

Ball vibrators for silos, hoppers, screens and chutes

A steel ball running round a hardened track. Eight sizes from 130 grams to 1.34 kilos, 2 to 6 bar, up to 35,000 vibrations per minute, and ATEX category 2 as standard.

The material clings to the wall instead of sliding, the grains lump together on the screen, or the last layer stays behind in the bottom of the chute. The S is OLI's ball vibrator for that kind of job. Compressed air at 2 to 6 bar drives a steel ball around a hardened track, and that gives a high frequency with a small amplitude, working where the material meets the steel. The unit bolts on the outside, and no hole is drilled in the wall. Eight sizes from 130 grams to 1.34 kilos, all with ATEX category 2 for both gas and dust.

Working pressure 2 to 6 bar	Centrifugal force 13 to 405 kg	Duty cycle Discontinuous	Noise level No more than 90 dB(A)	Weight 0.13 to 1.34 kg
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Two everybody knows, and two that are the S's own

Bridging and rat-holing are familiar to anyone who has stood at a silo. What sets the rotary range apart from the rest of the programme is the next two: reducing the friction between the material and the steel, and separating material that has lumped together.

Bridge over the outlet

The material spans an arch across the opening and carries its own weight. The silo is full, the screw underneath runs in empty space, and nothing moves on.

Rathole through the middle

A narrow shaft runs down through the centre while the rest stands still along the walls. It looks like it is running, but most of it stays put and gets older by the hour.

Friction and separation

The material does not slide because it clings to the steel, or it sits lumped together on a screen and never gets sorted. A high frequency with a small amplitude works exactly there, in the boundary between the material and the surface.

A ball that runs round

Inside the body is a circular track of hardened and ground steel, and in the track lies a steel ball. Compressed air at 2 to 6 bar drives the ball round the inner face of the track, and the mass running round is what produces the vibration. The force is therefore not a movement back and forth along one axis, as on a piston vibrator: it is a vector that rotates. That is the difference the word rotary covers.

The frequency is high and the amplitude small. An S 8 reaches 35,000 vibrations per minute at 6 bar, and even the largest, the S 36, sits at 10,000. By comparison the pneumatic piston vibrators run between 1,200 and 6,720. That is what makes the S the right one where the problem sits in the boundary between the material and the steel, rather than deep inside a full silo.

The body is blue anodised aluminium and the covers are Ixef®, a fibre reinforced plastic that stands up to weather and hard working conditions. The unit comes in eight sizes from 130 grams to 1.34 kilos, and all eight carry ATEX category 2 for both gas and dust as standard. The air has to be lubricated, class 5.4.4, and the duty is discontinuous. If the unit has to run without stopping, tell us for how long at a time and we will find the right answer.

Technical specifications

Technology	Rotary vibration, high frequency
Duty cycle	Discontinuous

Working pressure	2 to 6 bar
Centrifugal force	13 to 405 kg, depending on size and pressure
Frequency	7,300 to 35,000 vibrations per minute
Air consumption	83 to 675 l/min
Pneumatic circuit	Filter, flow control valve, lubricator and 3/2 way valve N.C.
Air supply quality	Class 5.4.4, lubricated
Working temperature	-20 to 150 °C
Noise level	No more than 90 dB(A) at maximum speed
ATEX	II2G Ex h IIB Tx Gb and II2D Ex h IIIC Tx Db, as standard
Material	Blue anodised aluminium body, Ixef® covers, hardened and ground steel track
Mounting	Foot with four fixing points, bolted on the outside
Connection	1/8", 1/4" or 3/8" BSPP
Weight	0.13 to 1.34 kg

Eight sizes

The frequency is given as the span from 2 to 6 bar, because the pressure moves it. The force is given at both ends. A is the width of the body and its overall height including the foot, B is the length of the foot, and both are dimensioned on the drawing in step 02.

Model	Frequency	Force 2 bar	Force 6 bar	Air 2 bar	Air 6 bar	A	B	Connection	Weight
S 8	25500-35000	13	36	83	195	50	86	1/8" BSPP	0.13
S 10	22500-34000	25	71	92	200	50	86	1/8" BSPP	0.13
S 13	15000-22500	32	87	94	225	65	113	1/4" BSPP	0.26
S 16	13000-19500	45	110	122	280	65	113	1/4" BSPP	0.30
S 20	10500-16500	72	172	130	340	80	128	1/4" BSPP	0.53
S 25	9200-14000	93	205	160	425	80	128	1/4" BSPP	0.63
S 30	7800-12500	151	321	215	570	100	160	3/8" BSPP	1.13
S 36	7300-10000	206	405	260	675	100	160	3/8" BSPP	1.34

