

Operating instructions for the bunker and dosing channel



Types : BVB-D/30
BVB-D/50
BVB-D/100
BVB-D/150
BVB-D/200
i.a.

Drive typ : Direct drive

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General Information

Symbols



Notice

This icon marks notes, which contain information for proper operation.



Attention

This symbol is found in all safety instructions in this manual, where there is danger to life and limb in front of people. These notes and behave in such cases special care. Pass on all occupational safety tips to other users. In addition to these instructions, the general safety and accident prevention rules are considered.

Introduction

This information should be read by those understood and complied with in all respects responsible for the machine.

This manual should always be kept near the machine.

A careful reading of this manual is particularly important, as the producer for damage or disruption, which result from the failure to observe the operation, no liability.

This manual, technical changes designed to improve or technical progress is reserved.

Application and use

The device is designed only to be described in this document functions and services. Any other use is considered improper. Shall not be liable for damages resulting from the manufacturer. The risk is on the user.

Non-observance of the warranty!

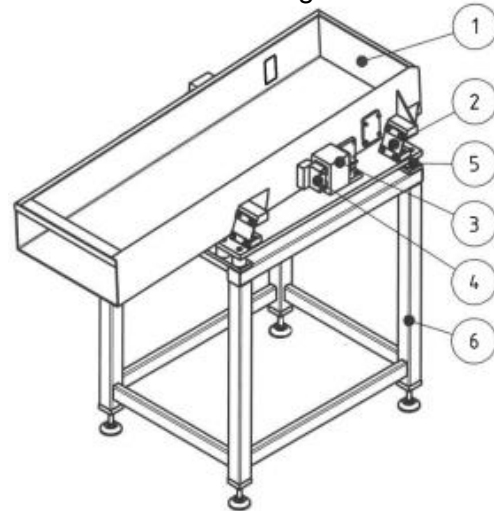
Structure and function description

The emptying process of the BVB-D bunker and dosing chute is based on the micro throw principle and is driven directly with the help of oscillating magnets.

The electromagnetically generated vibrations are converted into mechanical vibrations and these are used for the linear conveying of workpieces.

The basic structure of the bunker and dosing chute consists of the following elements:

- Pos. 1 = Conveyor rail/bunker trough
- Pos. 2 = Spring bracket
- Pos. 3 = Oscillating magnet
- Pos. 4 = Anchor
- Pos. 5 = Vibration mounts
- Pos. 6 = Frame



If the magnet that is permanently connected to the counterweight, electricity is supplied, it produces a force that attracts the armature, depending on the resonant frequency of the network and releases.

Because the armature is connected to the conveyor track (Bunker trough) in a fixed, does this also with the haunting movement. This raises the conveyed, from due to the angle of the leaf springs and the slope angle of the spiral, at every vibration of the conveyor belt and carries out little jumps in the direction perpendicular to the leaf spring plane.

In a period of 50 Hz AC system, the magnet reached twice its maximum tension, since it is independent of the direction of current flow. The magnet thus generates an oscillation frequency of 100 Hz.

For heavier or larger workpieces it is advisable to use a resonant frequency of 50 Hz. Here, a half wave of AC current through a diode or a thyristor is blocked.

This is used for devices connected to the drive type BVB-D.



Notice

The devices of type BVB-D may only be operated in half-wave operation with a mechanical vibration frequency of approx 50 Hz.

It is important to make sure that is set on the connected control device, the correct resonant frequency for the particular drive types. This is done according to the control unit, for example by internal DIP switches, bridges, or via the Settings menu. Otherwise, components of the equipment damaged.

Transport & Mounting

Transport

Any transport of the device must be carried with the necessary caution to prevent damage from rough or careless loading and unloading. Depending on the type of transport corresponding transport Fuses must be provided.

If the unit is stored, so care must be taken to carefully cover against moisture, dirt and dust. Bare metal parts shall be preserved against rust. This conservation must be checked from time to time and to replace if necessary.



Attention

The linear vibratory conveyor may not be raised and / or transported on conveyor rail.

Mounting

Conveyor rail:

The maximum length mentioned in the technical data and the weight of the upper part of the channel must not be exceeded

Installation conditions:

When installing the device, ensure that the bearing capacity of the frame used and the soil is sufficient.

The bunker and dosing chute is screwed from below into the anti-vibration mounts on the base plate using the appropriate fastening screws.

The environment of the device should provide sufficient clearance for maintenance, operation and repair.



Notice

It is important in establishing the fact that the device can vibrate freely. That has a sufficiently large air gap between the vibrating rail upper part and resting environment be present.

Starting



Notice

Before starting, ensure that the above points being >>Transport & Mounting<< complied with and monitored.

