

Operating Instructions

Horizontal cartoner

HK-IV-S-“k“-10“/R

Order Number: 2444
Customer: Wolf Tempo

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1.1. Current issue of the documentation

This documentation is based on the state of knowledge available at the time these operating instructions were prepared. No guarantee is given for the correctness and completeness of the information. We reserve the right to make technical changes without prior notice.

These operating instructions do not extend the sales and delivery conditions of DIENST Packsysteme GmbH.

1.2. Guarantee

The machine is designed to maintain its performance, operational safety and working accuracy for many years. However, this is only guaranteed if the rules and regulations for the operation and maintenance of the machine are observed.

DIENST Verpackungstechnik GmbH shall not be held liable for any damage caused by the improper use of the machine, its unlawful operation and/or incorrect preventive maintenance or lack of services.

All consequences of unauthorised modifications and changes are the responsibility of the operating company. This applies in particular to modifications that affect the safety of the machine.

1.3. Repairs

These operating instructions neither contain nor are intended to provide instructions on how to proceed in case of major repairs. Only DIENST Packsystems GmbH shall be requested to carry out such tasks.

When requesting our services, please describe the damage to the machine as precisely as possible and state the order number of the machine.

2.1. General information

Before the initial start-up of the machine, the operating personnel and the supervisor must have read carefully and completely understood these operating instructions. Both the operating personnel and supervisor must sign to confirm having read/understood the guide.

These operating instructions must be kept in a place that is accessible to the operating personnel at all times. A brief note where these operating instructions are kept must be attached to the machine.

2.2. Warnings and symbols in the user information

Warnings are shown in a box with a grey background and are indicated by a warning symbol (see chapter 2.1).

Compliance with these instructions is mandatory.

Failure to do so may result in injury to persons and/or damage to property.

2.3. Staff qualifications and training

In order to proceed with the operation and maintenance of the machine, the operating personnel must have been instructed by a DIENST Packsystems GmbH technician. At least two people must be trained. If a technician of DIENST Packsystems GmbH has trained a representative of the operating company on how to operate the machine, the latter shall be entitled to instruct other operating personnel on the operation of the machine.

The representative's superior must sign and thus confirm the participation of the employee.

The technician shall record the training and the participating persons shall confirm their training by signing the document. A copy remains with the machine manufacturer.

Only a qualified electrician with a trade proficiency certificate of the respective country shall be permitted to proceed with any tasks on the electrical system.

Only qualified mechanical personnel with a trade proficiency certificate of the respective country shall be permitted to proceed with any tasks on the mechanical system.

2.4. Non-compliance with the safety instructions bear inherent risks

Failure to comply with the safety instructions may place persons who are in the danger zone at risk and may cause damage to property of third parties.

The following perils are most prevalent:

Risk of personal injury

Danger to the machine and assets of the operating company. These risks can lead to loss of operational readiness of the machine and thus cause loss of production.

2.5. Working with safety in mind

Safety-conscious thinking and acting can lower the risk of damage and injuries. Safetyconscious working on the machine can only be guarantee if:

- the machine is operated, maintained and serviced only by trained and authorised personnel,
- the responsibilities are clearly defined as soon as several persons operate the machine. In order to prevent ambiguities, compliance with these requirements is mandatory.
- unauthorised persons stay clear of the machine's operating area.

The operating company undertakes to operate the machine only in a flawless condition.

This implies that the machine is operated and maintained in accordance with its intended use.

2.6. Safety instructions for the machine operator

- Tampering with the safety equipment is prohibited. Any infringement shall deem the machine manufacturer's liability null and void.
Emergency Stop buttons and safety devices must be easy to reach, and their accesses must always be kept unobstructed.
- Grease on the floor and on machine parts/components evidently creates a slipping hazard. These risks can lead to severe injuries. Therefore, when handling such fluids, cleanliness is indispensable!
- Never attempt to reach into the running machine!
For safety reasons, only the person actuating the jog mode button shall be permitted to work on the machine while the machine is in set-up mode.

2.7. Safety instructions for preventive maintenance, inspection and assembly installation tasks

- Only persons who are qualified and authorised to work on control cabinets shall be permitted to proceed with such tasks. Never attempt to touch live parts/components.
- Proceeding with preventive maintenance, inspection, and assembly installation tasks is only permitted while the machine is at a standstill. Before starting any type of work on the machine, its main switch must be set to "0".
- Never place tools or other objects on the machine! They can fall in the machine and cause serious damage.
- Compliance with the safety instructions in this operation manual regarding preventive maintenance, inspection and installation is mandatory.

2 Safety

2.8. Unauthorised modifications and arbitrary production of spare parts

Modifications and changes which adversely affect the safety of the machine are prohibited.

Only the manufacturer shall be permitted to proceed with modifications that may lead to functional changes. The operating company may only make

changes after consultation with the manufacturer and written approval by the latter.

Only original spare parts must be used. Non-compliance will cause all warranties to become null and void.

2.9. Contrary to intended use

- The machine is **exclusively** suitable for packaging milk powder in bags in folding cartons. Any other application is considered contrary to the intended use. The operating company shall be solely liable for any resulting damage. Intended use also includes the safety, operating and maintenance instructions described in these operating instructions.
- Cleaning the machine while in operating mode is not permitted. Compliance with the instructions in the chapter 9.2 "Preventive maintenance and cleaning" is mandatory.

3.1. Safety precautions

When using a forklift truck (minimum lifting capacity of the hoists must be 3,500 kg), the machine can be transported safely and carefully. The machine must be transported separately from the infeed system.

3.2. Transport requirements

When transporting the machine, compliance with the instructions contained in this chapter is mandatory. This applies in particular to the attachment points and the hoisting equipment.

It is essential to ensure that the permissible load of the hoisting equipment is sufficient.

Compliance with these safety instructions is mandatory. Failure to observe these warnings inevitably increases the risk of accidents and potential damage to the machine or the hoisting equipment.

3.2.1. Dimensions and weight

Length 10900 mm Width 2190 mm Height 2350 mm Weight 3000 kg

3.2.2. Manipulation

When lifting the machine, check and ensure that the centre of gravity of the machine is located in the centre of on the hoist's attachment points. While the machine is suspended in mid air, its stability must be ensured and the machine not tip over when the hoist is moving.