The number in the model name follows the size of the body: the S 8 is the smallest and the S 36 the largest. The sizes go in pairs on the dimensions — the S 8 and S 10 share A, B, C and D, as do the S 13 and S 16, the S 20 and S 25, and the S 30 and S 36 — but the two in each pair are not the same inside, and neither the frequency, the force nor the air consumption is. A is both the width of the body and the overall height of the unit including the foot, and B is the length of the foot. The four remaining letters are dimensioned on the drawing in step 02 and given as figures on the component card: C is the distance between the two slots, D the thickness of the foot, E its depth and F the width of the slot. The connection is a BSPP thread, and in and out share the same size on all eight. The force is the maximum centrifugal force, given in kilograms.

Four things worth looking at before ordering

It is the same mechanism in all eight: a steel ball in a hardened track. What changes with the size is the dimensions and the thread. What they all share is that no hole is drilled in the wall.

The foot · A · B · C · D · E · F

The foot has four fixing points, not two. The outer two are open slots running out to the end, and the inner two are round holes. The foot sits against whatever it is bolted to, and the body stands perpendicular to that face.

Foot length, B	86 to 160 mm
Slot spacing, C	68 to 130 mm
Foot thickness, D	12, 16 and 20 mm
Foot depth, E	20 to 50 mm
Slot width, F	7, 9 and 11 mm

1. An open slot means the unit can be dropped over two bolts that are already in place, rather than having to be threaded onto them.
2. We do not have the spacing between the two round holes. If you need it in order to pre-drill, say so and we will measure a unit.

The two ports · IN · OUT

There are two ports in the top face, an inlet and an outlet, and they share the same thread. The air comes in through one, drives the ball round and leaves the body through the other.

Thread, S 8 and S 10	1/8" BSPP
Thread, S 13 to S 25	1/4" BSPP
Thread, S 30 and S 36	3/8" BSPP
In and out	Same size

1. The outlet has the same thread as the inlet, so a silencer or an exhaust hose can be screwed into it.
2. If the air has to be taken away from the area around the unit, tell us where it should go and we will find the right arrangement.

The cover · Ixef®

The track is closed by a round cover on each side. The covers are Ixef®, a fibre reinforced plastic that stands up to weather and hard working conditions, and the body around them is blue anodised aluminium.

Cover	Ixef®
Body	Blue anodised aluminium
Track	Hardened and ground steel
Outdoor use	Yes

1. The aluminium body and the anodised surface are what make the range resistant to oxidation and suitable for sitting outside.
2. We do not have a replacement interval for the cover from OLI. If the unit has to go into a preventive maintenance plan, say so and we will ask.

The nameplate · ATEX

ATEX is standard on the whole range, not an option. The marking covers both gas and dust in category 2, that is zone 1 and 21, and it sits on the unit that is delivered.

Gas	II2G Ex h IIB Tx Gb
Dust	II2D Ex h IIIC Tx Db
Category	2, as standard
Zone	1 and 21

1. The temperature class is given as Tx, that is without a figure. If the unit has to sit in a zone with a requirement for a particular class, tell us which and we will come back with the answer.

2. Zone 20, that is the inside of a vessel containing dust, is not covered by category 2.

There are no options for the S: no timer, no solenoid, no ATEX kit and no mounting plate. There is one version of each size, and ATEX comes as standard.

Where the S belongs

Silo, hopper, chute and pipe	The units bolt on the outside, and the vibration runs through the steel and on into the material. No hole is drilled in the wall, so the range can also go onto a plant that is already running.
Screen and vibrating table	This is where the two words friction and separation come from. The high frequency and small amplitude keep the material moving on the surface, so it gets sorted instead of settling.
Dry material, not damp	The range is meant for dry powders and granules: plastics, sand, ashes, cement and lime. If the material is hygroscopic, that is it draws moisture, the roller vibrator OR is the right one: it is meant for exactly that.
Filter sleeve cleaning	Of the three rotary ranges the S is the only one also meant for shaking filter sleeves clean. It is the same property that makes it right on a screen: a high frequency that shakes a layer free without moving the structure.
Not for continuous running	The duty is discontinuous. Where running has to be continuous, the pneumatic piston vibrators K and F are built for it, and they sit at 80 dB(A) against the S's 90.

Which size, and how many?

Tell us what the silo, hopper or screen is made of, how thick the steel is, what you handle, and how long it has to run at a time. We come back with a size, a number and a price, not with a catalogue.

Sales and orders	+45 70 23 12 03 · sales@particulair.com
Product page	particulair.eu/flow-aid/en/products/ball-vibrators/
Product selector	particulair.eu/flow-aid/en/product-selector/

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