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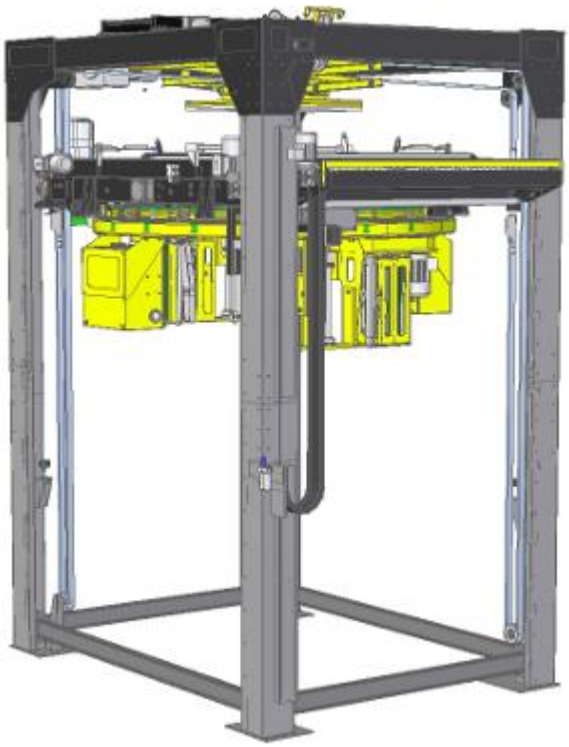


OBS ROTOMATIC

Product Specification

Instructions for Use

1. INTRODUCTION

Wrapping machines **ROTOMATIC** of all versions and variants are fitted with safety equipment both for protection of operators and for protection of the machine in its conventional use. These measures cannot cover all risks; therefore, it is necessary that the operator, before he/she starts using the machine, would study and understand these Instructions, and follow them.

These Instructions are intended for the user and its staff who operate and maintain the wrapping machine **ROTOMATIC** of all variants. The Instructions are written for a machine with complete equipment; in the case some of the accessory equipment is not mounted in your machine ignore its description and control.

If the wrapping machine **ROTOMATIC** is installed and operated in compliance with this accompanying documentation its operation is safe and the goods on pallets are wrapped quickly, economically, and with high quality.

1.1. Convention

The text of the Instructions is written in conventional letters as is this paragraph.

Names of push-buttons and control elements are written in **BOLD CAPITALS**.

1.2. Symbols used

In the text the following symbols are used:

	**Danger** – Failure to observe these Instructions can cause serious injury or death, or serious damage to the machine.
	**Warning** of danger of damaging the machine, or injury to operators or persons present in the vicinity of the machine.
	**Information** facilitating use of the machine.

1.3. Warning

In this documentation, some information is explained on examples. These examples are illustrative only, values of parameters can differ from those of your machine or from the programs used.

The display content of your machine can also visually differ from the display contents in this documentation. The difference is caused both by configuration of

your machine – the Instructions are written for a fully equipped machine – and by development of the graphical environment.

The manufacturer reserves its right to change the display content; however, these changes have neither any influence on properties and parameters of the wrapping machine nor on its control and behaviour that would be at variance with this documentation – Instructions for Use.

These Instructions are written for a wrapping machine with maximum equipment. In the case some of the described accessories are not installed in your machine, ignore their description and control.

These Instructions are original Instructions for use pursuant to the Directive EU no. 2006/42/EC and are authorized by the manufacturer.

2. SPECIFICATION, PURPOSE AND USE OF PRODUCT

OBS ROTOMATIC is a fully automated wrapping machine of reliable structure, the design and safety of which correspond to requirements of users of these machines. Contrary to a classical wrapping machine, where the goods rotate on the turntable, in this type of machine the film carrier moves around the standing goods. This, together with the top platen device, enables better wrapping of unstable goods. The machine **OBS ROTOMATIC** is intended for insertion into transport tracks according to the design.

Wrapping machines **OBS ROTOMATIC** are available in several size series and in several variants according to quality and capacity of wrapping. Control, operation and possible equipment of all series and variants are identical.

Basic series **OBS ROTOMATIC 1700** is intended for wrapping normalized Euro-pallets of dimensions 800 × 1200 mm.

Series **OBS ROTOMATIC 2300** is intended for wrapping pallets and goods of dimensions up to 1200 × 2000 mm.

Series **OBS ROTOMATIC 3000** is intended for wrapping pallet and goods of dimensions up to 1200 × 2400 mm.

Variant **BASIC** is intended into processes of medium capacity of wrapping.

Variant **STANDARD** is intended into processes with higher capacity of wrapping.

Variant **PROFI** is intended for processes with extremely high capacity of wrapping.

All the series and variants meet high requirements for packing and ensure fixation of goods on the pallet with minimum film consumption.

In a complete designation of the machine, the series is completed with the variant (example of complete designation: **OBS ROTOMATIC 2300 STANDARD**). In series **OBS ROTOMATIC 1700**, the size is omitted (example: instead of **OBS ROTOMATIC 1700 PROFI** the machine is designated **OBS ROTOMATIC PROFI**).

OBS ROTOMATIC is controlled from the control panel on the front side of the switchboard box. In the case that the machine is incorporated into a line it is controlled by the control system of the line.

2.1. Operating conditions of machine

The wind-round wrapping machine is intended to work in the environment meeting the following conditions:

Normal environment, AA5+AB5, pursuant to IEC 60364-5-51 under the conditions specified below in this chapter and under the condition of installation and operation according to this accompanying technical documentation.

The machine should be installed according to the plan (see Chapter 4.1) and operated in sheltered process areas protected against atmospheric effects.

The floor must be flat and consolidated, maximum permitted deviation of the floor flatness is ± 5 mm / 2 m.

Range of temperatures for the machine operation is +5ºC to +40ºC, rate of temperature change max. 10°C / 30 min.

Relative humidity 5 % to 85 % without condensing humidity (damping).

The machine can be operated in areas meeting requirements of national regulations for the working environment.

It is prohibited to install the machine in such a way that width of access ways to electric installations would be smaller than minimum values given in national regulations.

No obstacles may be in the vicinity of the machine that could cause injury to the operator (stairs, ramps, drop ceilings, other machines, etc.).

The product must not be used in an explosive environment or where an explosive environment can be formed, even for a short time.

The machine and, in particular, its electric installations must be operated in compliance with the manufacturer‘s instructions given in this accompanying technical documentation.

2.2. Machine variants

Provided the machine is installed and operated according to the plan elaborated in compliance with Chapter 4.1, the machine variant corresponds to particular technical regulations and standards, and meets requirements of pertaining safety and fire regulations.

Assumed service life of the machine is 10 years or 50,000 operating hours – what happens earlier – provided that it is used in compliance with this accompanying technical documentation and that prescribed maintenance and periodic checks of the machine are performed.

Equivalent level of acoustic pressure weighed by function A over the time of the wrapping cycle at the operator’s standpoint is 70.1 dB; the machine itself meets hygienic limits.

Electric outfit of the machine is made according to standard EN 60204-1.

The machine is made free of interference and this anti-jamming meets Group 1, Class B according to standard EN 55011.

Concerning resistance against interference, the machine meets requirements of the following standards:

IEC 1000-4-2, EN 61000-4-2
IEC 1000-4-3, EN 61000-4-3
IEC 1000-4-4, EN 61000-4-4
IEC 1000-4-6, EN 61000-4-6

2.3. Technical parameters

		OBS ROTOMATIC		
				PROFI+ 1700 Double
Pallet dimensions	max.	1250 × 1250 mm		
	min.	600 × 600 mm		
	max. height	according to particular order		
Weight of machine (according to equipment)		from 1700 kg		
Overall dimensions	width	2660 mm (transport 2400mm)		
	length (with top sheet)	3270 mm (3350 mm)		
	height	according to particular order		
Ring	diameter	2400 mm		
	drive			5.5 kW 3×400/230V 50Hz
	max. speed			60 r.p.m. (regulated)
Top platen	variant	shear		
	down-pressure force	about 100 kp		
Drive of frame (of lift of ring with prestretch device)				7 kW 3×400/230V 50Hz
Drive of prestretch device				2 x 2.5 kW 3×400/230V 50Hz
Air working pressure		0.5 MPa		
Wrapping film	Roll diameter	max. 250 mm		
	width	500 mm		
	weight	about 17 kg		
Control system		according to particular order		
Electric installation	operating voltage	3 × 400 V 50Hz		
	machine power input			
	protection of supply line			125 A
	control circuit voltage			24 V

2.4. Rating plate

The rating plate is attached at the lower part of the column and contains the following data:

- Name and address of manufacturer
- Type designation of product
- Machine serial number
- Year of production
- Number of wiring diagram
- Machine weight (kg)
- Supply voltage (V)
- Supply voltage frequency (Hz)
- Protection (A)
- Power input of machine (kVA)
- Control circuit voltage (V)

The data of the rating plate have priority over the data of the table of technical parameters or other data in this accompanying documentation.

2.5. Expendable property

2.5.1. Stretch film

The machine is intended for wrapping goods on pallets into the stretch film of linear low-density polyethylene (LLDPE), thickness 20 to 40 µm. The film should have minimum ductility 150 %. It should be in the form of rolls of width 500 ± 10 mm and diameter max. 250 mm. The tube on which the film is wound should have inner diameter 76 ± 3 mm and length 510 ± 5 mm.

The film used can be either non-adhesive or one-side adhesive. Adhesiveness of one side means that individual layers of the film wound on the goods stick very well together; however, they do not tend to damage the goods on the pallet. Main purpose of using this film is better fixation of the goods on the pallet, higher strength of the packing, and its better resistance against climatic effects and mechanical stress during transport. After wrapping the pallet with the goods, the wound film must be oriented with its adhesive side to the goods so that, during manipulation with wrapped pallets and their transport, the pallets would not tend to stick to each other.

As a standard, the film is resistant against UV radiation for 6 months, i.e. the wrapped goods can, for this period, be stored outside and exposed to sun radiation while all original properties of the packing being maintained. In case of requirement for longer period of storing in the external environment, some films can be delivered in variants with increased resistance against UV radiation.

The following stretch films meet the above given requirements:

Variant	Ductility	Use	Possible variants
POWERFLEX PQ	200 %	Wrapping of medium heavy or light goods, or brittle or deformable goods.	Various thicknesses; Non-adhesive and one-side adhesive. With increased resistance against UV radiation.
POWERFLEX HPQ	250 %	As POWERFLEX PQ	As POWERFLEX PQ
POWERFLEX SPQ	300 %	As POWERFLEX PQ	As POWERFLEX PQ

For putting the wrapping machine into operation, it is recommended to contact the dealer or the manufacturer who, based on their experience, will recommend optimum stretch film for wrapping your goods.

	Other wrapping material than stated here (for instance, perforated, netting, layered, printed, bubble films, film made of different material than PE, etc.) is not recommended for using without prior consultation with the manufacturer and without its consent – correct function of the wrapping machine cannot be ensured. If, during the guarantee period, the machine is wrapping in poor quality or if damage to the machine or the wrapped goods occurs, using of a film or wrapping maters not approved by the manufacturer can be a reason for rejecting a complaint.

2.5.2. Top sheet / overlapping film

The top sheet device (in the case the machine is equipped with it) should be operated with a smooth non-stretch film of polyethylene (PE), thickness 50 to 80 µm supplied in rolls. Particular width of the film is given by dimensions of the wrapped goods on the pallet and by the method of wrapping. The top sheet film that can be inserted into the machine can be in a roll of width max.:

1600 mm for machine OBS ROTOMATIC 1700;
2200 mm for machine OBS ROTOMATIC 2300;
2700 mm for machine OBS ROTOMATIC 3000.

The roll must meet the following requirements:

Diameter of the top sheet film roll is max. 250 mm. The tube must be of outer diameter min. 100 mm.

New reel with the film must not be visibly deformed, i.e. flattened to an oval, saggy, etc.; otherwise, the roll in the top sheet mechanism will roll off irregularly and the top sheet can be of poor quality, or the top sheet cycle can fail.

During rolling off, the wound film layers should get easily detached. This property can be checked during inserting new roll with the film: in rolling off the film from the roll using the push-button (see Chapter 6.6), the film should roll off from the roll automatically and smoothly; it must not tend to be pulled between the film roll and rollers of the top sheet device.

Concerning design of the machine, no requirements are defined either on ductility or other properties of the top sheet film than specified in this chapter. No atypical film (for instance, netting, perforated, layered, bubble, made of different material than PE, etc.) may be used without consent of the manufacturer.

2.5.3. Ecology

The film can be included into the classified waste as plastic (polyethylene PE). The material can be easily recycled. It burns well producing water and CO_2, and under proper combustion conditions, no harmful products are generated. It cannot be biologically degraded and its degradation in a landfill is very slow. No dangerous products are known that would escape into the air or contaminate water or soil.

