



Operating Instructions

for

Step Feeders

STS 220-4

STS 220-6

STS 320-4

STS 320-6

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Declaration of Incorporation

according to Machinery Directive 2006/42/EC

We,
Company

Rhein-Nadel Automation GmbH
Reichsweg 19-23
52068 Aachen
Germany

herewith declare under our sole responsibility that with regard to the following product:

Machine designation: (function) Step Feeder

Type designation: STS

Serial number 10865660 0001 2500000 0001

all relevant essential safety and health requirements of Directive 2006/42/EC have been fulfilled up to the battery limits.

The product to which this declaration refers is furthermore in conformity with following directives and standards or other regulations:

2006/42/EC	Machinery
2006/95/EC	Low Voltage
2004/108/EC	Electromagnetic Compatibility

EN 614-1	2006+A1:2009	EN ISO 13857	2008
EN 619	2002+A1:2010	EN ISO 14120	2015
EN 620	2002+A1:2010	EN 60204-1	2006
EN ISO 12100		2010	

The relevant technical documentation has been compiled in accordance with Annex VII B of the Machinery Directive and on request, such documentation will be transmitted to the competent authorities in hard copy.

Nico Altmeyer, Rhein-Nadel Automation GmbH, Reichsweg 19-23, 52068 Aachen

(Name and address of person authorised to compile the relevant technical documentation)

Notice: This machine must not be put into service until the complete system into which it will be incorporated has been declared to be in conformance with the provisions of the Directive.