Connection:



Attention

This work may only be performed by qualified personnel in compliance with all safety and local regulations. The control over that no unauthorized persons are in the danger zone of the machine are located is important faults.

Connection lines must be protected.

Terminal voltages and directions of rotation must be checked.

The connection of the device must be installed according to the information under >>Technical Data<<, or the data plate.

Check if the available supply voltage matches the specifications on the nameplate of the unit.

Make sure that the upstream control or regulating device is connected to the correct output frequency of 50 Hz (half-wave).

(See also >>Structure and function description<<)



Notice

Befor Starting are additionally perform the following checks and actions:

Nr.	Pos.	Module	Action
1	1	Bunker tub	Sufficient number of the transported material refill. Check for foreign objects and jammed material.

Adjustment

A proper tuning of the vibration system is essential for optimal operation of the device. This note is recorded as vibrating conveyors of series BVB-D by the number of springs.



Notice

In the case of the vibration system is to proceed as follows:

- a) Please first check whether the correct control unit is connected.
- b) Screw off the side cover plates (if present) and tighten all spring and channel fixing screws (100 Nm).
- c) Check the type and frequency of the magnets on accuracy.
- d) Check magnet spacing and adjust if necessary.
- e) Switch vibratory feeders and adjust regulator to 90%
- f) Loosen Slowly loosen the fastening screw at the bottom of a spring assembly (approx. $\frac{1}{4}$ to $\frac{1}{2}$ turn).

When loosening this screw, you can see a change in the running speed of the Material to be conveyed in the upper part of the channel; it follows:

- g) Running speed is lower: Install Additional springs. First, a spring in a spring assembly; should not suffice this, installing additional packages at the individual spring gradually ever a spring with intermediate plate.
- h) Running speed is greater: Remove feathers. Functioning in the same order as in the installation of the springs.

If the conveying speed on the length of the conveyor trough is not uniform, then:

- i) a spring needs to be taken out of the slow site.
- j) a spring has to be installed in the quick site.

If the rough running between two sets of springs, so must be seen in the direction, be installed or removed behind the rough running either a spring.

Installation instructions for oscillating springs



Notice

If springs are broken due to fatigue or overuse, it is advisable to replace all the springs.

The number of springs is determined by the spring constant, the frequency, the conveying speed and the weight ratio.

There are also many springs installed as were present in the delivery state.

For plastic springs (GfK) occur abrasion phenomena. With steel springs is to pay attention to hairline cracks. Only flawless springs can be used again.

When replacing the mounting bolts are initially just as hard to pull that off, the springs can not move.

The linearity of the upper spring bracket for lower spring bracket must be guaranteed. Then tighten all bolts (100 Nm or 140 Nm, see technical data).

Installation instructions for oscillating magnetic

1. First pour a few conveyor parts in the upper part.
2. Setting the magnets on the smallest distance. The distance must be

	<u>min.</u>		<u>max.</u>
BVB-D	2 mm	-	3,5 mm



Notice

It is important that the surfaces of the magnet and armature are parallel.

**Then all screws (including springs) must be tightened.
The screws should not be stretched.**

3. Knob to "max." , and switch device. Magnets and armature must not touch during the run. (Sample: on an inserted between the magnet and anchor strip of paper no pressure points may begin to emerge.) Where appropriate distance between magnet and armature gradually enlarge.
4. Now the device is loaded with the usual capacity and the control set at about 2/3 of the scale range. Will cause it to more parts being promoted as needed or it is found that the parts jump on the spiral, the conveyor speed by increasing the distance between magnet and armature must be reduced. It is important to ensure that the max. Spacing is not exceeded.

Troubleshooting

The following faults can occur during operation:

Nr.	Location	Description	Cause	Rectification
1	<i>bunker and dosing channel</i>	<i>Flow rate is insufficient:</i>	<i>too little material to be conveyed in the sorter</i>	<i>Conveyed refill and check conveyor line</i>
2	<i>bunker and dosing channel</i>	<i>Conveyor is not running when you turn on:</i>	<i>Plug not in socket</i> <i>Connection cable between vibratory feeders and control unit not in the control section housing</i> <i>Fuse defect</i>	<i>Insert the plug</i> <i>Insert the plug, regulate power</i> <i>Replace the fuse</i>
3	<i>bunker and dosing channel</i>	<i>Vibrating conveyor no longer brings after a certain term of the required performance:</i>	<i>Loose screws on the spring packs</i> <i>Adjusted magnetic gap</i> <i>Broken springs</i>	<i>Tighten the screws</i> <i>Set the magnetic gap correctly</i> <i>Replace broken springs</i> <i>Re adjust the suspension</i>
4	<i>bunker and dosing channel</i>	<i>Conveyor developed strong noises:</i>	<i>side cover plates (if present) loose</i> <i>Foreign body in the magnetic gap (chips, conveyed, dust)</i>	<i>Tighten side cover plates</i> <i>Shutdown and remove foreign body</i> <i>Check the magnet gap adjustment</i>
5	<i>bunker and dosing channel</i>	<i>Vibrating conveyor does not run in areas of Scale slider:</i>	<i>Potentiometer defect</i>	<i>Replace control unit</i>

Maintenance and Cleaning



Notice

The oscillating drive the bunker and dosing channel is virtually maintenance free.

