

Operating Instructions
Bunker Feed System „BZS 30“



BZS 30

FB.-No.: _____
Customer: _____
Date: _____

|

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1. Safety Instructions

1.1 General

This section contains information necessary for the correct use of the products described. It is directed at technically qualified personnel.

Qualified personnel are persons who on account of their education, experience and training as well as their knowledge of appropriate norms, regulations, rules concerning accident prevention and conditions prevailing at the place of work who have been authorized by those responsible for the safety of the equipment to carry out the particular operation required and thereby are able to recognize and avoid possible dangers (definition from IEC 364 of skilled personnel).

Danger Warnings

The following notes relate not only to the operator's personal safety but also to the protection of the products described and the equipment involved.



Attention!

Failure to observe can lead to personal injury or cause damage to the machine.



Warning!

High voltage.

Ignoring this warning can result in death or severe bodily injury.

Before assembling or dismantling disconnect the power supply.

Observe accident prevention and safety regulations relating to specific operations.

Before bringing into operation check that the local power supply matches the machine's rated voltage.

The EMERGENCY OFF mechanism must be active in all operating modes. Releasing the EMERGENCY OFF mechanism must not cause an uncontrolled re-start.

The guard equipment that is fitted must not be removed.

1. Safety Instructions

1.2 Danger from the machine

Mechanics:

- Because the conveyor belt rotates, parts of the body or parts of clothing can be drawn in.
- Because the upper part of the machine swivels, there is a danger of being injured by being crushed and cut.

Electronics:

If the electrical equipment is in good working order, no danger may be expected.

1.3 Noise emission

The bunker feed system noise level is mainly determined by the vibration feed equipment used and the workpieces being processed. For this reason, valid details of the noise level according to the EU Guideline 'Machines' cannot be given. These can only be ascertained when the machine is in use at its place of operation.

Because of the BZS's integral noise protection cover, noise from the conveyor belt and the vibration feed unit is greatly reduced.

If however, the noise level exceeds the permitted level, suitable noise prevention measures must be taken.

1.4 Authorized applications

The bunker feed system must not be used in explosive areas!

The BZS is designed to bunker dry bulk material and to pass it automatically to a vibration feed unit located underneath, as and when required.



Attention!

Improper use can lead to damage to the unit.

1.5 Special notice

The bunker feed system is adjusted for a maximum loading of 50 kg. This weight limit is also valid when the BZS is fitted with an auxiliary bunker (available as an accessory). On no account should the BZS be allowed to run overloaded.



Attention!

If the figures for maximum loading are exceeded, damage could be caused to the unit.

2. Transport and Storage

2.1 Transport

The bunker feed system BZS 30 is delivered as a fully-functioning unit on a wooden frame. The unit can be moved around the factory premises with a trolley or similar means of transport. Because of its light weight, the BZS 30 can be lifted by hand.

2.2 Storage

If the bunker feed system is stored for a prolonged period, it must be kept dry and protected against aggressive influences. The relative humidity should be between 15% and 95% and the storage temperature between 0°C and 40°C. Violent temperature fluctuations and direct sunlight should be avoided.

3. Assembling an Starting up

The bunker feed system must be mounted on a stable and vibration resistant foundation (for example, standing column, frame). The permissible ambient temperature (0°C to 40°C) and relative humidity (15% to 95%) must be observed. Strong magnetic fields in the proximity of the machine can lead to malfunctioning.

3.1 Assembling the BZS

Proceed as follows:

1. Stand your BZS on its intended base.
2. Remove the transportation securing devices.
3. Remove the upper clear foil covering.
4. Fold the upper part of the BZS completely back towards the rear. When doing this a second person should hold the lower part of the BZS firmly, as it would otherwise snap upwards, which could lead to injury.
5. Stand your ready-assembled vibratory rotary conveyor in the BZS lower part, adjust it and then secure it in accordance with its operating instructions.
6. Arrange the BZS so that the lower part does not rest against the vibratory rotary conveyor and that the control located in the rear of the BZS upper part is easily accessible.
Take care that there is sufficient room behind the BZS for the unfolded upper part. If the room is insufficient, it is possible to remove the upper part completely (see chapter 9.1).
7. On the lower part of the BZS, mark the place which is to be left open for the run-out from the vibratory rotary conveyor or for a subsequent unit (small conveyor band or linear conveyor).
8. Cut out the BZS lower part at the marked position. For this use a compass saw or similar tool. To avoid scratching the paintwork, mask it off with suitable foil.
If at all possible, do not cut through the fold on the upper side of the lower part.
9. Adjust the BZS so that the cut-out is at the correct position.
10. There are three holes on the lower part of the BZS. Mark their positions on the base, lift the BZS up and place three threads M6 on the marked positions.
11. Replace the BZS on the base and screw it to the base. To avoid damaging the lower part, be sure to use washers.
12. Set the level detector which is located at the front of the conveyor belt (pendulum initiator) to the vibratory rotary conveyor's direction of movement:
 - left-hand rotation: level detector must swing forwards
 - right-hand rotation: level detector must swing towards the rear

3. Assembling an Starting up

3.2 Starting up

After the bunker feed system has been set up at the place where it is to be operated, it can be supplied with electrical power.