2.6. Guarantee

General guarantee conditions are defined in the Guarantee Letter that is an integral part of the documentation provided with the machine. The Guarantee Letter must be properly and completely filled out and certified by the manufacturer.

The guarantee is conditioned by regular inspection and maintenance of the machine, by observing the Instructions for use, and by using original spare parts only.

The guarantee does not relate to the defects:

- caused by incorrect manipulation;
- by not observing the Instructions for using the product;
- if an intervention has been made to the product by an unauthorized person (organization)` and
- in case of the product overloading.

Likewise, the guarantee does not relate:

- to parts undergoing usual wear as specified in Chapter 8.2,
- to damages to the machine or goods, caused by using consumable material different from that approved by the manufacturer (see Chapter 2.5).

3. LABOUR SAFETY

To provide for reliability of machines of the firm PRAGOMETAL, it is necessary that **OBS ROTOMATIC** be only used for purposes for which it is intended, and according to the safety instructions. It is also necessary to carefully read these Instructions for use so that **OBS ROTOMATIC** would be properly installed, controlled, and maintained. Meeting the principles of maintenance ensures faultless operation of the machine for many years.

The machine user is responsible for carrying out safety inspections and regular maintenance according to these Instructions for use.

The user is also responsible for ensuring that any defect will be repaired and that **OBS ROTOMATIC** will be kept in such conditions that would exclude injury to the machine operator.

The machine user is responsible for observing national and local regulations, laws and standards in using the machine **OBS ROTOMATIC**.

3.1. Safety recommendations

Given that any non-professional intervention to the electric installation of the machine could cause serious damage to the machine or injury to the operator, any intervention can only be carried out by a person professionally capable to work on electrical installations according to national regulations.

The machine is subject to regular revisions and tests of the electric installation. In these works, it is necessary to meet requirements for revisions of electric devices EN 60204-1.

Before putting the machine into operation, revision of the electric installation must be carried out.

3.2. Protective devices for ensuring labour safety

Risky places that could cause jeopardizing of health of operators during operation are protected by a protective fence connected with the control system of the machine and line. Provided the specified operating procedure of winding-round and instructions in this documentation are observed, the work with the wind-round machine is safe.

Items used for ensuring protection of the operators:

1) Push-button **EMERGENCY STOP** to quickly switch off the machine. The push-button in its depressed position is mechanically blocked; it is located on the control panel within the operator‘s beat.

2) **Main switch** can be locked in order to prevent unauthorized using of the machine.

3) The complete machine is surrounded by a **protective fence**. Access to and exit from the machine, where wrapped pallets are wound round on the roller track, is protected by optical barriers. The access door in the protective fence

into the machine space is secured so that it can only be opened when the machine is in the standstill. The machine cannot be started when the door is open. The working area of the machine within the protective fence is well arranged. Activation of the protective barriers is indicated by a light beacon.

4) The machine is controlled from the control panel on the front side of the switchboard. The panel is installed out of the protective fence of the machine.

5) Push-button **CONTROL VOLTAGE**. In case of a fallout of power supply or when push-button **EMERGENCY STOP** is depressed power supply to the control system will be switched off and the machine will perform no operation, even if the power supply is restored or if push-button **EMERGENCY STOP** is prematurely unblocked either accidentally or by an error of the operator or the maintenance staff. Further operation of the machine is only possible after depressing push-button **CONTROL VOLTAGE**.

3.3. User‘s obligations

Weight of the wrapping film roll is about 17 kg. Manipulation with weights over 15 kg is prohibited to all women and young persons.

The working environment where the machine is used is given by character of the produced and wrapped goods. The user shall provide for labour safety and health protection of the staff in compliance with national regulations for health protection.

In the case the wrapped product is of such character that, during manipulation with it, injury to hands or other parts of the operator’s body can happen, or in the case the wrapped goods or workplace do not meet hygienic limits or requirements for the working environment (chemical and biological substances, dustiness, noise, etc.), the user shall provide the operators with corresponding means of personal protection.

Measures for protection against noise are influenced by situation at the workplace and they are subject to national regulations for health protection.

3.4. Obligations of machine operator

The operator of the machine is, in principle, one person. In addition to the operator, no other person can stay in the vicinity of the machine during the operating cycle.

The wind-round wrapping machine can only be operated by a physically and mentally capable worker older than 18 who was appointed with this post and who was, in a demonstrable manner, made familiar with these Instructions and these safety rules.

The operator shall operate and maintain the machine in compliance with these Instructions. Proper use of the machine and correct setting of parameters and programs will prevent material damages or injuries.

The operators or maintenance staff must not intervene in any way into the structure and electric elements of the machine and into the software of the machine control system.

Before switching on the machine, it is necessary to make sure that no person is present in the working area of the machine (within the protective fence).

Before starting the work, the operator shall check overall condition of the machine and correct function of individual parts of the machine, in particular, integrity of electric cables. If the operator discovers a defect or damage that could endanger labour safety or operation of the machine and that he/she is not capable to repair, the machine must not be put into operation.

Weight of the wrapping film roll is about 17 kg, weight of the top sheet film (in the case the top sheet of goods is used) is about 50 to 80 kg. Manipulation with weights over 15 kg is prohibited to all women and young persons.

For reducing physical effort in manipulation with the wrapped pallets, the operator shall use mechanization lifting means provided by the user for this purpose.

In the case the wrapped product is of such character that, during manual handling, injury to hands or other parts of the operator's body can happen, or in the case the wrapped goods or workplace do not meet hygienic limits (chemical and biological substances, dustiness, noise, etc.), the user shall provide the operators with appropriate means of personal protection.

Taking down, dismantling or lifting off of covers is only possible after complete stopping of the machine and ensuring the switched off state.

Safety marks, symbols and notices on the machine and on the protective fence must be maintained in a legible state. In case of their damage or illegibility, the user must restore their state in compliance with the original.

The operator can only enter the machine area (within the protective fence) through the door equipped with a safety device preventing access to the machine area while it is running.

When the operator is moving within the protective fence of the machine (for instance, during replacing the film) measures must be taken that the fence door remain open.

When maintenance, adjustment or another work is carried out within the protective fence beyond a short-time stay, a marked warning shall be placed on the switchboard and proper measures shall be taken to prevent jeopardizing persons within the machine working area.

It is prohibited:

1) **To use the machine for different purposes or in different way than stated in these Instructions for use.**
2) **To put the machine into operation and use it in the case the protective devices (covers) are dismantled or damaged.**
3) **To enter the area of the machine on the line tracks or along them.**
4) **To touch moving parts of the machine.**
5) **To run the machine in the case the working area of the machine and the workplace is insufficiently illuminated.**
6) **To carry out maintenance, cleaning, and repairs while the machine is running and/or if the machine is not secured against accidental starting.**
7) **To put the safety, protective, and securing devices out of action.**
8) **To enter the area of machines with shear top platen device in the case the top platen device and the frame are not in their bottom position**

3.5. Fire protection

In order to provide for fire safety in using the wrapping machine, the user shall equip the workplace of the wrapping machine with appropriate fire-fighting means. Their purpose and location must be discussed with and approved by experts in fire protection and supervision, particularly in relation to character of the processed materials.

Location of fire extinguishers and their choice shall be specified by the fire technician of the user according to local conditions.

3.5.1. Instructions for machine operators:

In case of a fire accident of the machine, the operator shall at first switch off the electric power supply by turning off the main switch.

Subsequent extinguishing of the fire can only be carried out using corresponding extinguishers.

No water or foam extinguisher may be used in fire-fighting!

4. ASSEMBLY AND PUTTING THE MACHINE INTO OPERATION

4.1. Plan

Before assembling the machine, a plan has to be elaborated that would solve:

- Meeting of requirements for working environment of the machine (see Chapter 2.1);
- Labour safety of operators and safety of other persons present in the vicinity of the workplace. It is necessary to prevent entering the working area of the machine during the wrapping process and/or starting the machine in the case there is a person in the working area. This is provided for by the protective fence and other protective measures as required (light barriers, electronic door locks, etc.). Another solution of adequate functionality can also be used. Level of properties PL = d, category, 4 is required for safety parts of the control system of the line and machine **OBS ROTOMATIC** according to standard EN 13849-1. Information on the fence and on the light barriers is provided in Chapters 5.9 and 5.10. The table below shows values of the time of emergency stop of the machine for calculating safe distances according to EN 13855:

Variant	1700	2300	3000
Profi + Double	1.4 s		

- Location and orientation of the machine within the wrapping line concerning functionality of the machine and line, and according to needs of the wrapped goods;
- Additional protective measures in the case unsafe goods (chemical and biological substances, source of dust, aerosols or vapours, explosive or flammable substances, pressure vessels, etc.) are to be wrapped on the machine, including regulation of their use and inspection. It should be reminded that the machine must not be operated in an explosive environment or where an explosive environment can be formed, although for a short while only;
- Location of the switchboard and the operator‘s stand;
- Access to the operators‘ stand and to places necessary for service and maintenance works;
- Mechanical, electric, and software cooperation with other machines in the line;
- Supply of electric energy and compressed air, and cabling layout so that these supply lines and conductors could not be damaged, and that injury to the operator or other persons present in the vicinity of the workplace could be prevented;
- Installation of the main shut-off valve of compressed air upstream of the machine (unless it is already a part of distribution of the compressed air of the user). The shut-off valve must be well accessible by the operator for the whole operation time of the machine and must be lockable in the closed position.

- As necessary, installation of additional push-buttons Emergency stop so that they would be easily accessible both for the operator and for other persons that can be present near the workplace.

The plan can be developed by a firm or a person familiarized with principles of safety of labour and machines laid down in valid international and national standards and legal regulations. Safety of the entire workplace should be analysed by the plan author who is responsible for the solution and, if necessary, also compiles directives of labour safety. As a standard, the plan is elaborated by the manufacturer or dealer of the machine. The wrapping machines **OBS ROTOMATIC** correspond to standards and laws valid in the European Union provided that a plan has been developed that meets the requirements given in this chapter and that applies to particular workplace, and provided that the machine has been installed and is operated according to this plan.

This documentation has been written for the machine with standard securing as recommended by the manufacturer:

- the firm protective fence physically prevents access to the machine;
- the electromagnetic safety lock of the protective fence only allows access to the machine if the machine is in the standstill; it does not permit starting the machine in the case a person is present within its working area;
- The light barrier on conveyors at the access to the working area of the machine and at the exit from it prevents access to the dangerous area at the conveyors.

In the case different means have been used for ensuring safety of the staff and other person present in the vicinity of the machine, the dealer shall repair and complete this documentation.

5. TECHNICAL DESCRIPTION, OUTFIT

5.1. Basic outfit

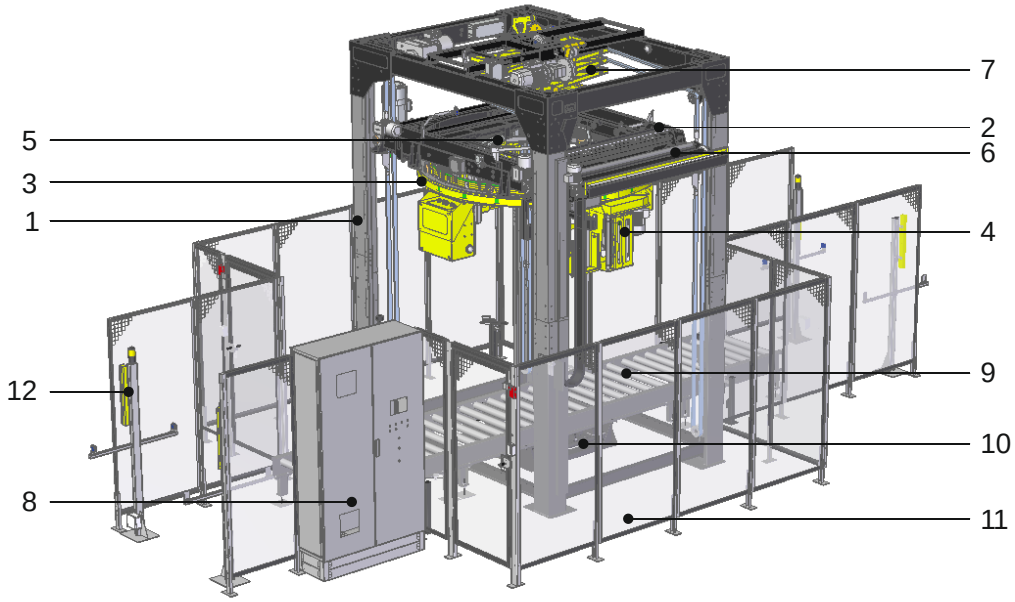
The machine is formed of the load-bearing structure in which the horizontal frame with the rotating ring is vertically moving. The ring is fitted with the film prestretch device and the film reel carrier. In the upper part of the square frame, there is a bracket of the mechanism of the film ending after the pallet has been wrapped, and possibly also the mechanism of the top sheet of the pallet. The machine can be equipped with the mechanism of holder of unstable goods that is independently moving above the horizontal frame with the ring. The machine is controlled from the control panel on the front side of the switchboard installed out of the protective fence of the machine.

