



TECHNICAL AND OPERATIONAL DOCUMENTATION

INSTRUCTIONS FOR USE

HANDMATIC

BYDGOSZCZ 2024

A decorative graphic at the bottom of the page consisting of a solid red horizontal bar and a dark grey trapezoidal shape extending from the right side.

HISTORY OF CHANGES

Edition:	REV 01/2023_PL
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IMPORTANT INSTRUCTIONS!

1. Before starting the machine, be sure to carefully read the instructions contained in this technical and operational documentation. Please remember that improper operation, repairs by third parties, or installation of non-original parts may result in serious damage and void the warranty.
2. The control device may be started and operated by persons who are over 18 years of age, have appropriate professional knowledge, have appropriate qualifications and experience in working with this type of machines, as well as know all relevant regulations regarding safety and accident prevention, especially in situations where safety devices are disabled and in accidental situations.
3. This documentation is protected by copyright according to applicable regulations. The information contained therein is confidential. In accordance with the regulations for use according to § 31 regarding copyright, the use of the device is limited only in a given facility and only by authorized persons. Translations or borrowing are not allowed. Violation of the regulations is punishable and may result in imprisonment for up to 5 years or a financial fine. The regulations also define negligence leading to the payment of compensation. Fraud attempts are punishable by law.
4. The charts, descriptions, sketches and illustrations included in the documentation show the standard scope of delivery and may differ from the delivered goods. The company reserves the right to make changes at any time that improve the quality of the device due to scientific and technical progress.
5. When purchasing a VERSOR Engineering machine, please read the general terms and conditions of the transaction. Other claims not included in previous arrangements are excluded.
6. We are not responsible for the correctness of the operating instructions. We are not responsible for translation errors, even if it was done on our behalf.
7. We reserve the right to register a patent or utility model.

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1 Contact details

Please send all warranty and post-warranty complaints and spare parts orders in writing to the company e-mail, fax or postal address:



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2 Technical and operational documentation

This technical and operational documentation contains the operating instructions for the Handmatic device.

Handmatic designed for final receiving of packages and verticalizing them for subsequent packaging.



INFORMATION

Machine manufacturer VERSOR ENGINEERING SP. Z O.O. Sp.K. reserves the right to make changes to the documentation at any stage of the product's life.

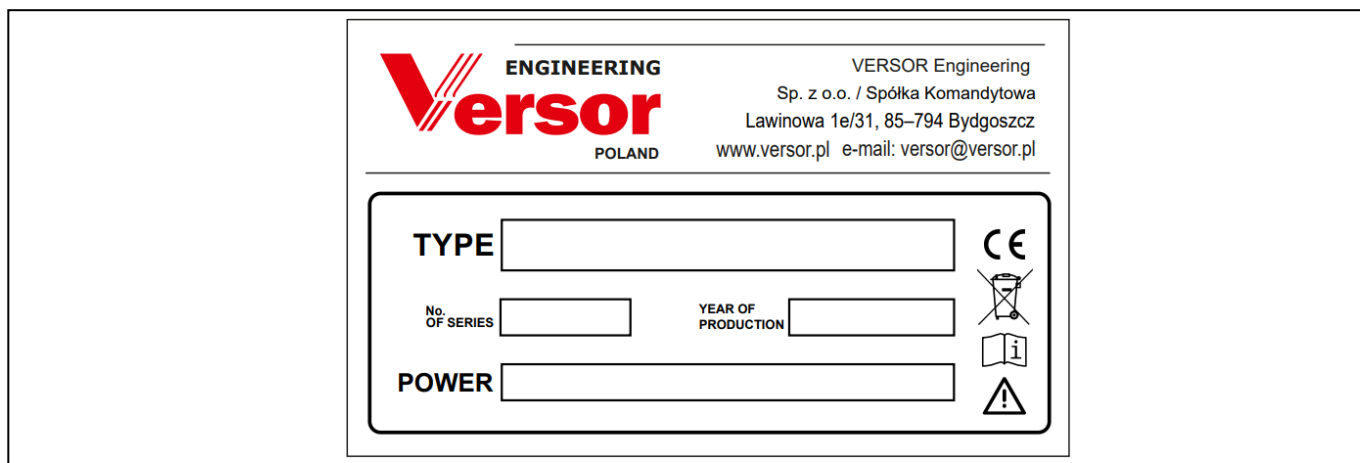


INFORMATION

Machines may have deviations from the standard version, but they are not described in this manual.

3 Machine marking

In accordance with the requirements of the Machinery Directive 2006/42/EC, Handmatic has a nameplate in a visible place. An example of a nameplate mounted on a machine is shown drawing 1.



Drawing 1 Nameplate template

1. The nameplate specifies:
2. Information about the manufacturer
3. Machine type
4. Machine serial number
5. Year of construction
6. Batch number
7. Having CE certificate
8. Power supply including protective connections
9. Diameter of power cables
10. Power protection
11. Current frequency
12. Pictograms informing about the need to read the operating instructions and the presence of dangerous places.

Documentation intended for the machine

Machine type	Handmatic 450V
Serial No	1657
Year of construction	2024

4 Information

4.1 Safety

In order to ensure safe use of the machine, persons intended to operate it are obliged to read this documentation carefully.

The documentation should be read by persons who have direct contact with the machine, such as the operator, operator's assistant, mechanic preparing the machine, production manager, maintenance workers or other persons on whom the proper functioning of the machine depends.

If you do not understand the operating instructions, please contact your supervisor to clarify the issues before starting work.

Safe working conditions

The machine meets the requirements of the following EU directives:

2006/42/WE	Machinery Directive (MAD)
2006/95/EC	Low Voltage Directive (LVD)
2004/108/EC	Electromagnetic Compatibility (EMC) Directive
2011/65/UE	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
2006/66/WE	The "battery" directive

The safe working conditions listed below are intended to provide protection against accidental injury to employees or damage to the machine.

They will also help in achieving optimal efficiency and quality of cut-out processing.

General provisions for users

- the documentation supplied with the machine must be read, understood and followed.
- the machine may be operated by a person who has been thoroughly familiar with the manufacturer's instructions.
- the machine may only be operated by properly trained personnel.
- the machine can be started provided it is in full technical condition.
- security mechanisms should be operational and additionally checked for functionality.
- safety mechanisms should not be disabled or limited in their normal operation.
- any types of irregularities in the operation of the machine should be immediately reported to superiors.
- each time the machine is started, it should be preceded by checking whether any operator or bystander is within the area of moving parts at risk.
- while the machine is operating, do not bring your limbs or other body parts close to the moving parts of the machine.
- keep order around and on the machine.
- the machine surroundings must be well lit.

The design of the machine in the outer body and outer outline is itself a protection during operation against direct contact of the people operating it with its moving elements.

The documentation supplied with the machine should be made available to all persons responsible for its operation, maintenance and supervision.

Before starting work, people working with the machine should be reminded to follow the rules of safe operation.

The operating manual should be available to the personnel operating the machine at all times.

The machine should undergo maintenance inspections at specified times in accordance with the maintenance schedule, which will help to avoid damage to the machine.

Order and cleanliness within and on the machine is an important element of safe operation of the machine and its staff. After finishing work, the machine should be cleaned.

All types of chemical impurities in the form of oil and grease found on the machine or in its surroundings should be immediately neutralized.

The machine operator should pay special attention to ensure that there are no tools or machine elements scattered around the machine, which may cause an accident.

