



*TECHNICAL-OPERATIONAL
DOCUMENTATION OF
DS. 5000 PACKING MACHINE
Serial No. 840*

1/11/18

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1. ABOUT COMPANY

We have the pleasure in presenting an offer of HUGART Company that has been operating in the market since 1992 and in this way invite you to cooperation

We are fully Polish company specialized in designing and production of highest class packing machines and complex process lines for the food industry.

A confirmation of our established position in the market is the fact that we have already produced 700 machines that successfully operate in the country and abroad.

We hope that the material contained in this documentation will bring closer to you the profile of our company as well as deliver necessary information regarding operation, adjustment and maintenance of DS. 5000 packing machine

Having the awareness that high quality of offered products and services is the most important thing, the company implemented and certified the Quality Management System consistent with ISO 9001 standard.

We have own agencies in Czech Republic, Slovakia, Germany, France, England, Bulgaria, Romania, Russia, Estonia, Latvia, Ukraine, Belarus and USA.

We treat our customers as regular co-partners for which, apart from offer for machines, we offer technical advisory and financial-legal help

Fundamentalne znaczenie mają dla nas dobre relacje producent – odbiorca, dlatego każdą ofertę dostosowujemy do indywidualnych potrzeb.

QUALITY

THE QUALITY SYSTEM THAT THE HUGART COMPANY HAS IMPLEMENTED AND CERTIFIED DEFINES THE "QUALITY" NOT ONLY IN THE MANUFACTURED PRODUCT.

THE QUALITY MANAGEMENT SYSTEM COMPRISES ON A BROAD BASIS THE WHOLE ACTIVITIES AND PROCESSES THAT TAKE PLACE IN THE COMPANY: FROM CUSTOMER WINNING, PROFESSIONAL ADVISORY, UP TO ACTIVITIES RELATED WITH PUBLIC RELATIONS AND RENDERED SERVICES, AND IN PARTICULAR WITH WARRANTY AND POST-WARRANTY SERVICE TAKING INTO ACCOUNT THE BEST SATISFACTION OF OUR CUSTOMERS NEEDS AND OUR SATISFACTION AS THE MANUFACTURER.

COMPANY MISSION

"QUALITY IS WHEN A CUSTOMER RETURNS AND NOT A PRODUCT"

SERVICES AND WARRANTY**SERVICE AND GUARANTEE**

Methods, quality and promptness of our service bring significant benefits for our company.

Our Customers very often decide to purchase our next machines. In this way they confirm that the policy of our company is correct.

All our machines and devices are covered by a 12-month guarantee.

The guarantee package includes the following:

- Preliminary start-up;
- Technological start-up;
- Training for the personnel in the scope of service, operation and maintenance of equipment;
- Guarantee service of equipment;
- Periodical inspections of working equipment.

Assistance version of service includes additionally the following:

- Systematic inspections of working equipment;
- 24-hour on-call duty of service personnel;
- Ongoing telephone consultations; advisory service in the scope of equipment operation;
- Collecting and analysing user feedback data.

HUGART provides complete assortment of spare parts and professionally trained and equipped service personnel during and after the guarantee period.

2. HEALTH AND SAFETY AT WORK INSTRUCTIONS

2.1. General principles of health and safety at work

- *Machine may be operated only by properly qualified employees;*
- *While operating the machine, the machine operator should wear working clothes specified by applicable health and safety at work regulations concerning operation of specific type of equipment;*
- *Machine must not be operated by persons under influence of alcohol or abusive substances;*
- *Smoking or using open flame near the machine is strictly prohibited;*
- *Proper lighting should be ensured for the machine operator;*
- *Easy access to the machine must be ensured for the operator in order to enable proper operation;*
- *Operators must not leave working machine unattended.*
- *Machine with removed or unlocked guards must not be operated;*
- *The machine must be immediately switched off if any disturbances occur during its operation;*
- *Please, remember that such activities as cleaning, washing, maintenance and technical inspections of the machine may be performed only according to applicable instructions;*
- *Components of electrical system and automatics system should be protected against moisture and dirt;*
- *Any repairs and technical inspections of the machine may be performed only by properly trained and qualified employees who have proper authorisations to repair this type of equipment;*
- *Prior to any repair, the machine must be disconnected from electrical supply;*
- *Apply proper technical procedures while operating the machine, maintain cleanliness of the machine and its surroundings and immediately remove small defects.*

In case of any doubts concerning safety of operation, the operator is authorized to stop working, stop the machine and ask his superior to clarify the situation.

2.2. Detailed principles of health and safety at work

BEFORE STARTING THE MACHINE:

- *Make absolutely certain that all safety guards and protective devices are installed and efficient;*
- *Make sure that no employee touches the machine;*
- *Remove (from the working area) all materials, tools and other foreign objects which might injure the employees or damage the machine;*
- *Check whether the machine is set to working mode;*
- *Check whether all indicator lamps, sirens, pressure gauges and other safety devices are ready for operation;*
- *Read and understand the User Manual and familiarize yourself with the machine and its control system before switching the machine on;*
- *Do not switch on the machine if its protective device or safety guard is removed or disconnected;*
- *Always wear required protective equipment (occupational hygiene equipment), for example: safety goggles, caps, safety shoes, ear protectors and other equipment;*
- *Warn the persons near the machine before starting the machine and make sure that these persons are outside the working zone;*
- *Remove all tools and other foreign objects from the working zone before starting the machine;*
- *Employees present near the working machine must not wear loose clothing, ties, necklaces or have untied long hair;*
- *Employees working near the machine must not wear gloves, rings, bracelets or other pieces of jewellery;*
- *Make sure that the working zone is free from any obstacles that might make employees stumble or fall down onto the working machine;*
- *Do not sit or stand on any objects which might make you fall down onto the machine;*
- *Playing around the machine is always dangerous and forbidden;*
- *Familiarize with the procedure of emergency stop of the machine;*
- *When the machine is not used, switch off the power supply of pneumatic system and electrical control system;*
- *The machine must not work with the speeds, pressures or temperatures higher than those defined in the machine's technical specification;*
- *Do not activate the limit switch manually when the power supply is on;*
- *Ensure that warning and monitoring lamps are working and warning messages can be displayed on the machine;*