Signatory information

Name: Dr. Hensen

Given name: Tobias

Function: Managing Director

Germany

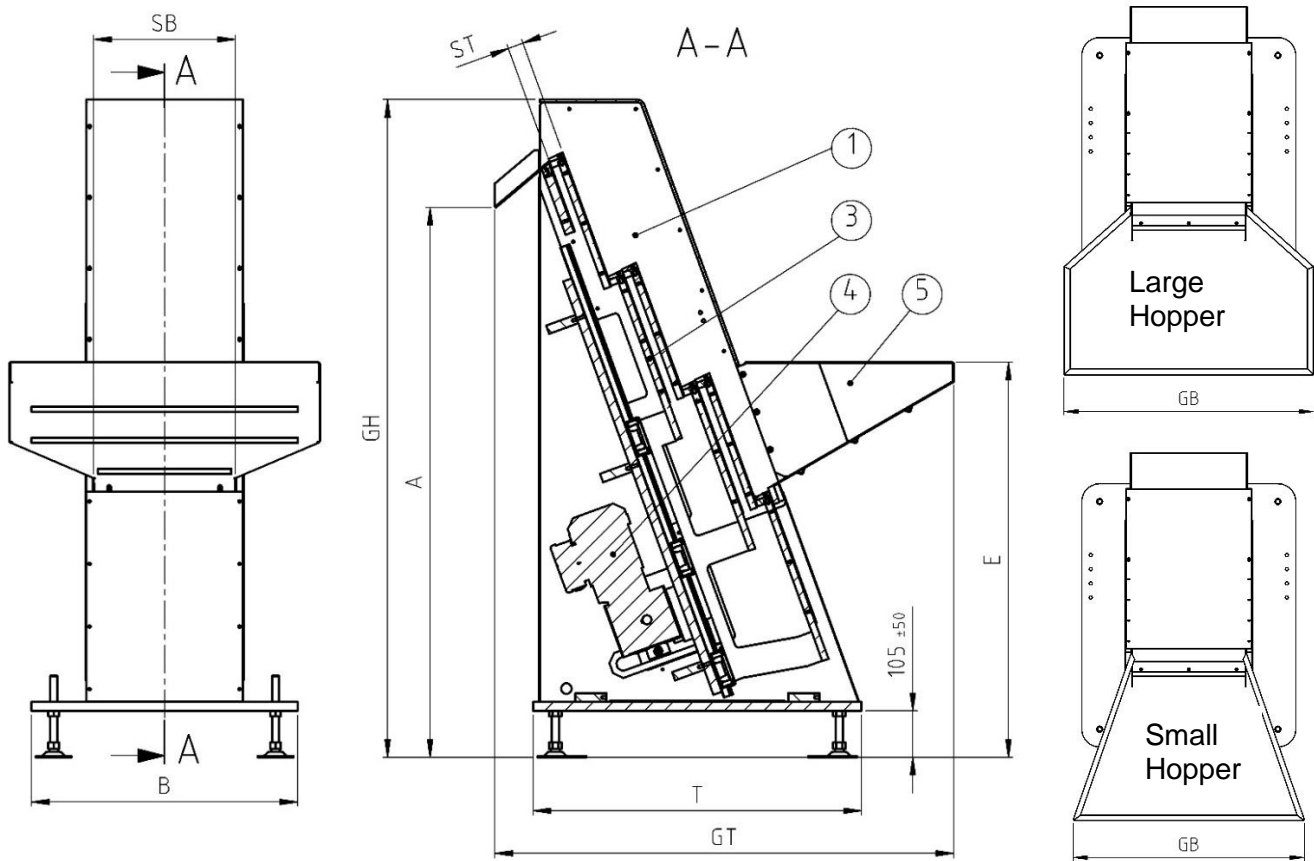
Aachen,

Place and date

Signature

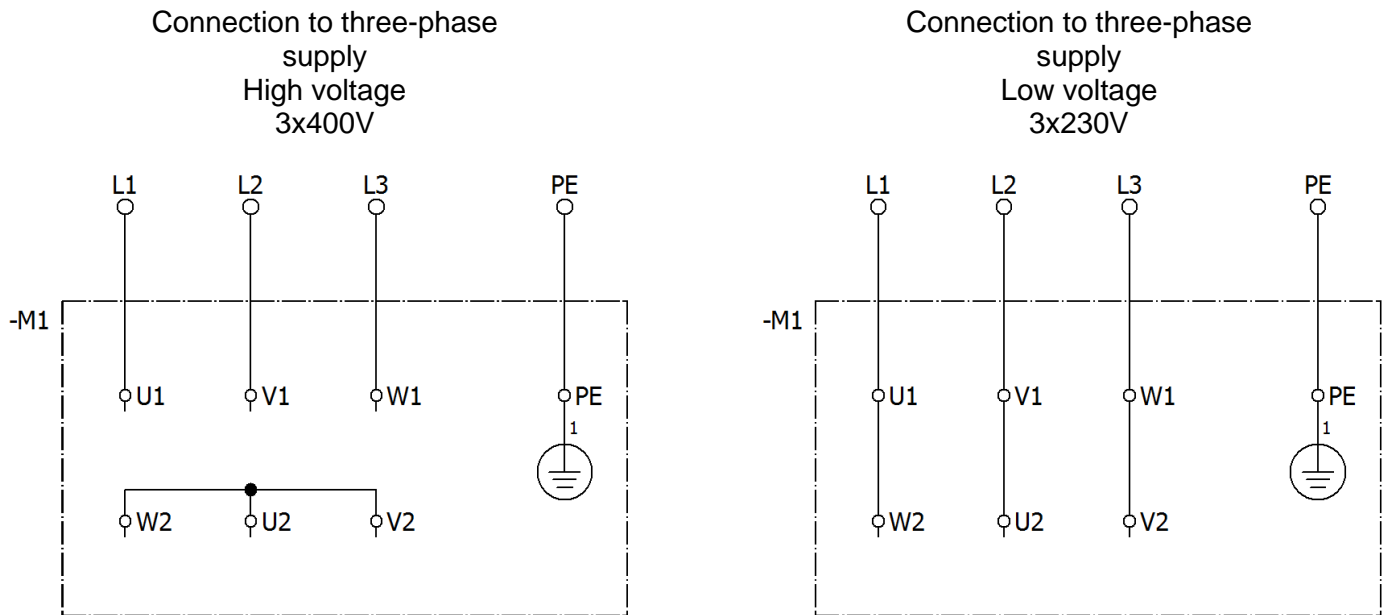
1. Technical data

1.1. Table



Type	STS 220-4	STS 220-6	STS 320-4	STS 320-6
E = filling height +/-50 (mm)	870	905	870	905
A = discharge height +/-50 (mm)	955	1250	945	1240
GH = total height +/-50 (mm)	1230	1480	1230	1480
GB = total width - large hopper	600	600	700	700
GB = total width - small hopper	550	550	650	650
GT = total depth	860	1000	900	1035
B = width of baseplate	500	500	600	600
T = depth of baseplate	630	700	670	740
SB = width of steps	218	218	318	318
ST = depth of steps	15/20/25/30	15/20/25/30	20/25/30/35	20/25/30/35
Number of steps	4	6	4	6
Footprint (GB x GT)	600 x 860	600 x 1000	700 x 900	700 x 1035
Strokes per minute without VFD	29 (50Hz) 35 (60 Hz)	29 (50Hz) 35 (60 Hz)	29 (50Hz) 35 (60 Hz)	29 (50Hz) 35 (60 Hz)
Strokes per minute with VFD	10 to 45	10 to 45	10 to 45	10 to 45
Hopper volume (L)	20/30	20/30	30/40	30/40
Max. filling weight (kg)	60	60	60	60

Connection of three-phase motors



Sense of rotation is indicated by an arrow on the motor.
 This area becomes visible after removal of the side cover.
 To reverse the sense of rotation invert two phases of the supply line

2. Safety Information

We have taken great care in design and manufacture of our step feeders in order to ensure smooth and safe operation. You, too, can make an important contribution towards safety at work. We therefore ask you to read these brief operating instructions completely prior to commissioning the system. Observe the safety directives at all times!



Attention

This warning sign indicates safety directives. Non-observance of such warnings may cause serious injury or even death!



Caution

This warning sign indicates safety directives. Non-observance of this warning may cause minor injury or material damage.



Notice

This symbol indicates useful tips for operation of your belt feeders.

Make sure that all persons working with or on the equipment also read the following safety directives carefully and follow them!

