

Turbine vibrators for dry material and food

A turbine with integrated masses turning in bearings. Twelve models in four sizes, 2 to 6 bar, up to 781 kilos of centrifugal force, unlubricated air and ATEX category 2 as standard.

Sugar, bicarbonate, phosphate and sodium are dry and granular, and they have to leave the silo without picking up oil. The OT is OLI's turbine vibrator for exactly that. Compressed air at 2 to 6 bar drives a turbine with integrated masses round in bearings, and the air does not have to be lubricated: the circuit is a filter, a flow control valve and a valve, and nothing else. The unit bolts on the outside, and no hole is drilled in the wall. Twelve models from 250 grams to 2.5 kilos, all with ATEX category 2 for both gas and dust.

Working pressure 2 to 6 bar	Centrifugal force 72 to 781 kg	Duty cycle Discontinuous	Working temperature -20 to 120 °C	Weight 0.25 to 2.53 kg
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Two everybody knows, and two that belong to the rotary range

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 what comes next: reducing the friction between the material and the steel, separating material that has lumped together, and packing it down where that is what is wanted. The last one belongs to the OT alone.

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

Fine powders stick to the steel instead of sliding, and they lump together instead of falling apart. A high frequency works exactly there, in the boundary between the material and the surface.

Consolidation

Sometimes the job is the other way round: the material has to pack down, not loosen up. Concrete in a mould has to settle tight, without air pockets and without pores in the surface. It is the only one of the rotary range documented for that.

A turbine with integrated masses turning in bearings

Inside the body sits a turbine with integrated masses. Compressed air at 2 to 6 bar drives it round, and the masses are not evenly spaced: that is why the centre of gravity lies off the axis, and why the rotation produces a force. This is where the OT differs from the ball and roller vibrators. The ball and the roller run free in a hardened track, while the turbine sits in bearings and turns about a fixed axis.

That allows a high rotational speed. An OT8 reaches 42,000 vibrations per minute at 6 bar, and that is the highest figure in the whole programme: no other vibrator gets there. The largest, the OT30, gives 781 kilos of centrifugal force at the same pressure. The noise stays below 90 dB(A), and the temperature limit is 120 °C.

The air does not have to be lubricated. The OT is the only one of the three rotary ranges running on class 5.4.1, so the circuit is three stages instead of four: a filter, a flow control valve and a 3/2 way valve. No oil mist leaves the exhaust, and that is what makes the range usable on sugar, bicarbonate, phosphate and sodium. The body is aluminium, the range has twelve models in four sizes from 250 grams to 2.5 kilos, and all twelve carry ATEX category 2 for both gas and dust as standard. 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	Turbine vibration, high frequency and centrifugal force
Duty cycle	Discontinuous
Working pressure	2 to 6 bar
Centrifugal force	72 to 781 kg, depending on model and pressure
Frequency	6,000 to 42,000 vibrations per minute
Air consumption	45 to 749 l/min
Pneumatic circuit	Filter, flow control valve and 3/2 way valve N.C.
Air supply quality	Class 5.4.1, unlubricated
Working temperature	-20 to 120 °C
Noise level	Below 90 dB(A)
ATEX	II2G Ex h IIB Tx Gb and II2D Ex h IIIC Tx Db, as standard
Material	Aluminium body
Mounting	Foot with four fixing points, bolted on the outside
Connection	1/8", 1/4" or 3/8" BSPP, the same in and out
Weight	0.25 to 2.53 kg

Twelve models in four 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. The three models in one size share every dimension and the whole air consumption.

Model	Frequency	Force 2 bar	Force 6 bar	Air 2 bar	Air 6 bar	A	B	Connection	Weight
OT8	34000-42000	110	292	45	110	50	86	1/8" BSPP	0.25
OT10	26000-38000	105	252	45	110	50	86	1/8" BSPP	0.26
OT10S	17200-26000	72	187	45	110	50	86	1/8" BSPP	0.26
OT13	24500-31000	202	300	122	285	65	113	1/4" BSPP	0.57
OT16	18000-21000	194	264	122	285	65	113	1/4" BSPP	0.58
OT16S	11500-17500	129	234	122	285	65	113	1/4" BSPP	0.61
OT20	14500-23000	251	526	184	452	80	128	1/4" BSPP	1.09
OT25	13200-17000	244	508	184	452	80	128	1/4" BSPP	1.12
OT25S	9000-13500	214	483	184	452	80	128	1/4" BSPP	1.20
OT30	11000-14500	351	781	322	749	100	160	3/8" BSPP	2.20
OT36	8500-12000	341	749	322	749	100	160	3/8" BSPP	2.30
OT36S	6000-8500	406	754	322	749	100	160	3/8" BSPP	2.53