The load-bearing structure of the machine is formed of an upper frame, four vertical columns, and bottom crossbeams. The whole structure can be dismounted. On the structure, there is a drive of the square frame enabling its vertical movement in both directions. The drive consists of an electric motor with mechanical gearbox. Torsional moment is transferred by a chain.

The horizontal frame is welded from sheet-metal profiles. This frame is fitted with a load-bearing ring and a collector of electric current for its transfer to the moving ring. The ring is made of machined enclosed profile and it is moving on pulley on the load-bearing circle. Drive of the rotating ring is provided by the electric motor with gearbox mounted on the horizontal frame. Torsional moment is transferred by a flat belt.

The prestretch device is formed of a set of rollers. Due to differences in the rollers speed, realized either by the belt transmission or by an independent drive of each main roller, required stretching of the film is generated in the machine assembly; in this way, saving of the film during wrapping and quality of packing are ensured. The device is driven by the electric motor via transmission with a toothed belt.

The mechanism of the film ending is designed as a set of levers that, during ending of the wrapping cycle, weld two final layers of the film, catch and detach the film. The levers are driven by pneumatic cylinders.



1) Load-bearing structure
2) Lift frame
3) Ring
4) Prestretch device
5) Mechanism of film ending
6) Top sheet device (optional equipment)
7) Top platen device (optional equipment)
8) Switchboard of machine with control panel
9) Conveyor (optional equipment)
10) Pallet lift (optional equipment)
11) Protective fence (around whole machine)
12) Light barriers (complete function of the protective fence)

5.2. Accessories

Some components of the equipment are not a standard part of the machine; they are delivered and assembled to order or depending on the plan.

The top sheet device makes it possible to overlap the pallet top with the protective film during the wrapping cycle. The device is composed of the film container, fixed and movable jaws. The movable jaws catch the end of the top sheet film and pull it over the top surface of the pallet so that the film rims would overlap sufficiently the pallet edge on all sides. The movable jaws are driven by the electric motor with mechanical gearbox. The fixed jaws hold the free end of the film from the container in a position necessary for easy catching by movable tongs.

The top platen device serves for fixing light or unstable goods during wrapping; the shear top platen is used as a standard.

Air holder of the top sheet film will hold rims of the laid top sheet film until they are attached to the pallet with the wind-round film. It is mounted on the top platen

device or the horizontal frame of the machine according to combination of the machine outfit.

Conveyors – without the conveyor, the wrapping machine OBS ROTOMATIC is not functional; however, depending on the plan, conveyors already installed and used at the workplace can be used. Their electric link to the control system should be ensured.

The pallet lift serves for lifting the pallet with goods during wrapping so that the goods, including the pallet, would be wrapped. The goods, particularly light or high-stacked, are thus more stable.

Protective fence – It is completed with other safety elements preventing access of persons to the working area of the machine during its operation and/or starting the machine in the case there is a person in the working area. An electronic lock on the door and the light barriers at the entry to and exit from the working area of the machine are usually used. The protective fence must be assembled according to the design; the machine may only be operated with this fence or with another functionally adequate means of personal safety. See Chapters 5.9. 5.10 for detailed information on the protective fence.

5.3. Prestretch device

The prestretch device is a standard part of the machine. It serves for regulating the film winding on the goods.

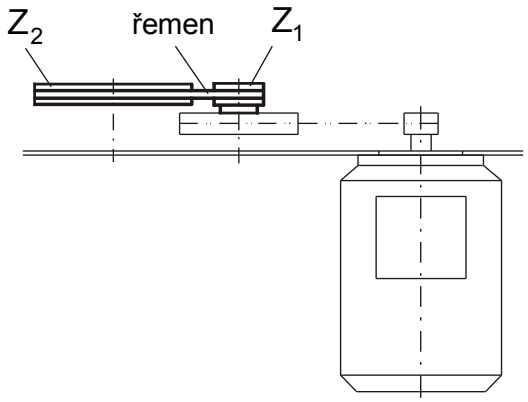
The film passes over two main rollers of the prestretch device. The difference in their speed of rotation determines primary prestretch; its main effect is saving of the film. Secondary prestretch is produced between the prestretch device and the pallet by direct pull of the pallet against braked rollers of the prestretch device; it determines tightness of wrapping (the film tightened around the wrapped goods).

5.3.1. Single-motor prestretch device

The difference in speed of the main rollers for primary prestretch is produced by transmission with the toothed belt. Primary prestretch can only be regulated by replacing the belt. Secondary prestretch is produced by pulling the film from the pallet; it is regulated by the motor braking the main roller. Secondary prestretch is set in parameters of the wrapping program. The machine can be equipped with two single-motor prestretch devices (variant DOUBLE – see Chapter 5.3.3).

Prestretch can be changed according to the type of the stretch film and character of the wrapped goods. To change required prestretch, it is necessary to replace the toothed belt and wheels for the toothed belt according to the table:

Prestretch	Z_1 / Z_2 Types of wheel	Belt FLENNOR	Length mm
80 %	30 / 36 RTA-3.0-01-21 RTA-3.0-01-22	HTD 405-5M-15	405
120 %	30 / 44 RTA-3.0-01-21 RTA-3.0-01-23	HTD 425-5M-15	425
160 %	30 / 53 RTA-3.0-01-21 RTA-3.0-01-24	HTD 450-5M-15	450
210 %	30 / 62 RTA-3.0-01-21 RTA-3.0-01-25	HTD 475-5M-15	475
250 %	30 / 69 RTA-3.0-01-21 RTA-3.0-01-34	HTD 500-5M-15	500
290 %	30 / 79 RTA-3.0-01-21 RTA-3.0-01-27	HTD-525-5M-15	525



The single-motor prestretch device is economical. It is used in processes with lower to high wrapping capacity for high-quality wrapping, above all, where requirements for changing the parameters of wrapping are only seldom changed.

5.3.2. Two-motors prestretch device

Principle of the two-motors prestretch device is prestretch of the film between two main rollers each of them having its own regulated drive. Parameters of the wrapping program enable setting of both the ratio of speed between the main rollers (primary prestretch) and the output force in the film (tightness of winding, i.e. secondary prestretch). The range of the primary film prestretch is from 50 % to 500 %, according to type of the prestretch film. In case of secondary prestretch, the range is 70 % to 400 % where the value 100 % means that the film leaves the device with such force that, after winding on the goods, neither prolonging nor shortening takes place. The two-motors prestretch device is intended for high-quality and demanding wrapping in processes with medium to higher wrapping capacity, and with requirements for saving the film and for frequent changes in the wrapping parameters.

5.3.3. Variant DOUBLE

In the wrapping machine of the variant DOUBLE two single-motor prestretch devices, always of identical version, are mounted against each other (Chapter 5.3.1). This variant is used where there are either high requirements for protection of goods by the film (more film layers are wound) or where the shortest possible time of wrapping the pallet is important.

5.3.4. Mechanism of cording

An optional outfit of the single-motor prestretch device; it is not a standard part of the machine.

This device allows the film to be partially brought together into a cord during wrapping. Cording upwards is partial (usually several cm) and makes it possible to more precisely define position of the lower rim of the film in the case when whole pallet must not be wrapped (for instance, for pallets intended for being put into storerooms using automatic stacking machines where it is necessary to maintain look-through between chocks of the pallet for optical sensors) and, at the same time, it is necessary to ensure better attachment of the film to the pallet.

The mechanism of cording requires using the lifting device (Chapter 5.8).

5.4. Mechanism of ending

The mechanism of ending is a standard part of the machine. It is installed on the ending bracket that provides for moving the whole mechanism in the direction to and from the goods on the pallet. The ending bracket is mounted on the frame which moves together with the ring and the prestretch device in vertical direction. The ending mechanism is driven by compressed air. It includes a bracket securing movement of the whole mechanism to and from the goods, and three levers. In the variant DOUBLE, the machine is equipped with two ending devices.

Operation of the machine during ending is influenced by several service parameters of the machine. See Chapter 6.9.1 for detailed description.

5.4.1. Air holder of wrapping film

This device is installed at the ending levers. In the beginning of wrapping, after the ending levers have been opened, the air flow holds the free end of the film at the pallet side until the film is packed to the pallet. One reason for using the air holder of ending is aesthetic; moreover, it can, under certain circumstances, happen that the free end of the film is not wrapped down and later it can catch on passing-by objects during transport.

5.5. Top sheet device

The top sheet device is optional (it is delivered to order); it serves for overlapping the pallet top with the film. Rims of the top sheet film are fastened to the pallet by the stretch film. If the goods are first overlapped and later wrapped into the stretch film the wrapping will be dust-tight. If the goods are first wrapped, then overlapped, and, subsequently, the pallet top is wrapped once again, i.e. the top

sheet film will be attached between two layers of the stretch film, the goods will be water-tight protected.

The top sheet device is controlled automatically without intervention of the operator. Activation of the top sheet is selected by particular parameter of the machine system (see Chapter 6.9.1).

5.6. Top platen

The top platen of all variants serves for fixing light or unstable goods. It is not a standard part of the machine, it is delivered to order.

The shear mechanism lifts the top platen plate above the goods on the pallet and, in the case the top sheet device is used, it enables the top sheet film to be laid. Top platen force is about 100 kp.

5.7. Air holder of top sheet film

As a part of the machine available to order, the air holder device holds rims of the laid top sheet film until the stretch film is attached to the wrapped goods. This ensures the top sheet film to be attached to the goods on the whole surface and perfect wrapping down of its rims to the goods along the whole circumference. According to the machine configuration, the air holder device is mounted on the horizontal frame of the machine or on the top platen plate.

Incorporation of the top platen and the air holder devices into the program is selected by particular parameters of the wrapping cycle (see Chapter 6.9.1).

5.8. Lifting device

The lifting device is an optional apparatus (available to order); it is installed under the conveyor in the axis of the wrapping machine. Before beginning of the wrapping process, its lifts the wrapped pallet by 10 to 15 cm and provides for wrapping the goods including the pallet (so called under-wrapping); in this way, the goods are fixed to the pallet. It is used, above all, for light or unstable goods; it should be used in the case that the prestretch device with the film cording mechanism is mounted on the machine (Chapter 5.3.4). The lifting device is controlled automatically by the control system of the machine without intervention of the operator. Incorporation of function of the lifting device into the program is selected by particular system parameter of the machine (see Chapter 6.9.1).

5.9. Protective fence

The protective fence provides for safety of the operator. It prevents starting the machine in the case there is a person in the area within the fencing and/or does not permit entering behind the fence during the machine operation. Function of the electromagnetic lock and its manual operation is checked by the control system of the machine. Control elements of the protective fence (push-buttons of the electromagnetic lock) are installed off the main panel of the switchboard, next to the door of the protective fence.

The protective fence is completed with the optical barriers, see Chapter 5.10.

5.10. Optical barriers

The optical barriers complete the protective fence; they check the roller track at the entry to and exit from the working area of the machine. In the case a person attempts to access the working area of the machine on the conveyor track it stops the machine immediately.

Safety elements PL = d, category 4, according to EN 13849-1 are used. Operation of the optical barriers is automatic and independent of the operator. State of the optical barriers is indicated by a text on the display and by the light beacon.

For the time necessary for passing of the pallet into the working area of the machine, the protective function of the light barriers is dampened (muting function). During this time the light barriers do not fulfil their safety function and a non-permitted passage on the conveyor track is possible. The passage on the track must be physically blocked both by the light barriers, by the machine fence extended to the light barriers, and, finally, by the light barriers installed close to the conveyors so that the passage between the goods on the pallet and the light barriers would be ruled out.

Function of the light barriers is indicated by the light beacon.

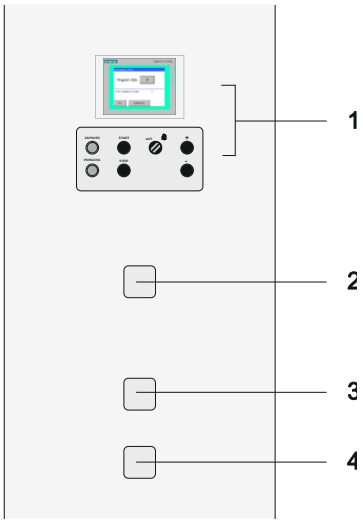
Line state	Beacon state
Normal state (the machine is switched on and the light barriers fulfil their safety function)	Lit off
Dampened state (muting – the pallet with the goods is just passing through the light barrier)	Lit on
Emergency state (attempt to pass on the track, collision or fall of the goods in the light barrier)	Blinking

For serious reasons, the protective function of the light barriers can be manually dampened. For detailed information see Chapter 8.19.

