

## ON-LINE MANUAL

### Vibrator Description

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#### 5. Description of FINDEVA vibrators

##### 5.2. The Vibrator's Design

The FINDEVA vibrator housings are machined out of extruded aluminum alloy. There are two standard forms, one for the FP-Piston Vibrator series and the other for the Ball-, Roller- and Turbine-Vibrator series.

The FP-Piston Vibrator series are available in four different piston diameters (12, 18, 25 and 35 mm) and three force levels (small, medium and large).

The other vibrator series are available in five different profile sizes: P-50, P-65, P-80, P-100 and P120 where the number indicates the main body dimensions in millimeters. The Golden Turbine Black Beauties GT-4 and -6 are machined out of a P-40 profile. Like the FP-series some other vibrators types are available in two or three force levels. For example the Golden Turbine profile type 80 is available with one brass unbalance weight (named GT-30), with two brass unbalance weights (named GT-36) or with two heavy metal unbalance weights, which has the best weight to force ratio, (named GT-36-S).

##### 5.3. The Ball Vibrator K-Series



[Click here for dimensions and performance specifications](#)

This is the simplest version of all vibrators and has been used for half a century. A steel ball driven by air rotates on hardened steel races and creates unbalance and vibration in a sinusoidal energy wave.

The rotating frequency varies from 7,000 to 35,000 r.p.m. depending on the model and pressure supplied. The centrifugal force varies from 130 N up to 4,000 N, and the air consumption changes accordingly.

###### 5.3.1. Description

The body is made out of extruded aluminum alloy fitted with hardened steel races. The steel ball is extremely durable. Nylon end plates are located on either side to keep dust and water out and to contain the ball.

Air pressure inlet and exhaust ports have standard pipe threads, allowing the exhaust air to be piped away, ensuring that no restriction is imposed on exhaust air.

The pipe thread is BSP (British Standard Pipe) but will accept the US NPT (National Pipe Thread).

Four mounting holes are provided, two vertically and two horizontally, for handling difficult mounting positions.

The K indicates the ball series and the number stands for the diameter of the ball in millimeters.

The maximum ambient operating temperature is 100°C (220°F).

The noise level range is 75 to 95 dBA with silencer.

### 5.3.2. Applications

The K-Series Ball Vibrators can be used in various applications including the following:

- Assisting the flow of material from bins, chutes and hoppers
- Excellent performance in packing machinery industries
- Preventing bottles and similar objects from locking together and blocking conveyor systems
- Compacting materials in containers or molds
- Separating various sizes of materials on screens

### 5.3.3. Installation / Operation

Please refer also to Chapter 6 for general information.

You can place the vibrator in any mounting position. The centrifugal force created when the air pressure is applied will cause the ball to immediately find its correct path on the race.

NOTE: If the vibrator is mounted with its rotary axle in a vertical position, the lower end cap will hold the ball as long as no air pressure is applied. As soon as air pressure is applied the ball will rotate on its races and not move along the end plate any more.

The ball vibrators can be operated intermittently without losing their effectiveness or causing other difficulties since the vibration stops immediately after pressure is cut. Therefore, it is very useful in packing machinery industries.

Lubrication is not required, but only clean (filtered) air should be used because dirt will cause the ball to jump and dent the ball's race.

### 5.3.4. Keywords

Type:	Ball vibrator
Frequency :	Medium to high

<b>Unbalance Weight:</b>	Ball (Type number is diameter in mm)
<b>Lubrication :</b>	Not necessary
<b>Air Supply :</b>	2 to 6 bar (30 to 90 PSI)
<b>Air Type :</b>	Clean, use of filter (40 µm) recommended
<b>Body :</b>	Aluminum, stove-enamelled cream-grey
<b>End Caps :</b>	black Nylon, self retaining
<b>Ambient Temperature :</b>	100°C = 220°F
<b>Noise Level Range :</b>	75 to 95 dBA with silencer

## 5.4. The Roller Vibrator R-Series



[Click here for dimensions and performance specifications](#)

This version is as simple as the ball vibrator. A steel alloy roller rotates on a cast iron liner delivering very high centrifugal forces.

The rotating frequency varies from 10,000 to 36,000 r.p.m. depending on model and air pressure supply. The centrifugal force varies from 1,070 N up to 12,500 N with an increase of air consumption accordingly.