- *Working machine must not be left unattended;*
- *Do not operate defective or damaged machine;*
- *Check whether proper service and maintenance procedures have been completed;*
- *Do not place fingers and other body parts in the machine or near the machine's moving parts when the control circuits are energized;*
- *Ensure safe working area including proper arrangement of working platform shields and proper design and use of ladders.*

SAFETY OF USE AND OPERATION:

- *The machine must not be used by the employees who are not thoroughly trained or unfamiliar with the work to be done;*
- *Do not activate the machine's control circuits while other persons are performing works on the machine;*
- *Do not bypass the machine's safety devices;*
- *Always use suitable tools for a specific work;*
- *Do not open covers protecting electrical components when the machine's power supply is on;*
- *Maintenance of working machine may be performed only by thoroughly trained persons;*
- *Take special care while making adjustments on the working machines;*
- *Release all remaining air and pressure before any maintenance works and before loosening the connections of pressurized systems;*
- *Disconnect compressed air supply and electrical power supply unless these supplies are absolutely necessary for a given maintenance work. In such a case, emergency personnel must attend the maintenance work;*
- *Fuses should be replaced only while electrical power supply is disconnected (locked);*
- *Do not specify the machine working area before prior checking of toxicity of fumes in the area and organizing the emergency personnel in the place.*

SAFETY OF ELECTRICAL SYSTEM

- *All works connected with electrical/electronic maintenance and service should be performed only by properly trained and authorized electricians;*

- *Always assume that power supply is on and behave in all conditions as in energized conditions. Such an approach guarantees safety and prevention of accidents and injuries;*
- *In order to remove electrical load from a circuit or device, open the disconnecting switch or circuit breaker and lock it in open position;*
- *To ensure maximum safety, the power source should be locked and the keys should be kept by properly authorized persons.*
- *Check whether a circuit is open using suitable inspection equipment;*
- *Inspection equipment must be regularly checked;*
- *Capacitors must be given for the release time, otherwise do it manually while exercising proper care;*
- *Sometimes it may be necessary to find and repair a defect on a live device. In such cases, take the following special precautions:*
 - *Make sure that your tools and body do not touch the ground;*
 - *Take special precautions while working in humid areas;*
 - *Stay alert and avoid external disturbances;*
 - *Before switching the power supply on, confirm that nobody touches the machine;*
 - *The control panel door should be open only when checking electrical devices. Check whether the circuit breaker knob mechanism works properly (on the panels where it is possible);*
 - *Close all covers of terminal boxes before completion of any work;*
 - *All electrical devices must be properly earthed and protected against overloading;*
 - *All electrical connections must be protected by closing them in a tight connection box.*

SAFETY OF PNEUMATIC SYSTEM

- *Pneumatic system must not be switched on if covers, safety devices and control devices are out of order or are not located properly;*
- *Pneumatically driven mechanical devices may be activated unexpectedly by a remote control signal;*
- *If the design limitations of the air supply system are exceeded, the connections may be disconnected and shifted in an uncontrolled manner;*
- *Pneumatic connections must not be loosened when the system is under pressure;*
- *Due to oil mist, air bleeding or air leaking above the product surface is not allowed;*

- *Pneumatic system maintains energy required for completion of movement, even after disconnection of supply. Exercise care due to risk of injury.*

SAFETY DEVICES AND PROTECTIONS:

In order to protect working environment and operators against electric shock and moving parts, DS. 5000 packaging machine is equipped with the following:

- *Shields with closure sensors;*
- *Side covers;*
- *Electrical cubicle and control cassettes which guarantee safety in the most difficult conditions of humidity;*
- *DS. 5000 machine is equipped with a red colour emergency stop switch;*
- *Electric motor is equipped with a double overload protection.*
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2. TECHNICAL CHARACTERISTIC

2.1. Technical data

Dosing device capacity	max. 5000 packages / h
Air consumption	40 m ³ / h
Nominal compressed air pressure	0.6 to 0.8 MPa
Power consumption	~ 4.5 kW
Supply voltage	3x400 V
Number of seats in turntable	16
Recommended current protection	C25
Weight	1300 kg

****Actual capacity of the machine depends on product parameters and dose size.***

2.2. Technical description

Hugart DS 5000 is a rotary machine with all stations installed around the turntable equipped with 16 seats. The machine works in fully automatic mode and is designed for dosing and packing a full range of food processing products into aluminium foil cups with thermo sealed aluminium lids. The machine's capacity is variably adjustable.

EQUIPMENT OF DS.5000 MACHINE DESIGNED FOR PACKAGING MEAT PRODUCTS INTO RECTANGULAR PACKAGES SUITABLE FOR AUTOMATIC PACKAGING AND CLOSED WITH ALUMINIUM THERMO SEALED LIDS

Construction of the machine: made of acid resistant steel, main drive unit – transmissions, automatics system, control panel, SIEMENS controller, Festo pneumatic system.

Cup feeding station consists of a column on which storages are installed with pneumatically driven drawers for individual releasing of cups. Under the storages there are pullers equipped with suction nozzles for placing cups directly in the work table's seats.

Main dosing device (doses from 0.1 to 0.5 l). The dosing device consists of two vertical cylinders with pistons and a roller-type divider. The dosing device's pistons are mechanically driven. The divider is pneumatically driven.

Mandrel-type tip of dosing device is designed for dosing meat products.

System for dose adjusting during machine operation. The dose adjustment is performed directly from the operating panel.

Container for product of approximate capacity of 200l. The container will be equipped with an agitator.

Lifter of cups under the dosing device is used for proper distribution of dosed product in the package and prevents splashing the product outside the package.

Aluminium lid feeding station consists of a column with storage bins. Two suction nozzles are installed on the rotary device. The suction nozzles rise under the piles of lids, pull the lids down, rotate by 180° and place the lids on two cups. If a lid is not taken from the storage bin, the machine is switched off. The machine can be restarted only if lids are replenished.

Station for thermo sealing of cups with aluminium lids consists of a column with a bridge on which two thermo sealing heads are installed. The heads are lowered onto the cups by means of two pneumatic actuators. Temperature and time of thermo sealing are adjusted automatically from the control panel.

Set of instrumentation for large rectangular cups.

