AViTEQ
Vibrationstechnik GmbH

Conveying Equipment

GETTING YOUR BULK SOLIDS MOVING

AViTEQ Vibration Technology
WE DRIVE YOUR SUCCESS

For more than 75 years, AViTEQ Vibrationstechnik GmbH has provided oscillating conveyor solutions to almost 350,000 projects. Our extensive experience and vibrating conveyor expertise is evident with our 125 AViTEQ employees worldwide, who are always to support our international client base.

UNSHAKEABLE QUALITY

AViTEQ systems and components feature comprehensive functionalities including: conveying, sorting and dosing, screening, classifying and dewatering, compacting and loosening, cooling and heating of various bulk materials. We provide extremely varied solutions and can apply these functionalities to suit small pills and coffee beans, as well as rocks and metal pieces weighing tons.

Every bulk material has its own special requirements and AViTEQ is most likely experienced with the process, as we have designed systems and components for more than 3,600 bulk materials to date. Endurance tests performed in our technical laboratories and numerous finite element calculations ensure the highest quality of our components and systems. Experience the unshakeable quality of AViTEQ.

AViTEQ Worldwide

AViTEQ Product Portfolio
QUALIFIED PARTNER FOR SYSTEMS AND COMPONENTS

Components

AViTEQ develops, builds and distributes drive components and control systems for vibrating conveyor systems. We also offer 24-hour replacement part support from the spare part warehouse, as well as various repair services (in-house or on-site).

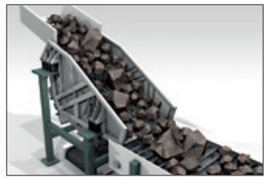

Drive technology

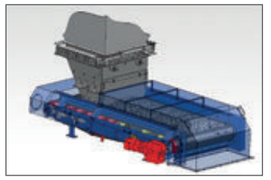

Control technology / Accessories

Systems

AViTEQ plans and realises vibration and process engineering solutions. Furthermore, a comprehensive offer including all-round service is made possible through AViTEQ and AEG.


Conveying technology


Screening technology


Weighing technology


Process technology

CONVEYING TECHNOLOGY

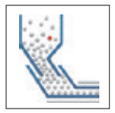
AViTEQ vibrating conveyors – proven technology, tried and tested over decades. These systems do much more than the name suggests: they transport bulk material, feed it continuously or in batches, or meter it. These functions are delivered with dependable German quality and engineering prowess.

AViTEQ Conveyor Systems
QUALITY MADE IN GERMANY

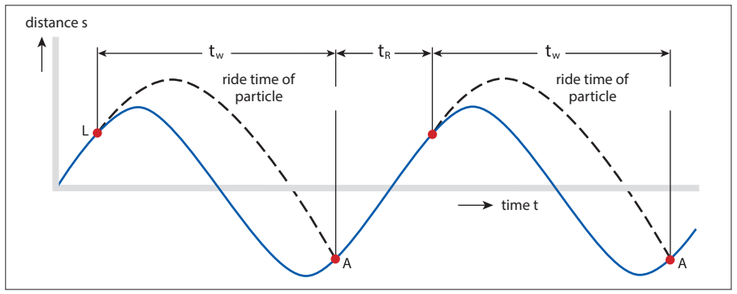
Vibrating conveyors are proven technology, tried and tested with bulk material over decades. They can feed the material continuously or in batches, and can meter it. The conveyor is always custom-built in terms of the design and the materials used. The structure and layout are determined by the intended use, the grain size, the material density and the material behaviour. AViTEQ engineers calculate everything to perfection. There are 75 years of experience to draw upon, as well as a database of more than 3,600 bulk materials and results from countless tests and experiments. Experience shows us what can and cannot be achieved, delivering fast results even in the most challenging applications. That means perfectly tailored conveying technology with durable quality "Made in Germany".