The number in the model name rises with the force and falls with the speed. The width of the body is A, which is also the overall height of the unit including the foot; B is the length of the foot. Both are dimensioned on the drawing in step 02, and the four remaining letters appear both on the drawing and 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 twelve models fall into four body sizes with three in each, and the three share all six dimensions, the thread and the whole air consumption. The models with an S after the number run more slowly than the other two in the same size. If you need a particular combination of speed and force, tell us and we will find the right one of the three. The connection is a BSPP thread of the same size in and out, and the force is the maximum centrifugal force, given in kilograms.

Four things worth looking at before ordering

It is the same mechanism in all twelve: a turbine in bearings. 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 two outer ones are open slots running out to the end, and the two inner ones are round holes. The foot lies against whatever it is bolted to, and the body stands up at right angles to it. It is deeper than on the ball and roller vibrators, because the turbine and the bearings need the room.

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	33 to 73 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 and tightened without taking them out.
2. No hole is drilled in the wall of the vessel.

The connections · IN · OUT

There are two ports in the top face. The air comes in through one and leaves through the other, and the thread is the same at both ends. A silencer sits on the exhaust. The two cast arrows in the front face sit one under each port.

The three smallest	1/8" BSPP
The six in the middle	1/4" BSPP
The three largest	3/8" BSPP
Air supply quality	Class 5.4.1, unlubricated

1. The thread is the same in and out on all twelve models.
2. If you need fittings, tell us and we will confirm which port is the inlet and which is the outlet.

The cover · Ø 0,9 A

The cover closes the bore the turbine sits in, and it therefore fills nearly the whole front face: the diameter of the bore is a good nine tenths of the width of the body. The four holes sit near the rim, evenly spaced.

Bore diameter	0.90 × A
Holes in the cover	Four, near the rim
Body material	Aluminium

1. The cover is one end of the bore. The section in step 02 shows the inside of the one at the other end.
2. If the unit has to sit somewhere the surface finish matters, tell us and we will confirm the execution with OLI.

Four sizes, twelve models · 50 · 65 · 80 · 100 mm

The range is four body sizes with three models in each. The three share all six dimensions, the thread and the whole air consumption, so what separates them is the speed and the force. The ATEX marking is the same on all twelve.

Body width, A 50, 65, 80 and 100 mm

Models per size Three

Weight 0.25 to 2.53 kg

ATEX II2G and II2D, category 2

1. The size decides the room it takes. The model within the size decides the speed and the force.
2. All twelve come with ATEX as standard.

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

Where the OT belongs

Dry and granular materials, food included	The range is meant for dry and granular powders: sugar, bicarbonate, phosphate and sodium. The OT is the only one of the three rotary ranges documented for food and pharmaceutical use.
Where oil mist is not allowed	The air does not have to be lubricated. The circuit is a filter, a flow control valve and a valve, the air quality is class 5.4.1, and no oil leaves the exhaust. That is what separates the OT from the S ball vibrator and the OR roller vibrator, which both want lubricated air.
Silo, hopper, chute and vibrating table	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.
Concrete consolidation	Concrete in a mould has to settle tight. It is the large centrifugal force and the high rotational speed that make the range usable there, and the OT is the only one of the three rotary ranges where consolidation stands as a job in its own right.
Not on hot steel	The temperature limit is 120 degrees, and that is lower than on the other two rotary ranges. Where the steel is hotter, the OR roller vibrator reaches 200 degrees, and so do the adjustable F and the P piston vibrators.
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 the K also comes in a version that runs without lubrication.

Which model, and how many?

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

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Product page particulair.eu/flow-aid/en/products/turbine-vibrators/

Product selector particulair.eu/flow-aid/en/product-selector/

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