These Operating Instructions only apply to the equipment types indicated on the cover page.

They must be available at all times at the place of installation of the step feeders.

If the step feeders are to be used in a humid or wet environment (wet area) make sure that the required degree of protection is provided.

**Notice**

For comprehensive information on the full range of control devices please refer to the 'Control Units' operating instructions.

Any commissioning, retooling, maintenance and repair work shall be carried out by qualified and authorized personnel only (see also 'Operator's duties' in this section).

For installation, maintenance and repair work, all poles of the power supply must be disconnected from the belt feeder in compliance with VDE provisions.

Any work on the electrical equipment shall be carried out exclusively by a professional electrician, or by instructed persons working under the supervision of a professional electrician, according to electrotechnical rules.

**Attention**

Risk of injury and electric shock hazard!

- The equipment user and operators shall ensure that only authorized personnel works at the step feeder.
- Any changes that have occurred on the feeding system affecting safety shall immediately be reported to the user.
- Operate the step feeder in perfect condition only!
- Use the step feeder only for its intended use.
- Observe the accident prevention provisions VBG 10 for continuous conveyors and VBG 4 for electrical equipment and components!

Machine hazards

- If the step feeder comes into contact with moisture or liquids there is risk of electric shock.
- Make sure that protective earthing of the power supply system is in perfect condition.
- Never operate the step feeder without guards and cover panels in place!

Intended use

The intended use of the step feeders is the storage and feeding of parts.

The shortest side of such parts must be at least 1 mm long.

Select the step feeder model (size) and step depth according to the size of the parts handled to make sure that the parts can be conveyed by means of the step plates.