Proceed as follows:

1. Check the bunker feed system connecting values against the supply voltage available.
2. Connect it to the mains supply with a lead and earthed plug.

Connecting values for BZS bunker feed system:

| | |
|--------------|--------|
| voltage: | 230 V |
| frequency: | 50 Hz |
| consumption: | 0.25 A |

3. The vibratory rotary conveyor is connected to the power supply via a suitable control unit. When doing this follow the unit's operating instructions.
4. Fill the container with bulk material to be conveyed.
5. Switch the bunker feed system control to ON and start up the vibratory rotary conveyor.
6. Adjust the amount of the material which is to be conveyed by moving the dosing slide on the front of the container. To do this the knurled screw located there must be loosened.
If the material carried falls beside the rotary conveyor or on to its spirals, attach a part deflector (see also chapter 12, Accessories).
7. Set the desired quantity of material to be conveyed in the vibratory feed unit by raising or lowering the level detector. To do this, loosen the aluminium holding plate cheese head screw and swivel it as necessary.

4. Technical Data Bunker Feed System

4.1 Motor

| | | |
|-------------------|-------|--------------------------------|
| Model | | 8IDGE-25G (M) / 8GBD180BMH (G) |
| Voltage | [V] | 230 |
| Frequency | [Hz] | 50 |
| Output | [W] | 25 |
| Speed | [rpm] | 1300 |
| Protective system | | IP 54 |
| Gear transmission | | 180 : 1 |

4.2 Dimensions, weights

| | | |
|--|--------|-----|
| Length | [mm] | 500 |
| Width | [mm] | 400 |
| Height | [mm] | 600 |
| Weight of unit ca. | [kg] | 20 |
| Full weight max. | [kg] | 50 |
| Full capacity max. | [ltr.] | 12 |
| Max. diameter for vibration feed unit (incl. vibration bowl and sorting elements) | [mm] | 320 |
| Max. height for vibration feed unit (incl. vibration bowl and sorting elements) | [mm] | 280 |

5. Technical Data Bunker Control

5.1 Power requirement

| | |
|-----------------|---------|
| Mains voltage | 230V AC |
| Mains frequency | 50Hz |
| Consumption | 250mA |

5.2 Bunker belt drive

| | |
|------------------|---------|
| Output voltage | 230V AC |
| Output frequency | 50Hz |
| Output current | 200mA |

5.3 Bunker belt input [E] / output [A]

| | | |
|----------------|-----|--|
| Level detector | [E] | 24VDC/80mA |
| Barrier | [E] | Closer potential free contact loading 24VDC/10mA |
| Fault | [A] | Changer potential free contact loading 240VAC/8A |

5.4 Bunker belt time parameters

| | | |
|-----------------------------|---------------------------------------|-------------|
| Switch on delay fault | t_{fault} | 35-180 sec. |
| Switch on delay bunker belt | t_{belt} | 0-20 sec. |
| Bunker belt ON | t_{impulse} (with jumper) | 1 sec. |
| Bunker belt ON | t_{impulse} (without jumper) | 2 sec. |
| Bunker belt OFF | t_{pause} | 0.5-13 sec. |

5.5 Bunker level control input [E]/output [A]

| | | |
|---------------|-----|-------------|
| Light barrier | [E] | 24VDC/80mA |
| Light signal | [A] | 24VDC/200mA |

5.6 Bunker level control time parameters

| | | |
|------------------|------------------|-----------|
| Switch on delay | t_{on} | 0-15 sec. |
| Switch off delay | t_{off} | 0-15 sec. |

