

Operating Instructions
Hopper control ESB-BZS/BB



ESB-BZS control for hopper feed system
ESB-BB Control of hopper band

FB. No.: _____

Com.: _____

Date: _____

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1. Safety information

1.1 General

This description contains the necessary information for the intended use of the products described therein. This description is directed to technically qualified personnel.

Qualified personnel are persons who are authorized by the one responsible for the safety of the system to carry out their respectively necessary jobs on the system based on their education, experience and training, as well as their knowledge of the standards, regulations, accident prevention regulations and operating conditions, and who can detect and avoid any possible hazards thereby (definition for qualified personnel according to IEC 364).

Hazard information

The following information serves for the personal safety of the operating personnel as well as the safety of the described products and the devices connected to them.



CAUTION

Non-observance can lead to damage to the device.



WARNING!

Danger - High voltage.

Non-observance can lead to death or serious bodily injury.

Disconnect the power supply before installation or deinstallation.

Observe the valid accident prevention and safety regulations specific to the application.

Before commissioning, check whether the nominal voltage of the device agrees with the local mains voltage.

Emergency shut-down equipment must remain in effect in all operating modes. Unlocking the emergency shut-down equipment must not result in an uncontrolled restart.

Any existing protective equipment must not be removed.

1. Safety information

1.2 Dangerousness of the machine

Mechanics:

If one does not work carefully with the hopper feed system or hopper band, there is the danger that articles of clothing or extremities can be pulled along with or into the conveyor belt system.

For this reason, the device may only be operated with the appropriate protective equipment.

Electrical technology:

When the electrical equipment is in perfect technical condition, no hazard is to be expected.

1.3 Noise emission

For a hopper band equipped with the standard belt, the continuous sound pressure level at no-load is max. 70 dB(A).

1.4 Intended use

The hopper band is to be used for the transport of clean and dry material. The material must not have any sharp edges.



CAUTION

If the device is not used as intended, the belt or drive could be damaged.

2. Transport and storage

2.1 Transport

The hopper band and the control are to be transported lying down.

2.2 Storage

For longer storage, the hopper band and control must be kept dry and protected from aggressive substances. High temperature fluctuations are to be avoided.

4. Technical data

3.1 Installation

It is forbidden to pull on or carry the hopper band or controller by its electronic parts.

The belt is to be protected from sharp objects.

The machine must be installed so that it is protected from vibrations and collisions.

The ambient temperature should be kept within the allowed 0°C to 40°C and the relative humidity should be kept within the allowed 15% to 95%.

Strong magnetic fields in the direct vicinity of the machine can lead to malfunctions.

3.2 Commissioning



ATTENTION!

The hopper band may only be connected to the electric mains when suitable safety devices have been installed.

The hopper control must have a connected power supply.

Connected load data : see technical data Chapter 4

5. Control description

4.1 Feed

Mains voltage *	230VAC
Mains frequency *	50 Hz
Current consumption	250 mA

4.2 Hopper band drive

Output voltage *	230VAC
Output frequency *	50 Hz
Output current	200 mA

* If desired, the control can also be delivered with 115V and 60Hz.

4.3 Hopper band Input [I]/Output [O]

Level sensor	[E]	24VDC/80mA
Block	[E]	Contact floating contact load 24 V DC / 10 mA
Fault	[A]	Changer floating contact load 240 V AC / 8 A

4.4 Hopper band - time parameters

Turn-on delay error	t_{error}	35 - 180 sec.
Turn-on delay hopper band	t_{band}	0 - 20 sec.
Hopper band On	t_{pulse} (with jumper)	1 sec.
Hopper band On	t_{pulse} (without jumper)	2 sec.
Hopper band Off	t_{Pause}	0.5 - 13 sec.

4.5 Hopper filling level control -Input [I]/Output [O]

Photoelectric barrier	[E]	24VDC/80mA
Warning light	[A]	24VDC/200mA

4.6 Hopper filling level control - time parameters

Turn-on delay	t_{on}	0 - 15 sec.
Turn-off delay	t_{off}	0 - 15 sec.