An overhead forklift truck or pallet truck can be used to transport the machine. In order to prevent the machine from tipping over, it is essential that the centre of gravity of the machine is also in the centre of the attachment points. When using a forklift truck, the length of the forks must be at least 3 m.

Stickers must be used to clearly indicate the position of the machine's centre of gravity. The hoisting equipment must only touch or be attached to the machine's frame.

3.2.3. Installation

No special foundations are required for the installation of the machine.

However, a floor loading capacity of at least 400 kg/m² must be ensured. A smooth, level and firm floor covering is sufficient.

A clearance of 1 m must be maintained all around the machine.

The final installation and alignment of the machine is carried out by fitters from DIENST Packsystems GmbH.

3.3. Storage requirements

3.3.1. Intermediate storage

The machine must be stored in a clean and dry place.

3.3.2. Preservation

The machine does not require preservation while in storage. However, before storing machines that have already been in operation they must be cleaned.

4.1. Machine description

The HK-IV-S-”k”-10”/R system consists of assemblies. An assembly overview and a list of recommended spare parts is supplied separately.

4.2. Function

- Infeeders provided by Wolf insert the incoming products into the cassette conveyor of the horizontal cartoner.
- Simultaneously, a rotary box erector is used to prepare a folding box blank and insert it into the carrier chain.
- The cassette conveyor transports the products into the insertion area of the horizontal cartoner.
- Subsequently, circulating product pushers push the products into the provided folding boxes.
- Then, hot glue is used to seal the filled folding boxes
- Finally, the packaging process is inspected to ensure that the goods have been packed correctly.
- If this is correct, the filled folding boxes leave the horizontal cartoner via vertical folding box exit conveyors. Defective products are ejected.

4.3. Design

The main design features of the system are:

- The welded frame is made of closed CrNi rectangular tube steel profile
- Carrier chains run inside plastic profile rails
- Mechanically controlled work function
- Electrical installation compliant with VDE
- Occupational safety/protection equipment

4.4. Master plan

The master plan can be found in the appendix of these operating instructions.

4.5. Accessories

The following accessories are part of the scope of delivery:

Qty.	Designation	Usage
2	Crank handle	Machine setting
1	Jog mode button with cable	Set-up mode

1	Key for "Enable jog mode"	Activates the jog mode
4 sets	Pusher plates per 12 units	Product insertion
2 sets	Pusher pressure plate per 8 units	Product leveller
1 conveyor	Folding box support (optional)	Support folding box on folding box magazine
1	Safety goggles	Refilling glue applicator
1 pair	Protective gloves	Refilling glue applicator

4.6. Protective devices

There are movable and fixed separating safety doors and guards (see graphics chapter 6) on the long sides of the machine.

While in Automatic mode, the machine can only be operated with all safety doors closed.

4.7. Application range of the machine

The HK-IV-S-"k"-10"/R horizontal cartoner packs milk powder in bags into folding boxes. Hot glue is used to close the folding boxes.

The machine processes folding boxes made of uncoated or coated cartons and vacuum bag products.

4.8. Performance parameters

Capacity: max. 174 cycles/min

4.9. Consumption data

Compressed air:	120 NI/min
Capacity:	20 kVA
SCCR	6 kA

4.10. Connections for operation and preventive maintenance

Mains voltage:	400 V ($\pm 5\%$), 3 phases, N, PE / 50Hz Rated
current:	32 A
Compressed air:	6 bar, condensate and oil-free

4.11. Sounds

The noise level of the machine is < 78 dB(A).

4.12. Information on pneumatic equipment

The pneumatic equipment consists of the following components:

No.:	Designation	Usage
1	Vacuum valve rotary feeder	Switching on vacuum for folding box extraction
2	Product leveller	Distributing the product in the bag
3	Pneumatic cylinder for product insertion deflector	Deflecting the product pusher
4	Pneumatic cylinder top guide way	Raising the top guide way
5	Glue applicator	Glueing of folding boxes
6	Pneumatic cylinder of folding box ejection	Ejection of folding boxes that are empty and not glued
7	Various switch valves	

4.13. Copyright and industrial property rights

These operating instructions as well as the technical documentation and the information contained therein are subject to copyright and may not be reproduced or made available to third parties, either in whole or in part, without the written permission of the publisher. The preventive maintenance schedule (Chapter 6 and Chapter 9) is excluded from this regulation.

DIENST Packsystems GmbH, Hofheim, Germany

4.14. Technical data sheet

Manufacturer: DIENST Packsystems GmbH, Hofheim, Germany

Machine type: Horizontal cartoner HK-IV-S-"k"-10"/R

Order Number: 2444

Customer: Wolf / Tempo

Capacity: max. 174 cycles/min

Product: Milk powder in a bag

Folding box dimensions: 35 mm	A	W	H	Product/ stacking height
min.	120	30	160	
max.	200	112	250	

Format 1	125	35	160	1
Format 2	155	45	207	1
Format 3	175	55	230	1
Format 4	175	55	230	1
Format 5	175	111	230	2
Format 6	192	55	240	1

Caution: Not all dimensions in this range can be combined with each other!

Operating side: left

Chain pitch: 10" = 254.0 mm

Machine frame: Length:

6207 mm Width:

2188 mm Outlet height:

850 mm

Folding box set-down dimension A at the rotary feeder 45 mm

Cassette conveyor

Distance between axes: 6908.80 mm

Belt width: 350 mm

Number of cassettes: 58 units

Displacement: 109 mm

Flap clearance 115 mm

5.1. Scope of delivery

1 horizontal cartoner HK-IV-S-"k"-10"/R with accessories (see chapter 4.5).

5.2. Staff qualifications

In order to proceed with the operation and maintenance of the machine, the operating personnel must have been instructed by a DIENST Packsystems GmbH technician. At least two people must be trained. If a technician of DIENST Packsystems GmbH has trained a representative of the operating company on how to operate the machine, the latter shall be entitled to instruct other operating personnel on the operation of the machine.

The representative's superior must sign and thus confirm the participation of the employee.

The technician shall record the training and the participating persons shall confirm their training by signing the document. A copy remains with the machine manufacturer.

Only a qualified electrician with a trade proficiency certificate of the respective country shall be permitted to proceed with any tasks on the electrical system.

Only qualified mechanical personnel with a trade proficiency certificate of the respective country shall be permitted to proceed with any tasks on the mechanical system.