5.11. Control elements of machine

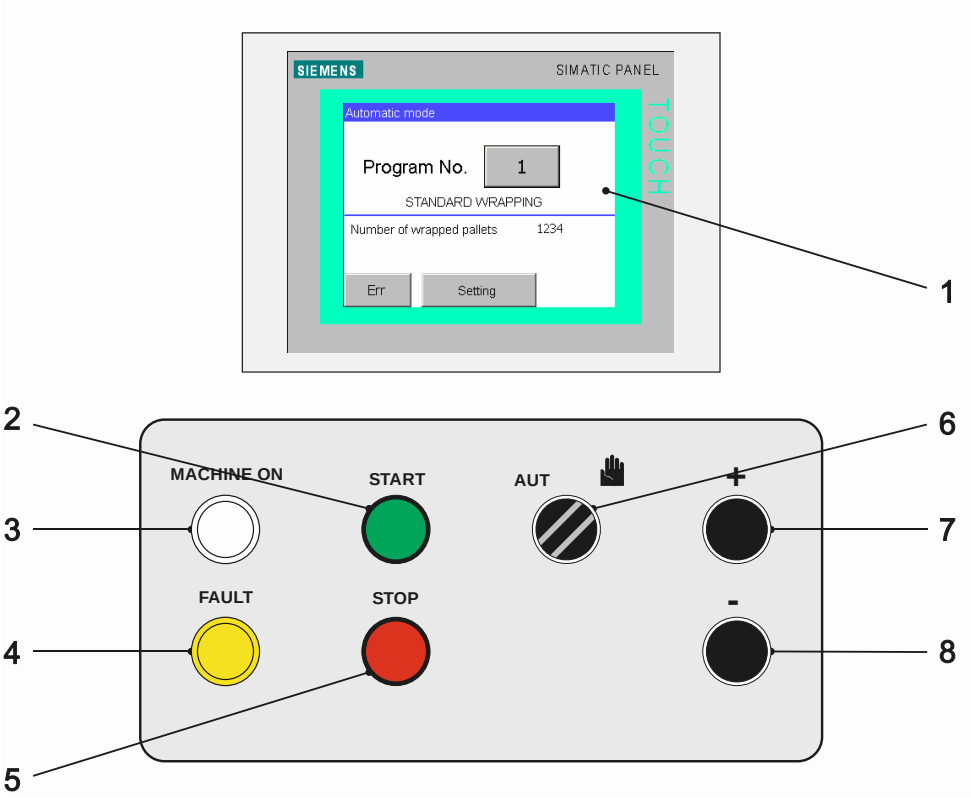
5.11.1.Switchboard panel

The panel contains all controllers necessary for operating the machine, with the exception of controlling the door of the protective fence.



1) Operator‘s panel
2) Push-button **EMERGENCY STOP** (emergency machine stop)
3) Push-button **CONTROL VOLTAGE**
4) **MAIN SWITCH**

5.11.2.Operator‘s panel



1) Operator‘s panel TP177B
2) Push-button **START** of cycle
3) Pilot light of machine under voltage **MACHINE ON**
4) Pilot light **FAILURE**
5) Push-button **STOP** of cycle
6) Change-over switch **AUTOMATIC MODE - MANUAL MODE**
7) Push-button **+** control of manual functions of machine - one direction
8) Push-button **–** control of manual functions of machine - second direction

The wrapping machine **OBS ROTOMATIC** is equipped with the control system Simatic; communication of the operator with the program automaton is realized through the touch panel of the operator TP177B. It enables the operator to edit parameters of programs, service parameters, to select the type of manual function; it also serves for depicting failures that have occurred.

Depicting on the panel is realized by the graphical touch LED display. The push-buttons depicted on the display serve for entering data, "moving" between displays, and operating the panel. Their layout and purpose are thus maximally adapted to usefulness and comfort of the operation.

Robust mechanical push-buttons "+" and "–" on the switchboard are used for direct control of manual functions.

5.12. Safety devices

The machine is equipped with several safety elements for protecting health of the staff operating the machine and/or for minimizing damages caused by emergency events.

5.12.1.Push-button Emergency stop

The push-button **EMERGENCY STOP** is installed close to the control panel and serves for immediate stopping of the machine in an emergency case (machine defect, fall of goods from the pallet, collision, injury). After being depressed, the push-button is automatically arrested in the depressed position. Before restarting the machine, the push-button should be unblocked. The depressed push-button **EMERGENCY STOP** is indicated by a pilot light on the panel. In putting the machine back into operation, proceed as follows:

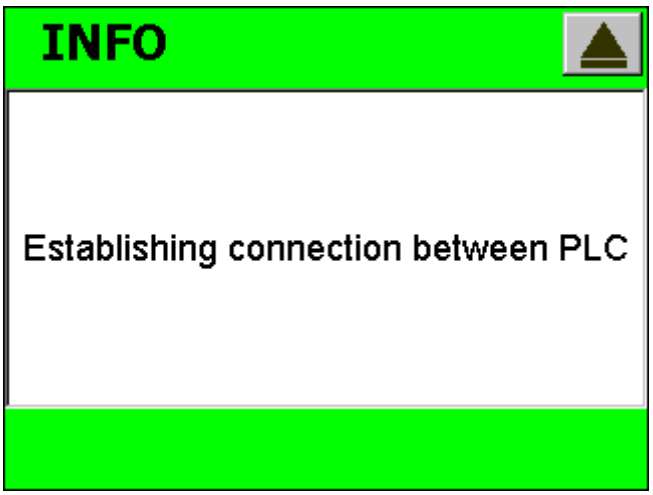
- Remove the cause of the emergency stop;
- Check condition of the machine (depending on particular configuration):
- The film holder and rollers of the prestretch mechanism should be in operating (closed) position;
- The film should be correctly inserted in the prestretch device;
- Unblock the push-button **EMERGENCY STOP** by partial turning to the right (marked by direction of the arrow on the push-button), until the push-button returns to the starting position;
- Finally, before putting the machine into operation, it is necessary to switch on control voltage of the system (push-button **CONTROL VOLTAGE**) – see Chapter 5.12.2.

5.12.2.Push-button Control voltage

This push-button and its function correspond to requirements of Czech and European safety standards as a protection against unexpected and undesirable behaviour of the machine after its switching on, after a defect, fallout of power supply, or occurrence of signal **EMERGENCY STOP**. In case of the power supply fallout or when push-button **EMERGENCY STOP** has been depressed, the power supply to the control system will be switched off; the machine will perform no operation, even if the power supply has been restored or if the push-button **EMERGENCY STOP** has been unblocked by an error of the operator or another non-professional or accidental intervention. Only depressing of push-button **CONTROL**

VOLTAGE will enable further operation of the machine. This push-button must also be depressed in switching on the machine. The power supply is indicated by lighting on of this push-button; on switching off the power supply, the push-button is lit off.

After switching on the control voltage, the main control system starts establishing connection with the control system of the prestretch device. During establishing the connection, the screen shows an information window and no movements of the machine may be performed.

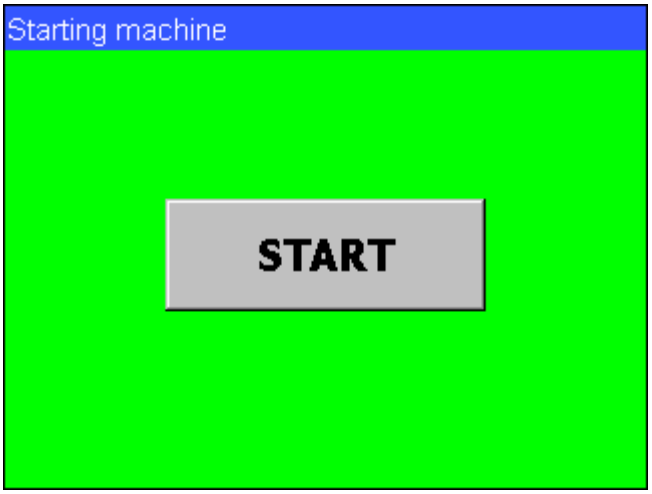


6. INSTRUCTIONS FOR USE

The Instructions for use are written for a machine with complete equipment. In the case your machine is not equipped with some of the described device ignore particular paragraphs.

6.1. Switching machine on and off

- Turn on the main switch.
- Make a visual inspection of the line (pallets are properly loaded with goods; they are not in collision with the machine, line, or with each other; there are no foreign objects on the line and in the wrapping area of the machine; there is no person in the wrapping area of the machine; safety device is in correct state and functional) and switch on control voltage by depressing push-button Control voltage. In the case the safety fence is a part of the delivery lock it by the push-button at the fence door and activate the safety barrier using push-button RESET. After the control voltage has been switched on, the main control system will start establishing connection with the control system of the prestretch device. During establishing the connection, the screen shows an information window and no movements of the machine may be performed. After establishing communication, check setting of the screen and, if necessary, modify it by turning the change-over switch Manual / Automatic mode.
- The display shows initialization of the device.
- In the case the conveyors are controlled by the machine the display on the panel **STARTING MACHINE** will show push-button **START**; make a visual inspection of the line (pallets properly loaded with goods; they are not in collision with the machine, line, or with each other; there are no foreign objects on the line and in the wrapping area of the machine; there is no person in the wrapping area of the machine; safety device is in correct state and functional) and, provided that everything is OK, touch the push-button **START** to start initialization of the machine and the line. Otherwise, it is necessary to repair defects– see Chapter 7.



Further procedure depends on the machine mode – automatic (Chapter 6.7) or manual (Chapter 6.10).

In switching off the machine, it is sufficient to turn off the main switch.

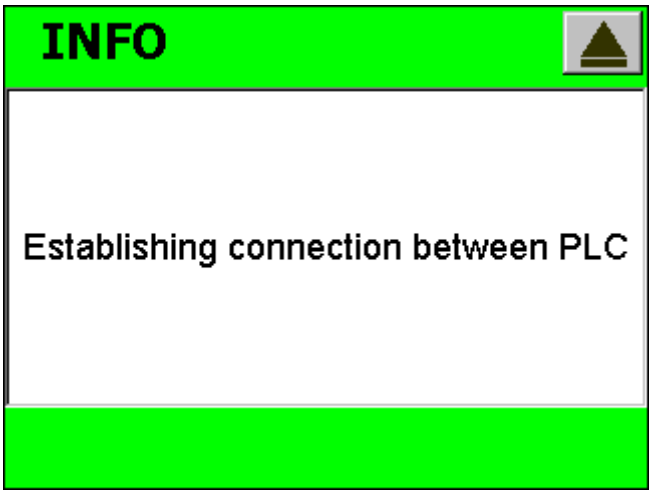
6.2. Control of door of protective fence

This chapter is written for the safety fence used as a standard by the manufacturer of the wrapping machine. If the designer of your wrapping line has used different safety devices he/she shall revise this chapter and, as necessary, repair or complete it. These amendments shall become an integral part of this accompanying documentation.

The push-button of the electromagnetic lock is installed at the door of the protective fence. The control system watches the machine state and defines when it is possible to enter the working area; for this period, the push-button is lit on. If you need to enter the working area of the machine press the push-button. This push-button will blink until the machine ends necessary movements. You must wail until the push-button is lit on and depress it. The control system will block the machine against starting and open the lock of the protective fence door. Only now, can you enter the working area of the machine; **the fence door should be left open**. After leaving the working area, you must shut the protective fence door and depress the push-button that will go off. The control system will close the lock of the protective fence, unblock movements, and enable the machine to work.

The request for entering the fence can be deleted anytime by repeated depressing of the push-button.

After the fence door has been locked, the main control system will start establishing connection with the control system of the prestretch device. For the period of establishing connection, the screen shows the information window and the machine cannot make any movements.



For the whole time of a person (persons) being present in the working area of the machine, the protective fence door must be left open.

Before shutting and locking the door, make sure that there is no person within the fence and that no objects have been left which could cause an incorrect function of the machine or its failure.

6.3. Switching off of machine using push-button EMERGENCY STOP

The push-button Emergency stop serves for emergency stopping of the machine (fall of goods from the pallet, collision in the working area of the machine, injury, etc.). For putting the machine back into operation, see Chapter 5.12.1.

See Chapter 7 for detailed description of emergency situations and responses to error messages.

6.4. Control of touch panel

The touch display serves for communication between the operator and the control system of the machine. The procedures and information in this chapter apply both to usual operation and to the mode of setting and configuring the machine and parameters of the programs.

6.4.1. Basic terms

To make these Instructions more lucid, the following basic terms are defined:

Panel (depicting panel) – technical device installed in the switchboard that serves for communication between the operator and the machine system.

Display – panel content, i.e. what is shown in the depicting panel.