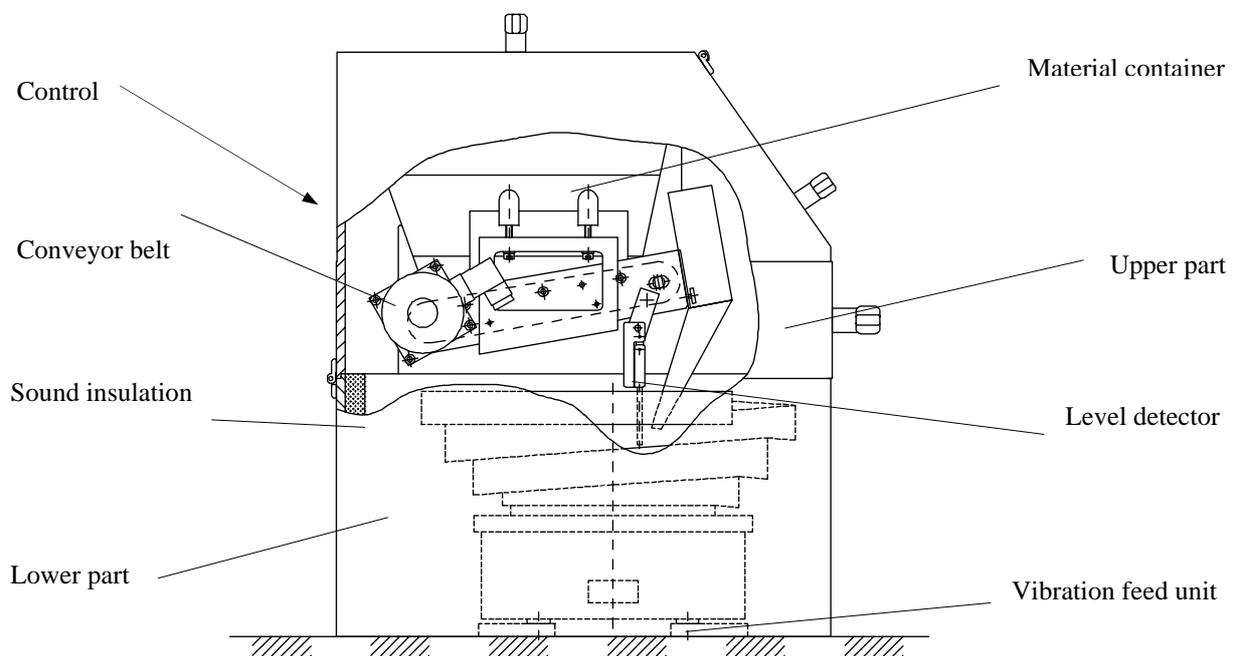
6. Description of Machine

6.1 Construction

The bunker feed system consists of the following component parts:

- upper part with integrated material container
- conveyor belt
- lower part with sound insulation
- control, type ESB-BB
- (vibratory rotary conveyor)

6.2 Side view



6.3 Operating method

A level detector (swinging initiator) mounted on the conveyor belt constantly scans the loading in the vibration feed unit below. This sorts the bulk material out and leads it in the correct position to a connected conveyor device (for example, a small conveyor band, a linear conveyor). If the level detector recognises a lack of parts, the conveyor belt located below the container transports material to the vibration feed unit. The conveyor belt stops when the amount of material to be conveyed, as pre-set when the machine was installed, is registered as having been reached.

If the store of material in the container falls below a certain mark, the fact will be registered by a light barrier installed in the funnel (see chapter 12: Accessories for bunker level control) and optically or acoustically registered by a signal lamp.

7. Description of Control

7.1 Lay out and function

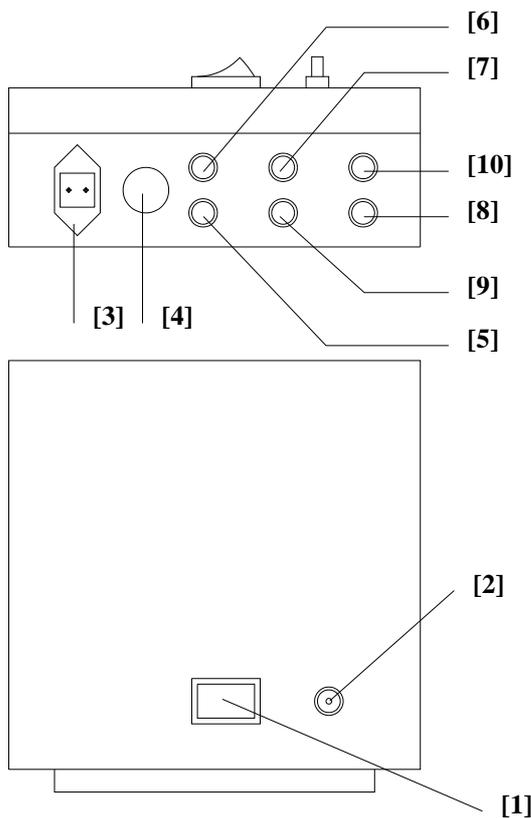
The bunker call controls ESB-BZS or ESB-BB switch the bunker drive cyclically on and off depending on the switched condition of a level probe.