5.1 Structure and function

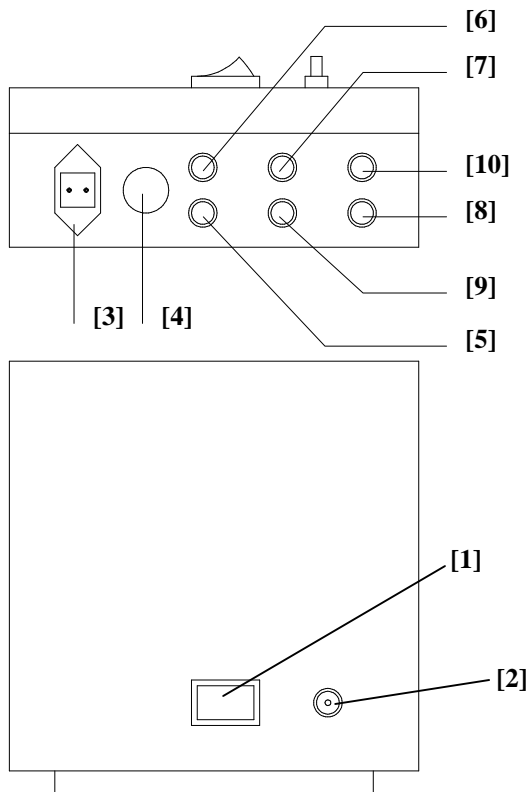
The hopper control ESB-BZS or ESB-BB switches the hopper drive cyclically on and off, depending on the switching state of the level sensor.

The operating elements are located on the front plate:

- Power switch On/Off [1]
- Reset button for acknowledging malfunctions [2]

The electrical connections are located on the bottom side of the housing:

- Power supply [3]
- Motor connection for hopper band [4]
- Level sensor [5]
- Block [6]
- Malfunction [7]
- Hopper filling level control - Photoelectric barrier transmitter [8]
- Hopper filling level control - Photoelectric barrier receiver [9]
- Hopper filling level control warning lamp [10]



5. Control description

5.1 Structure and function

The control is divided into two functional groups:

- Control unit for the **hopper band** with the corresponding in- and outputs.
The in- and outputs are designed to be pluggable.
- Control unit for the **hopper filling level control** with the corresponding in- and outputs.
The in- and outputs are designed to be pluggable.

5. Control description

5.1 Structure and function

Hopper band

General information

To detect the workpiece level, a level sensor is installed near the vibrating shell. If the sensor reports a lack of workpieces in the vibrating shell, the hopper drive switches on and off cyclically.

The hopper drive is protected with a thermal link [1].

The power supply is equipped with a microfuse [2].

Drive

The level sensor reports a lack of workpieces in the vibrating shell of the following sorter.

After the turn-on delay time t_{band} has elapsed, the hopper band drive starts up.

The turn-on delay of the hopper band can be set with the potentiometer t_{band} from 0-45 sec.

The turn-on time is approx. 1 sec. **with a jumper**, and approx. 2.5 sec. **without a jumper**.

After the turn-on time has elapsed, the pause time starts.

The pause time of the drive can be set with the potentiometer t_{pause} between 0.5 and 13 sec.

The filling of the following sorter can be controlled by setting the previously named parameters t_{band} ,

Jumper and t_{pause} .

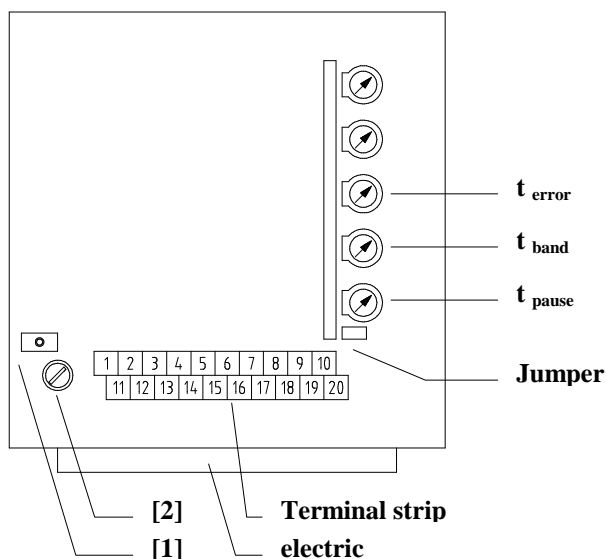
Fault

The turn-on delay "Error" is started when the level sensor reports "Lack of workpieces in the vibrating shell". This can be set with the potentiometer t_{error} from 35-180 sec.

If the level sensor is not activated by workpieces, the error time elapses. The hopper drive stops.

The error signal relay is triggered.

The error is acknowledged by pressing the **Reset** button.