Cup ejector is used for removing packages from the work table's seats and pushing them onto the collecting conveyor.

Machine housing is made of transparent polycarbonate fixed on the frame made of acid resistant steel. The purpose of the housing is to provide safe working conditions for the machine operators. The housing is equipped with tilting doors with sensors. The doors enable access to individual stations of the machine for the operators and stop operation of the machine when opened.

ADDITIONAL EQUIPMENT OF DS 5000 PACKAGING MACHINE:

Sensor of the cup station's storage bin warns the operator, by means of sound signals and light signals, that the quantity of lids in the storage bin is the minimum.

Sensor of the lid station's storage bin warns the operator, by means of sound signals and light signals, that the quantity of lids in the storage bin is the minimum.

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3. INSTRUCTIONS CONCERNING PREPARATION FOR MACHINE START-UP

DS5000 packaging machine should be positioned in the place of its installation.

Provision of fittings for the required utilities of specified parameters near the machine's working area is the precondition for proper installation of the machine.

After setting and levelling of the machine, the following utilities should be connected:

PRODUCT

- Loaded by means of a dumping device.

ELECTRIC ENERGY.

- Electric power demand is ~4,5kW;
- The minimum cross-section of the power leads connected to control cubicles is 2.5 mm². Current protection: C25.

COMPRESSED AIR.

- Demand for compressed air: 40 m³/h;
- Required pressure of supplied air: 0.6-0.8 MPa;
- Maximum pressure: 1.0 MPa;
- Connection ended with a cut-off valve with a tip for ½" hose.

Compressed air should be preliminarily cleaned and dehydrated. If there are problems with provision of a required amount of air, an equalizing tank should be used with a capacity ensuring required parameters of the working medium.

Quality of compressed air according to ISO 8573-1 Standard.

Particulates			Water content	Oil content
Classes	Maximum size of particles (µm)	Maximum density of particles (mg/m ³)	Maximum pressure dew point (°C)	Maximum oil concentration (mg/m ³)
5	40	10	+7	25

Components of pneumatic system should be supplied with compressed air which is free from any impurities and aggressive media. Safety of operation and durability of pneumatic system are significantly dependant on quality of compressed air.

3.1. Activities to be performed prior to the machine start-up

- *Perform inspection of the machine and pay attention to condition of power leads and signal leads (check for chafing, fractures) as well as condition of control and operating components. Should any abnormalities be found, immediately notify responsible persons;*
- *Lubricate the machine according to instructions provided in the Operation and Maintenance Manual;*
- *Dehydrate, wash and blow through the pneumatic system;*
- *Replace filtering cartridge periodically;*
- *Refill oil in the oiler and adjust oil uptake.*
- *Remove all tools and other unnecessary objects from the conveyor surface and the machine area;*
- *Insert more than the minimum quantity of packages into the storage bins (otherwise, the machine will signal the lack of packages);*
- *Switch on compressed air supply;*
- *Close the machine's guards;*
- *Check whether "TOTAL" breaker switches are released;*
- *Switch on the machine's power supply.*

4. USER MANUAL

4.1.Design and operation of individual subassemblies

4.1.1. Drive unit

The main drive consists of CHT-90LL4 1.85 kW B5 motor. A pulley with overload clutch is installed on the motor's output shaft. KTR SI-1 DKxKT-T2 clutch is used.

Driving force is transmitted from the continuously variable transmission to NRV 075 1:30 worm gear by means of a V-belt.

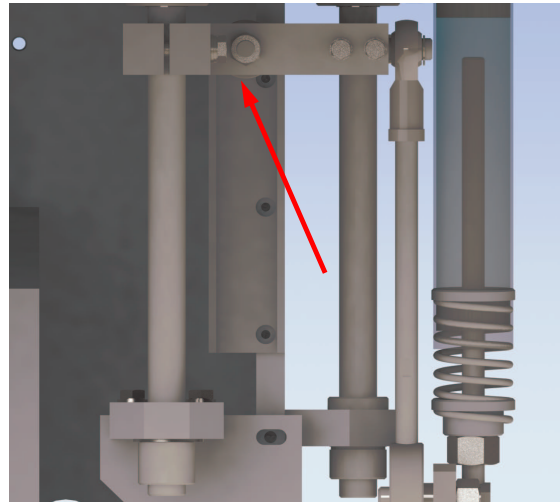
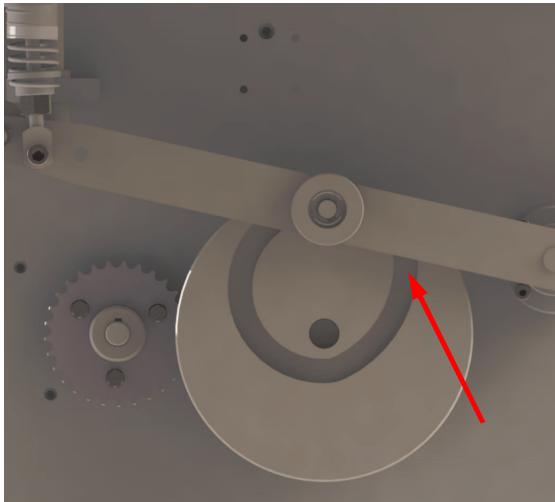
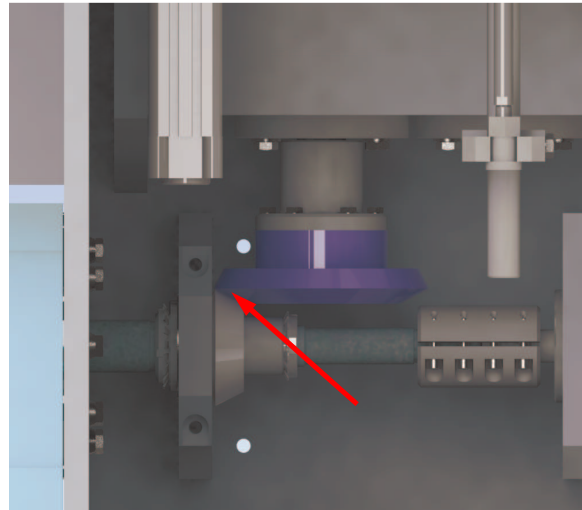
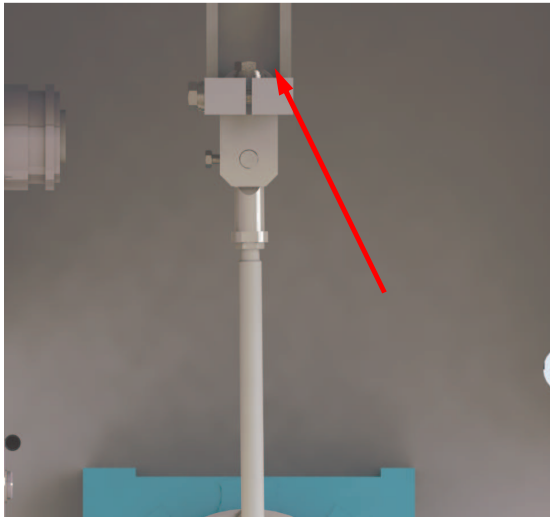
The belt is tensioned by a tensioner. A limit switch is attached to the clutch.