The machine is equipped with covers for moving and driving elements.

Each time before starting the machine, all covers should be in place.

The machine should not be started in the absence of guards.

Access to the components of the electrical cabinet is allowed only to an employee qualified and trained to operate it.

Before starting maintenance or repair work, turn off the main power switch of the machine and secure it against being turned on by unauthorized persons.

4.2 Warning and information signs

	ATTENTION Rotation of gears in the transmission while the wheels are moving. Possibility of crushing your hand if caught in the gears. When working on the gearbox, turn off the main power switch of the packaging line and secure it against being turned on by unauthorized persons.
	ATTENTION Rotation of gears in the transmission while the wheels are moving. Possibility of crushing your hand if caught in the gears. When working on the gearbox, turn off the main power switch of the packaging line and secure it against being turned on by unauthorized persons.
	ATTENTION Crushing hands. Possibility of crushing your hand if it is pulled under the feeder belt. During work, turn off the main power switch of the packaging line and secure it against being turned on by unauthorized persons.
	ATTENTION Hand jam. Possibility of getting your hand caught if it is pulled under the feeder belt. During work, turn off the main power switch of the packaging line and secure it against being turned on by unauthorized persons.

	ATTENTION Hot items. Possibility of burns. Start work only after the surface has cooled to a safe temperature or use protective clothing to protect against burns.
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	ATTENTION High voltage. Possibility of electric shock. Start work only after turning off the power supply or use protective clothing to protect against electric shock.
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	ATTENTION Warning against sharp elements. Possibility of injury. Start work only after turning off the pneumatic and electrical power.
---	--

	ATTENTION Danger of being caught in the belt. Do not touch while working.
---	--

4.3 Main switch



INFORMATION

The main switch of the machine is mounted on the left side of the electrical cabinet.



Drawing 2 Main switch

Principle of operation

To disconnect the power supply, turn the switch knob to the "0" position.

4.4 Safety button - LOCKS



Drawing 3 Safety button - lock

Principle of operation

The safety button is red, mushroom-shaped, and has an automatic lock.

Before starting work, always make sure that the safety buttons are working properly.

By pressing the safety button, all electrically controlled machine elements are immediately stopped.

After pressing the safety button, all machine control points are inactive.

Restarting the machine after pressing the safety button is done as follows:

- remove the reason for stopping the machine function
- unlock the pressed safety buttons by turning them in the direction of the arrow or pulling them towards you (depending on the button type).
- turn the machine on again as described.

The safety buttons should not be used to stop the machine normally.

Safety buttons are used for emergency, quick stopping of machine functions.

**ATTENTION**

Before any intervention in the machine during operation resulting from the need for adjustments, remember to locate the safety buttons or have a radio control panel close to you, which also allows you to quickly stop the machine's functions.

Conservation works

Before carrying out maintenance or repair work, the machine must be stopped using the standard stop buttons.

If the machine has previously been stopped, make sure that the standard stop buttons are turned on.

Turn off the machine's power supply using the main switch located in the electrical cabinet and install the safety device.

4.5 Measurement of noise intensity

The noise measurement performed within the machine operation area is an average value.

The measurement was made at maximum machine efficiency, in a production hall in free space without sound reflection.

When sound is reflected from walls, partitions and ceilings, the noise level increases - it is higher than that measured in free space.

The noise level is expressed in dBA.

The measurement was made with the machine at a distance of 0.6 m from the machine and at a height of 1.6 m from the floor.

The measurements were performed at the maximum speed of the machine without cutting cuts.

The noise level may change when working with blanks.

The noise level depends on the type of glued packaging - one, three or four/six-point.

The noise level also depends on the type of cardboard, the type of cutout, the cutout format, and the position of the machine in relation to walls and ceilings.

Average measurement result:

≤75 dBA

4.6 Occupational health and safety instructions

An employee who has been trained in the operation and is familiar with the technical and operational documentation and the occupational health and safety manual may be allowed to operate the machine.

1. Before starting the machine, check the correct settings of individual units - the device must not be operated if any elements affecting operational safety are found to be damaged. All damage must be reported to the supervisor!
2. Before starting, check the correctness of the electrical installation connections, in particular the PE protection.
3. Pay special attention to all parts of the machine that perform working movements.
4. The machine operator is obliged to wear working clothes.
5. It is unacceptable to touch moving parts of the machine - while the device is operating.
6. The machine is equipped with laser sensors whose light beam cannot be directed into the eyes.
7. During a power outage, turn off the main switch.

4.7 Warranty

Warranty and service conditions

Warranty

1. The Seller provides the Buyer with a warranty for a period of 12 months from the date of signing the final delivery and acceptance protocol of the set by the Buyer.
2. The Seller guarantees that the subject of the contract is new, complete and free from defects.
3. The Seller is obliged to remove defects found during the warranty period at his own expense within no more than 3 days from the date of written notification (by fax or letter), or replace damaged parts or components with new ones*.
4. The warranty period is extended by the duration of the repair.
5. The warranty does not apply to parts that wear out or are damaged more quickly due to improper use or application.
6. The warranty does not cover elements that have design changes made by the Buyer, unless they were made in consultation and in accordance with the Seller's instructions.
7. The warranty does not cover consumable parts of the machine, such as transport and drive belts, light bulbs, nozzle tips and other elements showing signs of mechanical damage.
8. If the Seller decides, based on the Buyer's explanations, that he can repair it on his own, then the Seller undertakes to instruct the Buyer in writing on the method of repair and assumes responsibility for the activities performed to remove the defect.

II. Service

1. The Seller provides the Buyer with warranty, post-warranty and operational service for the delivered subject matter of the contract.
2. The service will be carried out at the place of use of the subject of the contract.
3. Defects or damage to the equipment revealed during the warranty period will be removed free of charge.
4. Post-warranty repairs are carried out at the Buyer's expense.
5. The Seller declares readiness to provide full repair and maintenance services for the subject of the contract.

*Due to the delivery time of components caused by the pandemic, the deadline does not include components such as: PLC control elements (controller, inverters, digital input/output modules, HMI panels).

4.8 Training

The training includes elements of the functioning of the machine and its components.

Only qualified people who have:

- education and knowledge in the operation of machines in the paper/printing industry, in particular folding-gluing machines and tape applicators,
- education and knowledge in the field of making cardboard and cardboard packaging,
- having education and knowledge in the field of knowledge of the properties of cardboard and cardboard.

Training notes:

- The training is not vocational training,
- The training is not a lesson in how to prepare semi-finished products,
- The training is a form of providing information on the use of machine equipment for the production of specific groups of packaging and on how to operate the machine in terms of its control.

5 Installation

5.1 Transport

The machine is loaded by the manufacturer, who appropriately secures the machine during transport.

The machine can be transported directly on the floor of the transport vehicle using the standard adjustable legs, which in such a case should be lowered to the lowest mounting position.

Each form of loading and transport absolutely requires securing individual machine elements with transport belts.

The entire machine is protected with anti-corrosion plates and protective foils during transport.

	ATTENTION The minimum load capacity of a forklift is 1000 kg. Pay special attention to elements protruding beyond the outline of the machine body.
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Tabela 1 Komponenty maszyny

No	Element	Dimensions [dł. x sz. x wys.] [m]	Weight [kg]
1	Handmatic	2.8 x 2.2 x 1.2	500
		TOTAL	500

5.2 Installation

Handmatic is a free-standing machine that does not require foundations. Handmatic's internal transport is carried out by unlocking the transport wheels.