5.1 Structure and function

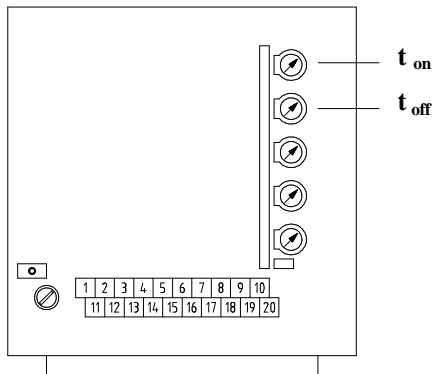
Hopper filling level control

Turn-on delay

The filling level of the hopper is monitored by a photoelectric barrier. As soon as a lack of workpieces is detected by this sensor, the adjustable turn-on delay t_{on} begins. Once this time has elapsed, the relay "Error and lack of workpieces" is triggered.

Turn-off delay

As soon as there is no longer a lack of workpieces in the hopper, the output of the adjustable turn-off delay t_{off} is reset. The relay "Error and lack of workpieces" is released.

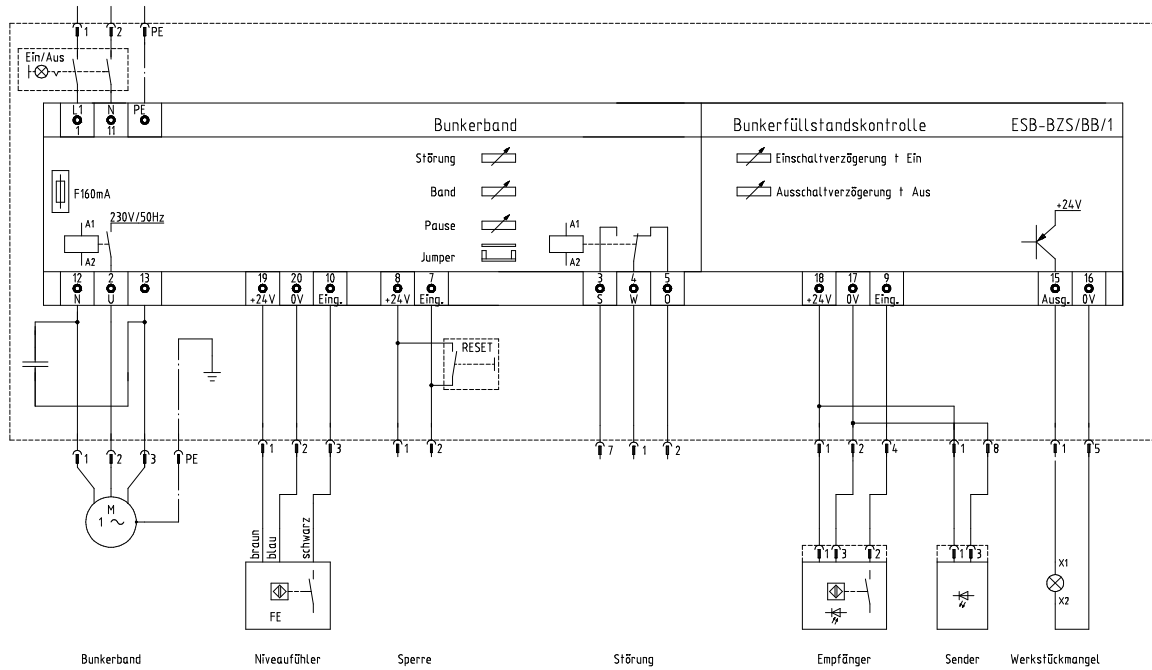


Terminal assignment

Number	Text
1	L1 Mains lead
2	U Output hopper band
3	Malfunction contact
4	Malfunction changer
5	Malfunction opener
6	Not occupied
7	Block input
8	Block +24 V
9	Hopper filling level control input receiver
10	Level sensor input
11	N Mains lead
12	N Output hopper band
13	Auxiliary winding / capacitor hopper band
14	Not occupied
15	Warning light - lack of workpieces +24 V / 200 mA
16	Warning lamp - lack of workpieces 0V
17	Hopper filling level control 0 V
18	Hopper filling level control +24 V
19	Level sensor +24 V
20	Level sensor 0 V

5. Control description

5.2 Wiring plan



6. Malfunctions

Fault	Causes of malfunctions	Trouble-shooting
Hopper band doesn't go	No mains connection The connection line is damaged. The mains switch is off The level sensor is defective. The block is activated	Connect to the mains. Replace the connection line. Set the mains switch to On. Check the level sensor. Check the block.