5.3. Fixing, anchoring, vibration damping requirements

It is not necessary to fix the machine at the place of use.

5.4. Installation and assembly requirements

All essential supply lines, such as power and compressed air, are available, sufficiently dimensioned, and connected in a professional manner.

5.5. Structural conditions for operation and maintenance

A clearance of 1 m must be maintained all around the machine. Access to safety doors must remain unobstructed at all times. Structural objects or the placement of items must not restrict operating positions. Warning signs on the machine must be clearly visible at all times. The lighting system in the operating and maintenance areas must be bright and illuminate the workspace in order to ensure safe working conditions.

5.6. Permissible operating conditions

Ambient temperature:	5 to 35° C
Relative humidity:	45 to 80 %, no condensation
Mains voltage:	400 V (±5%), 3 phases, N, PE / 50Hz
Storage temperature:	-5 to 50 °C

5.7. Energy supply

- Electrical connection, 3 x 400 V / N / PE 50 Hz
- Compressed air connection, 1/4" quick release, plug connection to the machine

5.8. Technical documentation

The operating instructions contain technical documentation. This includes:

- Electrical circuit diagrams; one of them must be kept in the control cabinet
- Operating instructions from third-party manufacturers
- General arrangement of assemblies with spare parts list and pneumatic diagram

6.1. Switching ON

No.	Action	Location
1.	Main switch on	Control cabinet
2.	Acknowledging faults (possibly several times)	Operation panel
3.	Selecting the Automatic mode	Touch panel
4.	Start the machine	Operation panel

6.2. Switching OFF

No.	Action	Location
1.	Empty the machine	Touch panel
2.	Stop the machine	Operation panel
3.	Main switch OFF	Control cabinet

6.3. Faults

A pending fault is indicated by the illuminated "Fault" lamp.

No.	Action	Location
1.	Fault occurs, machine stops, "Fault" lamp is lit,	Operation panel
2.	Reading the fault message on the display	Operation panel
3.	Eliminating faults	Place and cause of fault
4.	Acknowledging faults	Operation panel
5.	Turning the machine on	Operation panel

If the top guide way is automatically raised due to a malfunction, the guide way moves back automatically into its position after the fault has been eliminated. If the top guide way is not in position, a corresponding message is displayed on the touch panel.

6.4. Set-up mode

The set-up mode is used to set-up the machine during a format adjustment. In order to access the set-up mode, the system must be at standstill.

No.	Action	Location
1.	Selecting the manual mode	Touch panel
2.	Inserting the jog mode button	Operation panel
3.	Activating the “Enable jog mode” on the operation panel	Operation panel
4.	Setting-up the machine using the jog mode button	Jog button

6.5. Glue-pot

It is also important to ensure that there is always enough glue in the glue tank. This will ensure that production can proceed without delay.

No.	Action	Location
1.	Filling the glue tank/glue pot (optional) (see separate glue applicator operating instructions!) (optional)	Glue applicator/glue pot

6.6. Filling the folding box magazine conveyor

In order to ensure an uninterrupted production run, having a sufficient number of cutouts in the magazine is of utmost importance.

No.	Action	Location
1.	Filling the magazine (The folding boxes must be inserted into the magazine while the “grooving with splice” is facing “back and bottom”)	Magazine
2	Switch ON the magazine (the folding box magazine conveyor transports forward the folding box until the sensor below the magazine belt is activated!)	Touch panel

6.7. Format change of horizontal cartoner HK-IV-S-”k”-10”/R

Format change, left-hand side

Assembly	Changeover point	Action
	Chapter in operating instructions	
Operation panel	-	Select the new format on the operation panel

Adjustment tower	1	Adjust vertically (stopper)	7.3.1
Adjustment tower	2	Adjust horizontally (stopper)	7.3.1
Folding box feeding conveyor	3	Adjust the left side guide way (No. in display)	
	7.3.2		
Folding box magazine (No. in display)	4	Insert the folding box, adjust the upper holder	
	7.3.3		
Rotary feeder/suction cup (marking)	5	adjust the height (stopper) Re-set the suction cup	
	7.3.4		
		Intake roller for top guide way	6 A
			6B
6H		Adjust in running direction (use a measuring tape)	
		adjust the height (use a measuring tape) Place in the middle between the top guide way tubes (measuring tape)	7.3.5
Bottom flap deflector	7	Adjust to size of flaps (measuring tape)	7.3.6
Folder	8	Install/remove the upper folding lever	7.3.7
		Folder of top flap lifting device	9B
9H		Height (use a measuring tape) flap width (measuring tape)	
			7.3.8
Laser printer flap deflector	10	adjust the height (use a measuring tape)	7.3.9
Middle wall display)	11	Adjust dimension H of folding box (see numerical display)	
	7.3.10		
Side flap guide	12	adjust to the height of folding box (use measuring tape)	
	7.3.11		
Gluing	13	Adjust the glue height (see numerical display)	
	7.3.12		
Closure	14	adjust the height (use a measuring tape)	7.3.13

Format change, right-hand side

Assembly , Changeover point , Action , Chapter in operating instructions

Folding box feeding conveyor , 15 , Set the side guide way on the right-hand side (No. in display) , 7.3.2

Bag presser , 16 , adjust the height (stopper)

Replace the pusher plate (format part) , 7.3.14

Bottom flap deflector , 17 , Adjust to size of flaps (measuring tape) , 7.3.6

Folding box top guide way , 18.1

18.2 , adjust the height (stopper) , 7.3.15

Top flap lifting device insertion , 19B

19H , Adjust the height and

Adjust the flap width (No. in display) , 7.3.16

Insertion , 20 , Replacing all pusher plates

Caution: Never attempt to operate the cartoner without pusher plates! , 7.3.17

Folder , 21 , Install/remove the upper folding lever , 7.3.7

Side flap guide , 22 , adjust to the height of folding box (use measuring tape) , 7.3.11

Gluing , 23 , Adjust the glue height (see numerical display) , 7.3.12

Closure , 24 , adjust the height (use a measuring tape) , 7.3.13

6.8. Preventive maintenance and cleaning Horizontal cartoner HK-IV-S- "k"10"/R

Interval in hours of operation , Designation

8 , Use a vacuum cleaner and cloth in order to clean the cartoner, removing all cardboard fibres, contamination caused by the product etc. Thorough cleaning of all moving parts is highly recommended.