The machine should be installed on a level floor at a minimum distance of 1.2 [m] from walls or other devices.

The machine must be leveled by appropriately adjusting the supporting elements.

Do not place the machine in cold and damp rooms.

The machine has its own five-core cable with a cross-section of 1.5 [mm²] supplying electricity.

**ATTENTION**

The machine must be absolutely secured with a PE cable.

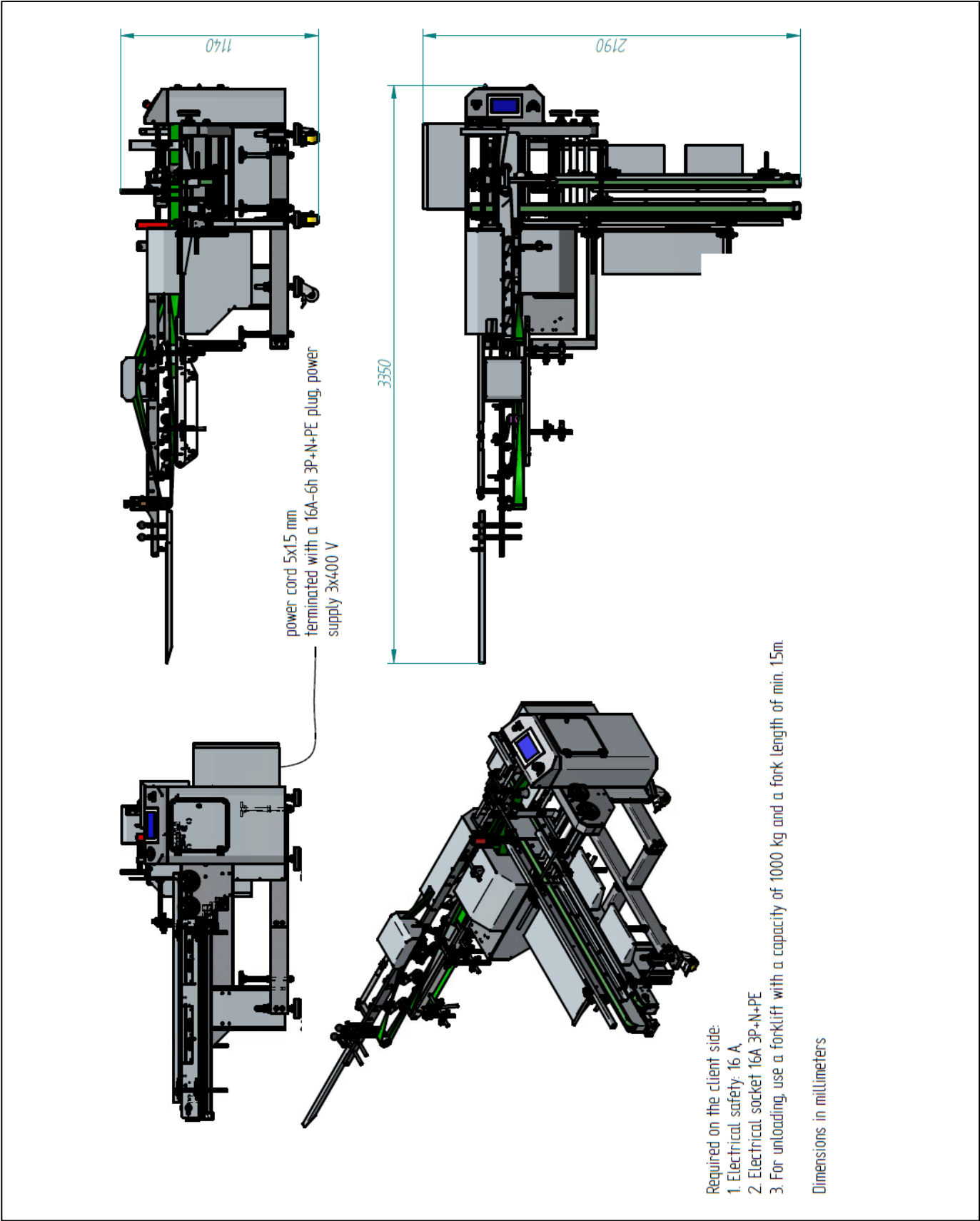


Diagram 4 General view of the machine

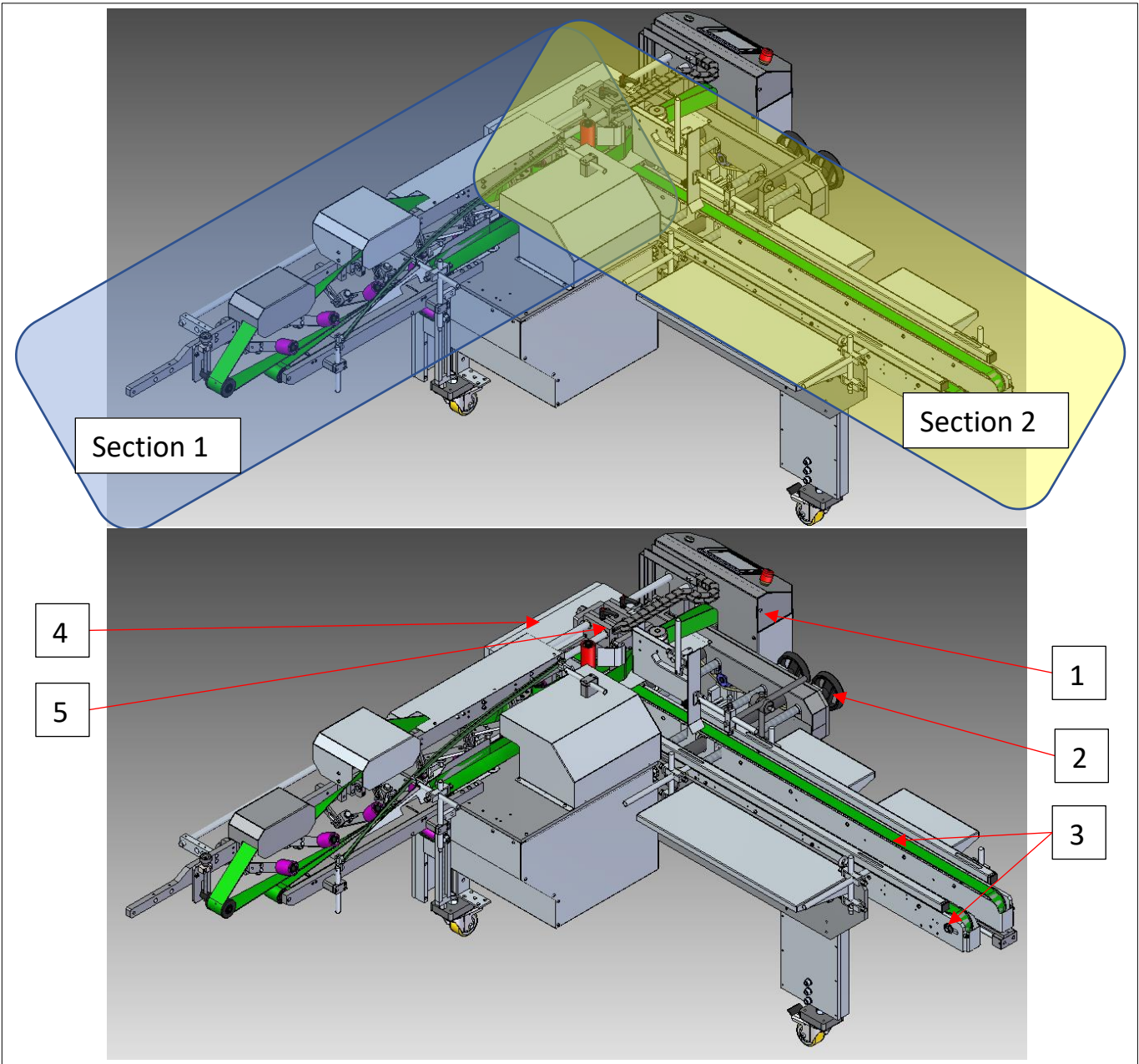
6 Technical characteristics

Handmatic is a transporter made of the highest quality materials, whose task is to support the process of receiving and packing glued packaging. The device has been adapted to work with any type of folder-gluer. The versatile use of the machine significantly speeds up the production process.