If a resistance larger than normal occurs in the mechanisms of the packaging machine, the overload clutch is disengaged and the machine is stopped by the limit switch. The packaging machine may be also stopped due to a too low compressed air pressure. In such a case a stop signal is sent by KP1 pneumoelectric relay installed in the compressed air circuit. In the opening of the transmission there is a shaft driving the foil station, ejectors and the puller in the cup station. This shaft also transmits the driving force, by means of bevel gears, to the indexing gear of the packaging machine's table.

Lubrication

The following parts must be lubricated with ŁT-43 machine grease before each start of production.

- *The foil station's guide;*
- *Gear transmission driving the indexing gear;*
- *The cam of the ejector and the cup puller;*
- *The cup puller's guide.*



Adjustment

No adjustment is required for factory-set drive unit.

In addition to mechanical drive units, the packaging machine is equipped with the power pneumatics system.

The power pneumatics system is used for driving the following units:

- *Cup station;*
- *Dosing device;*
- *Lid station;*
- *Thermo sealing machine;*
- *Stripper*

Lubrication

In order to guarantee proper operation of the machine, compressed air pressure should constantly amount to 0.6 MPa. Drain accumulated water from

the steam trap before start of operation. Periodically wash and blow through the air filter. Refill MOLYDAL AL oil in the tank to 3/4 of the tank capacity. Frequency of oil supply is ~3 drops per hour.

4.1.2. Work table

The rotary work table of DS 5000 packaging machine is made of acid resistant steel. The work table is equipped with 16 exchangeable seats suitable for specific types of cups.

Adjustment

In order to retool the machine, unscrew bolts (1) fixing the clamps, install a required seat (2) and secure the clamps (3) fixing the seat.

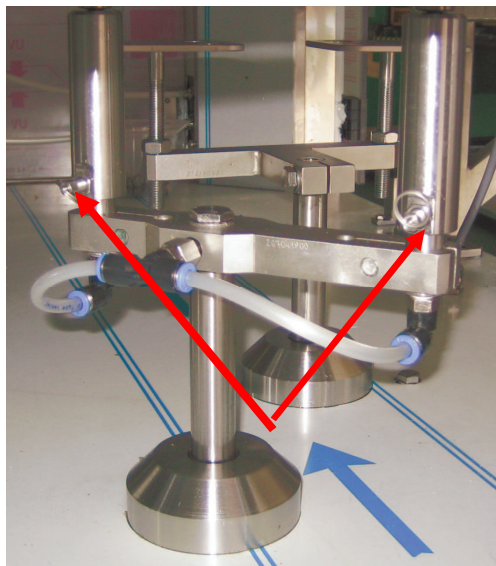


4.1.3. Cup station

Cup feeding station including the storage bin is used for inserting cups into the seats located in the rotary work table. The cup feeding station consists of a column on which two storages are installed with a pneumatically driven drawer for individual releasing of cups. Under the storages there is a puller equipped with two suction nozzles for placing cups directly in the work table's seats. In order to avoid interruptions in the machine operation during cup loading, the cup station's storage bins are separated by polycarbonate shields. The machine is equipped with 2 types of cup separation stations and 2 storage bins suitable for specific types of cups.