The following inspections and maintenance should also be carried out at the indicated time intervals:

No.	Module	Action	Frequency
1	<i>bunker and dosing channel</i>	- Check for unusual noises	<i>daily</i>
2	<i>bunker and dosing channel</i>	- Control of the conveying behavior	<i>daily</i>
3	<i>bunker and dosing channel</i>	- Control for contamination - Cleaning the treads of the transported material - Eliminating foreign parts	<i>daily</i>



Attention

For all maintenance and inspection work the chapter >> *Safety instructions* << is to be noted.

Malfunctions are caused by inadequate or improper maintenance can result in very high cost. Regular maintenance is essential.

Due to the different operating conditions, a general definition of the maintenance and inspection intervals is not possible. Taking into account the operating conditions of an appropriate routine is set.

Cleaning:

It is recommended that the unit regularly, for example, after each end of the shift to clean thoroughly of dirt, debris and possibly falling down. Coatings, such as made of polyurethane, conveyor brush or other product specific surface coatings must be cleaned with non rückfettendem cold cleaner. Coatings in pharmaceutical goat right equipment should be cleaned with pharmaceutically acceptable cleaning agents.

Wear control:

Wear parts, that is all parts that move against each other or come into contact with are conveyed to check from time to time for wear and, if necessary readjust or replace.

Safety instructions



Attention

The following work safety instructions must be observed especially:

- ⇒ *The device is designed according to state of the art and reliable. This equipment may constitute a hazard if it is used improperly or by untrained personnel to improper use.*
- ⇒ *Any person who is involved in the installation, dismantling, operation and maintenance of the unit must have read and understood the entire manual.*
- ⇒ *Users are recommended to have this confirmed in writing.*
- ⇒ *The unit is designed exclusively for the functions and operations described in this operating manual. Any use deviating is considered improper. The manufacturer is not liable for any resulting damage. The risk is borne solely by the user.*
- ⇒ *Intended use also includes the observance of imposed by manufacturers and component suppliers for installation, commissioning, operation, tool change and maintenance conditions.*
- ⇒ *The device may be operated, serviced and repaired only by authorized, trained and instructed personnel. These personnel must have received special about possible dangers.*
- ⇒ *The responsibilities for the installation, commissioning, operation, tool change and maintenance must be clearly defined and adhered to so ambiguous competencies in terms of security.*
- ⇒ *It is to refrain from any operation that affects the safety of the device.*
- ⇒ *The operator has to make sure that unauthorized people do not work on the device.*
- ⇒ *The operator is obliged to report any changes that occur to the equipment that may affect the security immediately.*
- ⇒ *The user company must ensure that the device is only operated in sound condition.*
- ⇒ *The user company must ensure, through the orders and checks for cleanliness and clarity of the jobs on and around the unit.*

Safety instructions**Attention**

- ⇒ *It must never be disassembled safety equipment or inoperative.*
- Failure to comply with this notice may be fatal!**
- ⇒ *If dismantling of safety equipment during repair and maintenance work required, must be made immediately after completion of the work the reassembly of the safety devices.*
- ⇒ *The proper installation and functioning of the safety devices must be checked before using the equipment.*
- ⇒ *Unauthorized modifications and changes which affect the safety of the appliance are not permitted.*
- ⇒ *All work on the unit must always be carried out only at a halt.*
- ⇒ *Before starting any work on the unit with drives and ancillary equipment must be secured against accidental operation.*
- ⇒ *After proper electrical installation or repair the protective measures are used to test (eg grounding resistance).*
- ⇒ *To operate the device, the local safety and accident prevention regulations apply in every case.*
- ⇒ *The linear vibratory feeder may not be employed in the Ex area or water area.*

**Attention****Elektromagnetic Field**

For persons with heart pacemakers the influence of the electromagnetic field is possible. It is therefore recommended that individuals maintain a minimum distance of 25 cm.