Handmatic is designed to allow synchronization of work with any base machine thanks to quick adjustment (including adjustment of the machine's height), as well as easy movement of the device and its independent power supply.

Tabela 2 Dane techniczne

Power	3x400 V, 50 HZ
Weight	~500 kg
Dimensions:	
- length	~2712 [mm]
- width	~2188 [mm]
- height	~1144 [mm]
Receive drive	Power: 0,55kW Speed: 1430obr/min przy 50Hz
Receiving drive gear	CHM50 gear ratio i=15
Delivery drive	Power: 0,55kW Speed: 3000obr/min by 50Hz
Delivery drive gear	THF28C gear ratio i=150



Drawing 5 Main elements of the machine - illustrative drawing

1	Operator panel	2	Wheels for adjusting the beam spacing of section 2
3	Section 2 beams	4	Electrical cabinet
5	Slider (to be adjusted together with section 2 beams)		

7 Controls

7.1 Description of the electrical installation and control

The control system includes the following elements:

- main control cabinet with equipment,
- controller, controller I/O modules,
- machine drives,
- limit switches, encoders,
- cassettes with operating buttons, safety elements,
- signaling elements,
- cabling.

Electrical data:

- supply voltage: 3 x 400V, 50Hz.
- adaptation to protective installation: TN-C or TN-S.
- voltage tolerance: -10% to +10%.
- frequency tolerance: -2% to +2%.

7.2 Connection to power and protection installations

Before connecting to the power supply network:

- check whether the device installation is adapted to the mains voltage at the installation site,
- check whether the electrical installation was damaged during transport or during installation of the line (crushed or broken wires, cracked electrical devices, damaged sensors, etc.); remove noticed defects,
- tighten all clamping screws and screws securing electrical devices,
- connect the motors and electrical installation elements to the appropriate terminal strip in the control cabinets in accordance with the electrical diagram,
- connect the communication circuits of the control cabinet with the operator panels (Ethernet),
- connect to the 3x400V, 50Hz power supply network using cables of appropriate cross-section through the main short-circuit protection with time-delay characteristics. Connect the power cables to the terminal block located in the main control cabinet.

A protective conductor with a cross-section appropriate to the cross-section of the power cables should be connected to the PE terminal. Depending on the anti-shock protection system at the place where the machine is installed, you should:

- for the TN-C system: connect the PE terminal with the N terminal by a bridge,
- for the TN-S system: remove any bridge between the PE terminal and the N terminal.

8 User manual

The purpose of this study is to familiarize users of the device with the operation and functions of the control system. The manual contains descriptions of emergency situations and threats that may occur during operation, as well as recommendations for maintenance and servicing.

	ATTENTION To ensure safe operation, please read and follow the recommendations contained in this documentation. The user is obliged to follow all safety instructions.
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The machine control system performs the following functions:

- transport of the product through the entire machine,
- supervision over the proper operation of devices - detection of emergency situations and appropriate response to their occurrence (stopping, displaying a message),
- process control on statistics screens,
- controlling devices in manual mode,
- user operation of the machine using the operator panel,
- visualization: displaying machine status, operating parameters, alarm messages, counters, speed, efficiency, operation of devices in manual and automatic mode, service settings, parameter backup, etc..

To start the machine, perform the following steps:

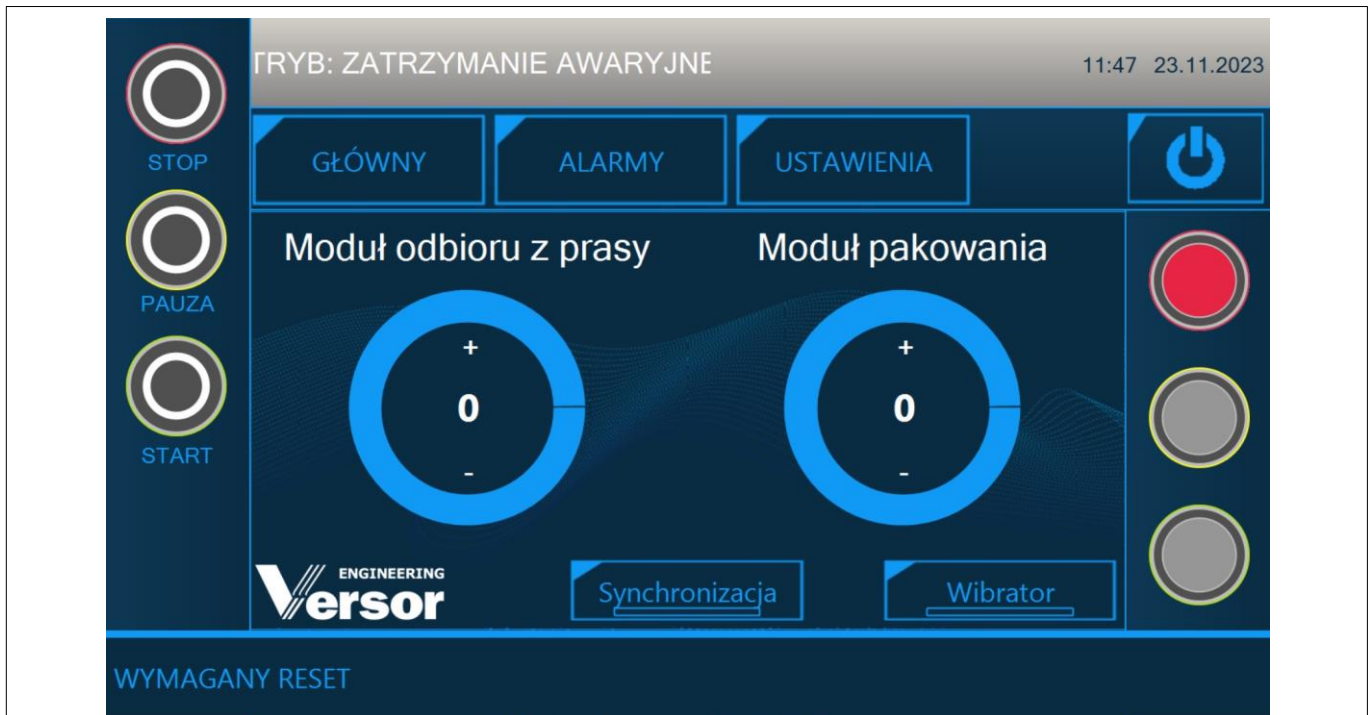
- check the condition of the electrical installation and elements responsible for operational safety (electric cables, drives, sensors, etc.),

- turn on the power supply with the main switch (Drawing 2),
- check the operation of all EMERGENCY STOP buttons,

	ATTENTION After each use of the emergency stop switch, it is necessary to reset the safety relay by pressing the blue RESET button located on the machine body near the control panel; reset is only possible when the safety switches are in the correct state (EMERGENCY STOP buttons pressed).
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- the device is ready for operation if there is no failure and the safety circuit is switched on.