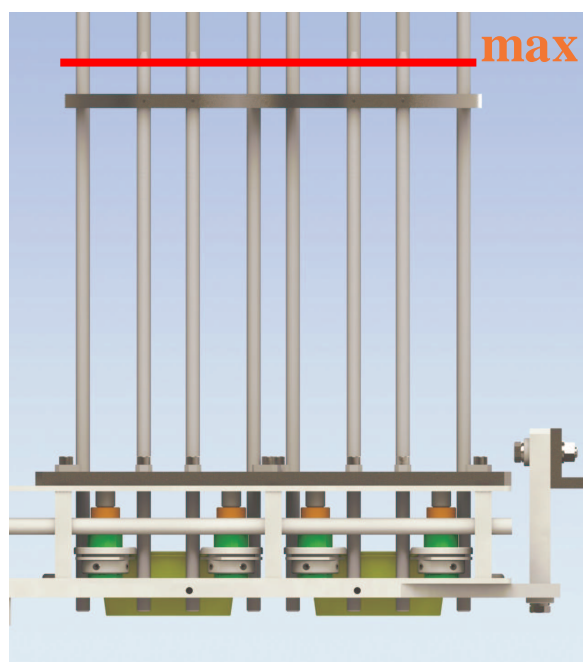
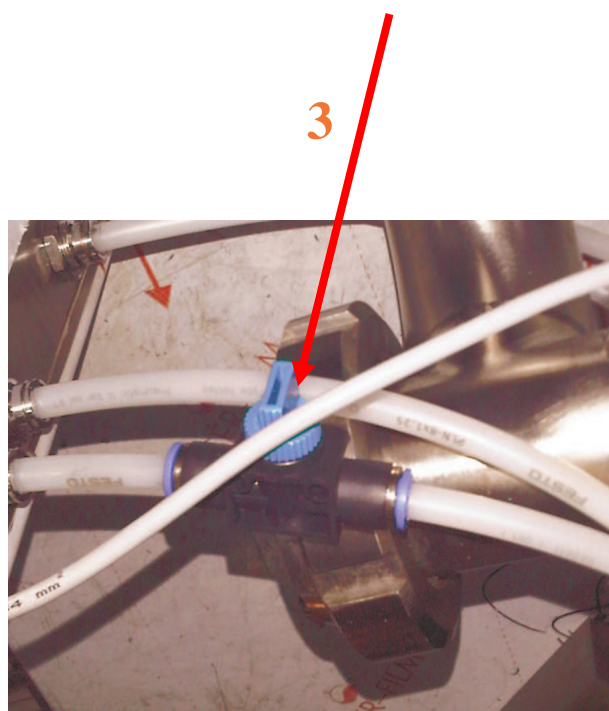
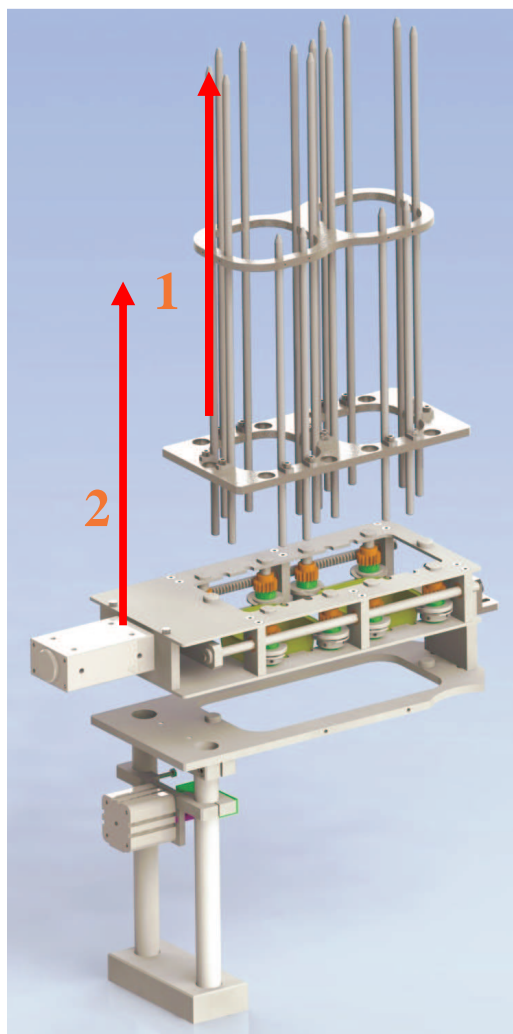
Adjustment

The cup puller height should be adjusted according to the type of cup. The height should be set in such a manner as to ensure that the puller's suction nozzle touches the cup in the upper dead centre.



In order to adapt the cup station to a specific package, close compressed air valve (3) and disconnect pneumatic conduits. Next, take out the storage bin (1) from the cup separation station (2) and dismount the cup separation station from the base and install the separation station and storage bin suitable for a specific package.

The maximum quantity of packages in the storage bin must not be exceeded.

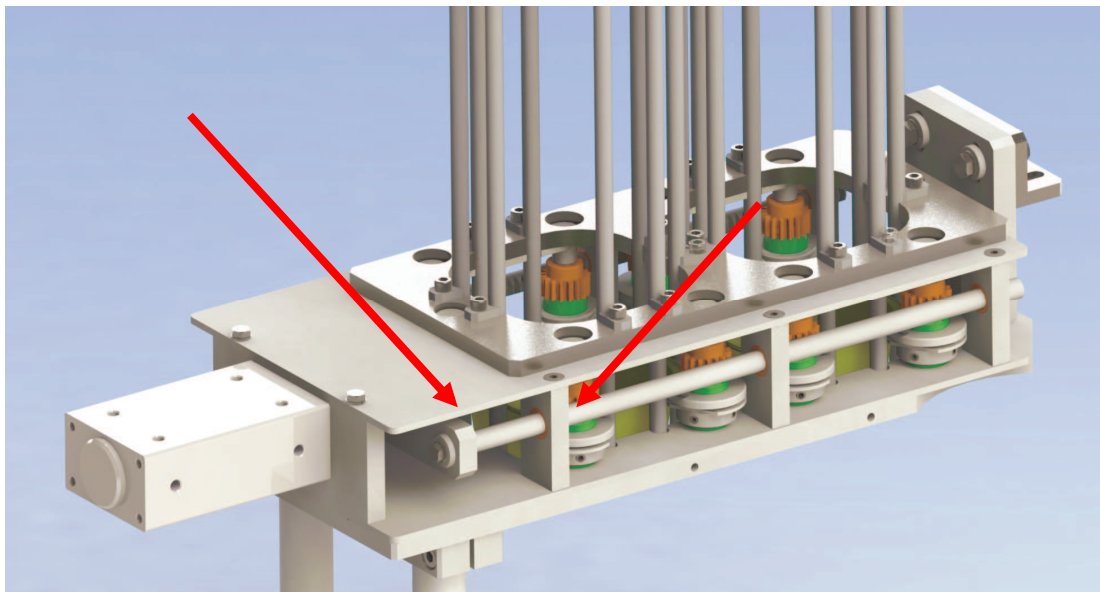


The cup may not be collected due to the following reasons:

- *Wrong setting of the storage bin height;*
- *Wrong setting of the cup puller height;*
- *Wrong setting of suction cycle;*
- *Contaminated vacuum system of the cup station – clean the air filter, pneumatic conduits, EZH 13 injector nozzles;*
- *Excessively worn suction nozzle – replace;*
- *Solenoid valve coil does not work – replace;*
- *Contaminated valve – clean.*

Lubrication

Remember to lubricate the toothed bar, gear wheels and guides of the toothed bar. These parts should be greased with foodgrade grease every 2 weeks or every 100 working hours.