Push-button – control push-button shown on the display. It is depicted so that it looks as a plastic (embossed) push-button.

Mechanical push-button – physical push-button with contacts mounted on the switchboard or in the machine.

Keyboard – the means of the touch panel system for entering numerical and/or alphanumerical values.

6.4.2. Common rules

On the right side of the display, there are push-buttons of basic functions. Only those push-buttons are shown that are relevant in the given display. For detailed description of function of respective push-buttons see the text below in these Instructions.

Transition by one level up.

Storing of parameters or programs into memory. The dialog is depicted that will enable and, at the same time, protect the system against undesirable interventions.

Help.

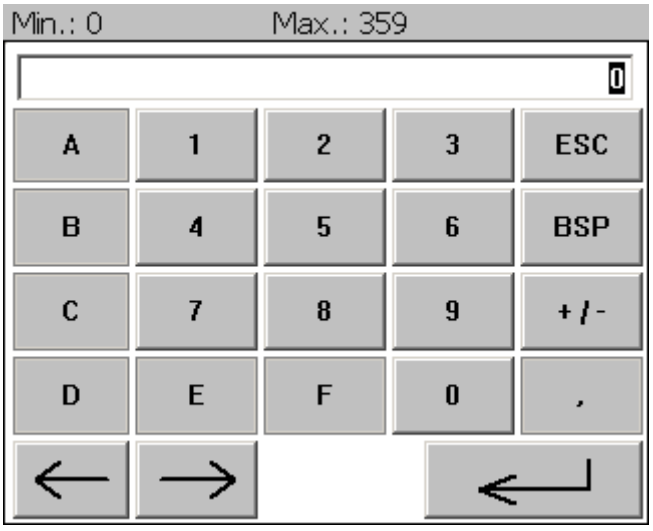
Transition upwards (to previous page)

Transition downwards (to next page)

6.4.3. Entering values

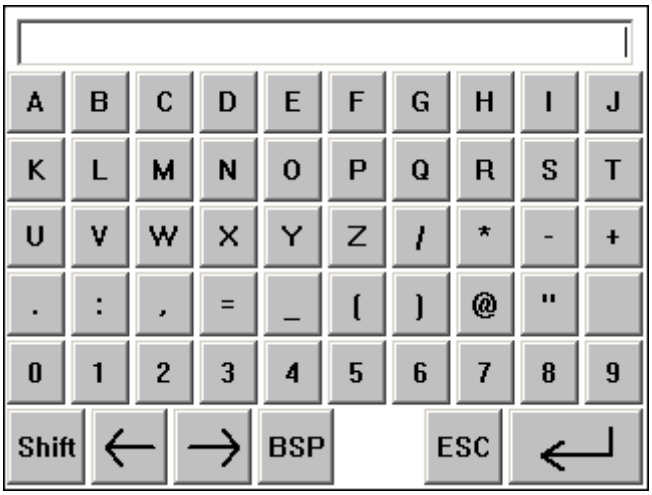
Parameters of the wrapping program as well as parameters of the machine can attain various values – according to their type. After the parameter value has been touched, numerical or alphanumerical keyboard is shown – according to the parameter typ.

Numerical keyboard serves for entering numerical values of the parameter. Each parameter can attain values within a certain range shown at the upper edge of the keyboard; if you attempt to enter a value falling off the permitted range such new value will not be stored.



Functional keys A through F are not used in this machine.

Alphanumerical keyboard



←→ - movement between depicted numbers and letters;

BSP – deleting of number, character;

ECC – ending of keyboard without storing new values of a parameter. The edited value will not change and will remain in the form before the panel has been opened;

SHIFT – switching of CAPITAL and small letters;

↵ - confirmation and ending of the keyboard with storing new value of the parameter.

6.4.4. Changing value YES-NO

Some parameters are two-state, they can attain the values YES or NO only.

In the program parameters, these two states are marked with green tick for the value YES and with red tick for the value NO. In editing the wrapping programs, the selected function is distinguished by the push-button colour) (orange push-button is non-active, white push-button is active).

The values are alternately switched over by touching particular push-button.

6.4.5. Machine protection with password

All programs and parameters can be freely watched; the protection password is applied at the moment of:

- storing changed parameters of the program;
- requested access into depicting and setting of service parameters 1 or service parameters 2, or service parameters of the line;
- changing language (Chapter 8.22).

The exception is editing of passwords (Chapter 8.21).

According to their importance and purpose, the machine and parameters are protected at various levels:

User		
S	Service	*For the manufacturer and service organization only*. It is required for service parameters 2 which cannot be changed without good knowledge of the machine and its system. It permits changing all parameters and programs of the machine available for the administrator, technician, user, and operator.
C	Statistics	*Dealer.* The password is known to the dealer of your machine. It enables the same interventions as those of the user P and, moreover, some actions reserved for the dealer of the machine.
P	Maintenance	*For company maintenance and administration of the machine*. The system requires this level of password for service parameters 1 which are not reserved for the user 1. They enable parameters and programs available to the technician, user, and operator to be changed.
U	User	*For the machine operator*. This level is used in setting parameters of the program (machine programming). Parameters and programs available for the user and operator can be changed.
	Operator	*General access*. The given parameter is not protected by a password. It can be freely changed and the system does not require its entering. This level is set in switching on the machine. It relates only to selecting number of the started program and manual mode of the machine.

Entering of the password is controlled by the machine itself; the password is asked for when you try to carry out an operation protected by the password (i.e. you try to change program parameters or machine parameters, or you try to enter the info area in service parameters 2).

The password of the user S (service) is only known to the manufacturer and service organizations.

The passwords of the user P (maintenance) and U (user) are listed on the last page of these Instructions for use. It is recommended to remove this page before handing over the Instructions to the operator and to make the passwords known to authorized staff only.

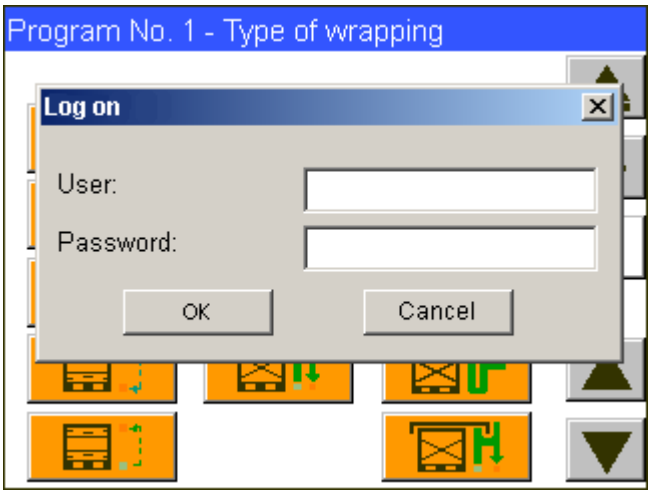
Values of the passwords can be changed. The person logged on to the machine system by means of a password can change the password of his/her level and lower levels. For the procedure of setting passwords see Chapter 8.21.

6.4.6. Entering password

The following text describes entering of a password in case of the program change. The procedure of entering the password is identical also for access to

editing service parameters in the manual as well as automatic mode, for switching languages of the display, and in other applications.

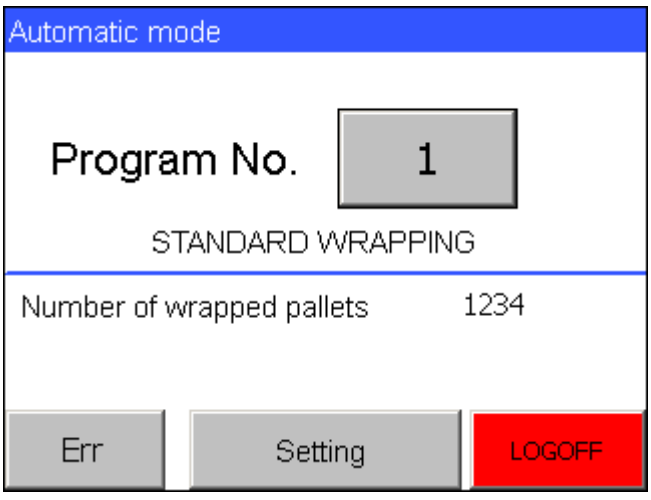
If you want to change a parameter without entering a valid password the window for entering the password is shown after depressing the push-button.



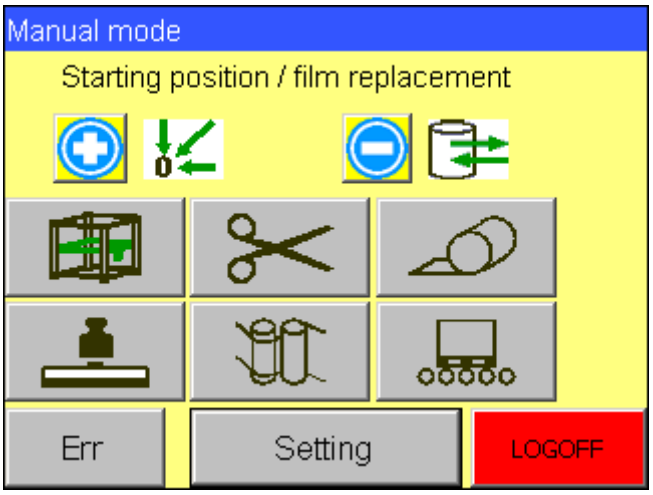
Enter the corresponding user (single-letter abbreviation from the column Abbrev. of the table in Chapter 6.4.5) and the password. After depressing the given field, the name of the user and the password are entered on the depicted keyboard (in the same way as entering text values). In entering the password, the keyboard display shows, instead of the entered character, * (star); it is thus impossible that an unauthorized person could read the password during its entering.

The entered password is confirmed by key OK. If the password is entered correctly its value can be changed after repeated depressing of the parameter push-button. If the entered password is incorrect the window for entering the password is shown once again. After depressing key "Cancel", entering of the password is ended and the keyboard disappears; the screen then shows the display from which the password has been entered.

The entered password remains valid for a set time; for this period, push-button LOG OFF is shown – Deleting the password for logging off on the main display of the automatic mode:

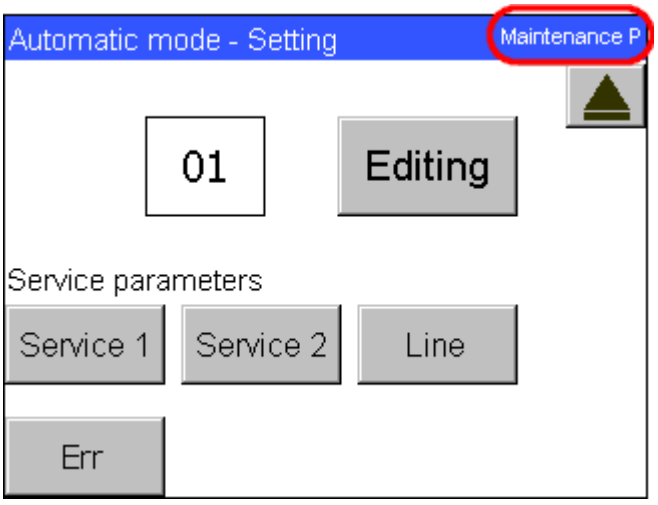


The same push-button is also shown on the display of the manual mode (if you switch over to or in case of editing the service parameters).



After entering the password, the set password is valid for a set period of time from the last depressing of any key; for this period, it is possible to set all parameters of the system, to which the password authorizes.

The set password is depicted on all displays that enable the parameters to be changed – an example is given in the picture.



After touching push-button **LOG OFF – logging off of password**, the set password is deleted and the system is again protected against storing of changed parameters and programs. Push-button **LOG OFF – logging off of password** is then not shown.

For the period of depicting the push-buttons **LOG OFF – logging off of password**, the password is set and valid, and the system makes it possible to change the parameters and programs, store them, and immediately test the modified parameters and programs.

6.4.7. Statistics

The main display of the automatic mode and the displays of service parameters 1 and 2 (for their placement - see Chapters 6.11.2, 6.11.3) show the item of counter "**Number of wrapped pallets**". Both counters include completely wrapped pallets only; the pallets the wrapping of which was interrupted, either by

the user or by a failure, have not been included into this number. Both counters can be set in the mode of editing service parameters after touching the figure of the number of wrapped pallets. The setting procedure is that according to Chapter 6.4.3.

Service parameters 1, initial display. Setting of number of wrapped pallets is protected by a password of level P – Maintenance. It is intended for monitoring the number of wrapped pallets according to needs of the user (for example, number of pallets per shift, per time period, of given type of goods, number of pallets to order, etc.).

The main display of the automatic mode shows the state of the counter of service parameters 1. The number of pallets in this display cannot be edited.