40 , Clean all toothed belts and toothed pulleys , Clean glue lines and closure ,Clean all light barriers

Interval in hours of operation , Designation

40 , Visual inspection of the water separator, drain water as required, Visual inspection of the entire system 320 , After the cleaning, lightly lubricate using the system using a multi-purpose grease as required: Gears of the top guide way. All hexagonal shafts, trapezoidal spindles and support axes

Interval in hours of operation , Designation

320 , Vacuum the carrier chains, cassette conveyor chains, intermediate conveyor chains, and insertion conveyor chains. Subsequently, use a brush and clean them

In order to maintain the smooth running of the machine, careful cleaning of the chains is mandatory.

, Clean the pushers along the insertion conveyor. The running surfaces require special attention. Never use metal objects for cleaning purposes. These objects will scratch the running surface.

, Clean the cassette conveyor including the cassette guide and the individual cassettes

, Clean the pneumatic filter on the rotary feeder and service unit or, if clogged, replace the filter.

Interval in hours of operation , Designation

320 , Clean the fans on the motors.

500 , Check the tension of all toothed belt drives and conveyor belts/chains. Re-tension the components as required.

, Check the parallelism of the carrier chains, set-down dimension A, position of cassette and insertion conveyor in relation to the carrier tape, re-adjust the components, as required.

, Check the suction cups on the rotary box erector, and replace if necessary

3000 , Change the oil of the bevel spur gear, the rotary feeder and the insertion conveyor

Lubricant quantity 0.3 kg

The gears are filled with Klüberoil 4 UH1 - 150 N at the factory.

7.1. Components

7.1.1. Compressed air service unit

Set the pneumatic pressure to 6 bar by turning the set screw on the service unit.

7.1.2. Main switch & Repair switch

The main switch and the repair switch of the machine are located at the end of the machine on control cabinet S1.

Main switch

The entire machine is de-energized

Repair switch

When the repair switches are disabled, all motors in the machine are disconnected from the power supply

7.1.3. Signal tower

The bright colours have the following meaning:

RED: Fault

ORANGE: Filling the magazine

BLUE: Fill glue applicator

GREEN: System running

HORN: Acoustic signal

7.2. Operation panel

The operation panel consists of:

- Operating housing with fault lamp and buttons - TouchPanel TP 1200 by Siemens

“Fault” lamp , indicates one or more faults are pending

“Fault acknowledgement” button , Acknowledgement of faults after they have been eliminated

Key-operated switch “Enable jog mode” , Activates the jog mode

Button System ON , Starts the cartoner

Button System OFF , Stops the cartoner

EMERGENCY STOP button , Press in case of danger to trigger an emergency stop

7.2.2. Miscellaneous controls

Controls of flap layer, cartoner left-hand side, product infeed, machine outfeed

Cartoner controls

EMERGENCY STOP button	Press in case of danger to trigger an emergency stop
Fault	indicates one or more faults are pending
Acknowledge fault	Acknowledgement of faults after they have been eliminated
Start	Starts the cartoner
Stop	Stops the cartoner

7.2.3. Automatic mode

Production data	Production data display
Nominal speed	Input of target cycle rate

7.2.4. Manual mode

Display the individual function names, drives, axes, etc.

Activating the folding box extraction

Unlock the safety doors

Removal conveyor	Removal conveyor ON/OFF
Ejector	Ejector ON/OFF
Deflector	Product insertion deflector ON/OFF
Discharge conveyor	Discharge conveyor ON/OFF

Gluing	Gluing On/Off
Lamp test	Lights On/Off
Nominal speed	Input of target cycle rate

7.2.5. Statistics

Productions diagram	Display of production graphics
Production data	Production data display
Control functions	Control functions display
Operating times	Display of operating times
Machine's operating hours	Display of the machine's operating hours counter counter
Resetting the current production counter to zero	
	Work shift counter settings

7.2.6. System

System diagnosis (for programmers only)

7.2.7. Faults

The FAULTS screen appears when:

- A fault is pending
- The FAULT button was pressed

When there are no more faults pending, this view is automatically faded out and the previously selected screen appears again.

7.2.8. Preventive maintenance

Display of the machine's maintenance intervals

7.2.9. Top guide way function test

The function test of the top guide way must be carried out every 24 days. Three days before the time expires, a warning message appears on the display that the function test must be performed. The machine is ready for operation despite the warning. After the time has expired, the machine becomes faulty and can only be restarted after a successful function test.

If the function test was successful, the green key is lit

If a test is not successful, a message is displayed stating that the function test could not be completed. In this case, check all mechanical functions of the machine and repeat the test. If the function test still cannot be carried out successfully, contact the Customer Service of the Dienst Verpackungstechnik GmbH:

Telephone: +49 (0)6192 9738-0 Fax: 49

(0) 6192 - 9738 990,

Email: service@dienst-packsystems.de

7.3. Format change

Select the new format at the operation panel when the machine is stopped.

When changing the format, the machine must be operated in set-up mode.

Before starting the format change, please read chapter 6 of these operating instructions carefully.

The format change must be carried out in the order described in chapter 6 of the Quick Guide.

First, the denominations of the folding box dimensions are illustrated here, as they are used in the following descriptions for format adjustment.

7.3.1. Adjustment tower

Function:

The adjustment tower positions the magazine for extraction

Format change:

Adjust the height and distance to the folding box carrier conveyor purposes

- Release the clamping lever
- Insert the crank handle onto the square shaft
- Use the crank handle to set the "Height" of the adjustment tower (the allocation of the fixed end stop can be found in the format table of the Quick Guide)

- Use the knurled knob to set the “distance” to the carrier chain conveyor (horizontal)
(the setting value of the position indication can be found in the format table of the Quick Guide)
- Re-tighten clamping lever, pull off hand crank

12 mm crank handle

7.3.2. Folding box feeding conveyor

Function:

The feeding conveyor transports the folded boxes into the folding box magazine

Set side guide way to match folding box:
reference edge first
then the counter guidance

The right edge of the lower folding box holder in running direction of the magazine must be aligned with the grooving of the folding box, acting as reference edge

Adjust the reference edge first, then the counter guide!

- Release the clamping lever
- Adjust the guides by turning the knurled handles, allowing for approx. 2 mm clearance between guides.
(the setting value of the position indication can be found in the format table of the Quick Guide)
- Re-tighten the clamping lever

7.3.3. Folding box magazine

Function:

The folding box magazine provides the Adjust the height of the upper folding box folding box supply for extraction holder purposes.