**Caution**

Small parts and parts with small outer contours may get lodged in the gaps of the step frames and causing damage or equipment failure.

**Caution**

Dirt deposits on the parts to be handled may get lodged in the gaps of the step frames and cause damage, equipment failure or excessive sliding skid wear.

**Caution**

Dirt from the parts handled may enter the linear guide units of the step frames and cause damage, equipment failure or excessive runner block wear.

For permitted hopper loading see Technical Data in Section 1.

The parts to be handled must not be dumped into the hopper from great height. The maximum permitted impact energy is 0.2 J.

Noise emission

The constant sound pressure level is 70 dB(A) max. Specific part handling applications may result in higher noise levels. For such exceptional cases noise abatement options are available from manufacturer.

Equipment user's duties

Commissioning, retooling, maintenance and repair work shall be performed by qualified and authorized personnel only.

We distinguish between four qualification levels:

Qualified personnel

refers to persons who are familiar with installation, start-up and operation of the step feeder. Their qualifications are appropriate for their activities.

Authorized personnel

refers to qualified personnel that has been assigned a clearly defined task by the user of the step feeder.

Qualified electrical worker

According to IEC 364 and DIN VDE 0105 Part 1, the term 'qualified electrical worker' refers to persons who, through their professional training, know-how and experience and through their knowledge of applicable standards are able to assess the work assigned to them and to recognize potential hazards.

Instructed person

According to IEC 364 and DIN VDE 0105 Part 1, the term 'instructed person' refers to persons who have been instructed in the tasks assigned to them by a qualified electrical worker. These persons have also been briefed on potential dangers resulting from inappropriate behaviour, and on the requisite guards and precautions to be used/taken.

2.1. Applicable directives and standards

The step feeder has been manufactured in accordance with the following directives:

- 2006/42/EC Machinery
- 2006/95/EC Low Voltage
- 2004/108/EC Electromagnetic Compatibility

We assume that our product will be incorporated into a stationary machine. The requirements of the EMC Directive 2014/30/EU must be satisfied by the user.

The applicable standards are specified in the Declaration of Incorporation.

3. Design and functional description of step feeders

Fill the parts to be conveyed (bulk products) into hopper (5). Please observe the filling quantity indicated on the hopper. In the hopper the parts are transferred to the step plate of the step frame. The step frames (2) and (3) oscillate up and down in reciprocating manner between the side panels of the base frame (1). The parts are moved up by the first plate. Due to the incline of the feeder and the projection of the steps involved, parts are transferred from one step plate to the next plate when one step frame reaches the top of its motion (reversal point), at which point the other frame is at the bottom of its motion. The parts are now moved up by this step plate and transferred to the next step plate etc. until the parts exit the step frame at the topmost point. The parts exiting the step feeder slide down a chute to the downstream equipment.

Control of the step feeder is effected, depending on motor type, by motor protection breaker or electronic control devices.



Notice

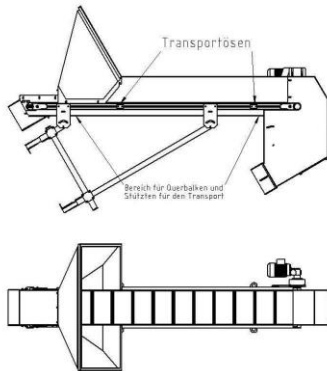
For information on the control devices please refer to the separate 'Control Units' operating instructions.

4. Shipment and installation

4.1. Shipping and handling

4.1.1. Shipment ex works

The incline conveyors are delivered ex works lying flat in a box or on pallets. Use the lifting eyes mounted on the incline conveyor to lift and erect the incline conveyor.



4.1.2. On-site moving

The incline conveyor weight depends on its dimensions and motor rating. Please refer to the shipping documents for the weight of your specific equipment.



Attention

Check all guards when unpacking. Replace any damaged parts before commissioning!