Service parameters 2, display Info, is only accessible by service organizations. Setting if the number of wrapped pallets is protected by a password level S – Service. It is intended for monitoring the number of wrapped pallets according to needs of the service (example: total number per service life of the machine, number of pallets since general repair, changes in configuration, etc.).

In service parameters 2, display Info, one can also ascertain the version of the machine program, number of revolutions of the latest wrapping cycle, and duration of the latest wrapping cycle.

In service parameters 2, display Statistics, one can ascertain times and numbers of revolutions of individual wrapping phases.

6.4.8. Structure of displays

Basic displays (for manual and for automatic modes) are switched over by a mechanical change-over switch **CHANGE-OVER SWITCH OF MANUAL AND AUTOMATIC MODES**.

The structure of displays (i.e. description of mutual dependence and logical link-up of displays) is always provided in particular chapter (automatic mode, manual mode, mode of free program editing).

6.5. Insertion of wrapping film into machine

The films for which the prestretch devices are intended are specified in Chapter 2.5.1.

After the film has been consumed, the machine automatically moves to the position for the film replacement. In replacing the film, proceed as follows:

1 After stopping the machine and depressing the push-button at the protective fence door, the protective fence door can be opened and new film can be inserted.

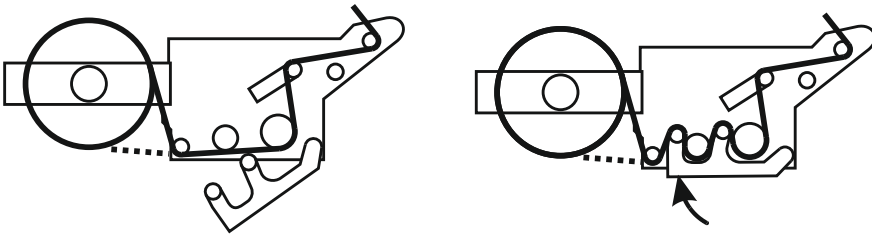
	For the whole time of a person (persons) being present in the working area of the machine, the door must remain open!

2 Open the door of the film inserting device, after releasing it (by lifting the lever to its upper position).

3 Release the container pin (by lifting the upper stop) and tilt it into the position until it closes shut. Remove the empty tube from the pin. Insert new film on the pin (it must correctly fit on the lower cone). Release and tilt back the container pin into its operating position until it is secured.

Insert the film into the prestretch device according to the sketch. For better manipulation, the film can be brought together into a cord; it will be flattened at the beginning of wrapping.

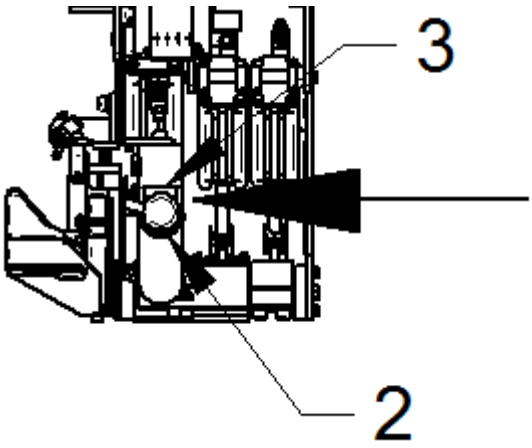
The film insertion differs in details depending on the type of the prestretch device mounted on the machine. The differences are marked in the sketch for inserting the film into the machine which is stuck on the prestretch device.



4 Close the door of the film inserting device and secure it (by tilting the lever to its lower position).

In variant DOUBLE, it is recommended to replace the film in both prestretch devices even if it is not yet fully consumed – the rotating mechanism must be balanced within certain tolerance and, in the case it has not been balanced, movement of the machine is slowed down (at the same time, the wrapping capacity is reduced).

5 Put the free end and insert it in the direction of the arrow between lever 2 and lever 3 so that the film could not touch the cutting wire. (After inserting the film, pull down lever 2 – the longest lever with circular cross-section – with your hand down so that the film end could be inserted).



6 Leave the working area of the machine, shut the door, and lock it with the push-button (at the protective fence door).

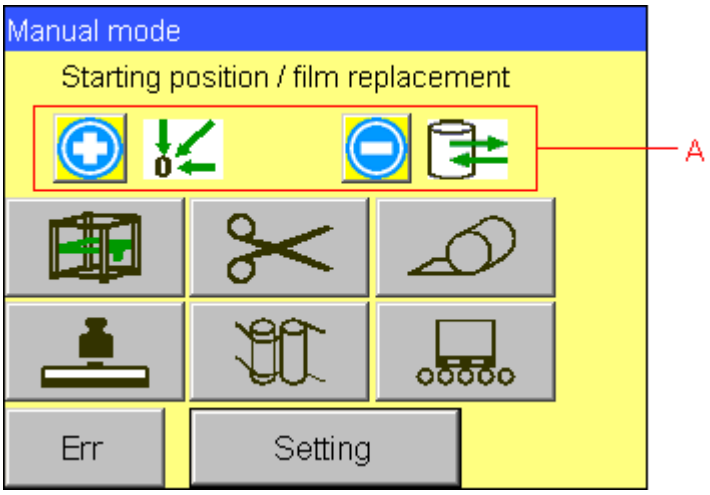
7 After the push-button **START** has been depressed, the machine moves to its starting position and the wrapping cycle is started according to the program number selected on the panel.

Similar procedure applies also to repeated inserting of a ruptured film.

If, exceptionally, manual handling is required in replacing the film (the mechanisms are not in a position suitable for the film replacement, for instance, after a defect) proceed as follows:

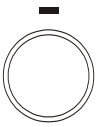
1 Wait until the machine stops.

Switch over the machine into the manual mode of control.



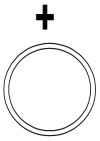
The main display of the manual mode is shown with depicted push-buttons for the film replacement and movement into the starting position. After switching over to the manual mode, this display is always shown as the first.

2 Using the mechanical push-button "**–**" on the switchboard (see the Help in the upper part of the display marked A) move the machine to the position for replacing the wrapping film. If, after the machine has moved to the position for replacing the wrapping film, push-button "**–**" is depressed once again the horizontal frame moves to the position for replacing the top sheet film. After repeated depressing of push-button "**–**", the frame shifts to the position for replacing the wrapping film.



3 Replace the film or insert it back into the machine – the procedure is described in the text above.

4 Using mechanical push-button "**+**" on the switchboard it is possible to move the machine into its starting position for wrapping – this step is not necessary, the machine moves into its starting position automatically after push-button **START** has been depressed – point 6.



5 Switch the machine back into the automatic mode (as necessary).

6 After push-button **START** has been depressed, the machine moves into its starting position and the wrapping cycle starts according to the program number selected in the panel. In the case the push-button Start is not depressed the wrapping process can be started by the superior system.

6.6. Inserting top sheet film into machine

The films for which the devices are intended are specified in Chapter 2.5.2. It should be stated that weight of the reel with the top sheet film is about 60 to 80 kg.

Similarly to consumption of the wrapping film, also in consumption of the top sheet film the machine automatically shifts to the position for the film replacement. In the replacing procedure proceed as follows:

1 Unlock the door of the machine protective fence using the push-button and open the door.

	For the whole period of a person (persons) staying in the working area of the machine the door must remain open!

2 Insert the top sheet film into the machine:

For easier manipulation, the stop preventing the top sheet film from falling out can be tilted – lift it and tilt down.

Remove the empty tube and possible rest of the film. Put the film reel on the carrier rollers. Pay attention to correct direction of rolling off of the film according to the sketch – in putting the film onto the goods, the reel with the film is driven by the motor.

According to the sketch, lay the film over the swinging roller and the guiding roller.

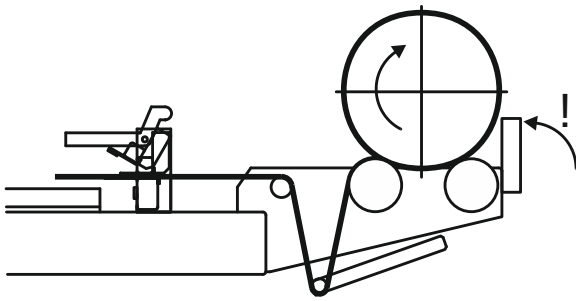
Using the change-over switch (it is installed in the half of the frame width) open the jaws of the film holder.

Insert the film in between the jaws of the holder so that it would pass slightly over them (about 5 to 10 cm).

Hold the film and, using the change-over switch, close the holder jaws.

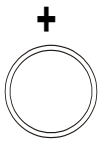
Put the tilted stop preventing the top sheet film roll from falling out back into its original position.

If it is necessary to wind the film up or off, the push-buttons installed on the bracket of the cable chain are at disposal. Using push-button roll off the film is rolled off from the reel; using push-button roll up the film is rolled up.



3 Leave the working area of the machine, shut the protective fence door, and lock it by depressing push-button **LOCK**.

4 Using the mechanical push-button **+** on the switchboard, you can move the machine into its starting position for wrapping – this step is not necessary, the machine moves into it starting position automatically after push-button **START** has been depressed – point 8.



5 Switch the machine back into the automatic mode.

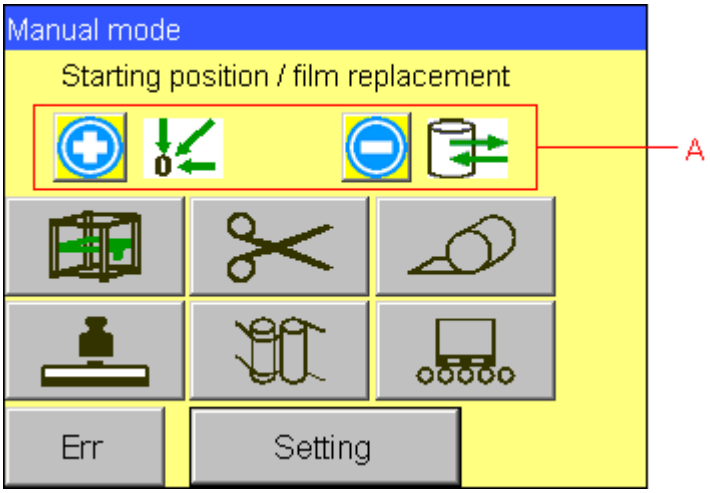
6 After push-button **START** has been depressed, the machine moves into its starting position and the wrapping cycle is started according to the program number selected on the panel.

If, exceptionally, manual handling is required in replacing the film (the mechanisms are not in a position suitable for the film replacement, for instance, after a defect) proceed as follows:

1 Wait until the machine stops.

Switch over the machine into the manual mode of control.

2



The main display of the manual mode is shown with depicted push-buttons for the film replacement and movement into the starting position. After

switching over to the manual mode, this display is always shown as the first.

In the case the machine is not in its starting position move it to this position by depressing push-button "**+**"

Switch over the screen to controlling top sheet

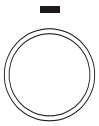
and move the bracket to the end-limit position (the position on the opposite side than the container of the top sheet film).

Hold mechanical push-button "**+**" for the time of the mechanism travel. Select the function Starting position / Film replacement,

and, using mechanical push-button "**–**" on the switchboard (see the Help in the upper part of the display marked A), move the machine into the position for replacing the wrapping film. If, after the machine has moved to the position for replacing the wrapping film, push-button "**–**" is depressed once again the horizontal frame moves to the position for replacing the top sheet film. (After repeated depressing of push-button "**–**", the frame shifts to the position for replacing the wrapping film).

Replace the film or insert it back into the machine – the procedure is described in the text above.

3 Leave the working area of the machine, shut the protective fence door, and lock it by depressing push-button **LOCK**.



Using the mechanical push-button **+** on the switchboard, you can move the machine into its starting position for wrapping – this step is not necessary, the machine moves into it starting position automatically after push-button **START** has been depressed – point 8.

4 Switch the machine back into the automatic mode.

5 After push-button **START** has been depressed, the machine moves into its starting position and the wrapping cycle is started according to the program number selected on the panel.

6.7. Automatic mode

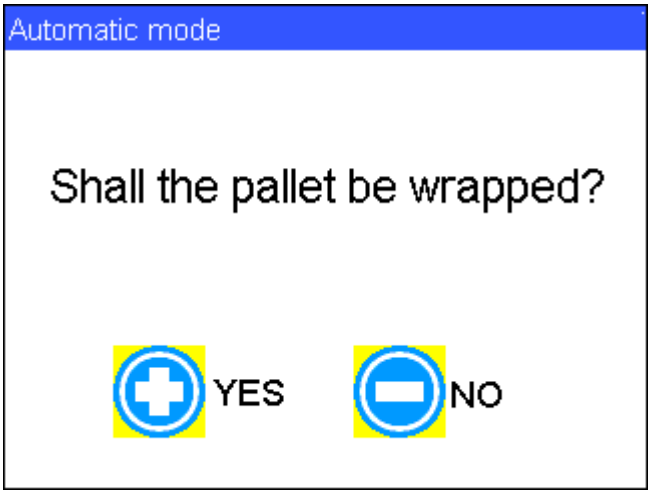
The **automatic mode** of the machine is entered by selecting the change-over switch **AUT** on the control panel. As this machine is preferentially intended for work in automatic lines command **START** for the wrapping machine is given by the control system of the line depending on movement of the wrapped goods on the line. The automatic cycle of the machine can also be started from the control panel using push-button **START**. After using command **START**, the machine will perform one wrapping cycle according to the selected program.

