/64)	274 (10 - 25/32)	120 (4 - 23/32)	540 (21 - 17/64)	
TC-M15		5			40	16.2 (35.7)	253 (9 - 61/64)	324 (12 - 3/4)	145 (5 - 45/64)	615 (24 - 7/32)	
TC-M25	2	5	1T (10,000G)	80°C	10	15.7 (34.6)	153 (6 - 1/32)	224 (8 - 13/16)	95 (3 - 47/64)	465 (18 - 5/16)	220 (8 - 21/32)
TC-M27		7			20	21.0 (46.3)	203 (7 - 63/64)	274 (10 - 25/32)	120 (4 - 23/32)	540 (21 - 17/64)	
TC-M29		9			40	29.5 (65.0)	253 (9 - 61/64)	324 (12 - 3/4)	145 (5 - 45/64)	615 (24 - 7/32)	

\*Magnetic separator is built-to-order product. Please ask your local distributor for the manufacturing lead time.

**Other specification is also available upon your requirement.  
Please contact your local distributor for the detail.**



Auto-cleaning model (all metal powder cleaning process is automated by actuator)

MAGNETIC SEPARATOR



# Suction feeder SF series

This product uses a small amount of compressed air to generate powerful suction force. Simple structure, long life and easy installation.

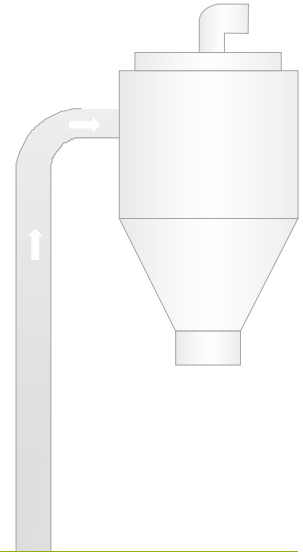


## FEATURES

- 1 Easy to transports powder, granule and even liquid.
- 2 Easy installation to existing facility or narrow space due to compact body.
- 3 Only compressed air is required for operation. No need of electricity.
- 4 Simple structure without any movable item.
- 5 Stainless steel body for high corrosion resistance.

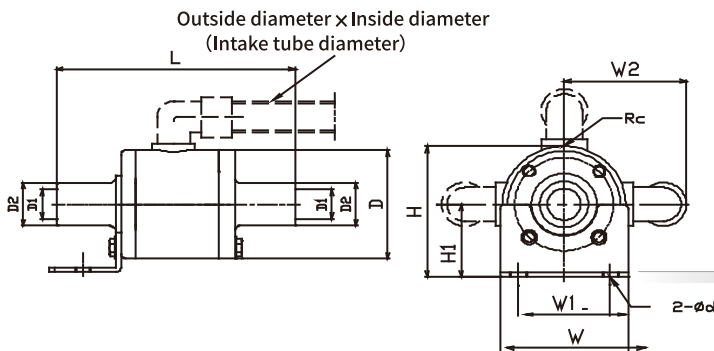
## PRINCIPLE

Compressed air enters from the inlet port and is injected at high speed with a special structure inside the unit. At the suction side of the equipment, minus pressure is formed, the material is sucked up, joined at the injection port side and ejected.



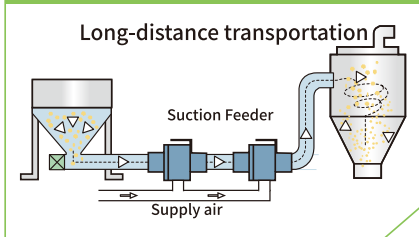
## Specification

Model	Working pressure (MPa)	Air consumption (Nm <sup>3</sup> /m)	Degree of vacuum (kPa)	Discharge volume (m <sup>3</sup> /h)	Inlet air tube size (mm)	Hose size (Inch)	Dimensions(mm)								Weight (Kg)	
							D	D1	D2	L	H	H1	W	W1		W2
SF1925 SUS	0.5	0.6	15	1.3	φ8×φ6	1	φ54	φ19	φ25	100	61	34	50	36	55	0.79
SF3238 SUS		1.1	10	3.3	φ12×φ9	1 - 1/2	φ71	φ32	φ38	118	79	43	72	53	75	1.32
SF4551 SUS		1.3	6	4.1	φ16×φ12	2	φ95	φ45	φ51	123	103	55	97	70	90	2.39