Attention

One-piece belt conveyors can be moved to their place of installation on a sufficiently strong trolley or cart.



Attention

For lifting the feeders be sure to use only sufficiently dimensioned vehicles, ropes, chains and sling gear.



Attention

Check all guards when unpacking. Replace any damaged parts before commissioning!



Attention

Handling operations to be carried out only by employees who are capable of performing such work due to their own knowledge and experience in this field.



Warning

Warning against suspended loads

4.2. Connecting the motor

Have a professional electrician connect the motor in accordance with the circuit diagram (see chapter 1). After that, check the sense of rotation.



Attention

Provide suitable overload protection for the motor. The motor characteristics are specified on the motor rating plate!



Caution

Motor protection breakers supplied unfitted must not be installed upside down as this would disable their protective function. Be sure to install the circuit-breakers in the specified orientation.

4.3. Installation

The incline conveyor is delivered fully assembled and mounted on a supporting structure.



Attention

The machine is intended to complete / to be incorporated into a complete system. Do not operate the machine before safe completion/incorporation by the user.



Attention

Be sure to anchor the supporting substructure to the foundation. Operation of unanchored feeders is not permitted!



Attention

Make sure that the specified distance of 35 mm (see drawing in chapter 1, Technical Data) is not exceeded.

5. Commissioning



Attention

Electrical connection of the step feeder must be made by trained professional electricians only! When making any change to the electrical connection be sure to observe the operating instructions for the motor circuit-breaker / control unit.

The step feeder is started and stopped at the motor circuit-breaker.

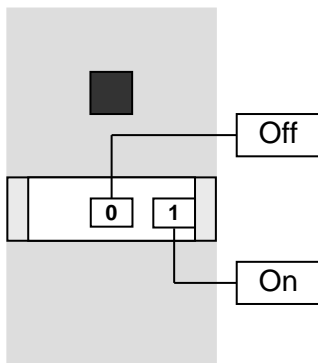


Fig. 10: Motor protection breaker

For step feeders with other control units please refer to the separate user's manual of the control unit.

First let the step feeder run for about 5 min. without the parts. During this time verify that the step feeder runs smoothly and without any trouble. No metal components of the step frames must touch each other.

6. Maintenance



Attention

For installation, maintenance and repair work all poles of the power supply must be disconnected from the hopper/belt feeder unit in compliance with VDE provisions. Any work on electrical equipment of the hopper/belt feeder unit shall be carried out exclusively by a professional electrician, or by instructed persons (see chapter 2) working under the direction and supervision of a professional electrician, according to electrotechnical rules.



Attention

Be careful when working on motors! They get hot during operation. Therefore let motors cool down before working on them. If this is not possible, take suitable protective measures such as the use of gloves.



Attention

If any guards have been removed, be sure to fit them back in place!

Clean the step feeder at regular intervals to ensure smooth mechanical action. The cleaning intervals are to be set by the user depending on the condition of the parts to be handled and on the specific ambient conditions prevailing at site but should not be longer than once a week. During cleaning, check the sliding skids on the step plates for wear and apply a thin layer of oil. The sliding skids prevent the metal components from touching each other. Replace the sliding skids when the gap sizes are reduced to approx. 0.1 to 0.2 mm.

Check the following once a day:

1. Absence of foreign matter or rejects in the equipment
2. Tight fit of machine parts and proper transition areas
3. Tightness of spring steel plates of steps