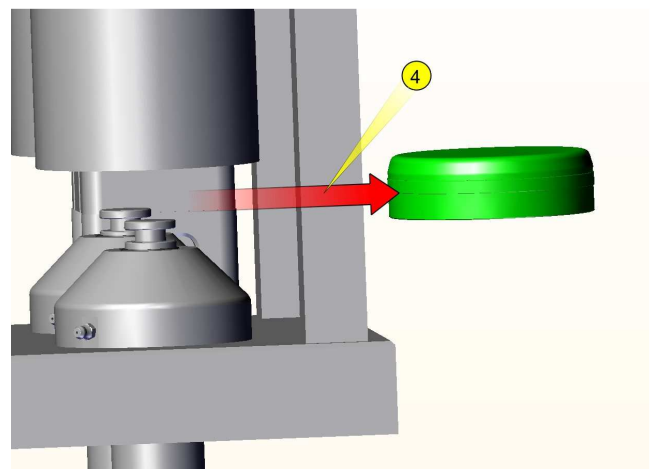
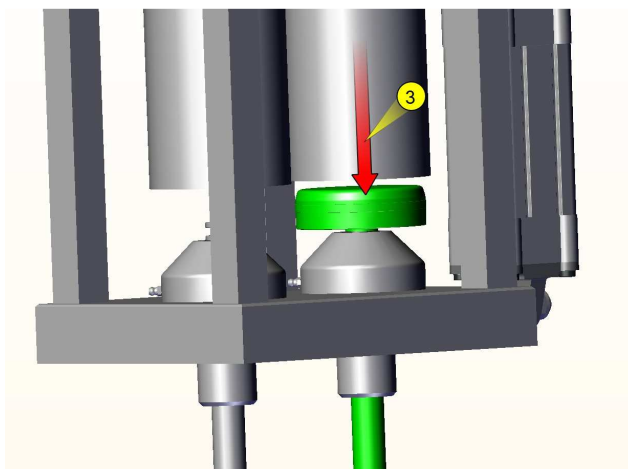
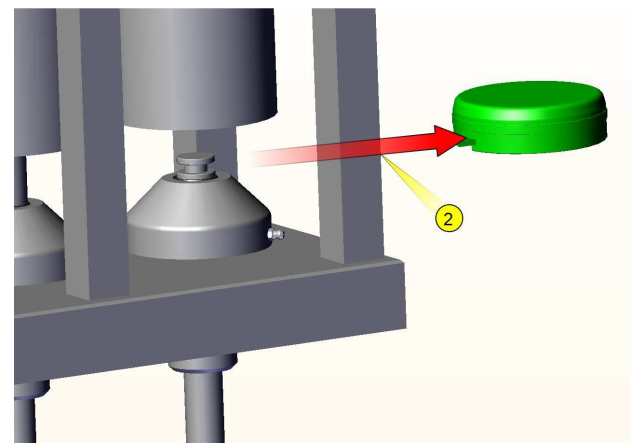
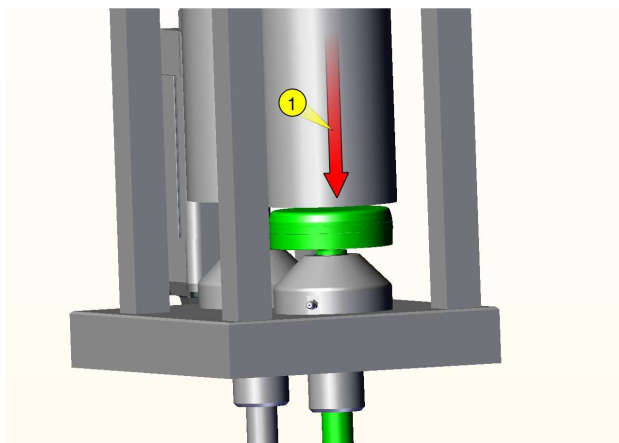
4.1.4. Dosing device

Dosing device is used for dosing meat products (doses from 0.1 to 0.5 l). Divider of the dosing device is pneumatically driven.

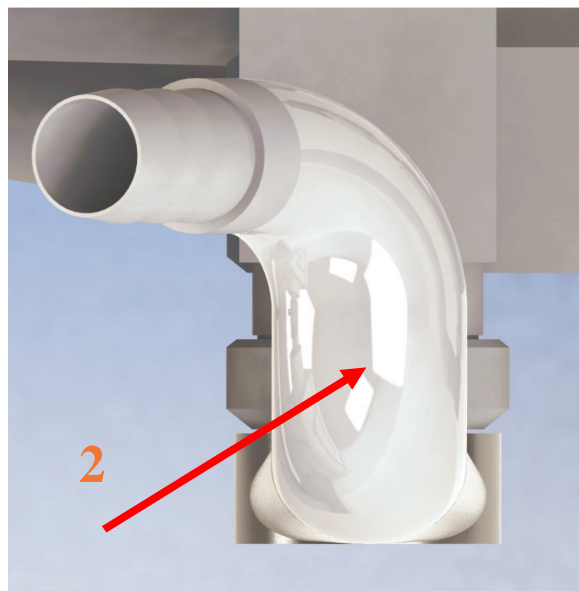
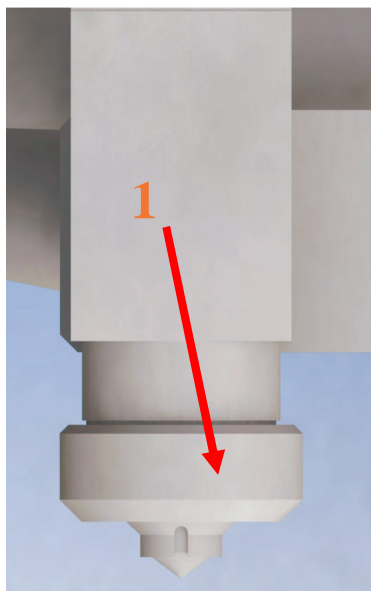
Adjustment

Cylinders of a smaller cross-section should be installed in order to guarantee repeatability of doses in case of doses within the range between 100 and 200g. The method of piston replacement is shown on the below drawing. The same method should be used when disassembling the dosing device for washing.

In order to guarantee proper distribution of product in the cup, lifting of the cup under the dosing device should be properly adjusted according to the type of cup used.



