

Pneumatic hammers PS for silos and hoppers

One blow against a welded plate — 8,4 to 153 joules at 3 to 6 bar, without a single hole in the wall.

Flour, detergents, phosphates, fertilizer, lime, cement, clay, pigments. Hygroscopic material clings to the wall and compacts under its own weight, and then making it lighter does not help — it stays where it sits. Air and vibration work on the mass. A hammer works on the wall. The PS charges with compressed air at 3 to 6 bar and delivers one blow: a piston inside the housing strikes a plate welded to the outside of the wall, and the blow travels through the steel and shakes the layer loose. Between 8.4 and 153 joules, depending on size and pressure. Nothing enters the silo, and not one hole has to be drilled — the plate is welded on, and that is the whole installation. Which is why it can also go on a plant that is already running.

Working pressure 3 to 6 bar	Impact energy 8.4 to 153 J	Duty cycle Discontinuous	Temperature -20 to 80 °C	Weight 5.1 to 25.6 kg
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Three ways the material stays behind

A pneumatic hammer solves three things: the bridge over the outlet, the rathole through the middle and the emptying that never finishes. What they have in common is that the material carries its own weight or clings to the steel, and that a layer which has once set does not let go by itself.

Bridge over the outlet

The material compacts under its own weight and spans an arch across the opening. The silo is full, the discharge works in empty space, and nothing comes out.

Rathole through the middle

A narrow shaft runs down through the centre while the rest stands still along the wall. The silo looks like it is emptying, but most of the contents stay put — and get older by the day.

Incomplete clean out

The material does come out, but a layer stays behind on the cone wall and the silo never empties completely. Hygroscopic material clings to the steel, and the layer grows with every batch.

One blow, through the steel

Inside the housing sits a piston. Compressed air at 3 to 6 bar drives it forward, and it strikes a steel plate welded to the outside of the silo wall. That is the whole mechanism: one blow, and then nothing until the next one. The energy runs from 8.4 joules on the smallest at 3 bar to 153 joules on the largest at 6 — and the force from 199 to 2186 newtons. The duty cycle is discontinuous, and that is why the consumption can be so low: the hammer only uses air in the instant it strikes. The timer decides how often, and can be set from 30 seconds to 45 minutes.

What separates a hammer from everything else in the range is where the work is applied. An aerator and an air cannon send air into the material and work on the mass. The hammer sends nothing in. The compressed air stays inside the housing, and what reaches the material is the blow through the steel. That is why it works on what clings to the wall rather than what sits loose in the mass — and why the installation needs no drilling at all. The plate is welded to the wall from the outside, the hammer bolts onto the plate, and that is it. The wall is intact afterwards, which is also why the range can go on a plant that is already running.

It is not quiet, though. The maximum noise level is 125 dB(A), the highest figure in the whole range. It belongs in the planning of where the hammers sit and who works nearby. If noise is what decides the matter, the K and F series sit at 80 dB(A), and if the material is fine and dry, a bin aerator does the job with no impact at all. The air also has to be clean: quality class 5.4.1, with a filter and a flow control valve in the circuit.

Technical specifications

Application	Hopper and silo
Material in the silo	All kinds of powders and granular material, hygroscopic included
Problem solving	Bridge, rat-holing and incomplete clean out
Duty cycle	Discontinuous
Working pressure	From 3 bar to 6 bar (from 43 psi to 87 psi)
Impact energy	8.4 to 153 joules, depending on size and pressure
Impact force	199 to 2186 newtons, depending on size and pressure
Air per blow	2.6 to 21 litres, depending on size and pressure
Pneumatic circuit	Filter and flow control valve
Air supply quality	Class 5.4.1
Working temperature	-20 to 80 °C (-4 to 176 °F)
Max noise level	125 dB(A)
Technology	Single impact
Material	Aluminium body, steel attachment plate and aluminium head
Air inlet	1/8 in BSPP on the PS 40, 1/4 in BSPP on the PS 63 and PS 80. Pipe diameter 8 mm on all three
Ex areas	II3D Ex h IIIC T85 °C Dc, with the ATEX kit
Position	External application, not in contact with the material. The plate is welded to the outside of the wall and the hammer bolts onto the plate

Three sizes, the same build

What separates the three is the size of the blow. D is the length of the housing — the dimensions of the plate depend on whether it becomes type A or type B, and they are further down. Energy and force are one blow, not a value per minute, and the air is what one blow costs.