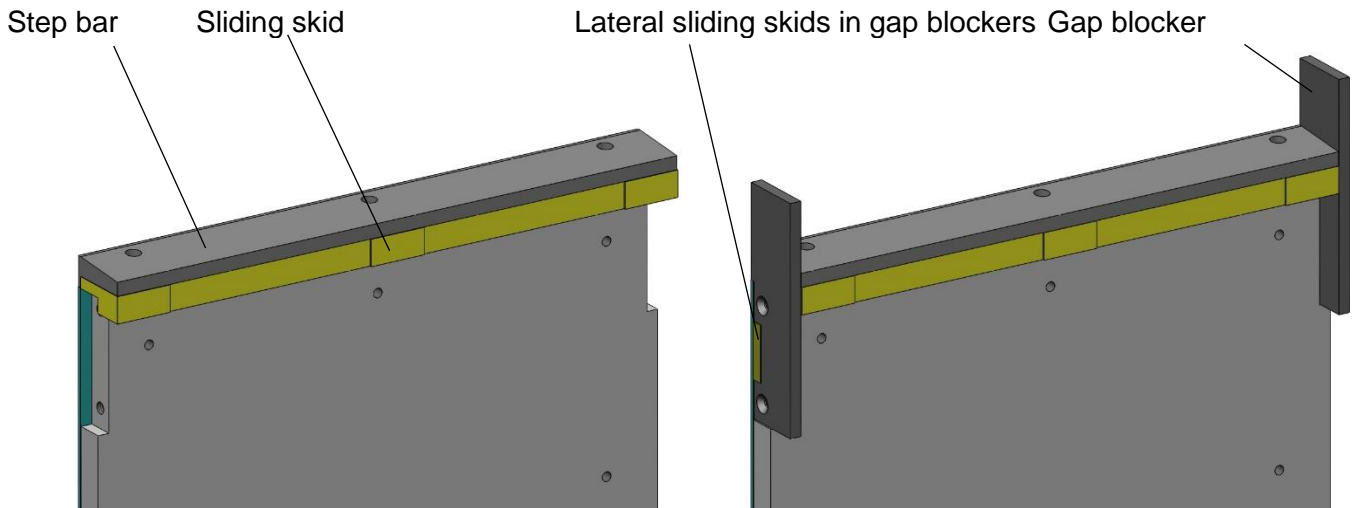
If any one of these points is not fulfilled stop the equipment and initiate repairs and/or adjustments.

6.1. Step frame motor

Motor and gearbox are low-maintenance units. In normal operation no re-lubrication or lubricant change is required.

6.2. Replacing the sliding skids of step plates

To remove the sliding skids of the step plates dismantle the step bar and lift out the skids. Step plates fitted with gap blockers have additional lateral sliding skids in said blockers. To replace these sliding skids it is necessary to dismantle all step plates first. To do so, remove the front cover underneath the hopper of the step feeder. Now you can dismantle the step plates from bottom to top. For installation proceed from top to bottom. Take care to remount the screw locking devices, if any.



6.3. Linear guides of step frames

The linear guides of the step frames come with an initial charge of grease. The greases used are standard types such as for antifriction bearings, with a base oil viscosity of 200 mm²/s at 40 °C. See table below for examples. Lubricants containing MoS₂ or graphite are prohibited.

Recommended greases for standard applications

HIWIN	G05
Klüber	MICROLUBE GL-261
Mobil	Mobilux EP1
Fuchs Lubritech	Lagermeister BF2
Lubcon	TURMOGREASE CAK 2502

Recommended lubricant charge for HIWIN HG_25 series

Initial lubrication	Relubrication
0.8 grammes (3x)	1.2 grammes

For initial lubrication, add the quantity of grease specified in the table by slow operation of the grease gun. Move the runner block three times by a distance equalling approx. three times its length. Repeat the procedure described twice more. Next move the runner block through its complete travelling distance and check that a film of lubricant is visible on the complete rail. If not, add more lubricant.

If re-lubrication is required, dismount the covers on the side panels. In order to access the lubricating nipples (2 per runner block) move the step frames until the runner blocks are in the area of the openings.

7. Spare parts and customer service

For an overview of genuine spare parts available please refer to the separate spare parts list.

In order to make sure that your order is processed swiftly and correctly please specify the device type (see rating plate), the quantity required, the spare part designation and the spare part number.

For a list of Service Center addresses refer to the back cover page of this manual.



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