### 5.4.1. Description

The vibrator body is machined from an extruded aluminum alloy section, inside of which a precision steel roller rotates. It is retained by two special high impact plastic end plates.

For easy mounting the housing has four holes, two horizontal and two vertical.

Air is introduced through one of the two inlet ports on top or on the right hand side of the housing. These inlet ports are tapped with standard pipe thread, and a sealing screw is provided for sealing the one not used.

The pipe thread is BSP (British Standard Pipe) but will also accept US NPT (National Pipe Thread).

The air is pressed through an air compression groove and exits into the roller chamber through a number of jets spread over the liner. This guarantees a silent, continuous and economic operation.

The air is exhausted through the special high impact plastic end plates, designed with an air silencer.

The R indicates roller series and the number is the dimension of the square body (without legs) in millimeters.

The maximum ambient operating temperature is 140°C (280°F)

The noise level range is 75 to 100 dBA.

### 5.4.2. Applications

The R-Series Roller Vibrators are to be used in the following application areas :

- Emptying bins, chutes and hoppers with very fine materials, such as powder, or humidified materials, such as hummus or jelly
- Moving of fine powders
- Agitation of small particles
- Compacting plastic cast and concrete in molds

### 5.4.3. Installation / Operation

Please refer also to Chapter 6 for general information.

You can place the vibrator in any mounting position, but we do recommend that you place the vibrator so that its rotative axle is horizontal because otherwise the roller moves along one of the end plates and will wear out relatively quickly.

The roller vibrators can be operated intermittently without losing effectiveness or causing other difficulties since the vibration stops immediately after air pressure is cut. Therefore, it is very useful in the concrete industry to calculate accurate compaction times.

Lubrication is required. One drop per five minutes is sufficient. Only filtered, clean air only (40 µm Filter is sufficient) should be used because dirt will cause the roller to jump and dents or cracks in the cast iron liner will result.

Please make sure that hydraulic oil ISO VG5 with 5 cSt/40°C is used. Any other viscosity will cause the unit to clog or reduce the vibrating frequency and power.

### 5.4.4. Keywords

<b>Type :</b>	Roller vibrator
<b>Frequency :</b>	Medium to high
<b>Unbalance Weight :</b>	Steel alloy roller
<b>Lubrication :</b>	Necessary, approx. 1 drop/5 minutes
<b>Air Supply :</b>	2 to 6 bar (30 to 90 PSI)

<b>Air Type :</b>	Clean, use of filter (40µm) recommended
<b>Body :</b>	Aluminum, stove-enamelled blue
<b>End Caps :</b>	Threaded high impact Grastin end caps One left, the other right hand thread
<b>Ambient Temperature :</b>	140°C = 280°F
<b>Noise Level Range :</b>	75 to 100 dBA

## 5.5. The Roller Vibrator DAR-Series



[Click here for dimensions and performance specifications](#)

The DAR-series roller vibrators complement our existing range of roller vibrators and are especially suited for concrete applications. The new design features provide a more robust vibrator, suitable for use under the most arduous conditions.

The rotating frequency varies from 8,000 to 38,000 r.p.m. depending on model and air supply pressure. The centrifugal force varies from 1,700 N up to 12,000 N. The vibration amplitude is extremely large compared to the other series.

### 5.5.1. Description

The vibrator housing is machined from an aluminum alloy profile, inside of which a precision cast iron roller rotates in high tensile steel races. It is retained by two high impact special bronze end plates.

The housing has two mounting holes.

The air inlet port and the exhaust port are tapped with standard pipe thread. The pipe thread is BSP (British Standard Pipe) but will accept US NPT (National Pipe Thread).

For optimal performance, silencers of sintered bronze should be used to improve exhausting.

The DAR indicates the heavy roller series and the number (2 to 7) is a running number.

The maximum ambient operating temperature is 200°C (400°F).

The noise level range is 75 to 100 dBA with silencers.

## 5.5.2. Applications

The DAR-series roller vibrators provide a new approach in compacting and moving fine heavy materials. Examples of their uses include:

- Compacting concrete and plastic in molds
- Assisting the flow of material from chutes and hoppers
- Separation of various sizes of material on screens

## 5.5.3 Installation / Operation

Please refer also to Chapter 6 for general information.