To achieve this goal, AViTEQ optimises every detail during design, development and execution. We target different areas:

- Type of equipment
- Materials and linings
- Sealing systems
- Vibration isolation
- Drive and control technology



DISCHARGING
FEEDING
CONVEYING



L = release point
L* = release point following L
A = landing point
t_w = jump time
t_R = ride time of particle on the trough

THE CONVEYING PRINCIPLE

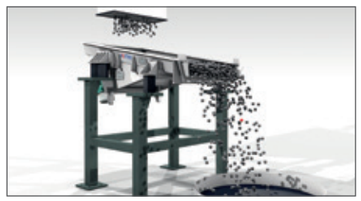
AViTEQ conveying equipment is based on a single conveying principle that has stood the test of time: a vibrating drive accelerates a trough-shaped steel structure in the jump direction, gently moving the bulk material forward in tiny jumps. The transport process is determined by the frequency and amplitude of vibration, the angle of impact and the trough inclination. The drive system is selected on the basis of the conveying length, the performance, the material characteristics and any additional functions.

Conveyor Types

HOPPER DISCHARGE UNIT

Hopper discharge units can perform multiple functions including discharging, transporting and metering. When switched off, they seal off the hopper. They are used under hoppers containing free-flowing bulk material, and are attached to the hopper outlet flange preferably with a decline. Components include a trough conveyor, a discharge chute, a container and a safety closure.

- robust and extremely durable
- length up to 6,000 mm, width up to 2,500 mm
- capacity up to 10,000 t/h



TROUGH CONVEYOR

Trough conveyors are suitable for conveying and metering virtually any kind of free-flowing bulk material. They can be equipped with a stationary (free-standing) or vibrating (attached) cover. They are extremely robust, both wear and caking can be minimised if the right lining is selected.

- robust and flexible design for conveying and metering
- length up to 9,000 mm, width up to 3,500 mm
- capacity up to 1,000 m^3/h

TUBULAR FEEDER

Tubular feeders can cover distances of up to 10 m, and their enclosed design means they are dust-free. They are characterised by their extremely high capacity of up to 100 m^3/h. AViTEQ tubular feeders can transport and meter free-flowing bulk material with a maximum grain size up to 1/3 of the tube diameter.

- dustproof and hygienic
- length up to 9,000 mm, diameter up to 500 mm
- capacity up to 100 m^3/h
- declines and inclines possible

REVERSIBLE TROUGH/TUBULAR CONVEYOR

Reversible conveyors can transport and meter bulk material in opposite directions. Highly accurate metering is possible with reversible trough or tubular conveyors if they are equipped with an AViTEQ magnetic vibrator. This also prevents disruption during motor ramp-up and ramp-down.

- bulk material deflected without mechanical flaps
- length up to 7,000 mm, width up to 1,200 mm
- capacity up to 200 m^3/h

SPIRAL CONVEYOR

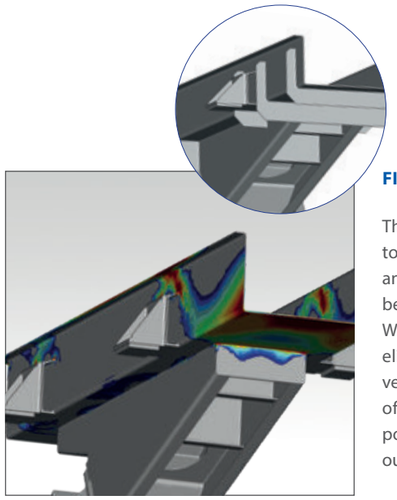
Spiral conveyors transport bulk material vertically. They can be used to carry fine-grained, coarse-grained and lumpy bulk material. Equipment can be added to heat/cool or dry the bulk material as it is transported.

- handles the material gently, saves energy and space
- conveying height 8,000 mm with a spiral diameter up to 1,500 mm
- capacity up to 30 m^3/h

Special-Purpose Equipment from AViTEQ
A TALENT FOR THE SPECIAL THINGS

For decades now, AViTEQ has been designing special-purpose equipment to perform various functions: horizontal or vertical conveying, sorting and metering, distributing free-flowing material across belts or rolls, knocking-out from moulds or compacting concrete mixes. AViTEQ special-purpose equipment is always perfectly suited to every application, however large or small, heavy or lightweight, robust or gentle, hot, abrasive or sharp-edged. Our bulk materials database contains more than 3,600 materials, and is an outstanding resource. AViTEQ engineers use finite element analysis to optimise systems down to the smallest detail.