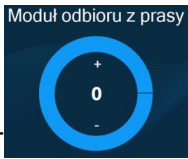
8.1 HMI panel main screen

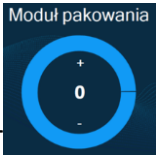


Drawing 6 Main screen

Drawing 6 shows the main screen. It contains the following buttons:

- Start [,
- Stop [,
- Goes to the settings screen [,
- Switches to manual mode [,
- Go to the alarm screen [,

- Setting the operating speed in the first section [],

- Setting the operating speed in the second section [],

- Starting the vibrator of the delivery section [].

The start button means the machine starts. When the blue reset light is flashing, to start the machine, clear all errors (e.g. stop button pressed) and press the physical reset button. The machine will go through the initialization process and allow you to press the START button to start the machine. The machine can be stopped in two ways: by pressing the STOP button and the "Emergency STOP" button. Stop is used to stop production after it is completed, the data needed for the current operation of the machine is forgotten.

The transition from manual mode to automatic mode is done by pressing the button [] the operation of the system in one of two modes is visible on the main screen.

The tiles on the left side of the HMI screen provide information about the machine's status. The assigned colors provide information about the machine's status:

-  - critical errors, lack of machine operation,
-  - information about errors that do not stop the machine,

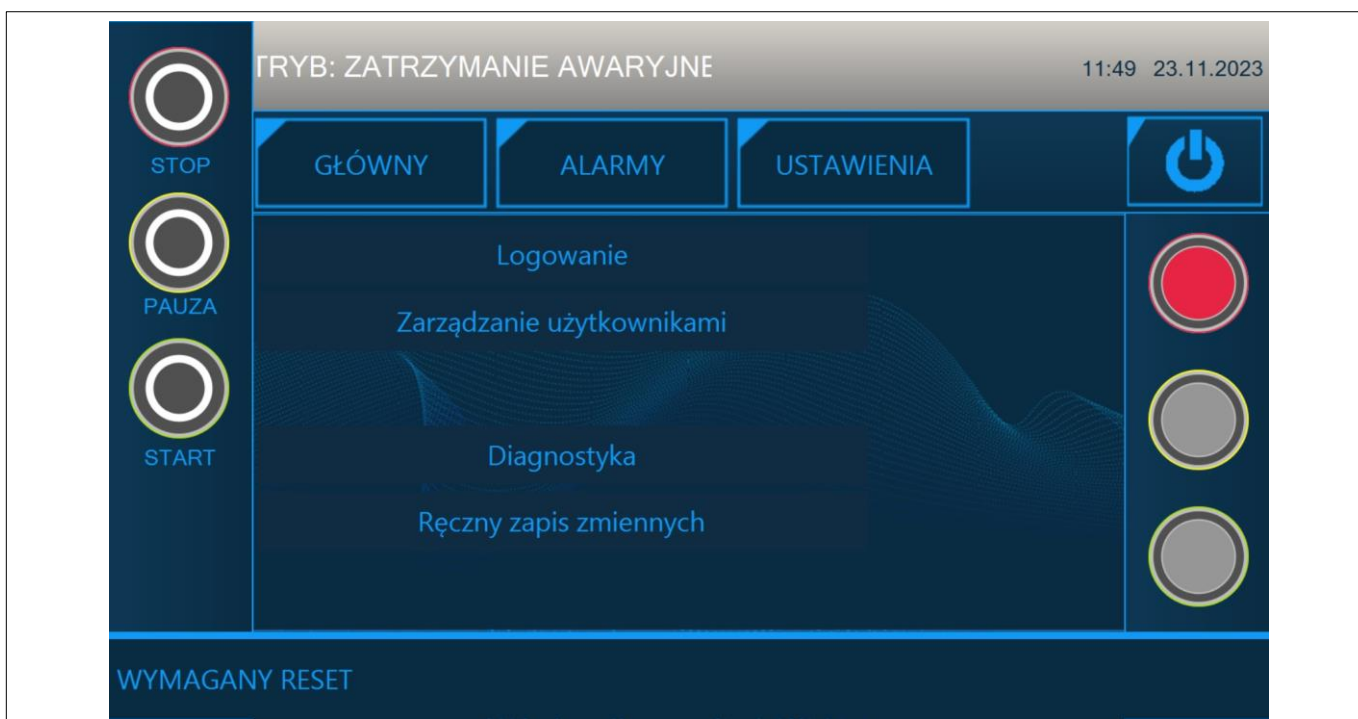


- - machine ready to work,

8.2 Settings Screen

From the settings screen you can access basic information about the operation of the HMI screen, including:

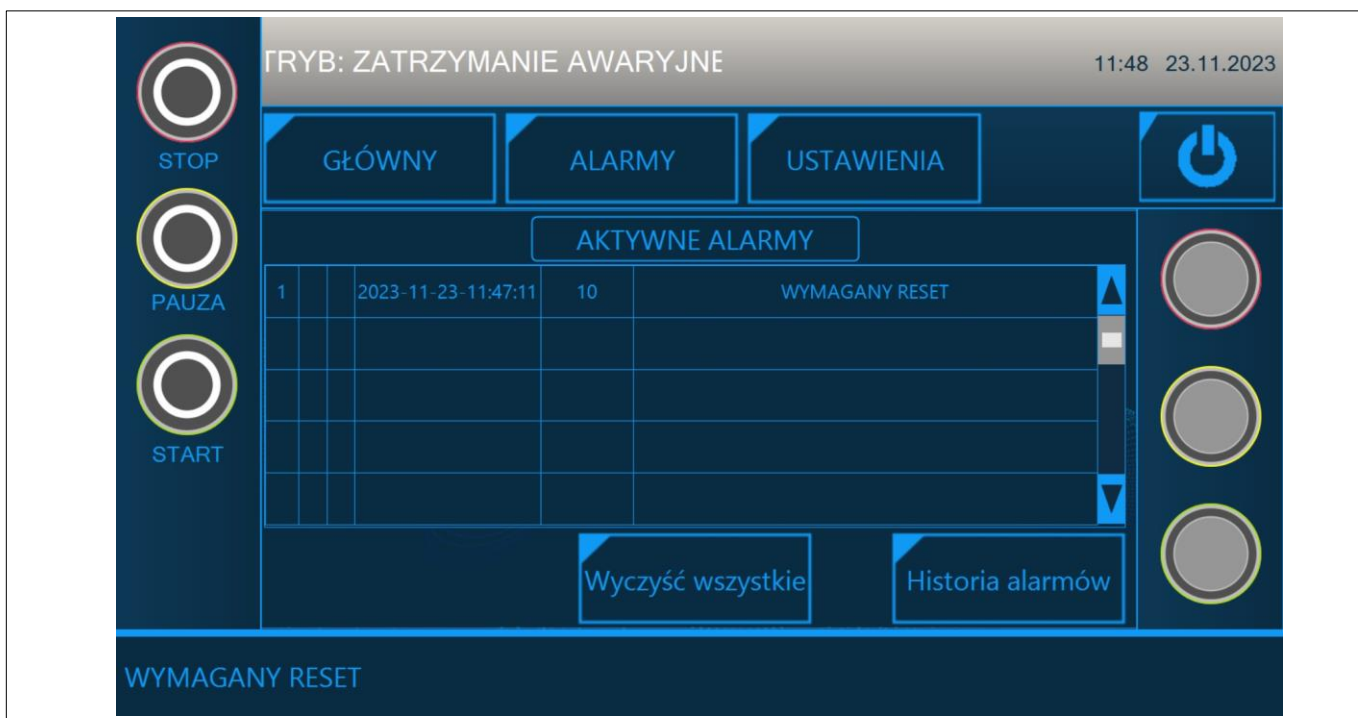
- Go to user login [**Logowanie**],
- User management [**Zarządzanie użytkownikami**],
- System diagnostics [**Diagnostyka**],



