Cushioned piston vibrators K for silos, hoppers and compacting tables

A floating piston that never reaches the metal. Five sizes from 0.2 to 4.6 kilos, 2 to 6 bar, no more than 80 dB(A), and the whole range is also available lubrication free.

The material stands still in the silo, in the throat of the hopper or on the table, and a blow would be too much: the plate is thin, the grains must not be crushed, or somebody is working next to it. The K is OLI's vibrator for exactly that situation. Compressed air at 2 to 6 bar drives a piston up and down inside a bore, and air is left at both ends so it never reaches the metal. That is why the noise stays below 80 dB(A), and why there is no impact to wear out. The unit mounts on the outside, and no hole is drilled in the wall. Five sizes from 0.2 to 4.6 kilos, and every one of them comes in a version that runs on dry air with no lubricator.

Working pressure	Force	Duty cycle	Noise level	Weight
2 to 6 bar	**33.4 to 2,123.7 N**	**Continuous**	**No more than 80 dB(A)**	**0.2 to 4.6 kg**

Two things the material does, and two you need done

Bridging and rat-holing are familiar to anyone who has stood at a silo. What sets the K and the F apart from the rest of the range is the next two: loosening what has already set, and compacting powder where that is the point.

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.

Detaching and compacting

A layer that has set on the steel has to be shaken free without damaging the plate, and powder in a mould or on a table has to be compacted evenly without crushing the grains. Compacting is the K's and the F's own job in the range.

A piston that stops in air

Inside the housing there is a bore, and inside the bore lies a floating piston. Compressed air at 2 to 6 bar drives it up and down, and air is left at both ends so it never makes metal-on-metal contact. That is what the word cushioned covers, and it is the whole difference between a vibrator and a hammer. That is why the noise stays below 80 dB(A), where a pneumatic hammer sits at 125. The vibration does not travel through the air to the material; it travels through whatever the housing is bolted to: the silo wall, the hopper or the table.

The force is chosen with the pressure. The same K 30 gives 171.8 newtons at 2 bar and 341.1 newtons at 6 bar, and the frequency follows from 2,640 to 3,720 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. 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 range comes in two versions, and that is the decision to take before ordering. The standard K wants lubricated air: a filter, a flow control valve, a lubricator and a 3/2 way valve in front, and air in class 5.4.4. The K-LF runs without lubrication on dry air in class 5.4.1, the same quality as the rest of the range. The whole range comes in the lubrication free version, and the force is different on three of the five sizes. The figures are in step 04.

The housing is aluminium with an Ixef® cover, and the working temperature runs from -20 to 130 °C. Where the plate is hotter, the F or the P are the ones to look at. ATEX is not an option: the K ships as standard 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 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 cushioned
Duty cycle	Continuous
Working pressure	2 to 6 bar
Force	33.4 to 2,123.7 N, depending on size and pressure
Frequency	1,260 to 6,720 vibrations per minute
Air consumption	9 to 202 l/min
Pneumatic circuit	K: filter, flow control valve, lubricator and 3/2 way valve N.C. K-LF: the same without the lubricator
Air supply quality	K: class 5.4.4, lubricated. K-LF: class 5.4.1, dry
Working temperature	-20 to 130 °C
Noise level	No more than 80 dB(A)
ATEX	II2G Ex h IIB Tx Gb and II2D Ex h IIIC Tx Db, as standard
Temperature class	T5 at ambients up to and including 90 °C and T4 up to 130 °C. The corresponding surface temperatures for dust are 95 and 135 °C
Material	Aluminium body and Ixef® cover
Mounting	K 15, K 22 and K 30: a thread in the end face, M8, M10 or M12. K 45 and K 60: a square flange with four holes
Weight	0.2 to 4.6 kg

Five sizes in two versions

The frequency is given as the span from 2 to 6 bar, because the pressure moves it. The force is given at both ends. LF is the lubrication free version. Ø A is the diameter of the housing and B its overall length, 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	Ø A	B	Weight
K 15	5040-6720	33.4	59.4	0.02	9	21	32	69	0.2
K 15 LF	5040-6720	33.4	59.4	0.02	9	21	32	69	0.2
K 22	2880-4080	95.4	191.5	0.21	32	73	45	105	0.5
K 22 LF	2880-4080	81.8	164.1	0.18	32	73	45	105	0.5
K 30	2640-3720	171.8	341.1	0.45	45	140	60	116	1.0
K 30 LF	2640-3720	160.3	318.4	0.42	45	140	60	116	1.0
K 45	1920-2580	390.9	705.9	1.94	56	194	80	151	2.9
K 45 LF	1920-2580	394.2	711.7	1.95	56	194	80	151	2.9
K 60	1260-2160	722.6	2,123.7	8.31	70	202	115	224	4.6
K 60 LF	1260-2160	722.6	2,123.7	8.31	70	202	115	224	4.6

