Continuous impact vibrators P for silos, hoppers and chutes

A piston that strikes a welded plate many times a minute. Three sizes from 2.2 to 11 kilos, 2 to 6 bar, 294 to 3,250 newtons, and steel that may be 200 degrees hot.

The material is wet, it sticks, and it stays on the wall no matter how long the air has been on. The P is OLI's vibrator for exactly that situation. Inside the housing a piston runs, driven by compressed air at 2 to 6 bar against a plate welded to the outside of the vessel, and every blow travels on through the steel into the material. It breaks bridges and ratholes, and it takes the build-up that has settled on the wall. The unit sits on the outside, and no hole is drilled in the wall. Three sizes from 2.2 to 11 kilos, and the steel may be as hot as 200 degrees.

Working pressure	Force	Duty cycle	Noise level	Weight
2 to 6 bar	**294 to 3,250 N**	**Continuous**	**No more than 100 dB(A)**	**2.2 to 11 kg**

Three things that happen to wet material

Bridging and rat-holing are familiar to anyone who has stood at a silo. The third is the one that gets expensive over time: the vessel never empties completely, because a layer stays on the wall that does not come along.

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.

Incomplete clean out

Wet material sets as a crust on the steel and grows thicker with every filling. The capacity of the vessel shrinks, the last of it never comes along, and in the end somebody has to go in with a bar.

A piston that strikes the steel

Inside the housing runs a piston, and compressed air at 2 to 6 bar drives it against a metal plate welded to the outside of the vessel. Every blow travels through the steel and on into the material. That is what the word impact covers, and it is the whole difference between the P and the cushioned piston vibrators, where the piston never touches the metal. It does cost something: the noise level is 100 dB(A), where the K and the F sit at 80.

The force is chosen with the pressure. The same P40 gives 484 newtons at 2 bar and 1,396 newtons at 6 bar, and the frequency follows from 1,650 to 2,800 vibrations per minute. The working moment, by contrast, is the same at all three pressures on any one model, so it is the pressure alone that moves both force and frequency. The range as a whole runs from 294 to 3,250 newtons. If you need to reach a particular level on a particular wall, tell us what the plate is and we will work it through.

The air has to be lubricated, class 5.4.4. Four things sit in front of the unit: a filter, a pressure regulator, a lubricator and a 3/2 way valve. The regulator is not decoration, because on the P the pressure is also what sets the force. Where oil mist is not allowed at the position, the K in its LF version is the one to look at.

The body is grey cast iron, powder painted, with an aluminium cover, and the working temperature runs from -20 to 200 °C. ATEX is an option and not standard as on the K and the F: with the ATEX kit the P ships in II2G Ex h IIB Tx Gb and II2D Ex h IIIC Tx Db, that is category 2 for zone 1 and zone 21. The kit costs 90 degrees: the ceiling falls from 200 to 110 °C. The letter Tx means the temperature class is not fixed in advance: it follows the installation and has to be agreed before equipment is ordered for a classified area.

Technical specifications

Technology	Piston impact
Duty cycle	Continuous
Working pressure	2 to 6 bar
Force	294 to 3,250 N, depending on size and pressure
Frequency	1,200 to 4,500 vibrations per minute
Air consumption	55 to 300 l/min
Pneumatic circuit	Filter, pressure regulator, lubricator and 3/2 way valve N.C.
Air supply quality	Class 5.4.4, lubricated
Working temperature	-20 to 200 °C. With the ATEX kit: -20 to 110 °C
Noise level	No more than 100 dB(A)
ATEX	II2G Ex h IIB Tx Gb and II2D Ex h IIIC Tx Db, optional with the ATEX kit
Temperature class	With the ATEX kit: T5 at ambients up to and including 90 °C and T4 up to 110 °C, with surface temperatures of 95 and 115 °C. The 200 °C limit applies without the kit
Material	Grey cast iron body, powder painted, and aluminium cover
Mounting	The foot bolts onto a plate welded to the outside of the vessel. No hole is drilled in the wall
Weight	2.2 to 11 kg

Three 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. A1 is the overall height of the unit and B the length of the foot, and both are dimensioned on the drawing in step 02.