The operating elements are located on the front panel:

- main switch ON/OFF [1]
- reset key for acknowledging malfunctions [2]

The electrical terminals are located on the underside of the housing:

- power supply [3]
- bunker belt motor connection [4]
- level probe [5]
- lock [6]
- malfunction [7]
- bunker level control light barrier transmitter [8]
- bunker level control light barrier receiver [9]
- bunker level control signal lamp [10]



The control is divided into two function groups:

- control part for the **bunker belt** with corresponding inputs and outputs.
The input and output connections are made by way of plugs.
- control part for the **bunker level control** with corresponding inputs and outputs.
The input and output connections are made by way of plugs.

7. Description of Control

7.1.1 Lay out and function bunker belt control

General

A level probe is provided to register the level of workpieces in the area of the oscillating bowl. If the probe registers a shortage of workpieces in the oscillating bowl, the bunker drive switches on and off cyclically.

The bunker drive is protected by a thermal fuse [1].

The power supply unit is fitted with a microfuse [2].

Drive

The level probe registers a shortage of workpieces in the oscillating bowl of the following sorting unit.

The bunker belt drive starts after the rise-delay time t_{belt} has expired.

The bunker belt rise-delay time may be set from 0 to 45 seconds with the potentiometer t_{belt} .

The turn-on time is about 1 second **with Jumper** and about 2.5 seconds **without Jumper**.

The pause time begins after the turn-on time has elapsed.

The drive pause time may be set between 0.5 and 13 seconds with the potentiometer t_{pause} .

On setting the said parameters t_{belt} , **Jumper** and t_{pause} the filling of a subsequent sorting unit can be regulated.

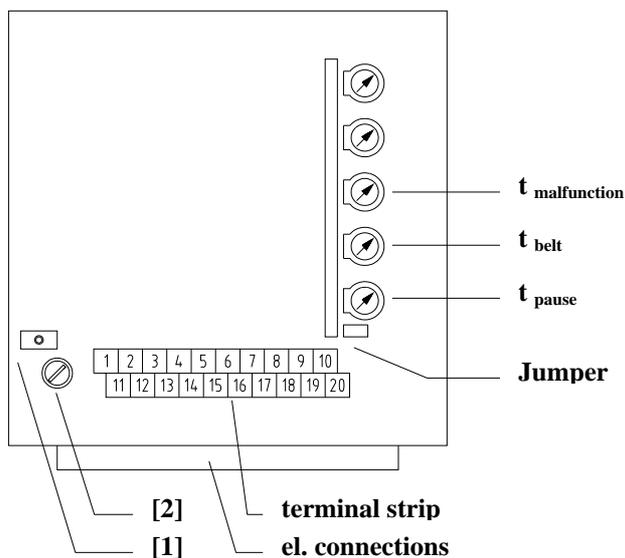
Malfunction

If the level probe registers a shortage of workpieces in the oscillating bowl, the malfunction rise-delay time will be started. It may be set with the potentiometer $t_{\text{malfunction}}$ from 35 to 180 seconds.

If the level probe is not activated by workpieces, the malfunction time elapses. The bunker drive stops.

The fault message relay will be triggered.

The fault message can be acknowledged with the **Reset** key.



7. Description of Control

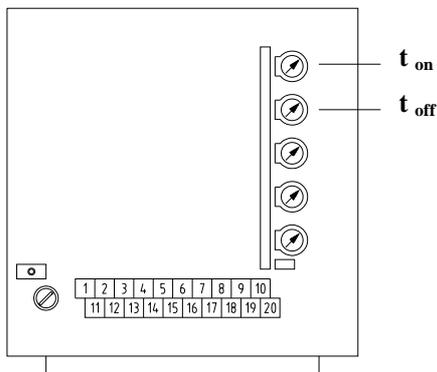
7.1.2 Lay out and function bunker level control

Rise-delay time

The level in the bunker is monitored by a light barrier. As soon as a sensor registers a shortage of workpieces, the rise-delay time t_{on} which may be adjusted, commences to run. After this malfunction time has expired, the malfunction and workpiece shortage relay will be triggered.

Cut-out delay time

As soon as the shortage of workpieces in the bunker has been relieved, the output will be reset via the adjustable cut-out delay time t_{off} . The malfunction and workpiece shortage relay will be released.