- Remove folding boxes from the magazine
- Release the clamping lever
- Use the knurled knob in order to adjust the upper holder to the folding box
(the setting value of the position indication can be found in the format table of the Quick Guide)
- Insert folding boxes of the new format into the magazine

- Re-tighten the clamping lever

7.3.4. Rotary box erector

Function:

The rotary feeder removes the folding magazine, folds it up and dimension B inserts it into the carrier chain.

Format change:

- Release the clamping lever
- Raise the rotary feeder by turning the knurled knob
- Rotate the turret to raise the fixed end stop to the top
(The allocation of the fixed end stop can be found in the format table of the Quick Guide)
- Lower the rotary feeder by turning the knurled knob
- Re-tighten the clamping lever

Function:

Extract the folding boxes

The entire surface of all suction cups must be in contact with the folding box. The folding box must be picked up as far out as possible. Therefore, if there are major differences in folding box's dimension H, re-screw the suction cups

- Unscrew the applicable suction cups and screw plugs
 - Screw the applicable suction cups and screw plugs into new position
- (The setting of the suction cup can be found in the format table of the Quick Guide)

7.3.5. Intake roller for top guide way

Function:

The intake roller deflects the inserted

Format change:

Adjust the intake roller of the top guide

- Release the applicable clamping lever
- Adjust the intake roller
- Adjust the height and width to match the folding box
- Depth: at the centre between top guide way tubes
(the setting value of the measuring tape can be found in the format table of the Quick Guide)
- Re-tighten the clamping lever

7.3.6. Bottom flap guide

Function:

After inserting the folding box into the chains, the flap guide moves the flap underneath a sheet.

Adjust the flap guide in order to ensure carrier that dust flaps can still pass unhindered. bottom

- Loosen the clamping screw
- Adjust the bottom flap guide using the slotted hole
(the setting value of the measuring tape can be found in the format table of the Quick Guide)
- Tighten the clamping screw

4 mm Allen key

7.3.7. Folder

Function:

The folding levers ensure that the rear flaps—which are facing in the to the format running direction—are pushed underneath the short flap guide.

Format change:

Install/remove the folding lever according short

- Loosen the clamping screw
- Install/remove the folding lever according to the format (the setting of the folding lever can be found in the format table of the Quick Guide)
- Tighten the clamping screw

7.3.8. Folder of top flap lifting device

Function:

Lift the top flap in order to ensure that product can be pushed unhindered Adjust the folding box height and width the of the flap into the box.

- Release the applicable clamping lever
- Adjust the top flap lifting device to the folding box height and width of the flap (the setting value of the measuring tape can be found in the format table of the Quick Guide)
- Tighten the clamping lever

7.3.9. Flap deflector laser

Function:

Fold over the top flap so that the laser Adjust to the height of the folding box can scan the folding box

- Release the clamping lever
- Adjust the flap deflector to the height of the folding box
(the setting value of the measuring tape can be found in the format table of the Quick Guide)
- Tighten the clamping lever

7.3.10. Middle wall

Function:

The carrier conveyor transports the folding Set to folding box dimension H box.
The chain guides of the middle walls support the folding boxes.

- Attach crank handle
- Use the crank handle to adjust the middle wall to folding box (the setting value of the position indication can be found in the format table of the Quick Guide)
- Remove the crank handle

7.3.11. Side flap guide **Function:**

- Release the clamping lever
- Adjust the side flap guide to the height of the folding box
(the setting value of the measuring tape can be found in the format table of the Quick Guide)
- Re-tighten the clamping lever

7.3.12. Gluing **Function:**

- Release the clamping lever
- Use the knurled knob to adjust the height
(the setting value of the position indication can be found in the format table of the Quick Guide)

- Re-tighten the clamping lever

7.3.13. Closure

Function:

Close the cover flap and deflect the Adjust to new folding box height folding box
between the pressure rollers

- Release the clamping lever
- Adjust the height of the top flap deflector to match the folding box (the setting value of the measuring tape can be found in the format table of the Quick Guide)
- Re-tighten the clamping lever

7.3.14. Product leveller

Function:

The product leveller smoothes the bags in Set fixed stop acc. to format
the cassette belt before they are inserted

- Release the clamping lever
- Release the lock nut
- Raise the product leveller by turning the knurled knob
- Raise the fixed end stop
(The allocation of the fixed end stop to the format can be found in format table of the Quick Guide)
- Lower the product leveller to the stopper
- Re-tighten the lock nut
- Re-tighten the clamping lever

Function:

The product leveller smoothes the bags cassette belt before they are inserted

Format change:

Replace pressure plate acc. to format in the

- Pull the lock bolt up
- Replace pressure plate acc. to format
(A selection of pressure plate can be found in the format table of the Quick Guide)
- Push in the pressure plates in until the locking bolt engages again.

7.3.15. Folding box top guide way**Function:**

The top guide way of the folding box holds the folding box in the carrier conveyor.

Adjust to the height (B) of the folding box

- Rise the top guide way (button in operation panel)
- Release the clamping lever
- Adjust the fixed end stop on the turret
(The allocation of the fixed end stop can be found in the format table of the Quick Guide)
- Re-tighten the clamping lever
- Lower the top guide way
- Clear the fault indicated when the raising of the top guide way and press the "Acknowledge fault" key

7.3.16. Top flap lifting device insertion**Function:**

Lift the top flap in order to ensure that product can be pushed unhindered

Format change:

Adjust to the new folding box height and the width of the flap into the box.

- Release the clamping lever
- Adjust the top flap lifting device to the folding box height and width of the flap
(the setting value of the position indication can be found in the format table of the Quick Guide)
- Re-tighten the clamping lever

7.3.17. Insertion**Function:**

The insertion conveyor pushes the box.

Replace **all** pusher plates product into the folding

- Loosen the Allen screw
- Pull out pusher plate to the front
- Insert pusher plate for new format
(The allocation of the format parts can be found in the format table of the Quick Guide)
- Re-tighten the Allen screw
- Replace all pusher plates (continue jogging)

7.4. Switching off devices

There are many ways to cut the power to the machine.