That is why no two AViTEQ special-purpose systems ever look quite the same. Five basic equipment types are used to create a whole world of optimised and customised special-purpose equipment, which also meets the highest standards in terms of hygiene. But two things always stays the same: perfect function and supreme durability.



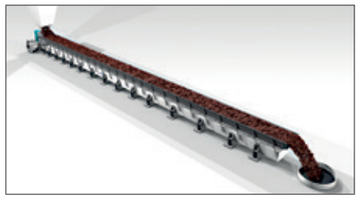
FINITE ELEMENT METHOD (FEM)

The finite element method has proved itself to be an excellent way to improve products and components. AViTEQ, too, recognises the benefits of this modern simulation method. We use it to identify hidden weaknesses and eliminate them. But FEM can do more than verify the reliability of a structure. An analysis often shows where cost optimisation is possible, and we are happy to pass this on to our customers.

BULK MATERIALS DATABASE

About 3,600 different bulk materials, with their principal characteristics, are stored in the AViTEQ bulk materials database – from Aerosil to xanthan, from bauxite to cellulose and quartz powder. The archive also stores the results of tests and experiments, along with vast quantities of empirical data. Our engineers have condensed around 70 years of experience in conveying technology into a single knowledge base of inestimable value.

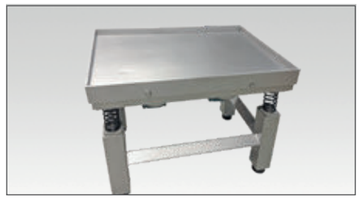
Special-Purpose Equipment



GUIDED ARM TROUGH CONVEYOR

Many industrial production processes handle sharp-edged or hot waste products such as metal shavings, foundry sand or punching waste. They often need to be transported over long distances before they can be disposed of or re-processed. Vibration technology has the edge over belt conveyors, with:

- low height
- transport of hot products
- gentle transport
- long trough
- dustproof design



VIBRATING TABLE

Vibrating tables can be used to compact and also loosen bulk material. There are two different methods: The load to be vibrated is placed in a container, and either left loose on the vibrating table or clamped firmly to the top of the vibrating table.

- for compaction
- lengths up to 4,000 mm
- widths up to 2,000 mm
- loads up to 3,000 kg

STREWING COVER/STREWING PLATE

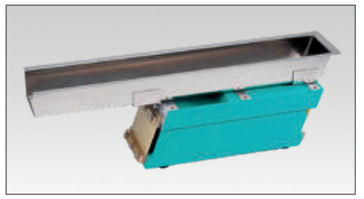
Vibrating strewing units are used to distribute a small quantity of free-flowing material evenly over belts, rolls or surfaces. The size of the equipment depends on the size of the gap, the vibration amplitude and the conveying characteristics of the distributed material.

- high distribution accuracy with magnetic vibrators, food-grade hygienic design available
- distribution width up to 4,000 mm
- distribution performance from 1 to 1,000 litres of material per hour per metre

VIBRATING FLUID BED SYSTEM AND HEAT EXCHANGE EQUIPMENT

AViTEQ heat exchange equipment is used wherever bulk materials have to be cooled, heated or dried. This special-purpose equipment performs the heat exchange function – usually by means of a double base – while transporting the material.

- gentle handling
- optimised and tailored for existing processes
- low wear and virtually maintenance-free
- available in various versions (hygienic, dustproof, explosion protection, etc.)



COMPACT FEEDER

Compact feeders are perfect for discharging, conveying, metering, feeding or distributing fine-grained bulk materials and small parts from storage containers.

- conveying and metering fine-grained bulk materials and small parts
- supplying and storing mass-produced parts
- industry and product-specific solutions
- capacity up to 45 m^3/h, maximum length 2,000 mm with single drives or maximum width 600 mm
- high capacity with small dimensions

PARTS CONVEYOR

Supplying mass-produced parts individually in a particular orientation and within a specified time – this is what AViTEQ parts conveyors do best. They are each designed individually, but use standard components for lower cost and greater reliability.