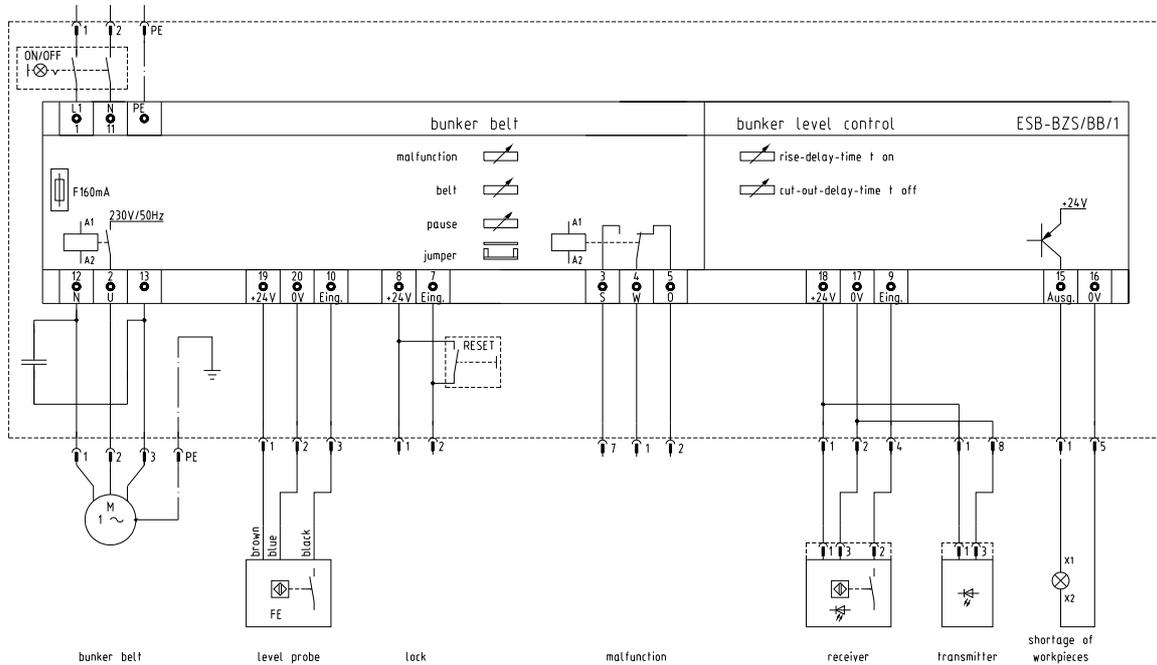


Assignment of terminals

| Number | Text |
|--------|---|
| 1 | L1 power supply |
| 2 | U output bunker belt |
| 3 | malfunction closer |
| 4 | malfunction change-over |
| 5 | malfunction opener |
| 6 | unoccupied |
| 7 | lock input |
| 8 | lock +24V |
| 9 | bunker level control receiver input |
| 10 | level probe input |
| 11 | N power supply |
| 12 | N bunker belt output |
| 13 | bunker belt auxiliary winding / capacitor |
| 14 | unoccupied |
| 15 | workpiece shortage signal lamp +24V/200mA |
| 16 | workpiece shortage signal lamp 0V |
| 17 | bunker level control 0V |
| 18 | bunker level control +24V |
| 19 | level probe +24V |
| 20 | level probe 0V |

7. Description of Control

7.2 Wiring diagram



8. Maintenance

In order to ensure that your BSZ bunker feed system operates smoothly and reliably, we recommend that you follow the maintenance instructions given.



Attention!

- The unit must be disconnected from the power supply before commencing maintenance work.
- Always ensure that there is a sufficient supply of fresh air when working with cleaning agents containing solvents.

8.1 Container

Before the bunker feed system is filled each time, the two transparent panels located inside the container below and to the side, should be checked and if necessary cleaned (only when bunker level control accessory is fitted).

Any parts which have become wedged must be freed.

The container may be cleaned with a domestic glass cleaning agent and a lint-free cloth.

8.2 Conveyor belt

The conveyor's transport belt should be checked before a shift begins to ensure that it is not damaged and has the correct tension. The procedure for changing a damaged belt and setting the correct tension is given in chapter 10.

If the conveyor belt becomes dirty it may be cleaned with a lint-free cloth.

8.3 Conveyor belt motor

The motor and gears are maintenance free. The housing for the motor and gears should be cleaned as and when necessary to avoid over-heating.

8.4 Lower part, upper part

If necessary, the outer surfaces to the upper and lower parts can be cleaned with commercially available window cleaner and a lint-free cloth.