- Controlled machine stop using Stop buttons on the operation panel
- Activate the locking EMERGENCY STOP button on the operating panel, the product placing unit, the product insertion, the laser scanner or at the end of the machine.
- If a fault occurs
- If the main switch is activated
- If a safety door is opened

7.5. Risks and consequences of improper use

Operating the machine for any other than the use intended by the manufacturer is not permitted. Failure to comply with this regulation shall render all warranties by the manufacturer null and void.

7.7. Troubleshooting/elimination of faults

Fault	Possible causes
-------	-----------------

Fault is Machine switches off when starting.	Possible causes are • The maximum torque of the servo drive has been exceeded
---	--

Fault is Despite overload, the machine does not switch off.	Possible causes are • The torque is set too high
--	---

Fault is The folding boxes are not extracted .	Possible causes are Magazine setting is incorrect
---	--

- Suction cups are damaged
- No vacuum (check filters, hoses, channels, control unit), extreme cleanliness is mandatory
- Product is not available

Fault is Machine does not start	Possible causes are EMERGENCY STOP button is activated
--	---

- Protective devices are not closed
- Folding box magazine is not full
- Control voltage interrupted
- Product pusher is disengaged
- Temperature at the glue applicator has dropped

Fault is Folding box is poorly placed in the carrier chain or pops out on the carton erector are wrong	Possible causes are Basic settings
---	---

- The vacuum stalls, either too early or too late
- Basic setting of the outer carrier chain has shifted
- Suction cup distance to the grooves of the folding box has shifted (set-down dimension A)

Fault is Glue of the folding box is insufficient.	Possible causes are Glue applicator is empty
--	---

- Glue nozzles are clogged
- Wrong glue temperature

Fault is Miscellaneous	Possible causes are Check all format change settings (chapter 7.3)
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- Check all settings according to chapter 8

7.8. Personal protection equipment

7.9. Required training, qualifications and familiarization of the user

In order to proceed with the operation and maintenance of the machine, the operating personnel must have been instructed by a DIENST Packsystems GmbH technician. At least two people must be trained. If a technician of DIENST Packsystems GmbH has trained a representative of the operating company on how to operate the machine, the latter shall be entitled to instruct other operating personnel on the operation of the machine.

The representative's superior must sign and thus confirm the participation of the employee.

The technician shall record the training and the participating persons shall confirm their training by signing the document. A copy remains with the machine manufacturer.

Only a qualified electrician with a trade proficiency certificate of the respective country shall be permitted to proceed with any tasks on the electrical system.

Only qualified mechanical personnel with a trade proficiency certificate of the respective country shall be permitted to proceed with any tasks on the mechanical system.

7.10. Information on workspaces along the machine

There are no permanent workspaces along the machine. Only if and when required, certain spaces along the machine must be occupied by a technician. This applies to the feeding conveyor of the magazine when trays must be added or the glue granulate must be added to the glue applicator.

8.1. Parameters

Using the key to make the selection

Functions	Settings of the cartoner's functions
Drives	Settings of the cartoner's main drive
	Display of various statistics
	Calculation of cam values
	Display of help texts
	Display the individual function names, drives, axes, etc.

8.1.1. Parameters: The basics

A shaft encoder divides a working step (cycle) of the cartoner into 360 increments. During parameterisation, the programmer enters which function is triggered at which position of the cartoner. Data can be entered as angle (zone/cam), counter (place) or time.

A **shift register** assigns a slot number to each cassette/station. The cartoner "remembers" an empty cassette thus, a folding box is not extracted at the corresponding position and the pusher does not push in.

An **offset parameter** adjusts parameters to other speed/cycle counts. Thus, the parameter value and the entered offset remain the same, even if the number of cycles changes.

Adjusting the offset:

- set the cam parameter while at the minimum number of cycles:
e. g. minimum number of cycles 40 cycles

Determine the gluing cam: e.g. 40 to 100°

(at the minimum cycle rate, the offset value is meaningless) • set the offset parameter while at the maximum number of cycles:

(Do not adjust gluing cam, it remains at e.g. 40 to 100°)

Increase the offset parameter until the same glue line is applied as at the minimum cycle speed

8.1.2. Changing the parameters

Go to the system menu to log in. To do this, press the System button.

8.1.3. Parameters: Functions of the cartoner & infeed

This screen provides the options to set the cam values, times, the counter of the cartoner, and the synchronisation

Press the applicable button The window for entering the parameters appears Use the on-screen keyboard to enter new values, then press Enter to confirm the selection.

While in these menus, it is possible to adjust/change the machine's lag times, the cam and counter values of the individual functions.

8.1.4. Parameters: Drives of the cartoner & infeed

This screen provides the options to set the drives of the cartoner and the infeed system.

Settings of the main drive/virtual master

Parameters: Drives

Basic position

Entering the basic position

Torque limitation

The torque is used in order to change and adjust the maximum pulling force of the drives. If the values are too low, this leads to system faults. Values that are set too high can lead to damage or destruction of the system.

Selecting the zero point

Display of motor utilization %

When selecting “Apply position”, the current value is
utilised as the basic position

Curve segment calculation (only for programmers)

Moving the axle back and forth

Status	Display of various status messages
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Virtual Master

Press the button

Adjusting the parameters of the Virtual Master

Basic position	Stopping point of the system when using a controlled machine stop
Starting acceleration	Acceleration in °/s
Start delay time	Delay time in °/s
Cartoner start delay	Start of the system within a certain pre-set time in ms

8.1.5. Format

In this menu, different formats can be selected, copied, deleted, saved and edited

8.2. Setting up new folding box formats

Only an authorised technician of DIENST Packsystems GmbH shall be permitted to set up new folding box formats. The shapes of the latter must comply with the minimum and maximum dimensions specified in the technical data sheet. Only operating companies who are sufficiently familiar with the machine shall be permitted to set up new folding box formats on the machine. The responsibility to proceed with the set up rests solely with the operating company.

The folding box magazine must be adjusted in order to ensure the suction cups extract the folding box at the distance of the set-down dimension A from the grooves of the folding box.

Adjust the height of the rotary feeder to match the folding carton dimension B. While the folding box is inserted and the suction cup is standing vertically, facing downwards, adjust the height on the rotary feeder.

In order to ensure a speedy format change in the future, make and mark the fixed stops of all adjustments accordingly!

9.1. Repairs

9.1.1. Safety precautions

Before proceeding with any type of work on the machine, the main switch must be set to "0". In order to prevent an unintentional restart of the machine, use a padlock to secure the main switch.