Drawing 7 Settings screen

8.3 Alarm Screen

From the alarm screen, the user can check and early diagnose the error that prevents the machine drive from turning on. On the screen, the user can check the entire history of errors reported by the machine controller.



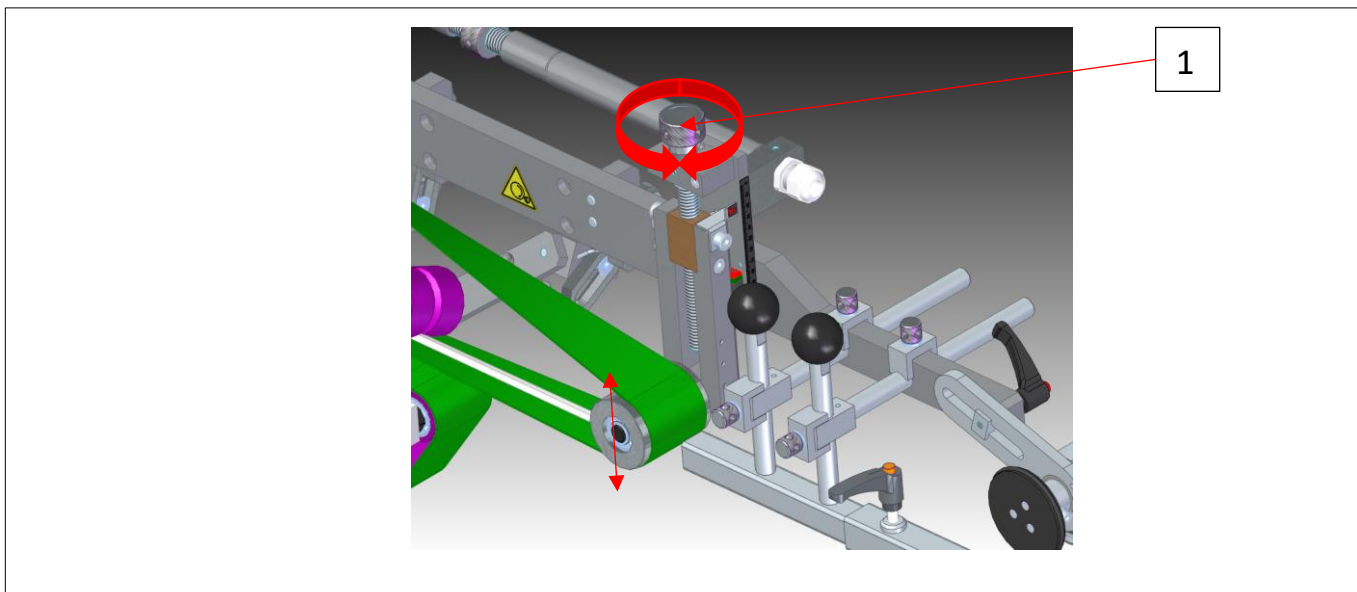
Drawing 8 Alarm screen

9 Handmatic adjustments

9.1.1 Raising/lowering the first roller

Handmatic is equipped with an adjustable first roller, thanks to which we can set the upper receiving belt flush with the level of the base machine.

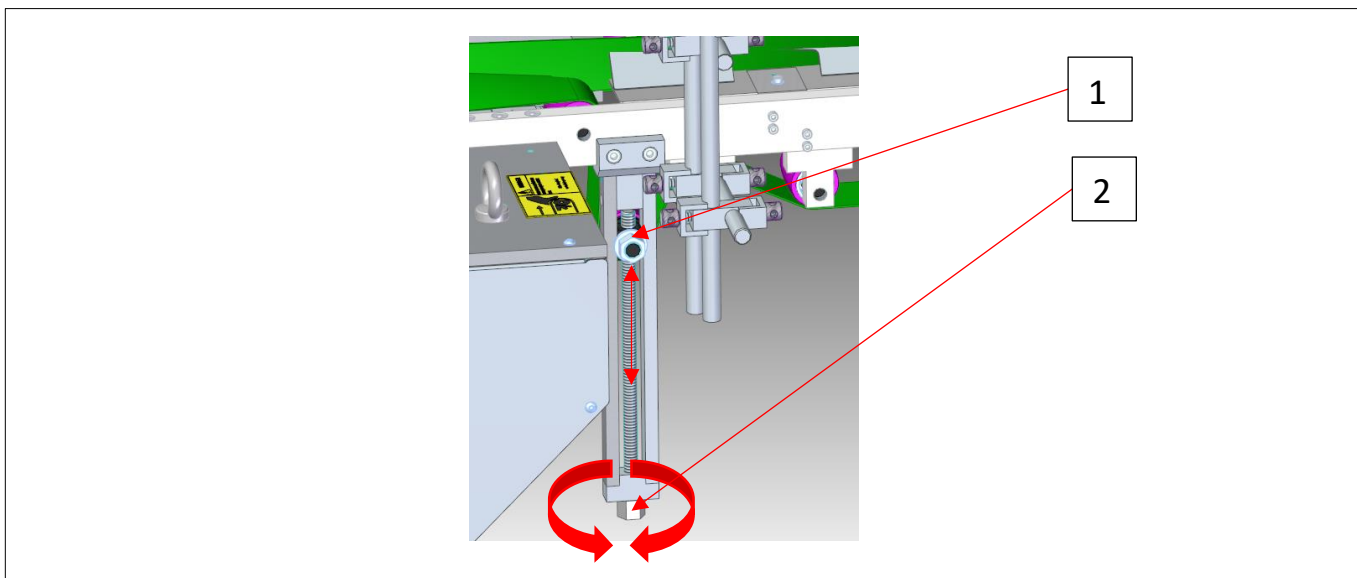
Adjustment is made by turning the screw (Drawing 9; poz.1). We select the height of the first roll until the received cardboard is not damaged.