8.5 Setting up equipment

The fixing screws on the supporting plate on the lower part of the BZS should be checked once a week to ensure that they are tight and tightened up if necessary.

Similarly, the fixing screw on the support on the upper part of the BZS should also be checked once a week and tightened if necessary.

The locking bolt must always slide easily into the recess in the support. If necessary, it may be lubricated with a thin, non-coagulating oil.

9. Access to the Vibratory Rotary Conveyor

9.1 Access from above, setting up equipment

Malfunctioning with the vibratory rotary conveyor vibrating bowl can normally be remedied after opening the front transparent cover.

If this is not possible because, for example, a part deflector is fitted, the BZS upper part can be lifted up by the T shaped handle at the front and then swung upwards. Before doing this, remove enough material so that you can lift the upper part *without great effort* and can hold it *safely* with one hand.



Warning

The permissible maximum full weight when swinging the upper part of the BZS is 20 kg. If this limit is exceeded, damage to the BZS and/or an accident can be caused.

An setting up equipment locks the upper part at an angle of approximately 20°. For this, the support on the upper part must be swung downwards and its conical end placed into the hole in the support plate fitted on the BZS lower part. The locking bolt on the side *must properly slide into the support recess*. To close the BZS, the head of the locking bolt is pulled out, the upper part is lifted slightly by the front T shaped handle, the support is swung to the rear and the upper part is finally lowered.



Warning

When lowering the upper part of the BZS, no part of the body should be inside the lower part of the BZS or against the upper edge of the lower part (danger of being crushed and cut).

If access to the vibratory rotary conveyor is still insufficient (for example, for changing the vibrating bowl), the upper part of the BZS can also be completely folded backwards. Before doing this however, the upper transparent cover must be removed and the material for conveying in the container, must be completely removed.

If there is insufficient room behind the BZS for the swinging movement of the upper part, it is possible to lift it off after first undoing the hinges. When setting the upper part down, care should be taken not to damage the level detector located at the front of the conveyor belt.

9.2 Access from the side

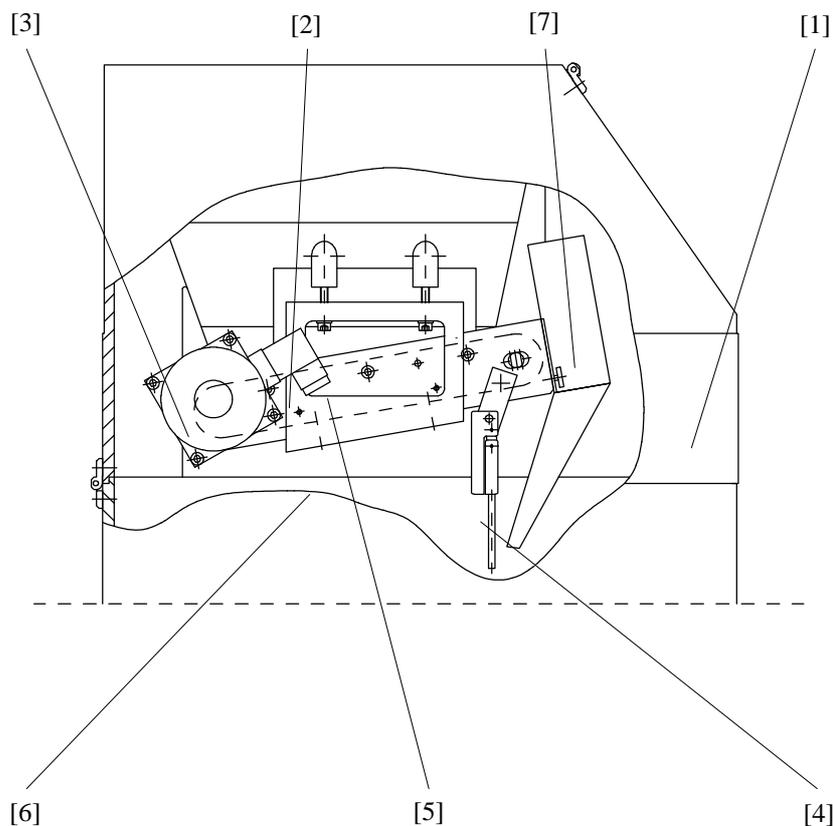
If the vibratory rotary conveyor is in need of maintenance or repair, access from the side is normally required. In this case, proceed as follows:

1. Take off the upper transparent cover and remove all material in the container.
2. Fold the upper part of the BZS to the rear or lift it off (chapter 9.1).
3. Switch off the electricity and/or pneumatic supply to the vibratory rotary conveyor.
4. Loosen the vibratory rotary conveyor from the base (it may be that the vibrating bowl must first be removed) and lift it out of the BZS.
5. Carry out the maintenance/repair work.
6. Re-assemble the vibratory rotary conveyor in the reverse sequence.