9.1.2. Repairs that require special qualifications

Only qualified personnel according to chapter 2.3 of these operating instructions shall be permitted to proceed with any type of repair work.

Extensive repair work necessitates the assistance of Dienst Packsystems GmbH.

9.1.3. Drawings required for troubleshooting and maintenance purposes

- Electrical circuit diagrams
- General arrangement of assemblies with spare parts list and pneumatic diagram
- Operating instructions from third-party manufacturers are provided separately.

9.1.4. Spare parts

Only original spare parts must be used. Failure to do so shall render all claims and warranties null and void.

9.1.5. Lists and pneumatic diagram

A general arrangement including a spare part list and pneumatic diagram are provided separately.

9.1.6. Repair service provided by the manufacturer

Extensive repair work necessitates the assistance of DIENST Packsystems GmbH. Our customer service can be reached by calling:

Telephone: +49 (0)6192 9738-300

Fax: 49 (0) 6192 - 9738 990,

Email: service@dienst-packsystems.de

9.2. Preventive maintenance and cleaning

Regular preventive maintenance of the horizontal cartoner ensures the best productivity of the machine. The maintenance intervals depend on the use of the machine and ambient conditions.

The necessary preventive maintenance and cleaning tasks are specified in chapter 6 of the Quick Guide.

The preventive maintenance shall be documented in the list provided in the Annex. Before completing the list, it is recommended to copy the list in order to provide sufficient space for entries.

The completed lists must be collected and kept attached to the operating instructions.

ETP Classic , Dimension , T (Nm)

ETP 15 , 15 mm , 6

ETP 19-42 , 19 - 42 mm , 8

9.2.1. Preventive maintenance and cleaning the horizontal cartoner

Never attempt to use inflammable, easily gasifying or corrosive liquids for cleaning purposes!

Interval in hours of operation , Designation

8 , Use a vacuum cleaner and cloth in order to clean the cartoner, removing all cardboard fibres, contamination caused by the product etc. Thorough cleaning of all moving parts is highly recommended.

40 , Clean all toothed belts and toothed pulleys

, Clean glue lines and closure

, Clean all light barriers and safety laser light guards

, Visual inspection of the water separator, drain water as required

, Visual inspection of the entire system

320 , After the cleaning, lightly lubricate using the system using a multi-purpose grease as required:

- Gears of the top guide way
- All hexagonal shafts, trapezoidal spindles and support axes

, Vacuum the carrier chains, cassette conveyor chains, insertion conveyor chains.

Subsequently, use a brush and clean them

In order to maintain the smooth running of the machine, careful cleaning of the chains is mandatory.

, Clean the pushers along the insertion conveyor. The running surfaces require special attention. Never use metal objects for cleaning purposes. These objects will scratch the running surface.

, Clean the cassette conveyor including the cassette guide and the individual cassettes

, Clean the pneumatic filter on the rotary feeder and service unit or, if clogged, replace the filter.

, Clean the fans on the motors

500 , Check the tension of all toothed belt drives and conveyor belts/chains. Re-tension the components as required.

, Check the parallelism of the carrier chains, set-down dimension A, position of cassette and insertion conveyor in relation to the carrier tape, re-adjust the components, as required.

, Check the suction cups on the rotary box erector, and replace if necessary

3000 , Change the oil of the bevel spur gear, the rotary feeder and the insertion conveyor

Lubricant quantity 0.3 kg

The gears are filled with Klüberoil 4 UH1 - 150 N at the factory.

9.2.2. Reference / 0-point adjustment.

Reference

Each axis, including the virtual master, has a reference position. This mechanically defined position must be set once on each slave axis. If a drive is removed, rereferencing is required after re-installing the drive. The reference position has nothing to do with different formats or settings, it merely defines the zero or start position for each axis. If all axes are in their applicable reference position, meaning at 0°, this implies that the virtual master is also in the 0° position.

9.2.3. Moving the machine to its reference position

- Select the “Reference position” format on the touch panel
- Move the cartoner to its **basic position**
- Check the axes if their positions are correct.

Reference point: Rotary box erector

When the rotary box erector is at zero, one of the three suction arms of the rotary box erector must be positioned exactly vertically and facing downwards. The screw on the opposite side of this suction cup

must point exactly vertically and upward (Use a spirit level to check the position of the two upper suction arms).

Reference point: Carrier

When the carrier chain is at the zero point, a carrier of the outer carrier chain must coincide exactly with the reference point.

9.2.4. Re-referencing the axis

Only qualified personnel shall be permitted to change parameters!

If the system is started before the positions of the drives are aligned with each other, there is an inherent risk of damaging the drives.

Unauthorised changes to the parameterisation data by the company owner is not permitted. These changes may damage the machine or render it inoperable. The manufacturer accepts no liability in such cases.

Press the button and select the “Drives” settings menu

Select the “axis” that must be referenced again

Use the keys to jog the axle into position “0”

Press the key. A warning is displayed

Press the key to apply the value

9.2.5. Adjusting the rotary feeder

Function:

Vacuum is applied in order to extract the folding box from the magazine and inserted into the carrier chains.

Slotted grooves in the respective vacuum adjustment flange control the vacuum. If the vacuum is not controlled correctly anymore, the vacuum setting must be readjusted.

Procedure see "Setting the vacuum on the rotary feeder".

Basic setting:

If the suction arms are no longer exactly symmetrical to each other at the zero position, the basic setting must be renewed.

Adjusting the vacuum settings on the rotary feeder:

Slotted grooves in the respective vacuum adjustment flange control the vacuum. If the vacuum is not controlled correctly anymore, the vacuum setting must be readjusted.

The folding box should be released at the zero position. The vacuum and suction supply lines are fixed in place. The adjustment flange for the vacuum and the suction arms rotate simultaneously.

- Readjusting the adjustment flange:
- Loosen the screws
- Shift the adjustment flange
 - When shifting the adjustment flange in the direction of rotation ⇒ the vacuum stalls later
 - When rotating the adjustment flange against the running direction
⇒ the vacuum stalls earlier
- Tighten the screws again

The smallest displacements of the adjustment flange can have great effects. Extreme care must be taken when readjusting the flange!

Only a technician authorised by DIENST Packsystems GmbH shall be permitted to proceed with any modification to the machine.