The vibrator should be placed so that its rotative axle is horizontal in order to avoid friction between roller and end plates that would prematurely wear out the end plates.

The DAR-vibrator can be operated intermittently without losing efficiency or causing other difficulties since the vibration stops immediately after air pressure is cut. Therefore, it is very useful in the concrete industry to calculate accurate compaction times.

Lubrication is required. One drop per five minutes is sufficient. In addition, only filtered, clean air (40 µm filter is sufficient) should be used. Dirt will cause the roller to jump and dents or cracks in the steel races will result.

Please make sure that hydraulic oil ISO VG5 with 5 cSt/40°C is used. Any other viscosity may cause the unit to clog or reduce the vibrating frequency and power.

## 5.5.4. Keywords

<b>Type :</b>	DAR-roller vibrator
<b>Frequency (Object) :</b>	Low to medium
<b>Unbalance Weight :</b>	Cast iron roller
<b>Lubrication :</b>	Necessary (Oil ISO VG5 = 5cSt/40°C)
<b>Air Supply :</b>	2 to 6 bar (30 to 90 PSI)
<b>Air Type :</b>	Clean, use of filter (40µm) recommended
<b>Body :</b>	Aluminum, stove-enamelled orange
<b>End Caps :</b>	Bronze, threaded (Left and right hand)
<b>Ambient Temperature :</b>	200°C = 400°F
<b>Noise Level Range :</b>	75 to 100 dBA with silencer

## 5.6. The Golden Turbine Vibrator GT-Series



[Click here for dimensions and performance specifications](#)

A low to high speed range and eccentric working moments are combined in this vibrator series to produce a powerful vibration.

The rotating frequency varies from 5,600 to 46,000 r.p.m. depending on model and air supply pressure. The centrifugal force varies from 1,000 up to 12,000 N.

### 5.6.1. Description

The vibrator body is made from an extruded aluminum alloy profile, and the threaded end plates are hard coated so that the vibrator can be used in the food and pharmaceutical industries.

The GT-Turbine vibrators conform to current international noise regulations under factory test conditions.

The vibration is produced by the centrifugal force of the positive and negative unbalance weights in the rotor. The rotor is supported on two heavy duty, prelubricated, matching shielded ball bearings. A special long life grease ensures a long working life.

Air pressure inlets and exhaust ports have BSP thread (British Standard Pipe) but will accept US NPT (National Pipe Thread).

The inner and outer raceways of the bearings are designed so that the bearings can be easily replaced using only a pin-wrench.

The end-plates are fitted with right- and left-hand threads and are self-locking.

### 5.6.2. Applications

The GT-series Golden Turbine Vibrators are used for a wide range of applications including the following:

- Assisting the flow of material from bins, hoppers and chutes
- Compaction of silica sand in moulds of foundries

Due to its low noise level it may be used instead of all other vibrator types where there are low noise requirements. It can also be used wherever no lubricated air pressure is available.

### 5.6.3. Installation / Operation

Please refer also to Chapter 6 for general information.

The Golden Turbine Vibrator can be placed in any position, but in order to increase its lifetime the vibrator should be operated ,whenever possible, with the rotor axle horizontal so that the ball bearings do not get side pressure.

Intermittent operation is not suggested since when air pressure is cut down, the rotor will continue running for about ten seconds. Thus, it should only be operated intermittently if the off time is more than 10-20 seconds.

Lubrication is not required, but an air line filter should be used to prevent dirt from clogging the silencer.

#### 5.6.4. Keywords

Type :	GT - Golden-Turbine vibrator
Frequency :	Low, Medium, High
Unbalance Weight :	Aluminium Rotor with positive and negative unbalance (brass or heavy metal)
Lubrication :	not necessary
Air Supply :	2 to 6 bar (30 to 90 PSI)
Air Type :	Clean, use of filter (40 µm) recommended
Body :	Aluminum, stove-enamelled yellow
End Caps :	Aluminum, black anodized, threaded
Ambient Temperature :	120°C = 250°F
Noise Level Range :	60 to 75 dBA with silencer

#### 5.7. The Turbine Vibrator T-Series



[Click here for dimensions and performance specifications](#)

A low speed range and large working moments are combined in these vibrators to produce a powerful vibration with a high amplitude.