10. Replacing a Band

In order to change a band, it is necessary to disconnect the conveyor belt. Proceed as follows:

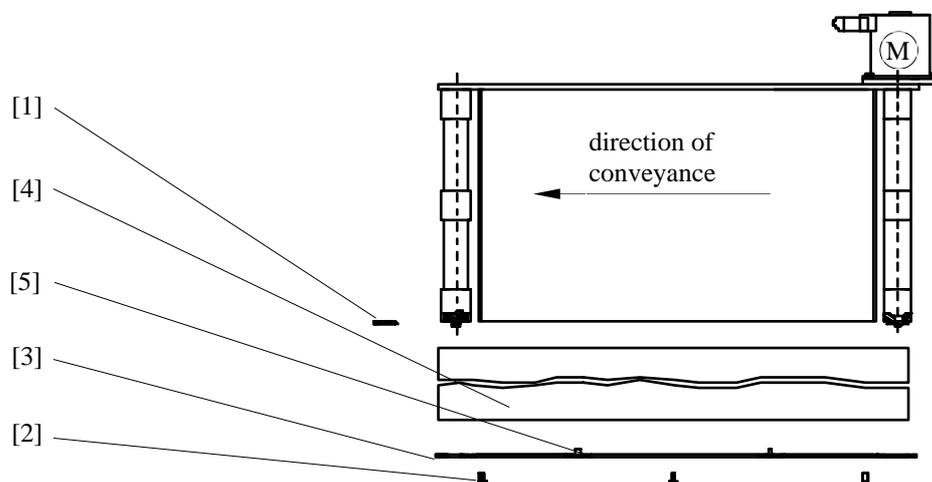
1. Switch the bunker feed system control power supply switch to OFF and pull the mains plug out.
2. Remove the upper transparent cover.
3. Remove all material from the container.
4. Fold the upper part [1] of the BZS to the rear.
5. Withdraw the mains plug [2] from the conveyor belt motor [3].
6. Remove the level detector [4].
7. Remove the four cheese head screws [5] on the two aluminium brackets [6] holding the conveyor belt. Use for this an extended ball-head spanner SW 5.
8. Lift the conveyor belt away from the material container.
9. If necessary, remove the part deflector [7].



10. Replacing a Band

After the conveyor belt has been freed, proceed as follows:

1. Release the tension from the band by loosening the two set screws at the front of the conveyor belt.
2. Remove set screw [1] on the carrier side (opposite the motor side).
3. Remove the three cylinder screws [2] in the carrier [3] and carefully remove it.
4. Now replace the band [4].
5. Ensure that after changing the band the adjusting washers are correctly located (between the bearing and the serrated shaft on the driving axis, and between the bearing and carrier on the return axis).
6. Replace the carrier and position it correctly with the aid of the two half length taper-grooved dowel pins [5].
7. Screw the three cylinder screws into the carrier.
8. Replace the carrier side set screw.
9. Tension the band by drawing the return axis to the front by screwing in the two set screws.
10. The band has the correct tension when the return axis is nearly in the centre of the carrier or drive carrier elongated hole and doesn't slide.
11. Ensure that the band is evenly tense on both sides and correct this if necessary.



Re-assemble the bunker feed system in reverse order.

NOTE:

Before re-starting the bunker feed system, check the motion of the band. If it runs away from the centre, turn the set screw to the side against which the band runs so far until an even run is set. Take care when doing this not to over-tighten the band. If this is the case, correct the running by unscrewing the opposite set screw.

11. Malfunctioning



Warning!