The number in the model name follows the size of the housing: the K 15 is the smallest and the K 60 the largest. LF is the lubrication free version, and the two in each pair share dimensions and weight. Ø A is the diameter of the housing and B its overall length. The air inlet is M5 on the K 15 and BSPP on all the others: 1/8″ on the K 22, 1/4″ on the K 30 and K 45 and 1/2″ on the K 60. The outlet matches the inlet except

on two: the K 15 has 1/8″ BSPP out, and the K 45 has 3/8″. The mounting changes form with the size: the K 15, K 22 and K 30 hang in a thread in the end face, M8, M10 or M12, while the K 45 and K 60 have a square flange with four through holes of 8.5 and 13 millimetres. The working moment is the same at all three pressures on any one model.

Two ways to hang it, and two ports

It is the same mechanism in all five: a floating piston in a bore. What changes with the size is how the unit is fixed. What they all share is that no hole is drilled in the wall.

The flange · K 45 · K 60

The two largest hang in a square flange with four through holes. The flange sits against whatever it is bolted to, and the body stands perpendicular to that face.

Models	K 45 and K 60
Flange side, L	90 and 130 mm
Hole spacing, H	72 and 102 mm
Hole diameter, Ø G	8.5 and 13 mm
Flange thickness, M	15 and 20 mm

1. The K 60 is the strongest in the range: 2,123.7 newtons at 6 bar.
2. The flange is part of dimension B, which is therefore the overall length of the housing including it.

The thread in the end face · K 15 · K 22 · K 30

The three smallest have no flange. They hang in a single thread in the middle of the end face, and that is also what makes them so small: there is no plate to make room for.

Models	K 15, K 22 and K 30
Thread, G	M8, M10 and M12
Ø A	32, 45 and 60 mm
The M dimension at the end face	9, 13 and 13 mm
Weight	0.2, 0.5 and 1.0 kg

1. The K 15 weighs 200 grams and has the highest frequency in the range: 6,720 vibrations per minute at 6 bar.
2. We do not have a tightening torque for the thread from OLI. If the unit has to sit somewhere where that matters, say so and we will get the figure.

The inlet and the silencer · {'da': 'Alle fem', 'en': 'All five', 'pl': 'Wszystkie pięć'}

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

Inlet, E	M5 on the K 15, otherwise BSPP
Outlet, F	1/8″ to 1/2″ BSPP
Distance from the end face, C and D	37 to 115 mm
Air consumption	9 to 202 l/min

1. The two ports sit the same distance from the end face on every model. C and D are the same figure throughout.
2. Air consumption is identical for the two versions of each size. It is the force and the working moment that change.

What is not a component card here is the circuit in front of the unit, because that is not a part but a decision. The standard K wants a filter, a flow control valve, a lubricator and a 3/2 way valve, while the K-LF manages with the three without the lubricator. The choice is in step 04.

Where the K belongs

Plant	Silos and hoppers, pipes, tanks, compacting, vibrating feeders, tables and channels
Material	Hygroscopic or dusty powders and granules: animal feed, aggregates, plastics and foods
Particularly suited to	Coarse grained hygroscopic materials and electrostatic powders in the plastics and recycling sector, which tend to adhere to the inner wall
Typical jobs	Emptying silos and hoppers, big bag emptier, compacting table for powders, filter bag cleaning, pipes and chutes
Sectors	Building and construction, food and feed, heavy industry, machinery and plant, plastics and chemicals, recycling and environmental technology, renewable energy
Not for	Plate above 130 °C: the K does not reach that, and then it is the F or the P. A classified area without an agreed temperature class. And where the material has set hard under pressure and needs a real blow, the pneumatic hammers or the P do the work.

Which size, and may the air be lubricated?

Tell us what the silo or hopper is made of, how thick the steel is, what you handle, and whether oil mist may occur where the unit has to sit. We come back with a size, a version 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/cushioned-piston-vibrators/
Product selector	particulair.eu/flow-aid/en/product-selector/

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