The automatic cycle of the machine can be interrupted anytime using push-button **STOP**. After push-button **START** has been depressed, the machine moves to its starting position, unless it is already there, and starts a new wrapping cycle. In the case push-button **STOP** was depressed during wrapping and the film is partially wound on the goods the film should be manually ended in the manual mode and, if necessary, cut from the pallet, and its end inserted back into the machine (see Chapter 6.5).

ATTENTION !

The operator only can move in the vicinity of the machine.

The following step is only applicable in the case your wrapping machine controls the conveyors: If, after the machine has been switched on or switched over to the automatic mode and there is a pallet on the conveyor within the working area of the machine the display shows the system question for wrapping "Shall the pallet be wrapped?":



By depressing mechanical push-button "**+**" the wrapping is started. After depressing push-button "**–**", the pallet is considered wrapped and moves out of the wrapping machine.

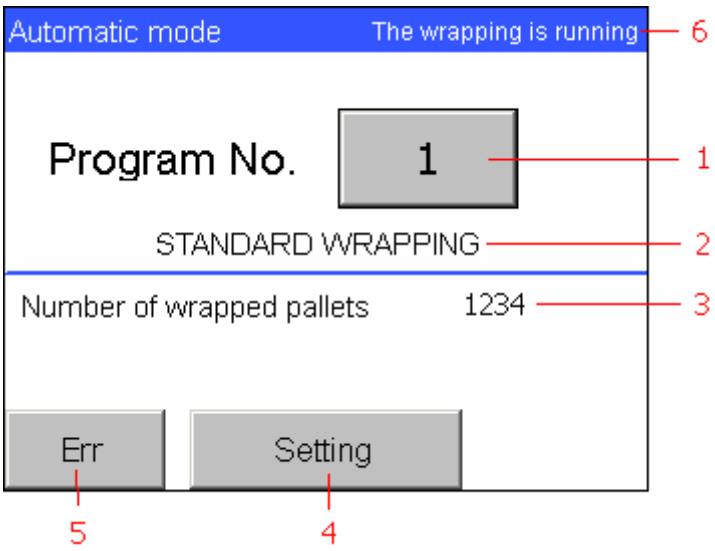
Up to 20 wrapping programs can be used on machines OBS ROTOMATIC.

If the push-button with the program number is depicted in red it belongs to the group of programs automatically switched over by the external control of the line;

at the beginning of wrapping, the set program can be automatically switched over to a different program depending on the machine setting; for detailed information - see Chapter 6.7.3.

6.7.1. Display content

After switching on the machine set to the automatic mode or after switching over to the automatic mode, the screen shows the basic display of the automatic mode in which the machine is found.



1 Program number.

The programs switched over automatically are depicted by red number, the programs switched over by the operator are depicted in white.

2 Short informative text describing the wrapping program.

3 The counter of wrapped pallets. The depicted counter can be set by the user of the machine (see Chapter 6.4.7).

4 The push-button for transition to editing the parameters and setting the machine.

5 In the case any error occurs push-button ERR changes its colour and the screen shows the window with information on the defect - see Chapter 7

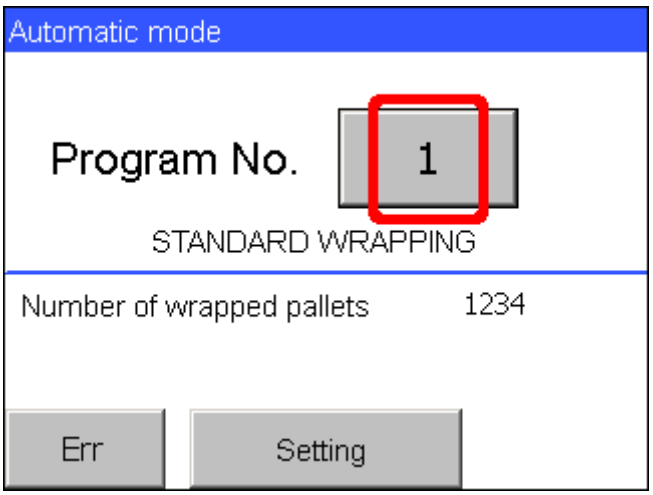
6 Information on the running operation.

The texts are common for the automatic and manual modes; they need not be depicted in both modes.

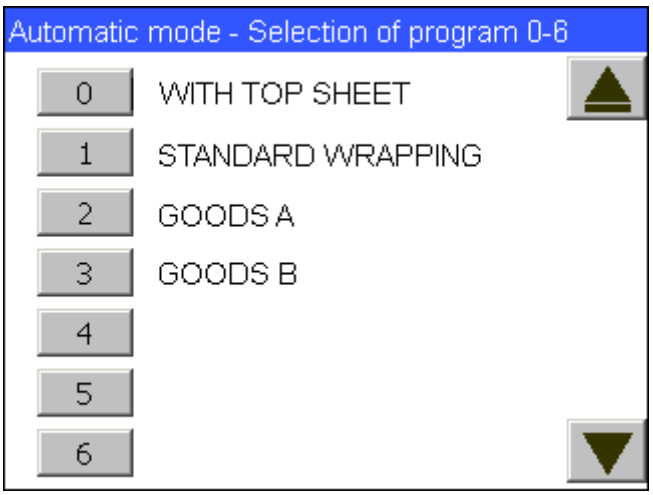
Text of information on running operation	Meaning
Movement to starting position is running	The machine is putting the mechanisms into their starting positions.
Movement for replacing the film is running	The machine mechanisms are moving into their position for the film replacement.
Ending is running	The cycle of the film ending is running.
The top sheet is running	The cycle of laying the top sheet film is running.
The wrapping is running	The wrapping program is running.
Waiting for the start	The machine completed the wrapping; it gave instruction for taking the pallet away, and is waiting for the start of the next wrapping cycle.
Non-completed wrapping	The machine has not completed the wrapping cycle by taking the pallet away.
Wait for ending the wrapping and for confirmation of taking the pallet away	The operator will be required to take away the pallet manually.
External stop	The communication signal is not active.
The wrapping is running – imbalance 1	The wrapping program is running at a reduced speed because of great difference in weights of films in the prestretch devices.
The wrapping is running – imbalance 2	The wrapping program is running at a reduced speed because of great difference in weights of films in the prestretch devices.
The wrapping is running – slowing down	The wrapping program is running at a reduced speed based on the communication signal on a reduced capacity of the line.

6.7.2. Selection of program in automatic mode of machine

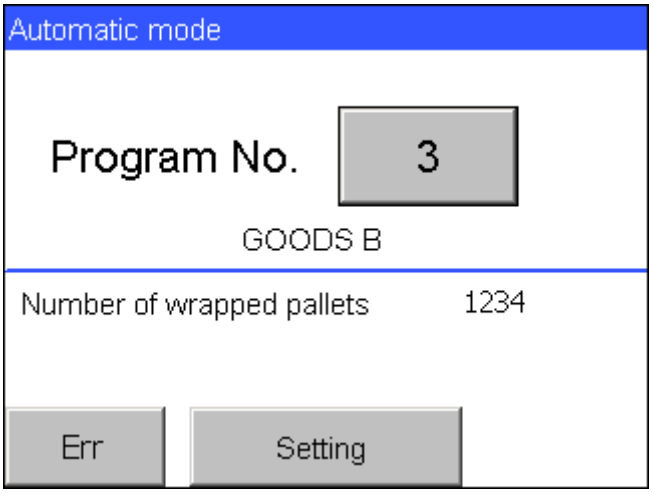
The program is switched over by touching the program number on the display.



The display with the list of programs and their brief description is shown (texts of descriptions depend on programming of your particular wrapping machine).



In our example, program no. 3 ZBOZI B is used. Touch the push-button to set the program and the main display of the automatic mode with the set new program is shown:



In the case the push-button of selecting the program number is red, weather on the main display of the automatic mode or in the list of programs, the program belongs to the group of automatically switched-over programs, i.e. the programs switched over by external signal – for details - see Chapter 6.7.3. If you want the automatic switching of the programs to be active just select any of the red-marked programs and the system will automatically select a correct program according to the wrapped goods. If you select a program with the grey push-button the pallet will only be wrapped with the program selected on the operator‘s panel.

If conditions for beginning the wrapping are not met an error message will be shown on the display after depressing START. After the defect has been repaired the program can go on. For repairing defect - see Chapter 7.

6.7.3. Automatic switching over of program in incorporation into line

This is not a standard function, it depends on programming of your wrapping line.

Remotely (i.e. by the control system of the line without intervention of the operator), can the programs be switched over by means of three communication signals. Usually, the switching over is carried out by the superior system of the line. For remote switching over, programs highlighted in red are used.

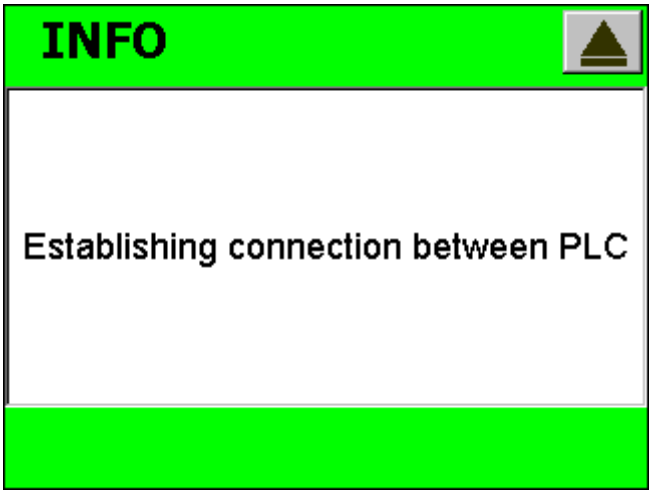
Table of assigning combination of communication signals and programs (valid for communication by means of binary signals and for setting the number of remotely switched over signals to 8)

Communication signal	Assortment 1	Assortment 2	Assortment 3
Program 0	0	0	0
Program 1	1	0	0
Program 2	0	1	0
Program 3	1	1	0
Program 4	0	0	1
Program 5	1	0	1
Program 6	0	1	1
Program 7	1	1	1

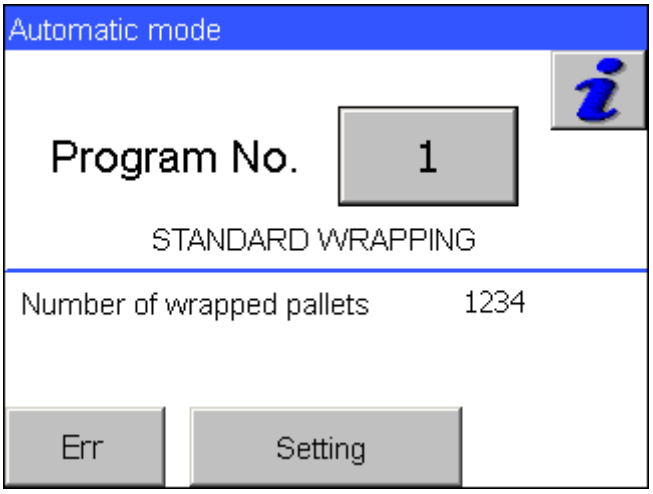
6.8. Information panels

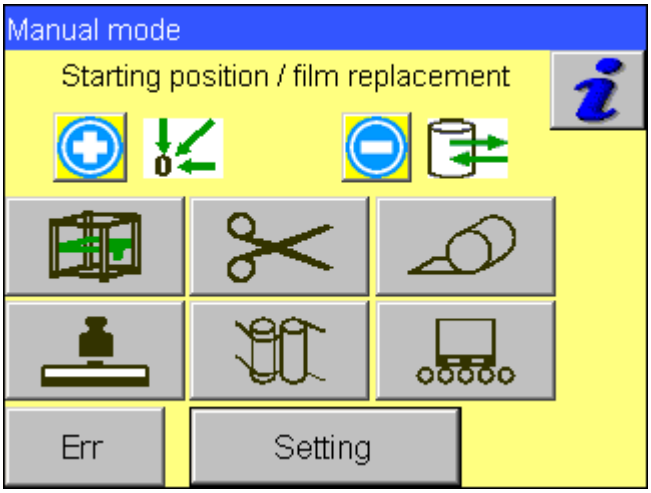
6.8.1. Information panels

During the operation, situations can occur that do not require announcing a failure but an information for the operator is sufficient. In this case, the information panel is shown.