Only a skilled electrician may open the bunker control.
Before opening the unit must be disconnected from the power supply.

| Malfunction | Possible cause | Remedy |
|--|--|---|
| bunker feed system conveyor belt does not start despite lack of parts in the vibration feed unit | no voltage supply control rocker switch on OFF connecting cable damaged no voltage supply to the motor conveyor belt drive short circuit protection switch is released (thermal switch 200 mA) conveyor belt motor defective level detector not connected level detector not correctly set level detector defective container empty, lock activated | plug in mains plug set rocker switch to ON replace connecting cable check that motor mains plug is correctly inserted open bunker control and operate switch manually replace motor connect level detector adjust level detector replace level detector fill container, activate control reset key |
| bulk material in container is not being transported | insufficient tension in band drive pins defective | adjust tension replace drive pins |
| lack of parts in container is not displayed (only with accessory "bunker level control") | panes of light barrier in container are dirty light barrier soiled voltage supply (24 V) interrupted light barrier defective signal lamp defective | carefully clean pane clean light barrier check that plugs to light barrier and signal lamp are correctly inserted check transmitter and receiver and replace if necessary check bulb in signal lamp and replace if necessary |

11. Malfunctioning

| Malfunction | Possible cause | Remedy |
|---|---|---|
| too many workpieces are being conveyed to the vibration feed unit | doser slide set too high | set slide lower |
| too few workpieces are being conveyed to the vibration feed unit | workpieces wedged in container | replace band with fluted band |
| | conveyor band fluting defective or torn away | replace band |
| | doser slide set too low | set slide higher |
| workpieces deposited at wrong place in vibration feed unit | vibration feed unit badly positioned | adjust vibration feed unit again |
| | | mount parts deflector |
| high level of noise | front transparent cover not closed | close cover |
| | opening at the mouth of the vibration bowl too great | reduce the size of the cut-out (e.g. by attaching a shaped metal plate) |
| setting up equipment does not lock | dirt or foreign body in the receiving hole in the support plate on the BZS lower part | clean the hole, remove the foreign body |
| | burr on or damage to the recess in the support on the BZS upper part | remove the burr or damage with an oil stone |
| | locking bolt stiff | clean locking bolt and treat with a thin, non-coagulating oil |

12. Accessories

12.1 Mechanical accessories

If the workpieces are not bunkered in the desired place in the vibrating bowl of the vibratory rotary conveyor, a **part deflector** can be mounted at the end of the conveyor belt.

As an alternative to the standard conveyor band, a **fluted conveyor band** is available for the BZS. If this is used, the rear wall of the material container must be cut out.

12.2 Electronic accessories

In order to prevent the bunker feed system running empty, it can be fitted with a **bunker level control**. This consists of a light barrier which is mounted on the side under the container and a signal lamp which gives the operator in good time an optical and/or acoustic signal that there is a lack of pieces in the container.

13. Spare Parts

For the models described in this operating instruction, the following components are available:

- * container
 - * dosing slide
 - * transparent cover, front
 - * transparent cover, top
 - * locking bolt
 - * light barrier type LS-05 transmitter: FFM 90.1125.25
 receiver: FFM 90.1125.26
 - * level detector NF-02
 - * drive pin
 - * deep groove ball bearing 6001.2 RSR ($\varnothing 12 \times \varnothing 28 \times 8$)
 - * deep groove ball bearing 61805-2 RS 1 ($\varnothing 25 \times \varnothing 37 \times 7$)
 - * conveyor band (flat or fluted)
 - * spur wheel back-geared motor FFM 90.1000.06 (230 V) / FFM 90.1000.07 (115 V)
- } conveyor belt

In order to guarantee a quick and correct processing of your order, please always indicate the type of unit (see type plate) and the year of production of your bunker feed system, the necessary number of pieces and the exact designation of the spare part.



declaration of incorporation

- **Maschinen:** [RL 2006/42/EG](#)
- **EMV Richtlinie:** [RL 2004/108/EG](#)

The Product

Designation: Bunker Feed System BZS 30

Year of construction: 10/2010

Has been developed, designed and manufactured in accordance with the above mentioned EU guidelines by:

Manufacturer: fimotec - fischer GmbH & Co. KG Person responsible for documentation: Edgar Nagel

Friedhofstraße 13
78588 Denkingen
Tel.: 07424-884-0

Hereby we declare, that the incomplete machine comply with the requirements of the machine guidelines (2006/42/EG) attachment II 1 B.

Beside the named guidelines the product conforms to the EU guidelines:
- directive of electromagnetic compatibility (2004/108/EG)

The following harmonized norms have been adopted:

- EN ISO 12100-1,2: 2004 Machine, Equipment and Plant Safety
- EN 60 204-1: 2006 Electrical Equipment for Machines

The specified technical documents of the product according attachment VII part B were compiled. The manufacturer obligates himself, to offer those special technical documents to state departments on demand.

This machine may not be brought into operation until it has been ensured that the equipment into which it is to be incorporated accords with the conditions of the EU guidelines.

Denkingen 05.10.2010 Anton Fischer, Chief executive

| Place | Date | Signatory and description | Signature |
|-------|------|---------------------------|-----------|
|-------|------|---------------------------|-----------|