9.2.6. Set-down dimension A

The **set-down dimension A** (see Data Sheet chapter 4.14) can change over time due to the elongation of the carrier chain. Readjust the dimension as required

Re-adjusting the set-down dimension A

- Move the rotary box erector in to its zero position
- Go to the "Setting" menu, press the Jog minus / Jog plus keys from the "Outside carrier chain" menu until the set-down dimension is reached

- Apply this position as the new reference position
- Insert folding box into the carrier conveyor
- Go to the “Setting” menu, press the Jog minus / Jog plus keys from the “Inner carrier chain” menu until the inner carrier is positioned at the folding box (folding box + 1 mm)
- Apply this position as the new reference position

9.2.7. Setting the cassette and insertion conveyor

Due to varying elongations of the chains, an offset can occur over time. This offset must be corrected as required.

Setting the cassette conveyor in order to match the cassette conveyor

Setting the cassette conveyor in order to match the cassette conveyor

- Move the outside carrier chain to its zero position
- Go to the “Setting” menu, press the Jog minus / Jog plus keys from the “Cassette conveyor / Insertion” menu until the inside of the rear cassette angle is aligned with the inside of the outer carrier.
- Apply this position as the new reference position
- The pushers of the insertion conveyor are adjusted simultaneously

Do not adjust the sprockets on the cassette conveyor and on the insertion. They are subject to factory settings and can only become misaligned in extreme cases (excessive overload of the machine).

In this case the cassette conveyor and insertion conveyor must be set parallel again (see following paragraph).

Aligning the pusher of the insertion conveyor with the cassette tray

Set the cassettes at right angles to the direction of travel

- Loosen the clamping hubs on the insertion conveyor
- Use the slotted holes to position the pushers in line with the cassette tray
- If it is not possible achieve an aligned setting, the chains of the insertion conveyor must be re-positioned
- Dismantle the cassettes
- Loosen the clamping hubs on the cassette conveyor
- Align the cassettes at right angles
- Re-tighten the clamping screws

9.2.8. Parallelism of the carrier chains

Check both the parallelism of the outer and inner carrier chains from time to time and correct as required

Check the parallelism of the carrier chains:

Use a flat square to verify the parallelism of the carrier chains

- Use a flat square and place one leg of the square against a side sheet
- Adjust chains and ensure they are parallel
- Tighten screws on clamping hub

Adjustment for both chains on one clamping Clamping hub of the inner carrier chain on hub in the *fixed* middle wall (insertion side) the other side of the fixed middle wall

Adjusting the parallelism:

- Loosen the screws on clamping hub
- Adjust chains and ensure they are parallel
- Tighten screws on clamping hub

9.2.9. Pressure rolls

There should be about 1 mm clearance between the outer edge of the outer carrier and the pressure roll

Adjusting the pressure roll:

- Loosen the screws
- Adjust the pressure roll
- Tighten the screws

9.2.10. Tightening the conveyor belts

Folding box discharge:

- Adjust the tension screw

Magazine conveyor:

- Release the lock nut
- Adjust the tension screw
- Tighten the lock nut

Removal conveyor:

- Release the lock nut
- Adjust the tension screw
- Tighten the lock nut

9.2.12. Chain tensioner

Never tension just a single chain, always tension the complete belt in pairs!

Carrier chains:

Tension the carrier conveyor at the fixed and adjustment middle wall

- Release the lock nut
- Set the chain tension
- Adjust the tension screw
- Tighten the lock nut

Cassette conveyor:

Chain tensioner on both sides outside on the side walls

- Release the lock nut
- Use the tension screw to adjust the chain tension
- Tighten the lock nut

Insertion conveyor:

Chain tensioner on both sides outside on the side walls

- Release the lock nut
- Use the tension screw to adjust the chain tension
- Tighten the lock nut

9.2.14. Oil change

Rotary feeder:

- Loosen the plug screw
- Drain old oil
- Insert the plug screw again

- Loosen the plug screw
- Fill with fresh oil
- **Lubricant quantity 0.3 kg**
- **Klüber oil 4 UH1 – 150N**
- Insert the plug screw again

Product insertion:

- Loosen the plug screw
- Drain old oil
- Insert the plug screw again

- Loosen the plug screw
- Fill with fresh oil
- **Lubricant quantity 0.3 kg**
- **Klüber oil 4 UH1 – 150N**
- Insert the plug screw again

9.3. Preventive maintenance schedule

Enter the date, type of preventive maintenance (weekly, monthly, quarterly) and the name of the operator in the relevant box.

Date of initial start-up: __/__/2025

10.1. Shutdown

- Using the Stop button to stop the machine
- Main switch OFF

10.2. Dismantling

- Disconnect the machine from the compressed air network
- Disconnect the machine from the power supply
- Transport section for cycled infeed separately

10.3. Storage

10.3.1. Intermediate storage

The machine must be stored in a clean and dry place.

10.3.2. Preservation

The machine does not require preservation while in storage. However, before storing the machines they must be cleaned.

10.4. Disposal

The machine must be dismantled before disposal. Wherever possible, the materials shall be separated and recycled. The electronic components must be disposed of as hazardous waste.

10.5. Environmental compatibility & energy saving measures

The machine is equipped with the following energy saving devices:

- **Cooling unit:** All Rittal TopTherm cooling units with an e-Comfort Controller from firmware 3.2 upwards feature the energy-saving Eco mode, which is activated on delivery. The Eco mode is used to save energy of the cooling unit with no or low heat load in the switch cabinet.
- **Machine stand-by:** If products are not available for processing, the cartoner goes into stand-by mode and waits for further products. When new products arrive, the cartoner starts automatically.

- **Conveyor belts:** If the machine goes into stand-by mode, the conveyor belts stop.
- **Vacuum pump:** When the machine is stopped, the vacuum pump switches off.
- **Glue applicator:** The glue applicator is only active when a product is present

11.1. EMERGENCY STOP button

In case of danger, press one of the EMERGENCY STOP buttons. The EMERGENCY STOP buttons are located at the operation panel, at the infeed and at the machine outlet.

11.2. Fire-fighting equipment

All fire extinguishers approved for electrical equipment are suitable for fire fighting.

11.3. Dangerous substances and fighting their effects

When using the glue applicator, not inhale the harmful vapours.

Sufficient ventilation or fresh air supply must be provided in the operating room.