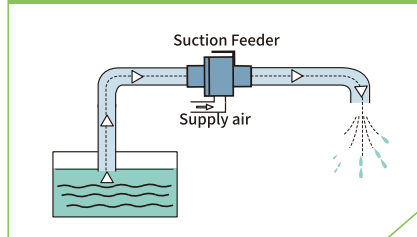


# SUCTION FEEDER

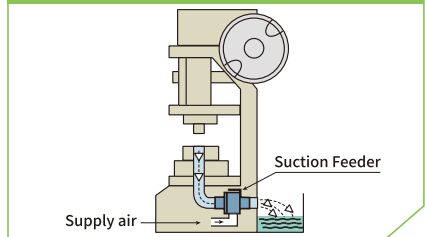
### LONG-DISTANCE CONNECTION



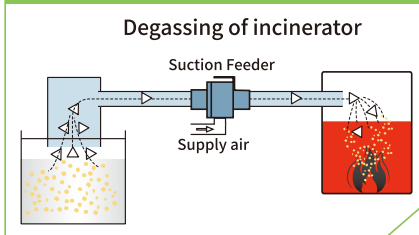
### REMOVAL OF LIQUID



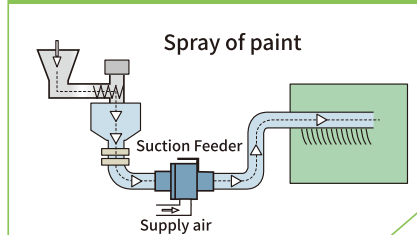
### COLLECTION OF PUNCHED SCRAP



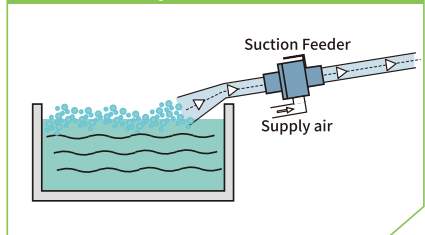
### FURFACE FUEL CONVEYING



### SPRAY OF PAINT



### COLLECTION OF LIQUID SURFACE FOAM





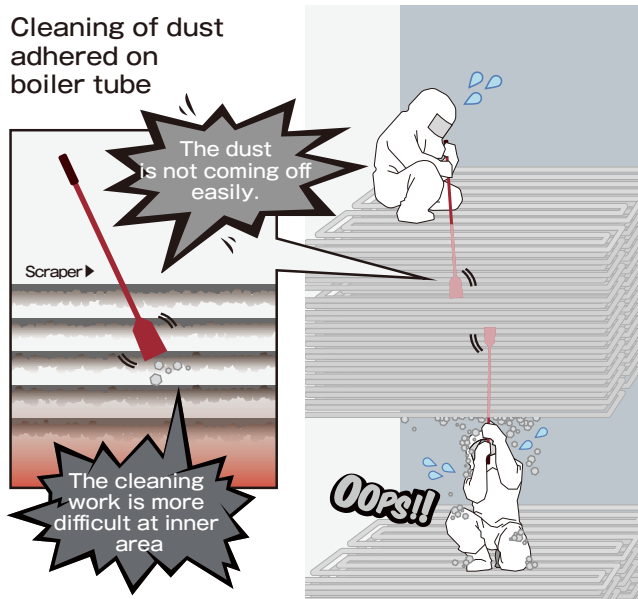
# The vibrator for boiler tube (heat exchanger) cleaning

- Improves cleaning efficiency and shortens shut down time



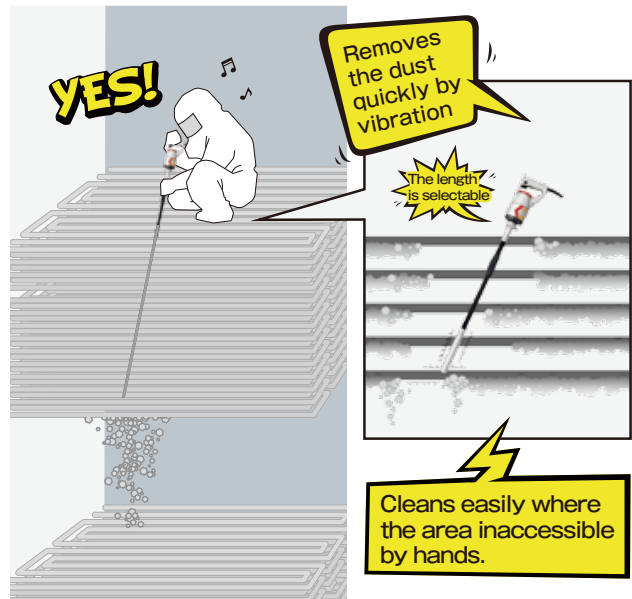
## Conventional method

Cleaning of dust adhered on boiler tube



cleaning from bottom-Unsafe & dirty

## Vibrator for boiler tube cleaning



cleaning from top-Easy & safe

## Component



Vibrator head

Flexible Shaft 1.5m - 2.0m

Motor assembly

**BCV2820**

**BCV2825**

### ■ Specification (Metric)

Model	BCV2820	BCV2825
Output (W)	280	
Voltage (V)	100 - 240 1-phase	
Current (A)	5	
Frequency (Hz)	220~280Hz	
Vibration head (dia x length) mm	Φ28×232mm	
Overall length (mm)	2,028mm	2,528mm
Weight (kg)	6.6kg	7.4kg