- sorting, supplying and storing mass-produced parts
- tailored solutions with a pot diameter up to 600 mm
- high capacity with small dimensions

Materials and Linings
PERFECTLY STYLED FOR EVERY APPLICATION

Our vibrating equipment is made of different materials depending on the intended application. S235 JRC structural steel is ideal for most conditions. It is malleable and easy to weld, its resistance to wear is sufficient for most applications, and it is economical.

We use extra strong special steels where increased wear is expected. If there will be contact with foodstuffs, adhesives or aggressive substances, we prefer to use oxidation-resistant chromium-nickel steels such as V2A or V4A. We use heat-resistant steels like Novotherm® for high temperature applications, keeping AViTEQ systems running reliably at maximum temperatures exceeding 900 °C.

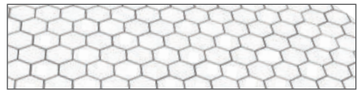
Linings

Structural steel is economical and its characteristics are suitable for most applications. However, the troughs sometimes need extra protection. If so, we give them a second skin specifically for the conditions they will encounter. We use the following lining materials:

Wear inserts made of S235 JRC or hard materials like XAR30, Hardox®, Dillidur®, Creusabro®, manganese steel, ceramic plates (for extreme wear and temperature conditions) or hardfaced composite wear plates like EIPA® or Vautid®.

Applications: abrasive materials like stones, sand or metal parts.

Composite wear plates



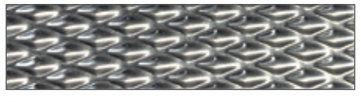
Ceramic lining

Wear-resistant lining made of V2A®

Screw-in inserts made of chromium-nickel stainless steels or plastics like RCH1000®, Kalen® or Teflon®, or glued inserts made of textured metal or rubber. Coating systems may be used in special cases.

Applications: where caking is expected or if there is contact with chemically aggressive material such as molten substances, cement or acids.

Plastic lining

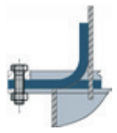


Textured metal

Sealing Systems
KEEPING EVERYTHING RUNNING SMOOTHLY

To get bulk material moving, parts of the equipment are vibrated. So that only the bulk material moves, the vibrating parts are isolated from the stationary parts. To do this, AViTEQ uses a range of sealing systems. As well as damping the vibration, they protect sensitive components from dust. AViTEQ sealing systems are all very different from each other, but they all have two things in common: they are maintenance-free and extremely durable.

The following sealing elements are used in AViTEQ vibrating equipment.

SEAL TYPE	DESCRIPTION	TEMPERATURE	BENEFITS	NOTES
Gasket 	Closed gasket. Secured with metal straps	Depending on selected membrane material -20 to +250 °C Special designs up to +400 °C	Simplest and most cost-effective seal type for round inlets and outlets	Materials used: Trellex®, neoprene and silicone
Rubber lip seal 	Rubber lip seal attached with steel bar	Depending on selected membrane material -20 to +250 °C	Simplest and most cost-effective seal type for square inlets and outlets, limited dust protection around edges	The rubber lip seal is made of a soft rubber material
Bar seal 	Rubber membrane attached with two steel bars	Depending on selected membrane material -20 to +250 °C	Dustproof seal for square and round inlets and outlets	One material widely used for the seal membrane is Trellex®
Seal with snap-on profile 	Sealing membrane attached with rubber profile	Depending on selected membrane material -20 to +70 °C	Dustproof seal for square and round inlets and outlets, quick to assemble/remove	One material widely used for the seal membrane is Trellex®
Compensator 	Compensator with cut-outs, attached with flanges	Depending on selected compensator material -70 to +250 °C	Completely dustproof seal for square and round inlets and outlets	Pressure-resistant up to around 0.5 bar