Model	Energy 3 bar	Energy 6 bar	Force 3 bar	Force 6 bar	Air 3 bar	Air 6 bar	D	Ø pipe	Air inlet
PS 40	8.4	18.1	199	429	2.6	4.6	223	8	1/8"
PS 63	28.8	62.0	589	1268	6.4	11.6	263	8	1/4"
PS 80	59.2	153.0	846	2186	12.5	21	318	8	1/4"

The number in the model name follows the size of the hammer: the PS 40 is the smallest and the PS 80 the largest. The air inlet is 1/8 in BSPP on the PS 40 and 1/4 in BSPP on the other two, and the pipe diameter is 8 millimetres on all three. The letter D is the length of the housing; A and B belong to the flat plate and A1 and B1 to the flared foot.

The plate, the weld and the ATEX kit

The hammer comes with the plate it is going to strike. The plate is welded to the outside of the silo — nothing is drilled — and the hammer bolts onto it. Which plate it becomes is decided by one thing: how thick the steel is in the vessel the hammer is going on.

The plate and the weld · PS 40 · 63 · 80

There are two versions, and the thickness of the steel decides which. If the wall of the vessel is 3 millimetres or thinner, it is type A with the flared foot. If the steel is thicker, it is type B with the flat plate. The plate is welded on from the outside, and that is the whole operation — the wall is intact afterwards.

Type A, wall ≤ 3 mm	A1 160, 200 or 250 mm · B1 80, 95 or 119 mm
Type A, weight	6.7, 15.9 or 25.6 kg
Type B, wall > 3 mm	A 130, 160 or 200 mm · B 20, 20 or 25 mm
Type B, weight	5.1, 13.1 or 20.1 kg
Stainless version	Type B in AISI 304
Material	Housing and head in aluminium, plate in steel

1. The plate is welded to the outside of the silo. No hole is drilled.
2. The hammer bolts onto the plate with four bolts and rubber washers.
3. Type A is used on thin steel, type B on thick.
4. Type B can be supplied in stainless steel AISI 304.
5. The dimensions are given in the order PS 40, PS 63, PS 80.

The ATEX kit · KIT ATEX

If the hammer has to sit in a classified area, it is supplied with an ATEX kit: a polypropylene plate and a WKL tablet. The kit gives category 3D, that is dust zone 22, with temperature class T85 degrees. Note that the category depends on fully pneumatic activation — that is, no coil at the hammer.

Marking	II3D Ex h IIIC T85 °C Dc
Directive	2014/34/EU, category 3D
Zone	Dust zone 22
Contents	Polypropylene plate and WKL® tablet
Condition	Fully pneumatic activation

1. Category 3D covers dust zone 22, not zone 21 and not zone 20.
2. The kit depends on the hammer being fired fully pneumatically.
3. Without the kit the hammer is not marked for classified areas.
4. We obtain the certificate on the individual order.

How many hammers are needed, where they should sit, and whether it becomes type A or type B depends on the dimensions and angle of the cone, the thickness of the steel, what you handle, and what the compressed air can deliver. Tell us, and we come back with a size, a number and the right version.

Where it sits and what it works in

Plant	Silos, hoppers and storage systems
Materials	All kinds of powders and granular material, hygroscopic included. Typically flour, detergents, phosphates, fertilizers, lime, cement, clay and pigments
Other duties	Big-bag emptying and filter cleaning
Benefits	Economical, low air consumption, efficient, multi-voltage, integrated solenoid valve and timer

Sectors	Building and construction, food and feed, heavy industries, plastics and chemical processing, recycling and environment technology, and renewable energies
Ex areas	With the ATEX kit: II3D Ex h IIIC T85 °C Dc, that is dust zone 22

Which size, and how thick is the steel?

Tell us the dimensions and angle of the cone, how thick the steel is, what you handle, and what the compressed air can deliver. 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/pneumatic-hammers/
Product selector	particulair.eu/flow-aid/en/product-selector/

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