### ■ Specification (Imperial)

Model	BCV2820	BCV2825
Output (W)	280	
Voltage (V)	100 - 240 1-phase	
Current (A)	5	
Frequency (VPM)	13,200 - 16,800	
Vibration head (dia x length) inch	Φ1 - 7/64 X 9 - 9/64	
Overall length (inch)	79 - 27/32	99 - 17/32
Weight (lb)	14.6	16.3



# Hand-Push Sweeper

Suitable for cleaning large space such as factory floor, warehouse floor, construction site, car park, sidewalk and so on



## ES-2RA

\* Side brush (ES-2S) is optional item.

Model	ES-550A
Sweeping width mm (inch)	5715 (28 - 5/32)
Sweeping performance m <sup>3</sup> /h (ft <sup>3</sup> / h)	2,500 (26,910)
Waste bin capacity L (gal)	20 (5.28)
Sweeping brush width mm (inch)	460 (18 - 7/64)
Dimension (when using) L X W X H mm (inch)	890 X 700 X 925 (35 - 3/64 X 27 - 9/16 X 36 - 27/64)
Dimension (when folding) L X W X H mm (inch)	740 X 700 X 330 (29 - 9/64 X 27 - 9/16 X 12 - 63/64)
Weight kg (lb)	27 (59.52)with side brush 29.0(63.93)



Stackable design (up to 4 units) to save storing space.



Mobile caster keeps cleaning brush untouched to ground when moving ES-2RA. This makes easier handing because of no resistance from the brush and also it extends brush life.



## ES-550A

Model	ES-550A
Sweeping width mm (inch)	550 (21 - 21/32)
Sweeping performance m <sup>3</sup> /h (ft <sup>3</sup> / h)	1,920 (20,667)
Waste bin capacity L (gal)	20 (5.28)
Dimension (when using) L X W X H mm (inch)	580 X 550 X 1,250 (22 - 53/64 X 21 - 21/32 X 49 - 7/32)
Weight kg (lb)	7.2 (15.87)



Equipped with side roller which guides the body for easier cleaning just besides the wall (for all models).



Brush height and ground pressure are adjustable in accordance with floor surface (for all models). \*Shape is different for ES-550A



Equipped with air filter to prevent dust scattering from dust case. (ES-770)



## ES-770

Model	ES-770
Sweeping width mm (inch)	770 (30 - 5/16)
Sweeping performance m <sup>3</sup> /h (ft <sup>3</sup> / h)	2,690 (28,955)
Waste bin capacity L (gal)	50 (13.21)
Dimension (when using) L X W X H mm (inch)	1,050 X 800 X 1,050 (41 - 11/32 X 31 - 1/2 X 41 - 11/32)
Weight kg (lb)	13 (28.66)



Vertical storing for space saving.