The rotating frequency varies from 6,500 to 23,000 r.p.m. depending on model and air supply pressure. The centrifugal force varies from 600 N to 6,000 N.

### 5.7.1. Description

The vibrator housing is machined from an aluminum alloy profile which is tempered and hard anodized. It is chemically resistant and suitable for use in the food and pharmaceutical industries.

The LP-vibrators (Low Pressure) work most economically between 2 and 4 bar (30 to 60 PSI) while the HP-vibrators (High Pressure) show best results between 4 and 6 bar (60 to 90 PSI). In this range the frequency of vibration can be varied by regulation of the air pressure, thus enabling the vibrator to be tuned to suit the application.

The housing has two mounting holes.

The air inlet port and the exhaust port are tapped with BSP thread (British Standard Pipe) but will accept US NPT (National Pipe Thread) as well.

The maximum ambient operating temperature is 140°C = 280°F.

These pneumatic turbine vibrators have a relatively low noise level range of 65 to 80 dBA. The noise level measured in the proximity of the silencer may be reduced in half when an exhaust hose is used.

### 5.7.2. Applications

The T-series turbine vibrators are used in a wide field of applications including the following:

- Emptying bins and hoppers
- Compacting materials in molds
- Separation of materials

### 5.7.3. Installation / Operation

Please refer also to Chapter 6 for general information.

The vibrator should be mounted so that its rotative axle is horizontal to avoid side pressure to ball bearings, thus increasing its lifetime.

Intermittent operation is not suggested since when the air pressure is cut down, the rotor will continue running for about ten seconds. Only when the OFF-time is more than about 20 seconds is it advisable to operate intermittently.

### 5.7.4. Keywords

<b>Type :</b>	T-Turbine vibrator
<b>Frequency :</b>	Low to Medium

<b>Unbalance Weight :</b>	Aluminum/Brass Rotor
<b>Lubrication :</b>	Necessary (Oil ISO VG5 = 5 cSt / 40°C)
<b>Air Supply :</b>	2 to 6 bar (30 to 90 PSI)
<b>Air Type :</b>	Clean, use of filter (40 µm) recommended
<b>Body :</b>	Aluminum, black anodized
<b>End Caps :</b>	Plastic endcap with thread on one side and nylon endplate
<b>Ambient Temperature :</b>	140°C = 280°F
<b>Noise Level Range :</b>	65 to 80 dBA with silencer

## 5.8. The Piston Vibrator FP-Series



[Click here for dimensions and performance specifications](#)

The FP-series pneumatic piston vibrators produce a linear vibration with an infinitely variable amplitude and frequency. The frequency is controlled by the air pressure.

The frequency varies from 2,400 to 9,300 v.p.m. depending on model and air supply pressure. The linear force varies from 34 N to 1,060 N.

The FP-series vibrators are non impacting so the piston does not hit the socket, but rather stops on an air cushion formed in the respective chamber (socket or end cap side). The force/time curve is therefore relatively sinusoidal without peaks. This feature is excellent whenever parts have to be moved.

### 5.8.1. Description

The aluminum body is hard coated and corrosion resistant. The power-to-weight ratio of the unit makes it particularly efficient for feeder applications. Explosion proof, light weight, compact, quiet and efficient, these units are ideal for most applications. They are easy to install and designed to work continuously under the most arduous conditions. Servicing requirements are minimal.

The housing has a metric thread in the aluminum socket so the vibrator can be easily mounted. The air inlet port in the body as well as the exhaust port in the end cap are tapped with BSP thread (British Standard Pipe)

but will accept US NPT (National Pipe Thread) as well.

The maximum ambient operating temperature is 50°C = 120°F

Piston vibrators with aluminum end cap may be operated at higher temperatures, but the vibration power will decrease due to increased leakage.

The noise level is extremely low, from 57 to 74 dBA.

### 5.8.2. Applications

The FP-series piston vibrators are used mainly for feeding materials mounted on chutes, spiral chutes and channels :

- Feeding of chemical powder in tube channels
- Feeding of flour, sugar, etc. in the food industry
- Feeding of small parts into machines
- Feeding of seed and grain in the flower and vegetables industries

### 5.8.3 Installation / Operation

Please refer also to Chapter 6 for general information.