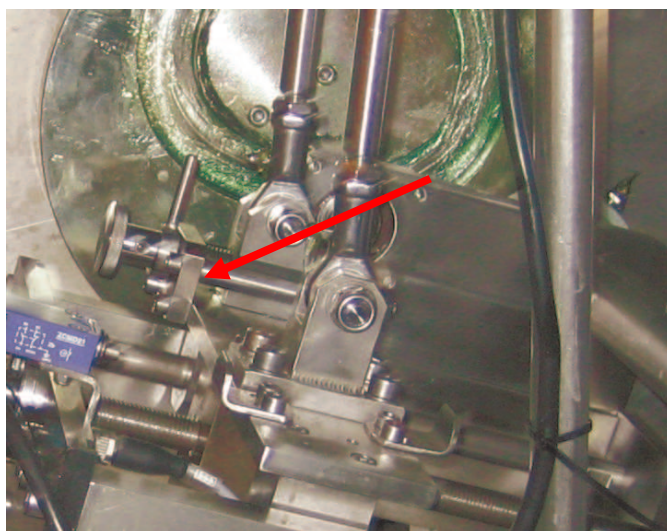
In order to prepare the machine for washing, unscrew the tips of pouring nozzle (1) and install collectors for washing agents (2).



Lubrication

- *After each washing and before assembling, grease all moving and cooperating parts (piston, valve, divider) with MOLYDAL AL-TL grease or USAGOL AL aerosol greasing agent;*

After each replacement of cylinders, adjust the dose on the dose regulator.

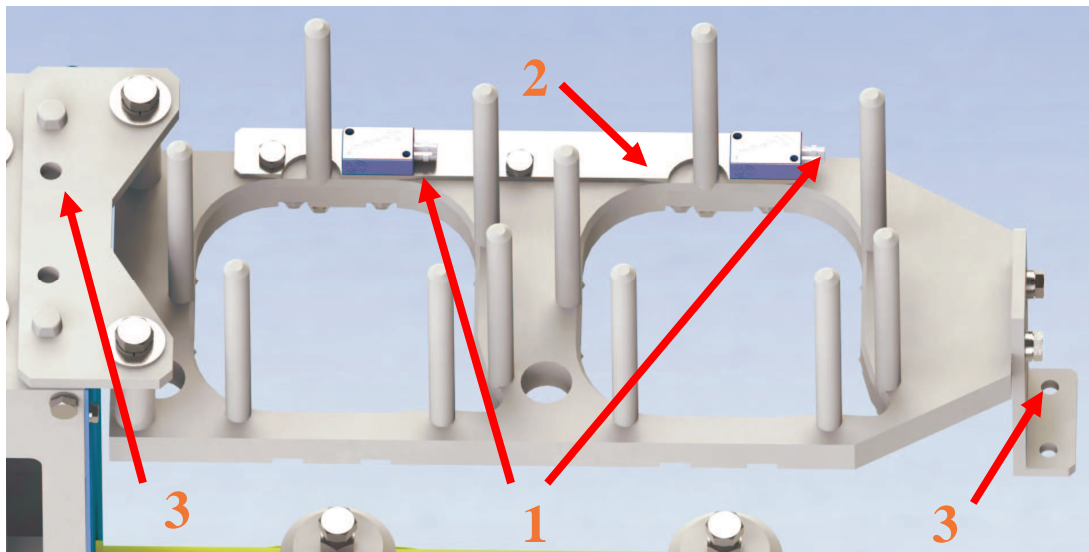


4.1.5.Lid station

Aluminium lid feeding station consists of a column with two storage bins. Suction nozzles are installed on the rotary device. The suction nozzles rise under the piles of lids, pull the lids down, rotate by 180° and place the lids on cups. If a lid is not taken from the storage bin, the machine is switched off. The machine can be restarted only if lids are replenished manually. In order to avoid interruptions in the machine operation during cup loading, the lid station's storage bins are separated by polycarbonate shields.

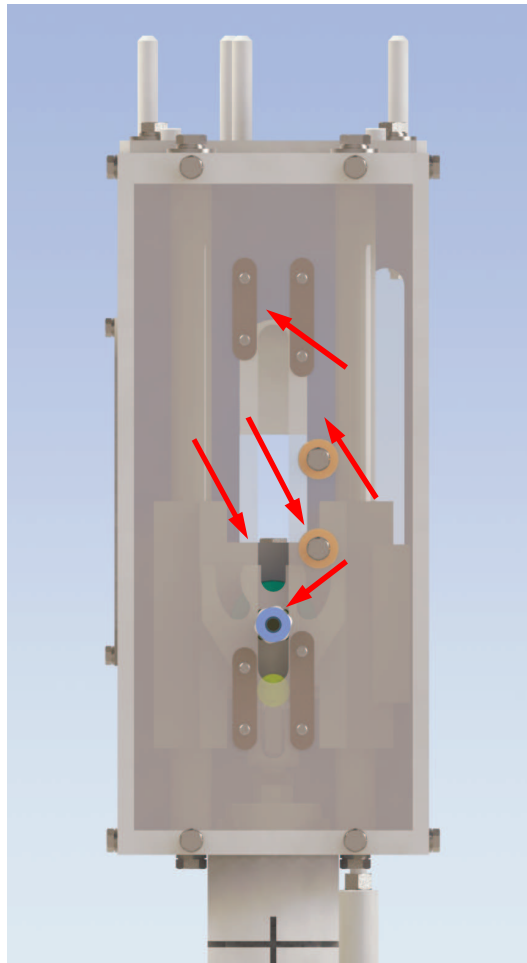
Adjustment

In order to replace the storage bin, disconnect the lid presence sensors (1), disassemble the plate with the lid presence sensors (2), unscrew bolts which fix the storage bin (3) to the station and the table axis bracket.



Lubrication

- Remove the side shield and grease the cam and guides with ŁT-43 machine grease. Grease the station every 100 working hours or every 2 weeks with ŁT-43 machine grease.



The lid may not be collected due to the following reasons:

2. Contaminated suction nozzles (replace);
3. Bad quality of lids (for example, lids are cut in a wrong manner or glued with water);
4. The suction nozzle holder in its maximum upper position is not perpendicular to the foil storage bin (set the holder perpendicularly to the foil storage bin);
5. Contaminated vacuum system (clean or replace the air filter and conduits);
6. Contaminated injector nozzles (clean or replace);
7. Contaminated or defective solenoid valve (clean or replace);
8. Solenoid valve coil does not work;
9. Damaged vacuum sensor CV - replace. The sensor controls the vacuum system. If a cup is not collected, the sensor detects the lack of negative pressure increase and switches off the machine. Sensitivity of the sensor can be adjusted by changing the position of adjusting knob in a proper manner. In case of the sensor malfunction, try to clean the sensor inlet and adjust its sensitivity.