*Company name *Address *Tel No. *E-mail address *Person in charge				
Material	*Name			
	Specific gravity / Temperature	(        ) g/cm <sup>3</sup> / lb/inch <sup>3</sup>	Temperature (        ) °C / °F	
	Moisture content	%		
	*Particle size	(        ) ~ (        ) mm / inch,    μm / μin,    mesh		
	*Fluidity	<input type="checkbox"/> Good    or <input type="checkbox"/> Average    or <input type="checkbox"/> Bad		
	*Adhesion	<input type="checkbox"/> Strong    or <input type="checkbox"/> Average    or <input type="checkbox"/> Weak		
	*Any problem cause to the material by blowing compressed air into the material?	<input type="checkbox"/> Yes    or <input type="checkbox"/> No		
	If Yes, the reason	(        )		
Storage tank	Name			
	Establishment	<input type="checkbox"/> New setup    or <input type="checkbox"/> Existing		
	*Shape / Structure	<input type="checkbox"/> Round    or <input type="checkbox"/> Square    or <input type="checkbox"/> Other		
	Capacity	(        ) t	(        ) m <sup>3</sup> / ft <sup>3</sup>	(        ) L / gal
	*Hopper/Silo diameter	(        ) mm / inch		
	*Plate thickness	(        ) mm / inch		
	*Material	<input type="checkbox"/> Steel    or <input type="checkbox"/> Stainless Steel    or <input type="checkbox"/> Other (        )		
	*Inner lining	<input type="checkbox"/> Yes    or <input type="checkbox"/> No		
	If yes, material and thickness	(        ) (        ) mm		
Installation place	① <input type="checkbox"/> Indoor    or <input type="checkbox"/> Outdoor			
	② <input type="checkbox"/> High humidity <input type="checkbox"/> Dusty <input type="checkbox"/> Anti-explosion <input type="checkbox"/> Special area (        )			
	Temperature	Summertime (        ) °C / °F	Wintertime (        ) °C / °F	
	Power supply	(        ) V / (        ) Hz	Phase (        )	
Compressor	<input type="checkbox"/> Existing <input type="checkbox"/> Not available <input type="checkbox"/> Installing newly			
	Normal pressure	(        ) MPa / Bar / PSI		
	Air consumption	(        ) L/min / CFM		
	Distribution to other machine/equipment	(        ) %		
*Trouble phenomenon	<input type="checkbox"/> Bridging <input type="checkbox"/> Arching <input type="checkbox"/> Rat holing <input type="checkbox"/> Funneling <input type="checkbox"/> Clinging to wall surface <input type="checkbox"/> Natural cling and adhesion of bulk material <input type="checkbox"/> Clogs when starting discharge <input type="checkbox"/> Clogs while discharging <input type="checkbox"/> Clogs by freezing <input type="checkbox"/> Easily influenced by atmospheric condition <input type="checkbox"/> Chance of gas generation <input type="checkbox"/> Injurious material <input type="checkbox"/> Dusty bulk material <input type="checkbox"/> High hygroscopicity <input type="checkbox"/> Other (        )			
*Current measurement	<input type="checkbox"/> Screw system <input type="checkbox"/> Vibration motor <input type="checkbox"/> Air <input type="checkbox"/> Diaphragm <input type="checkbox"/> Manual    How (*) : _____ <input type="checkbox"/> Other (* ) E.g. : Using -- Kg (lb) hammer			
Feeding method ( <input type="checkbox"/> continuous or <input type="checkbox"/> intermittent )	<input type="checkbox"/> Belt conveyer <input type="checkbox"/> Dump truck	<input type="checkbox"/> Feeder <input type="checkbox"/> Chute	<input type="checkbox"/> Bucket loader <input type="checkbox"/> Crane <input type="checkbox"/> Elevator <input type="checkbox"/> Others:	
Discharging method ( <input type="checkbox"/> continuous or <input type="checkbox"/> intermittent )	<input type="checkbox"/> Screw conveyer <input type="checkbox"/> Hopper car	<input type="checkbox"/> Belt conveyer <input type="checkbox"/> Others:	<input type="checkbox"/> Feeder <input type="checkbox"/> Freight car (        )	
*Drawing and/or sketch of bin, hopper etc. - <b>IMPORTANT</b> - Please provide following data/information to select suitable model and to suggest installation position. (1) <u>Hopper drawing</u> (or specify demention in below sketch) (2) <u>Clogging position</u> within the hopper, bin, etc.		Request items: <input type="checkbox"/> Model selection <input type="checkbox"/> Recommendation for installation position <input type="checkbox"/> Price estimation <input type="checkbox"/> Specification  Others		

\*Mandatory field



Unit exchange chart

Particle	Unit1	Unit2		
Frequency	Hz	v.p.m	1Hz = 60v.p.m	1v.p.m = 1/60Hz
Revolution speed	min-1	r.p.m	1min-1 = 1r.p.m	1r.p.m = 1min-1
Centrifugal force·Vibratory force	kN	kgf	1kN = 101.97kgf	1kgf = 0.00980665kN
Torque	N·cm	kgf·cm	1N·cm = 0.10197kgf·cm	1kgf·cm = 9.80665N·cm
Torque·Stroke energy	N·m	kgf·m	1N·m = 0.10197kgf·m	1kgf·m = 9.80665N·m
Impulsive force	kg·m/s	kg·m/sec	1kg·m/s=1kg·m/sec	1kg·m/sec=1kg·m/s
Pressure	MPa	kgf/cm2	1MPa = 10.197kgf/cm2	1kgf/cm2 = 0.0980665MPa
	Pa	Mpa	1Pa=0.000001MPa	1MPa=1,000,000Pa
	MPa	PSI	1MPa=145psi	1psi=0.006895
	MPa	BAR	1MPa=10bar	1bar=0.1MPa
Horse poewer·Output	kW	PS	1kW = 1.3596PS	1PS = 0.7355kW
Acceleration	m/s2	G	1m/s2 = 0.10197G	1G = 9.80665m/s2
mass	g	oz	1g=0.03527oz	1oz=28.35g
	kg	lb	1kg=2.2046lb	1lb=0.4536Kg
measurement	inch	mm	1inch=25.4mm	1mm=0.03937inch
	feet	cm	1feet=30.48cm	1cm=0.03281feet
temperature	°C	°F	1°C=(°F-32)/1.8	1°F=°CX1.8+32



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