Residual risks relating to the machine



Attention

From the following areas goes to the extent described in all operating and maintenance a possible threat from:

No.	Designation	Possible hazards	Comment
1	<i>bunker and dosing channel</i>	<i>Electric shock</i>	<i>Open Control unit only when the power is off.</i>
2	<i>bunker and dosing channel</i>	<i>Clamping / crushing</i>	<i>Disconnect the control unit from the drive before engaging in the drive.</i>
3	<i>bunker and dosing channel</i>	<i>Influencing heart pacemakers by electromagnetic field</i>	<i>Safety distance of min. 25 cm.</i>
4	<i>bunker and dosing channel</i>	<i>Malaise / discomfort / headache by:</i> - noise - vibration - Flow air (only for units with air support)	- Use hearing protection - Use sound insulation hood - Increase distance to the running device - Do not look or see in the airflow
5	<i>bunker and dosing channel</i>	<i>Risk of injury to the eyes and / or other parts of the body by:</i> - Airflow or spewing particles (only on devices with air support)	- Put on protective goggles - Wear personal protective equipment

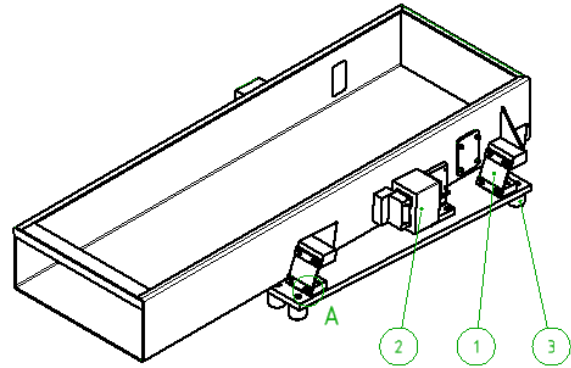
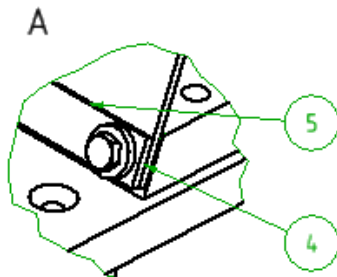
Technical Data

Type:	BVB-D			
Dimensions:				
Dimensions L x B x H: (without additional weights)	depending on the version			
Drive weight (with additional weights):	depending on the version			
Vibration buffers:	45° Shore, Form C			
Dimensions:	Rd 50x50 (M8)			
Pieces:	depending on the version			
Electrical connection:				
Protection:	IP 54			
Connection cable length:	ca. 1,5 m			
Input:	1050 VA			
Power consumption:	4,76 A			
Magnet nominal voltage:	220 V			
Frequency:	50 Hz			
Number of magnets / Type:	2x / WI 111/11			
Max. magnetic gap:	3,5 mm			
Mech. frequency:	50 Hz; 3000 min ⁻¹			
Mechanical:				
Number of spring brackets:	4			
Number of spring assemblies:	4			
Spring type:	GFK			
Spring dimensions:	90 x 2(4) x 105 mm			
Standard spring assembly:				
	t=2 mm		t=4 mm	
	Left	Right	Left	Right
Front spring group:	-	-	1	1
Rear spring group:	-	-	1	1
Intermediate plate numbers:	-			
Pressure plate numbers:	8			
Spring mounting:				
Screw Type / quality:	M8 / 8.8			
Torque:	100 Nm			

For additional or deviating data, see >>Delivery data<<

Drawings & Bill of material

Drawing BVB-D:



Bill of material:

Pos.	Designnation	Type	Dimensions in mm	Supplier
1	Leaf spring	GFK, d=8,5	see technical Data	P.J. Prause Durotec GmbH
2	Magnet	see technical Data	-	Kendrion Magnettechnik GmbH
3	G/M buffer	45° Shore, Form C	see technical Data	Franksa GmbH
4	Intermediate plate	Ms, d=9	see technical Data	FMB GmbH
5	Pressure platte	St, d=9	see technical Data	FMB GmbH

Manufacturer**Manufacturer of oscillating drive:****FMB GmbH**

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E-Mail: info@fmb.deInternet: www.fmb.de**Declaration of conformity**

as defined by Low voltage directive 2014/35/EU

Herewith we declare, that the product complies with the following provisions:

- Low voltage directive 2014/35/EU

Applied harmonized standards:

- DIN EN 60204 T1

Remarks:

We assume that our product is to be integrated in a fixed machine. The provisions of the EMC directive 2014/30/EU has to be considered by the user.

FMB GmbH

Manager: Hartmut Striepe, Edwin Neue

**Manufacturer of oscillating construction (only in complete units from the factory FMB):****FMB GmbH**

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Operating instructions for the bunker and dosing channel BVB-D with direct drive

Date: 06/2022

Technical changes and misprints excepted.

Appendix