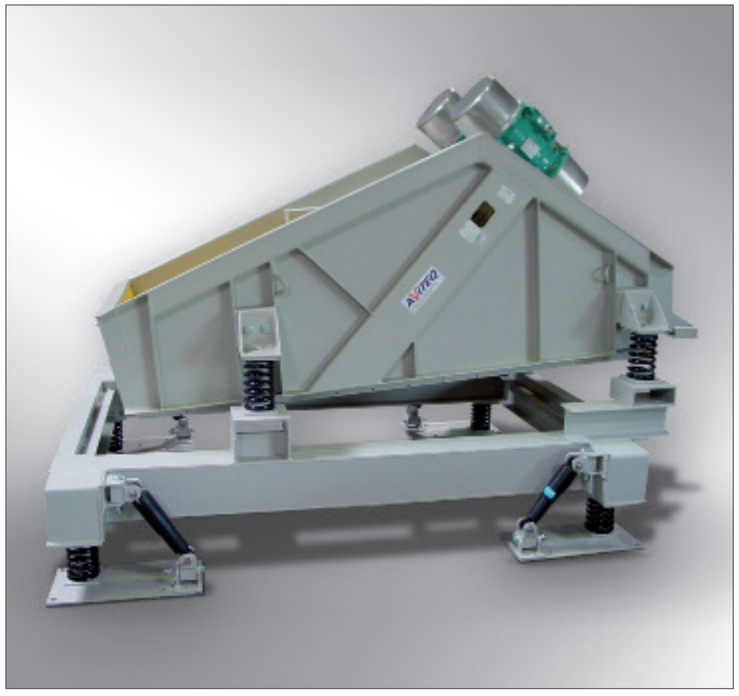
Vibration Isolation
HARD ON THE OUTSIDE, SOFT ON THE INSIDE

The support and suspension elements of a vibrating conveyor perform two functions:

- they absorb the loads
- they dampen the vibrations

Whereas rigidity and stability are needed to absorb the loads, vibration damping requires flexibility. The aim is to transfer the least possible dynamic forces to the supporting framework, the hopper or the building structure It is particularly important to ensure that the resonant frequency of these surrounding structures is different from the working frequency of the vibrating conveyor.

That is why AViTEQ vibrating equipment can be equipped with various different support or suspension elements. Each of them has particular characteristics and benefits.



Vibrating equipment with isolating frame

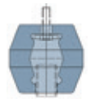
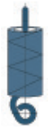
Pressure spring

Rubber buffer

Articulated rubber supports

Pneumatic element

Vibration Isolation
SUPPORT AND SUSPENSION EQUIPMENT

SUPPORT TYPE	DESCRIPTION	VIBRATION FREQUENCY	TEMPERATURE	BENEFITS
Rubber buffer 	Support with rubber buffer under compression Trough position precisely fixed	50 to 60 Hz	-20 to +80 °C	Simplest type of support, trough position securely fixed even during system startup and shutdown, minimal travel
Suspension with rubber buffer under compression 	Suspension with rubber buffer under compression Trough position not precisely fixed	50 to 60 Hz	-20 to +80 °C	Simple suspension to hopper or ceiling, height of trough adjustable
Hollow rubber buffer 	Support with hollow rubber buffer under compression Trough position precisely fixed	25 to 40 Hz	-20 to +80 °C	Simplest type of support, trough position securely fixed even during system startup and shutdown
Hollow rubber buffer with suspension 	Suspension with hollow rubber buffer under compression Trough position not precisely fixed	25 to 40 Hz	-20 to +80 °C	Simple suspension to hopper or ceiling, height of trough adjustable
Tension springs 	Suspension with coil springs under tension Trough position not precisely fixed	12.5 to 60 Hz	-40 to +200 °C Special design up to +300 °C	Flexible suspension, good vibration isolation, also suitable for high-temperature materials
Compression springs 	Support with coil springs under compression Trough position precisely fixed, high strength	12.5 to 60 Hz	-40 to +200 °C Special design up to +300 °C	Flexible support, good vibration isolation, also suitable for high-temperature materials
Compression spring suspension	Suspension with coil springs under tension Trough position not precisely fixed, high strength	12.5 to 50 Hz	-40 to +200 °C Special design up to +300 °C	Simple suspension to hopper or ceiling, height of trough adjustable
Articulated rubber supports 	Support with oscillation mountings Trough position precisely fixed	12.5 to 25 Hz	-40 to +80 °C	High self-damping, no swaying as with coil springs. No torsional movement in the conveying direction, large vibration amplitudes possible
Pneumatic elements 	Support with pneumatic spring element Trough position precisely fixed, low compressed air requirement	12.5 to 60 Hz	-20 to +80 °C	Precise height adjustment by modifying air pressure. Effective noise reduction, large vibration amplitudes possible, very good vibration isolation

