



Operating instructions Vibratory bowl feeder

SRC-N 63-2
SRC-N 100-2

BA

Rhein-Nadel Automation GmbH

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Notice

All vibratory bowl feeders listed in the table may only be operated in connection with a RNA control unit at a mains voltage of 230V/50Hz. Special voltages and frequencies see separate data sheet.

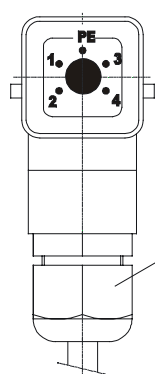
1 Technical data

Vibratory bowl feeder type ¹⁾		SRC-N 63-2	SRC-N 100-2
Dimensions ø x height	in mm	60 x 65	90 x 82
Weight	in kg	0,8	1,8
Insulation type		IP 54	IP 54
Connecting cable length	in m	1,4	1,4
Power consumption ²⁾	in VA	8	11
Current consumption ²⁾	in A	0,04	0,055
Magnet nominal voltage ²⁾ /frequency	in V / Hz	230 / 50	230 / 50
Air gap [mm]	in mm	0,3 - 0,4	0,3 - 0,4
Number of magnets		1	1
Vibration frequency	in Hz/min ⁻¹	100 / 6000	100 / 6000

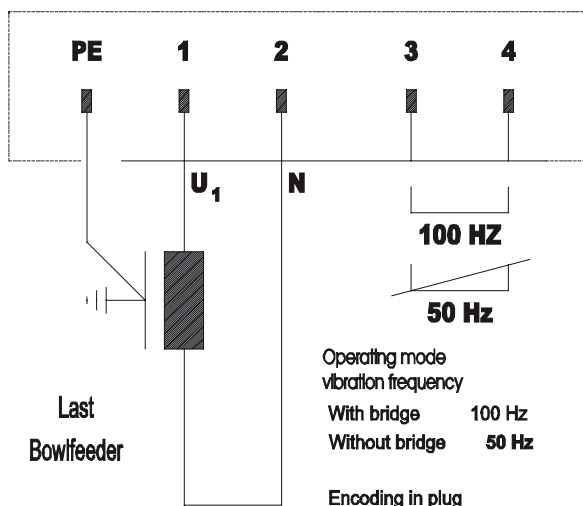
¹⁾ The last figure of the type identification shows the Vibration frequency: 1=50Hz (black mains cable), 2=100 Hz (grey mains cable)

²⁾ For special voltages (voltage, frequency) see type plate at the magnet

Pin assignment



Screw connection M20
Grey-2, 100 Hz
Black-1, 50 Hz
Metal-EMV-screw connection
For frequency controlled equipment



2 Safety instructions

The conception and production of our vibratory bowl feeders has been carried out very careful, in

order to guarantee a trouble-free and save operation. You too can make an important contribution to job safety. Therefore, please read this short operating instruction completely, before starting the machine. Always observe the safety instructions!

Make sure that all persons working with or at this machine carefully read and observe the following safety instructions!

This operating instruction is only valid for the types indicated on the front page.



Notice

This hand points to information that gives you useful tips for the operation of the vibratory bowl feeder.



Attention

This warning triangle marks the safety instructions. Non-observance of these warnings can result in serious or fatal injuries!

Dangers occurring at the machine

- The most dangerous parts of the machine are the electrical installations of the vibratory bowl feeder. In case the vibratory bowl feeder becomes very wet, there is the danger of an electric shock!
- Make sure that the protector ground of the electric power supply is in perfect condition!
- Operation of the vibratory bowl feeder without trim panel is strictly prohibited!

Proper use

The intended use of the vibratory bowl feeder is the actuation of sorting machines. These sorting machines are used for sorting and feeding correctly positioned mass-produced parts, as well as for the proportioned feeding of bulk material.

Using the machine for other purposes than the above mentioned, eg. as vibrating screen or in material testing, is considered not to be the intended use.

The intended use also includes the observance of the operating and servicing instructions. Please take the technical data of your vibratory bowl feeder from the table "technical data" (see page 1-2). Make sure that the connected load of the vibratory bowl feeder, control unit and power supply corresponds to each other.



Notice

The vibratory bowl feeder may only be

operated in perfect condition!

The vibratory bowl feeder may only be operated in the configuration drive unit, control unit and bowl, as specified by the manufacturer.

The vibratory bowl feeder may not be operated in the explosive or wet area.

No additional loads may act upon the vibratory bowl feeder, apart from the bulk material, for which the special type is designed.



Attention

It is strictly prohibited to put any safety devices out of operation!

Demands on the user

- For all activities (operation, maintenance, repair, etc.) the details of the operating instructions must be observed.
- The operator has to refrain from any working method which would impair the safety of the vibratory bowl feeder.
- The operator has to take care that only authorized personnel works at the vibratory bowl feeder.
- The operator is obliged to inform the operator immediately about any changed conditions at the vibratory bowl feeder, which could endanger safety.