4.1.6. Thermo sealing station

The station is used for closing the product packaged in the cup by thermo sealing the cup with aluminium lid.

Special attention should be paid to operation of this station. Even the smallest problems in its operation have influence on quality of thermo sealing.

Normal maintenance includes replacing the thermo sealing pad. The pad is fixed with a M6 bolt. During operation, under influence of high temperatures, the pad is covered with oxides which deteriorate thermal conductivity. Layers of oxides should be removed periodically in order to improve efficiency of thermo sealing. The heater disassembling sequence is as follows. Undo the nut of the thermo sealing machine on the work table axis; lift the thermo sealing machine on its hinge. Unscrew the thermo sealing pad, disconnect supply conduits and take the heater out from below. Assemble in the reverse order of disassembly.

The user himself can also regenerate the thermo sealing pad. To do this, place a sheet of fine grain abrasive paper (waterpaper is the best choice) on a flat surface (bench plate, pane) and grind the thermo sealing pad on this surface.

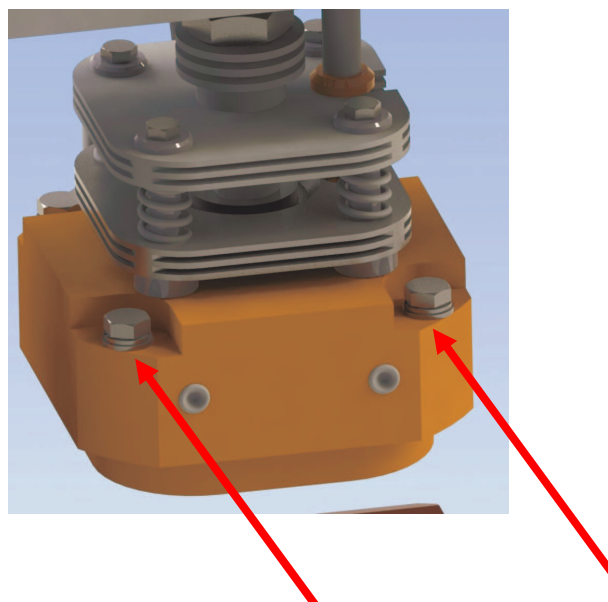
Pay particular attention to thermo sealing time. Its value must not exceed 0.7s.

The station for thermo sealing of the cup with aluminium lid, equipped with the temperature adjustment system operated from the main control panel.

If lids made of material other than aluminium are used, the thermo sealing pads made of Teflon should be installed.

Adjustment

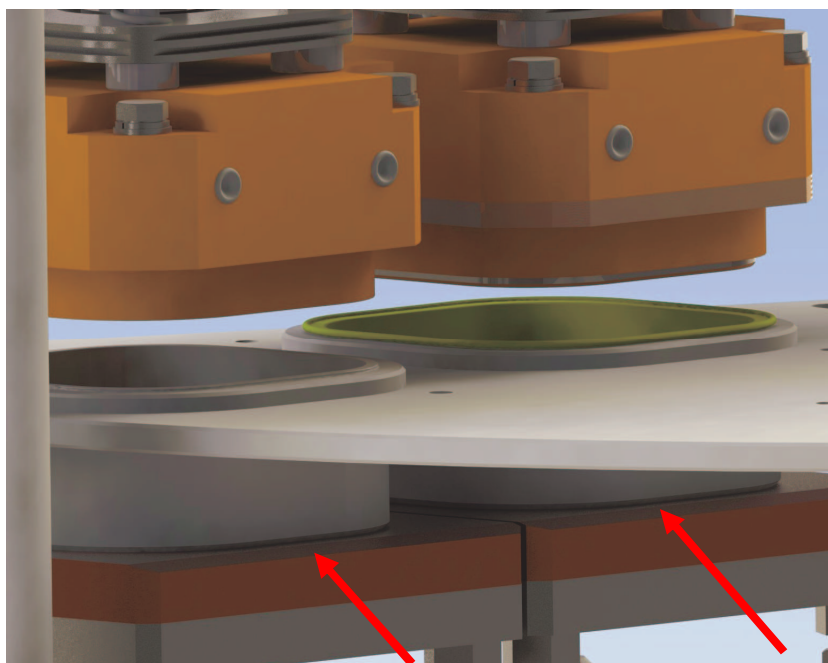
In order to replace the thermo sealing pad, unscrew the bolts and replace the thermo sealing pad.



Lubrication and maintenance

After washing the machine, grease the supports under the thermo sealing unit with grease (foodgrade grease) - MOLYDAL AL/TL vaseline.

Also, remember to insert grease into the grease nipple on the articulated joint which lifts the thermo sealing station. Grease during periodic inspections.



4.1.7.Cup ejector

Cup ejector cooperates with the stripper and takes the finished cup from the seat and pushes it onto the conveyor.

4.1.8. Automatics

The complete automatics system is controlled electrically and electronically. Components of the automatics system are clearly arranged in the control cubicle and they are easily accessible. The control desk is made of stainless steel. The maximum voltage supplied to the control desk is 24V.

The safety class of the control cubicle is IP 65. The power supply of the control cubicle: 3 x 400 V 50 Hz

The following devices are installed in the control cubicle:

- *Safety transformer ~400/220V;*
- *Rectifier with output = 24V for the sensors' supply;*
- *Contactors, relays and fuses.*

The following devices are installed on the front panel of the control box:

- *Electronically adjustable displays of heater temperature;*
- *Push-buttons;*
- *Switches;*
- *Signal lamps.*

ATTENTION!

**PROTECT THE SENSORS AND OTHER ELECTRICAL COMPONENTS
INSTALLED IN THE MACHINE IN SUCH A MANNER AS TO PREVENT
THEIR DAMAGE DURING MACHINE WASHING!**

4.1.9. Safety shields

The safety shields made of polycarbonate insulate the packaging chamber from the outside environment and ensure safe working conditions for the machine operators. The shields are equipped with proximity sensors which stop the machine automatically when the shields are open.