Drawing 9 Vertical adjustment of the first roller

9.1.2 Section 1 belt tension

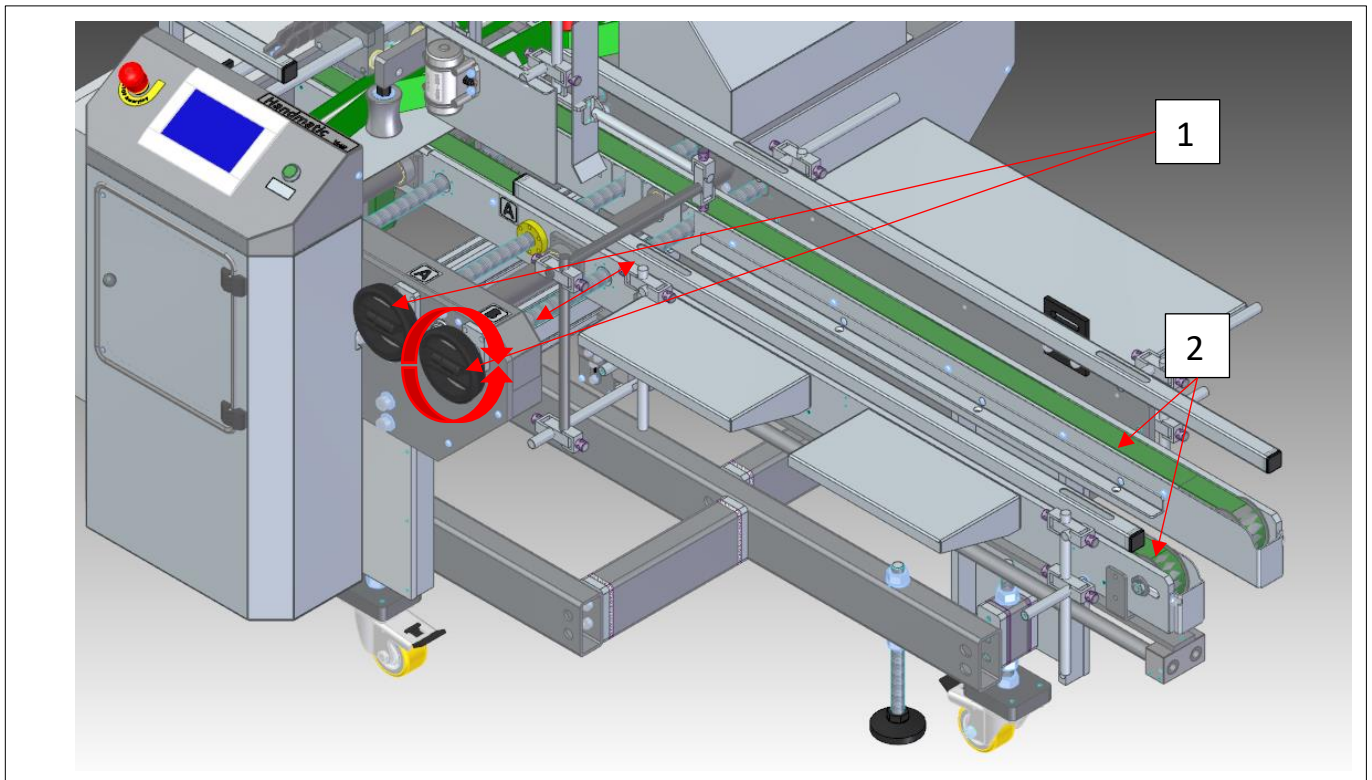
The belt tension in section "1" is done by loosening the locking screw (Drawing 10, poz.1) then tension the belt by turning the adjustment screw (Drawing 10, poz.2).



Drawing 10 Lower belt tension of section 1

9.1.3 Adjusting the beam spacing of the second section

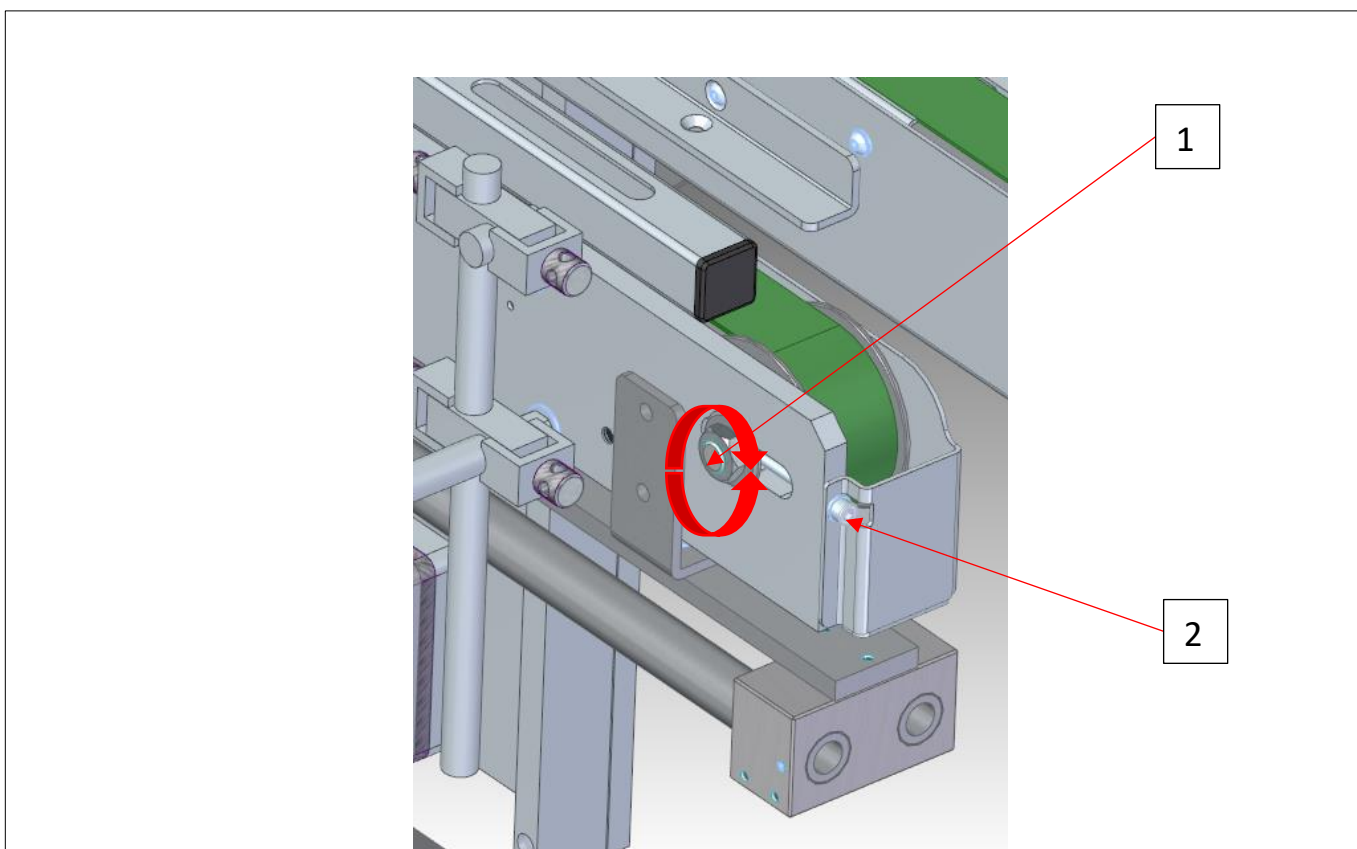
The beam spacing is adjusted by selecting the appropriate width adapted to the packaging in current production. Beam adjustment (Drawing 11, poz.2) is done by turning the adjustable wheels (Drawing 11, poz.1).