Attention

The vibratory bowl feeder may only be installed, put into operation and serviced by expert personnel. The binding regulation for the qualification of electricians and personnel instructed in electrical engineering is valid, as defined in IEC 364 and DIN VDE 0105 part 1.



Attention:

Since the electromagnetic-field may have an impact on persons carrying pacemakers it is recommended to keep a minimum distance of 25 cm.

Noise emission

The noise level at the place of operation depends on the total equipment and the material to be sorted. The determination of the noise level according to the EC-Regulations "Machinery" can therefore only be carried out at the place of operation.

If the noise level at the place of operation exceeds the limit permitted, noise protection hoods may be used, which we offer as accessory parts (see catalogue).

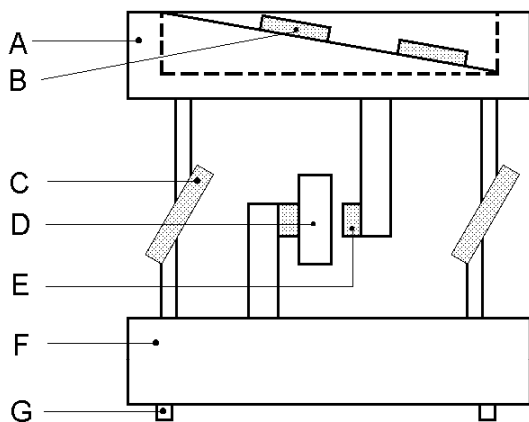
Standards and regulations

The device was built according to the following standards and regulations:

- EC- Directive Machinery 98/37/EC
- EC- Low voltage directive 73/23/EC
- EMC- Directive 89/336/EC
- Applied harmonized Standards
EN 60204, T.1
EN 292, T.1 and T.2
- Applied national technical standards
VGB 4
VGB 10
- Rheinnadel- Conditions for purchasing
- VDE- Standards
- VDMA- Conditions of delivery

3 Construction and function of the vibratory bowl feeder

Vibratory bowl feeders are used for the actuation of sorting machines. The actuation takes place by electromagnets. The following schematic diagram shows the function of a vibratory bowl feeder:



- A = Bowl**
- B = Material to be conveyed**
- C = Spring assembly**
- D = Drive magnet**
- E = Armature**
- F = Counter-mass**
- G = Vibration buffers**

The drive magnet D is firmly connected with the counter-mass F. When current passes the drive magnet, it exerts power on armature E. The power is transmitted to bowl A, which is supported by the spring assembly C. The moving direction of the bowl is determined by the angle of the spring assemblies.

Owing to the vibrations the material to be conveyed is shortly lifted off the conveyor belt (helix of the bowl) and it carries out little jumps (micro-jumps). The jump direction is in a right angle to the level of the spring assemblies.

The drive magnet achieves its maximum magnetic force twice during a period of the alternating current. Consequently the vibration frequency corresponds to the double mains frequency.

For heavy sorting installations a lower frequency of 50 Hz can be more advantageous.

The vibration frequency of your vibratory bowl feeder results from the last figure of the type designation:

-2: 100 Hz - 6000 vibrations/min.

A vibratory bowl feeder is a resonant system (spring-mass-system). The result is that the adjustment made at the plant will rarely meet your requirements. Chapter 5 shows how your vibratory bowl feeder is adapted to your requirements.

As accessory parts we are offering a spectrum of sorting bowls, which cover a wide range of application. For special applications individual problem solutions can be manufactured.

Controlling of the vibratory bowl feeder takes place by a low loss electronic control unit. The selection of the control unit depends on the power consumption of the vibratory bowl feeder. The following table shows the kind of control units that can be used at the individual vibratory bowl feeders:

	ESG 2000	ESK 2000	ESG 90
SRC-N 60	✓	✓	✓
SRC-N 100	✓	✓	✓

The pin assignment of the bowl is shown in the table "Technical Data" (chap. 1).



Notice

Detailed information on the complete range of control units may please be taken from the operating instructions for control units.

All control units have got two main operating elements:

- By the **mains switch** the vibratory bowl feeder is switched on or off.
- By the **turning knob** the conveying capacity of the sorting unit is set.

4 Mounting

The device is completely mounted.
 The vibrator has to be screwed on a strong sub-assembly in a dry room.
 Ambient temperature – 10° to + 50°C
 Ensure that no contact exists between the bowl feeder in operation and other equipments. The bowl feeder is to be firmly mounted from beneath the fastening threads on a mass of at least 15 – 20 Kp.

Vibratory bowl feeder type	Hole circle \varnothing [mm]	Hole circle angle [°]	Vibration buffer thread
SRC-N 63	40	2 x 180 °	M4
SRC-N100	70	3 x 120 °	M4

Further details on the control unit (bore plan, etc.) are please taken from the operating instructions of the control unit separately delivered.