The FP-piston vibrator can be placed in any position.

An air line filter with five micron ( 5 µm ) is required to keep dirt from entering and blocking the piston.

A lubricator filled with oil (ISO VG5 = 5 cSt/40°C) or distilled water should be used to avoid abrasion.

Although intermittent operation is possible without lubrication if the operation factor is less than 20%, we do strongly recommend that you always lubricate.

Please note that when mounted in upright position it will take up to two seconds for the piston to move back to its end position after the air pressure is cut down because the piston has to move air out of the housing with the help of the starter spring. If the vibrator will be operated intermittently, the starter spring should be turned to the upper side so that gravity supports the spring.

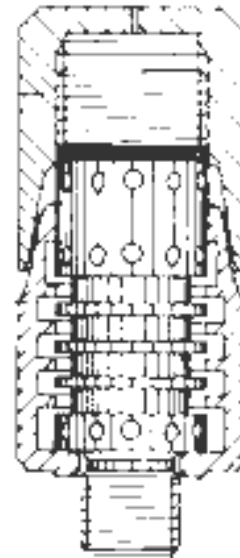
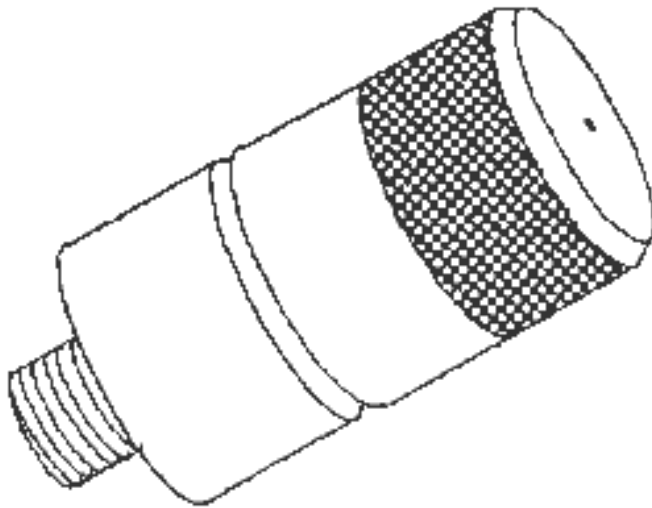
Please also refer to Chapter 7.2 section 1 and 7.3.6.

### 5.8.4. Keywords

<b>Type:</b>	Piston vibrator
<b>Frequency:</b>	Low
<b>Unbalance Weight:</b>	Bronze Piston

<b>Lubrication:</b>	Necessary (Oil ISO VG5 = 5 cSt/40°C or distilled water)
<b>Air Supply:</b>	2 to 6 bar (30 to 90 PSI)
<b>Air Type:</b>	Clean, 5 µm filter required
<b>Body:</b>	Aluminum, block anodized and teflonized
<b>End Cap :</b>	Aluminum socket with metric mounting thread plastic or aluminum end cap
<b>Ambient Temperature:</b>	50° C = 120° F
<b>Noise Level Range:</b>	57 to 74 dBA with silencer (FF-type)

### 5.8.5. Silencer / Flow Restrictor



Free Flow silencer FF-type

The exhaust air flow of rotary vibrators is continuous, and ordinary filter type silencers may be used. Due to the operating principle, the air is exhausted in waves.

The exhaust from piston vibrators is given off in pulsating puffs. The principle of the FF-silencer suits the need for a special silencer by regulating the flow of exhaust.

The FF-type silencer (FF = Free Flow) employs the principle of diffusion using a flow labyrinth and eliminates the clogging problems encountered with conventional filter type silencers.

The silencer also incorporates a flow restrictor which makes it possible to select and hold a given amplitude.

The 1/4" Free-Flow silencer can be fitted either on the vibrator or positioned as remote control device.

The FF-silencer fits the FP-25 and FP-35 series. For FP-12 and FP-18 series standard silencers can be used.

By correct adjustment of the flow restrictor the dB value can be reduced by up to 50%.

The Free-Flow silencers are machined from black acetal resin POM.

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