Model	Frequency	Force 2 bar	Force 6 bar	Working moment	Air 2 bar	Air 6 bar	A1	B	Weight
P25	2500-4500	294	954	0.43	55	125	98	115	2.2
P40	1650-2800	484	1,396	1.63	70	150	127	148	4.5
P60	1200-1900	1,296	3,250	4.11	100	300	173	138x142	11

The number in the model name follows the size of the housing: the P25 is the smallest and the P60 the largest. A1 is the overall height of the unit and B the length of the foot. The foot changes form with the size: the P25 and P40 have a two lobed foot with two bolts, while the P60 has a square foot with four, which is why B on the P60 is two figures and not one. Ø G is the diameter of the housing, 58, 75 and 115 millimetres. The air inlet is BSPP throughout: 1/4″ on the P25, 3/8″ on the P40 and 1/2″ on the P60. The outlet matches the inlet, except on the P60, which has two. The working moment is the same at all three pressures on any one model.

Two foot shapes, two ports and a cover

It is the same mechanism in all three: a piston that strikes. What changes with the size is the foot, and the foot is what decides what has to be welded onto the vessel. What they all share is that no hole is drilled in the wall.

The two lobed foot · P25 · P40

The two smallest sit on two bolts, one in each lobe. The foot is longer along than across: 115 against 70 millimetres on the P25 and 148 against 91 on the P40.

Models	P25 and P40
Foot length, B	115 and 148 mm
Foot width, D	70 and 91 mm
Bolt spacing, C	85 and 110 mm
Hole diameter, Ø F	13 and 17 mm

1. The P25 weighs 2.2 kilos and has the highest frequency in the range: 4,500 vibrations per minute at 6 bar.
2. We do not have a tightening torque for the bolts from OLI. If the unit has to sit somewhere where that matters, say so and we will get the figure.

The square foot · P60

The largest sits on four bolts, one in each corner. The foot is almost square, 138 by 142 millimetres, against the elongated foot of the two smaller ones.

Model	P60
Foot dimensions, B	138 × 142 mm
Bolt spacing, C	99 × 99 mm
Hole diameter, Ø F	17 mm
Weight	11 kg

1. The P60 is the strongest in the range: 3,250 newtons at 6 bar, and the only one with two outlets.
2. The bolt holes are counterbored, so the bolt head does not stand proud of the top of the foot.

The inlet and the silencer · {'da': 'Alle tre', 'en': 'All three', 'pl': 'Wszystkie trzy'}

The two ports sit opposite each other on the circumference. Air comes in through one and leaves through the silencer in the other, and that is the whole circuit inside the housing.

Inlet	1/4″, 3/8″ and 1/2″ BSPP
Outlet	The same as the inlet
P60	Two outlets, both 1/2″ BSPP
Air consumption	55 to 300 l/min

1. Air consumption grows with the pressure: the P40 uses 70 l/min at 2 bar and 150 at 6.
2. The silencer is the sintered brass part in the outlet. The P60 has two of them.

The cover and the body · {'da': 'Alle tre', 'en': 'All three', 'pl': 'Wszystkie trzy'}

The body is grey cast iron and powder painted, and the cover at the far end is aluminium. It is one set of materials across the range, and there is nothing to choose between.

Body	Grey cast iron, powder painted
Cover	Aluminium
Ø G, housing diameter	58, 75 and 115 mm
A1, overall height	98, 127 and 173 mm

1. The cover sits at the end facing away from the vessel. The blow lands at the opposite end, down towards the foot.
2. Where ATEX is needed, the unit ships with the ATEX kit. The ceiling falls from 200 to 110 degrees at the same time.

What is not a component card here is the plate on the vessel, because it belongs to the wall and not to the vibrator. The foot bolts onto it, and it is welded to the outside so that nothing has to be drilled. Tell us what the vessel is made of and how thick the steel is, and we will come back with the right execution.

Where the P belongs

Plant	Silos and hoppers, piping and chutes, salt spreaders, tipper bodies and rail cars
Material	Hygroscopic and humid powders: sludge, aggregates, sand, salt, foundry sand and animal feed
Particularly suited to	Wet and electrostatic powders, clay, salts and sludges that adhere to the wall, and to thick steel of 10 to 12 millimetres
Typical jobs	Emptying silos and hoppers, clearing chutes and piping, unloading tipper bodies and rail cars
Not for	Dry, fine powder such as cement and lime: there, air underneath the material is the right answer, and then it is bin aerators or fluidisation. Places where 100 dB(A) is too much: the K and the F sit at 80. And a classified area without the ATEX kit, or with the kit and steel above 110 °C.

How thick is the steel, and does the unit go into a classified area?

Tell us what the silo, hopper or body is made of, how thick the steel is, what you handle, and whether the position is classified. 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/continuous-impact-vibrators/
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