5 Starting

Preparations



Notice

Ensure that the machine frame (stand, under frame, etc) is connected with the protective conductor (PE). If necessary, protection earthin must be praided on spot.

Check, whether

- the vibratory bowl feeder stands in an isolated position and does not come in contact with a solid body
- the sorting bowl is tightly screwed down
- the connecting cable of the vibratory bowl feeder is plugged in at the control unit.



Attention

The electric connection of the vibratory bowl feeder may only be made by trained personnel (electricians)! In case modifications are made at the electric connection, it is absolutely necessary to observe the operating instructions "control units".

- the available supply voltage (frequency, voltage, power delivery) corresponds to the connecting data of the control unit (see type plate at the control unit).

Plug in the mains cable of the control unit.

Switch on the control unit with the mains switch.



Notice

At vibratory bowl feeders which are delivered as a completely adjusted system, the optimal conveying capacity is already set in the factory. It is marked on the scale of the turning knob with a red arrow. In this case set the turning knob to the marking.

The optimal operative range of the vibratory bowl feeder is at a controller position of 80% at the control unit. In case of higher deviations

($\geq \pm 15\%$) a new adjustment must be made. This adjustment is described on the following page.

In the factory the vibratory bowl feeders are approximately adjusted to standard sorting bowls (without sorting element).

Adjustment

To set the air-gap, lift and lower the magnet coil, which is fastened with a threaded pin.

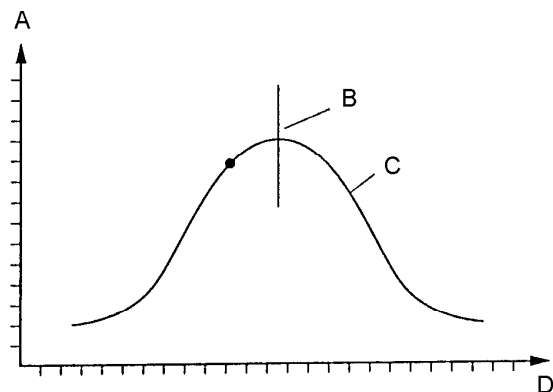
Adjusting the magnet coil:

1. Fit the unit on a solid subsurface
2. Loosen the fixing screw of the magnet coil (Screw is fitted laterally at the counter mass across the cable outlet)
3. Adjust the air-gap with the height adjusting screw of the magnet coil. This new is found laterally at the counter mass between the cable outlet and fixing new of the coil magnet
4. Tighten the fixing screw

In order to guarantee an optimal sorting behaviour, the vibratory bowl feeder must be adjusted to the concrete operating conditions. The adjustment is made by adding or removing leaf springs and washers.

While the spring fastening screw is loosened, you can see a change in the conveying speed.

The following graphic chart shows the resonance curve of a vibratory bowl feeder:



- A = Conveying speed
- B = Natural frequency of the system
- C = Resonance curve (not true to scale)
- D = Spring power (number of springs)



Notice

The resonant frequency of the vibratory bowl feeder may not correspond to the mains frequency.



Notice

The adjustment is, however, more easy with an electronic frequency

converter, which you can buy from our range of accessory parts.

The vibratory bowl feeder should be adjusted that the required conveying capacity is achieved at a controller position of approx. 80% at the control unit.

6 Maintenance

The vibratory bowl feeders are generally maintenance-free. They should only be thoroughly cleaned when they are considerably dirty or after fluids have been spilled over them.

7 Stockkeeping of spare parts and after-sales service

The range of the spare parts available may be taken from the separate spare parts list.

In order to guarantee a quick and faultless handling of the order, please state the following data at each individual order:

- Type of equipment (see type plate)
- Number of pieces needed

- Spare part name

- Spare part number

You will find a list of our service addresses on the back page of the cover

8 What happens, if...

Instructions for trouble-shooting

Attention



The control unit or the connecting terminal box may only be opened by an electrician. Before opening the a.m. devices, the mains plug must be unplugged!

Trouble	Possible cause	Remedy
Vibratory bowl feeder does not start at being switched on	<p>Mains plug of the control</p> <p>Connecting cable between vibratory bowl feeder and control unit not plugged in</p> <p><i>Only in connection with control unit ESK 2000</i> Sensor gives the faulty message of pile-up, owing to defect or maladjustment (green LED at the vibratory bowl feeder STOP</p> <p>Fuse in the control unit defect</p> <p>Mains switch off</p> <p>Magnet coil defect</p>	<p>Plug in the mains plug unit is not plugged in</p> <p>Plug in the 7-pole plug at the control unit</p> <p>Replace the sensor or readjust it</p> <p>Check whether the sensor is plugged in</p> <p>Replace the fuse</p> <p>Switch on the mains switch</p> <p>Have the coil checked by trained personnel and , if necessary, have it exchanged.</p>
The vibratory bowl feeder vibrates only slightly	The control unit is set to 0%	Set the controller to 80 %



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