Drives – Magnetic Technology
SUPREME MUSCLE PACKS

The principle behind AViTEQ vibrating conveyors is the uniquely gentle way they handle material. This is also the key to the solid quality and durability. In a trough-shaped steel structure, the material is accelerated by a vibrating drive and moved in the jump direction. This inches the bulk material forward in tiny jumps. It spends most of the time in the air, not even touching the equipment. The transport process depends on three factors:

- the vibration frequency
- the vibration amplitude
- the angle of impact and the trough inclination

The vibration frequency and vibration amplitude are strongly dependent on the selected drive system. There are other factors involved in selecting the best drive, controller and design, such as the conveying length, the performance and the material characteristics. If conveying equipment is expected to perform several functions, the choice of drive must take this into account too. There are two different approaches – magnetic vibrators and unbalanced technology.

Magnetic Vibrators

AViTEQ magnetic vibrators are continuously adjustable. They work at 100% capacity as soon as they are switched on, and when they are switched off they stop the flow of material in fractions of a second.

They are suitable for volumes of a few kg/h to several thousand t/h, and have an impressive service life even with a large number of operating cycles.

TECHNICAL CHARACTERISTICS

Vibration frequency: 25, 33, 50, 100 Hz in a 50 Hz network
30, 40, 60, 120 Hz in a 60 Hz network

Capacity: from a few kg/h to more than a thousand t/h

Working weight: 2.5 – 1,800 kg

Mains frequency: alternating current (50 or 60 Hz)

Mains voltage: 230, 400, 500 V / 220, 380, 440, 480 V
(special voltages available on request)

Ambient temperature: -20 °C to + 40 °C
(lower and higher temperatures possible)

Standard protection*: IP 55 to DIN EN 60529
Optional: tropic-proof insulation, special coating, external ventilation, thermal switch (on request)

* different protection with different types of magnetic vibrator

OUR SAFETY STANDARDS

Controllers – Magnetic Technology
INTELLIGENT CLOCK GENERATORS

To keep your drives running longer, AViTEQ has a full range of controllers. These modules are not just suitable for our own components – they also work perfectly with drives from other manufacturers. Even though the standard controllers are highly versatile, they can be optimised with a range of optional equipment.

Voltage-controlled controllers designed for current consumption up to 100 A and for soft starts. Mains voltage fluctuations are compensated and have little effect on capacity.

TECHNICAL CHARACTERISTICS	SRA(E)...	SC(E)...	SA(E)...	SD(E)...
Vibrator current, maximum	6 A	15 A	25 or 43 A	25, 50 or 100 A
Mains voltage in 50/60 Hz networks Special voltages available on request	105...115 V	220...240 V	220...240 V[1]	220...240 V[1]
	220...240 V	380...420 V	380...420 V	380...420 V
		440...480 V	440...480 V	440...480 V
		500...520 V	460...500 V	480...520 V
Vibration frequency in 50 Hz network	50 or 100 Hz	25 or 50 Hz	25, 33 or 50 Hz	25, 33 or 50 Hz
Vibration frequency in 60 Hz network	60 or 120 Hz	30 or 60 Hz	30, 40 or 60 Hz	30, 40 or 60 Hz
Signal processing	analog	analog	analog	digital
Voltage control	+	+	+	+
Vibration amplitude control with collision monitoring			+	
Limiting control with collision monitoring				+
Effective vibration amplitude control			+	+
Temperature monitoring for magnetic vibrator directly connectable			+	+
External reference variables directly connectable (0-10 VDC, 4-20 mA and 0-20 mA)	+	+	+	+
Set value switchable between potentiometer (local) and external reference variable	(+)[2]	+	+	+
Vibration amplitude approximately proportional to setpoint	+	+	+	+
External actual value display connectable			+	+
Open frame version (E), height x width x depth [mm]	125 x 112 x 102	200 x 62 x 190	200 x 230 x 140	388 x 150 x 350
Version with housing (standard), height x width x depth [mm]	170 x 120 x 92	300 x 300 x 210	300 x 380 x 155 (25A) 380 x 380 x 210 (43A)	600 x 380 x 350

+ = integrated [1] 25 A version [2] Only possible for 0-10 V DC.