Drawing 11 Adjusting the beam spacing of the second section

9.1.4 Adjusting the tension of the beam belt of the second section

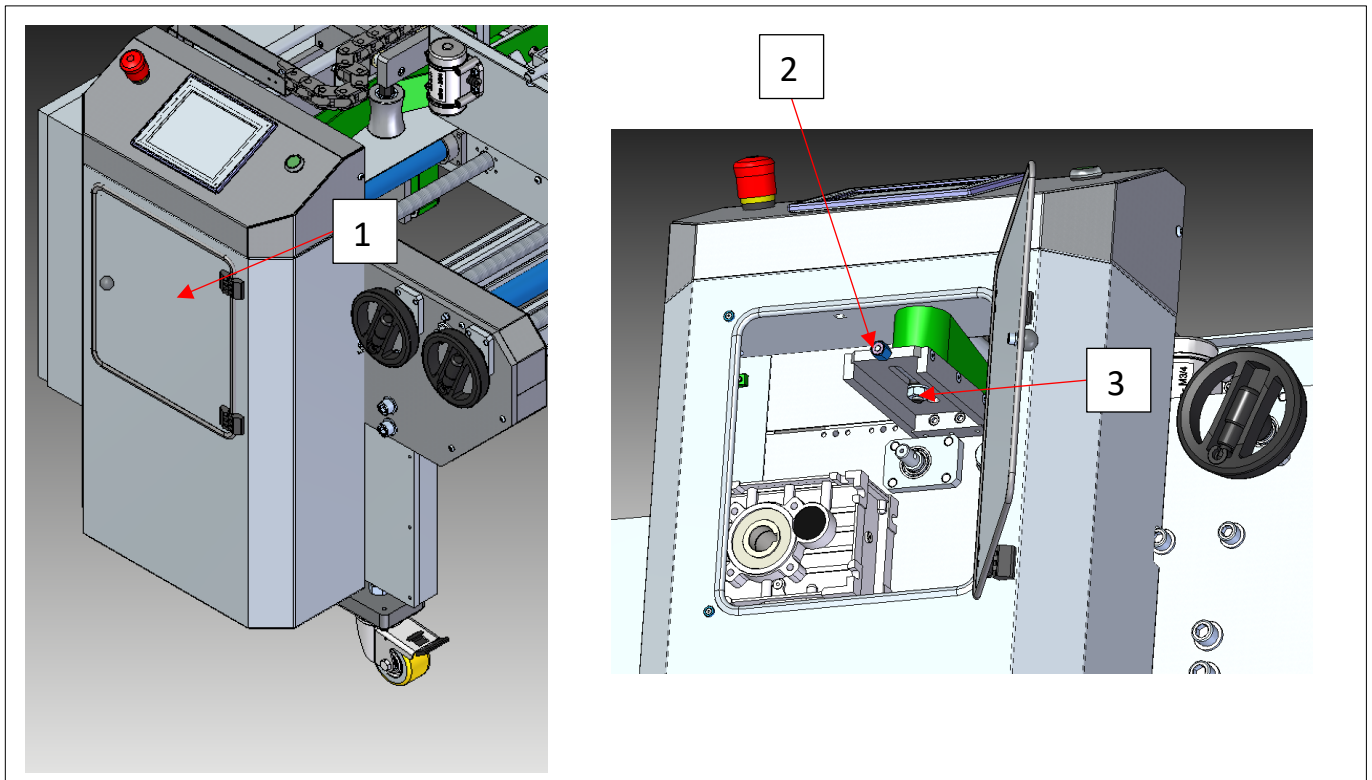
The beam belt of section "2" is tensioned by loosening the locking screw (Drawing 12, poz.1) then tension the belt by turning the adjustment screw (Drawing 12, poz.2).



Drawing 12 Belt tension of section "2" beams

9.1.5 Tension of the upper belt of section "1"

In order to tension the upper belt of section "1", first open the service door located next to the wheels for moving the output beams (Drawing 13, poz.1). The upper belt of section "1" is tensioned by loosening the locking screw (Drawing 13, poz.1) then tension the belt by turning the adjustment screw (Drawing 13, poz.2).



Drawing 13 Adjusting the tension of the upper belt of section "1"

10 Safety recommendations

- The machine control system has been designed to ensure the maximum level of safety while maintaining its functionality. Every person operating the device or staying near it is obliged to exercise particular caution and ensure its good technical condition
- Any repairs or maintenance work must be carried out with the power turned off, the main switch secured with a padlock and with a sign warning about the work being carried out and the prohibition to turn on the device.
- It is also the operator's responsibility to ensure the proper technical condition of the devices, which directly affects the safety of the system. The condition of safety components, sensors, connection cables, etc. must be checked daily.
- When operating the gluer, pay attention to the proper functioning of individual executive components and protective devices. In the event of an emergency, turn off the gluer using the EMERGENCY STOP switch

11 Service activities

- To ensure proper and failure-free operation of the device, maintenance and service activities must be performed periodically.
- • Every day you should visually check the condition of connections, plugs on sensors and valves, motor cables, etc., clean photoelectric sensors and ensure that control cabinets are tightly closed.
- • If any mechanical damage to the cables is noticed, they should be replaced immediately. If any element of the system has been replaced (sensor, cable, button, etc.), the new element must be described in a manner consistent with the electrical diagram.
- • If you notice that the signal lamp is burnt out, replace it!!!
- • Periodically check the condition inside the main control cabinet. Keep the wardrobe tidy, do not store any other items in it, always close it tightly and prevent it from being opened by unauthorized persons. The electrical installation should be kept clean, checked after each repair or painting, and protected against mechanical damage, grease, dust and moisture.
- • Any type of replacement, repair, adjustment or maintenance of electrical and mechanical devices should only be performed by an authorized person.
- • All electrical devices and screw connections of the protective installation are subject to periodic inspection and maintenance every 1-2 months, depending on the degree of use and after each failure.
- W celu zapewnienia prawidłowej i bezpiecznej obsługi będącej gwarancją długotrwałej i niezawodnej pracy maszyny należy zapoznać się i przestrzegać zaleceń zawartych w niniejszej instrukcji.

11.1 Cleaning the machine

Transport and drive belts can be washed with liquids supplied by companies offering adhesives.

The remaining elements of the machine should be cleaned of cardboard dust and dried with compressed air.

	ATTENTION Do not use sharp or hard tools to clean the machine.
---	--

The electronic components of the machine should be cleaned periodically - by ordering this service from the manufacturer.

12 Parts catalog

For safety reasons and based on the risk to the health and life of operators, all spare parts that may be used in the machine should be specified by the machine manufacturer.

Below is a list of equipment offered by Versor Engineering, depending on the product purchased.

12.1 List of transport and drive belts

ELEMENT	No	Name	Type	Dimmension [mm]	Quantity
COLLECTION	1	Top lane	2	1,5 x 58 x 5500	1
	2	Bottom lane	1	1,5 x 58 x 3600	1
TRANSFER SECTION	3	Exit Belt	1	2.1 x 40 x 4620	2
TIMING BELT	4	Pickup belt drive	3	T10 x 25 x 850	1

Type	
1	PT1.5 G3FL combined drive belt
2	PT1.5 G3FL combined drive belt + KN8 U guide wedge
3	Endless timing belt PU T10 STEEL CORDS

13 Related documentation

Annex 1_Declaration of confirmity EC

Annex 2_Machine diagram

Annex 3_ Electrical diagram

Annex 4_ Spare Parts Catalogue