Drives – Unbalanced Technology
POWERFUL ENDURANCE RUNNERS

AViTEQ unbalanced drives are particularly suited to continuous material transport over long distances. Unbalanced motors, unbalanced exciters and slider-crank mechanisms are all characterised by high performance, low-cost running and high reliability and durability. AViTEQ drives are easy-going when it comes to mains frequency, so they are happy to be plugged into 50 and 60 Hz networks.

TECHNICAL CHARACTERISTICS	Unbalanced motors	Unbalanced exciters
Centrifugal force range	40 – 119,000 N	28,000 – 424,000 N
Torque	0.08 – 2,763 kgcm	
Working weight	1 – 11,250 kg	900 – 20,000 kg
Rate power consumption	0.03 – 10,000 W	1.8 – 90,000 W
Ambient temperature	-20 °C – + 40 °C/+ 55 °C	-20 °C – + 50 °C*
Mains connection	Three-phase/AC (50 or 60 Hz)	Three-phase (50 or 60 Hz)
	All common voltages up to 690 V	All common voltages up to 690 V
Synchronous speed in 50/60 Hz networks	750 / 900 min^{-1}	750 – 1,500 min^{-1}
	1,000 / 1,200 min^{-1}	
	1,500 / 1,800 min^{-1}	
	3,000 / 3,600 min^{-1}	
Safety standards (optional)	IP66 (DIN EN 60529) tropic-proof insulation, ATEX Zone 21 and 22, Explosion protection for ATEX Zone 1 and 2	IP66 (DIN EN 60529) ATEX protection, CSA version only for stationary motor

* Different design and alternative drives (e.g. slider-crank mechanisms) on request.

Controllers – Unbalanced Technology
INTELLIGENT CLOCK GENERATORS

Specially designed control systems from the AViTEQ VIBTRONIC® range ensure that our vibrating conveyors with unbalanced drive will keep working perfectly over a long service life. You can choose from two controller types depending on the required function:

Our braking units (braking block or braking unit) brake the unbalanced drives when the equipment is switched off. They are used if short stop times are needed. AViTEQ braking systems will work everywhere: controlled or uncontrolled, with or without PTC thermistor protection and as an open-frame version or with housing. Our solutions are tailored and can be equipped with lateral vibration monitoring as an option.

AViTEQ speed controllers (frequency converter or speed controller) are used for continuous adjustment of capacity during operation. The capacity can be adjusted from 40 to 100% of the nominal performance. In addition, they are not sensitive to high inrush currents. This is one of the characteristic features of AViTEQ speed controllers.

TECHNICAL CHARACTERISTICS	Braking block	Braking unit	Frequency converter	Speed controller
Vibrator current, maximum	6 A	15 A	25 or 43 A	25, 50 or 100 A
Mains voltage in 50/60 Hz networks Special voltages available on request	105...115 V	220...240 V	220...240 V[1]	220...240 V[1]
	220...240 V	380...420 V	380...420 V	380...420 V
		440...480 V	440...480 V	440...480 V
		500...520 V	460...500 V	480...520 V
Vibration frequency in 50 Hz network	50 or 100 Hz	25 or 50 Hz	25, 33 or 50 Hz	25, 33 or 50 Hz
Vibration frequency in 60 Hz network	60 or 120 Hz	30 or 60 Hz	30, 40 or 60 Hz	30, 40 or 60 Hz
Signal processing	analog	analog	analog	digital
Voltage control	+	+	+	+
Vibration amplitude control with collision monitoring			+	
Limiting control with collision monitoring				+
Effective vibration amplitude control			+	+
Temperature monitoring for magnetic vibrator directly connectable			+	+
External reference variables directly connectable (0-10 VDC, 4-20 mA and 0-20 mA)	+	+	+	+
Set value switchable between potentiometer (local) and external reference variable	(+)[2]	+	+	+

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