As necessary, the information panel can be hidden using the push-button in the upper right corner. Valid information message is indicated by icon "**i**" on the main panel of the automatic and manual modes; by depressing this push-button it can be restored.



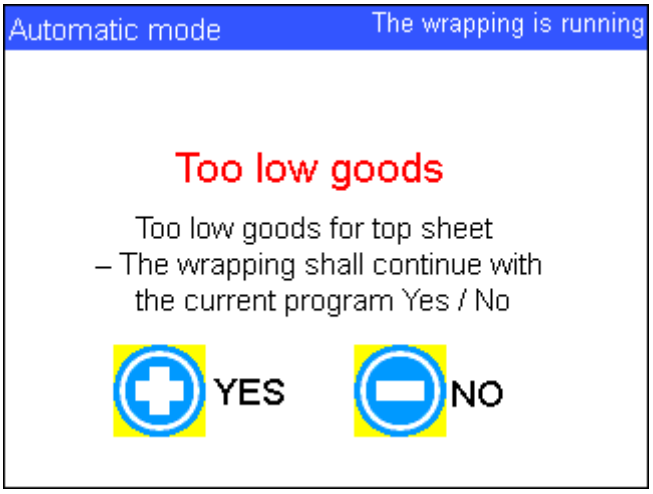


Text of message	Meaning
Establishing connection between PLC	After switching on power supply to the switchboard of the prestretch device, connection between the main control system and the system of the prestretch device has to be established. For the time of its establishing, the information window is shown.
The film is running out.	If the machine is equipped with the film measurement and the amount of the wound-up film is smaller than selected the information window is shown.
The machine is waiting for entering the fence or for deleting the request.	The operator required access to the fence. For the time of the valid request, the wrapping program cannot be started and the machine mechanisms cannot move. The request can be deleted by depressing the push-button on the fence door.

6.8.2. Selection panels

During the operation, situations can occur that require decision of the operator. In such case, the selection panel is shown.

This situation occurs, for instance, when the height of the goods is smaller than the height with which proper wrapping can be carried out. In such case, the following messages appear on the panel.



Message text	Meaning
Too low goods for top sheet – The wrapping shall continue with the current program Yes / No	The measured height of the pallet is lower than the minimum value and possibility of correct laying of the top sheet film is not ensured. The operator can decide to go on with the current wrapping program or to start a different program. **Yes –** going on with the current program. In such case, the operator shall watch the procedure of wrapping; he/she can terminate it using push-button Stop; then he/she shall wait till the end of wrapping because of checking and taking the pallet away. **No –** ending of the current program, detachment of the top sheet film in the case it was pulled out from the container; the machine frame will move to its starting position. In case of detachment of the top sheet film the operator shall remove this film from the wrapping area of the machine.
Too low goods – The wrapping shall continue with the current program Yes / No	The measured height of the pallet is lower than the minimum and possibility of correct wrapping is not ensured. The operator can decide on going on with the current wrapping program or on starting a different program. **Yes** – going on with the current program. In such case, the operator shall watch the procedure of wrapping; he/she can terminate it using the push-button Stop; then he/she shall wait till the end of wrapping because of checking and taking the pallet away. **No** – ending of the current program, detachment of the top sheet film in the case it was pulled out from the container; the machine frame will move to its do starting position.
Too low goods – height was not measured. Wait for the confirmation of the taking away.	
Wait for completing the wrapping and confirming the taking away.	This message informs the operator that his/her intervention will be necessary after the wrapping process has been completed.

Message text	Meaning
Send the pallet away Yes/No	After the wrapping process has been completed, the operator shall check whether the wrapping of the pallet has been carried out correctly and decide on its taking away. **Yes** – sending of the signal on the end of wrapping based on which the line system will take the pallet away. **No**,– the pallet will not be dispatched and the operator can wrap it with different program.

6.9. Machine programming

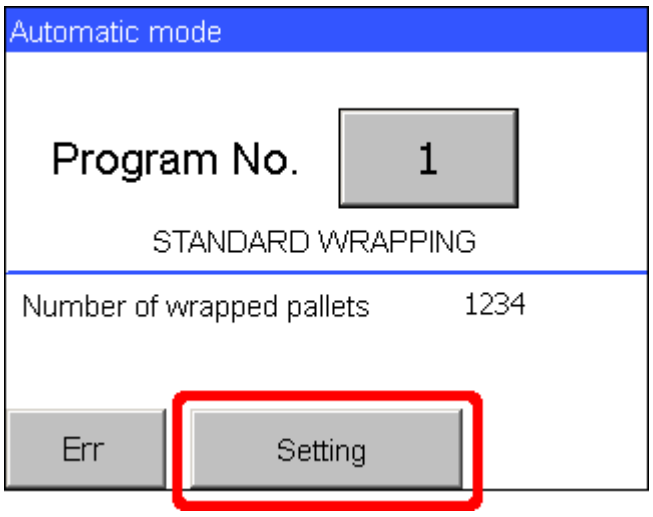
Changes in the program or program parameters are possible anytime, even during the program run. If, at the moment of a change in the program or in the program parameters, the machine performs the wrapping cycle it will use the parameters valid at the moment of starting the wrapping. The program or program parameters changed during the program run will be valid in the next start of the program after the changed parameters have been stored.

The program number can only be changed when the machine is not performing the wrapping cycle.

The following examples demonstrate possibilities of the procedure in movement within the list and during programming. The examples are illustrative and the presented procedures are generally valid. The values of parameters in the examples can differ from those on your machine – depending on current setting of your machine.

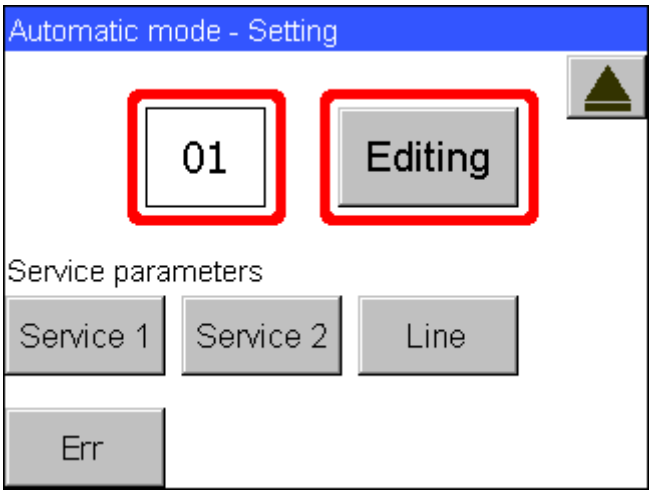
Access to programming mode

The programming mode can be entered in the automatic mode of the machine by touching push-button **Setting**. It is irrelevant whether the set program is that you are going to edit; you can set it in the next step.



If you want to edit the program offered on the following display (in this example program no. 9) it is sufficient to pass to editing the parameters of the selected

program by touching push-button **Editing**. In the case you are going to edit different program, set the number of the program you want to edit using the procedure according to Chapter 6.4.3 and confirm by depressing push-button **Editing**.

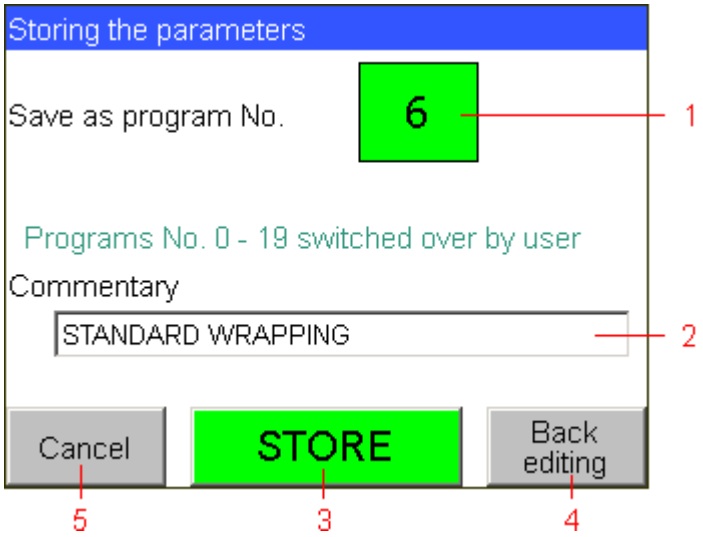


In the case you have entered this display by mistake you can return to the main display using push-button **Transition by one level up**.

Note: Other push-buttons on the display do not relate to programming (push-button **Service 1**, **Service 2** and **Line** relate to service parameters of the machine in Chapter 6.11, push-button **ERR** serves for depicting and processing error messages – see Chapter 7).

Ending of programming mode

By touching push-button **Storing** (or push-button **Storing, back**) you can get from any display of editing service parameters to display **Program – storing** with the dialog box for storing the changed parameters.



1) The entering field show the number of currently edited program. In the case you want to store the program under different number (**STORE AS PROGRAM**), by touching the program number the keyboard is displayed (see Chapter 6.4.3), and, using it, enter the number under which you want the program to be stored.

2) The row with brief commentary; this text will appear in the list of programs (see Chapter 6.7.2). It serves for better orientation of the operator; the description of wrapping of maximum 20-character length can be entered. After touching this row, the dialog box for entering text values is shown – see Chapter 6.4.3.
3) Push-button **STORE**. The program is stored and the display shows the main display of the automatic mode.
4) Push-button **Back editing**. In the case you omit to change some parameter use this push-button to return back to editing the parameters.
5) Push-button **Cancel**. The changed program is not stored and the main display of the automatic mode is shown. This push-button is also used in the case the storing is protected by a password and you do not know the correct password for changing the program.

6.9.1. Parameters of automatic wrapping cycle

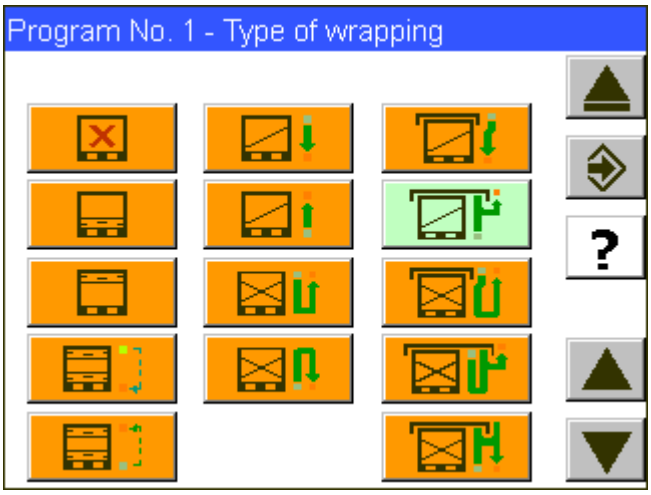
The table of parameters of the wrapping programs of the automatic cycle is presented as an annex to this documentation – Instructions for use. It is recommended to write into this table the tested values of the programs used – In case of a failure or a fallout you can save time and work in repeated setting of your wrapping machine.

After depressing push-button **Editing**, you enter the main display of editing the parameters. This display enables quick access to any group of parameters. The sequence and access to individual groups of parameters are demonstrated in the table.

Display			
Main display – Setting program parameters			
Type of wrapping			
Configuration of wrapping			
Speed of wrapping			
Distances and speed			
Travel with stopping			
Prestretch device			
Pulling down of lower rim			
Top sheet			

The text below describes individual displays, their content, and meaning. The content of displays depends on configuration of your machine; these Instructions describe displays for the machine with maximum outfit.

Type of wrapping



Single touch on this display selects the type of wrapping. The symbols on the push-buttons depict direction of wrapping and, if the top sheet is selected, also the method of laying the top sheet film (dust-tight or water-tight). The selected type has a highlighted push-button. If the top sheet is used the pallet can be wrapped:

- **Dust-tight** – the top sheet film is laid directly on the goods which are subsequently wrapped. The packing is resistant against dust; however, in a humid environment there is a risk of penetrating of moisture under the packing. The wrapping is quicker and less wrapping film is consumed.
- **Water-tight** – The top of the pallet is wrapped; subsequently, the top sheet film is laid and then it is wrapped over once again. The top sheet film is between two layers of the wrapping film and the packing is resistant even against humidity (rain).

Fixation is used where it is sufficient to strengthen the top of the goods on the pallet or the interface between the pallet and the goods (for instance, in case of inter-company transport) or where it is necessary to provide for ventilation of the goods.

Symbol	Method of wrapping	Description		
		Type	Begin	Over
	T0 – Program without wrapping – after starting, the program will be immediately terminated, including transmitting of signal „end of wrapping“ for taking the pallet away.	**0**	**–**	**–**
	T1 – Simple wrapping without top sheet; beginning of wrapping up; ending of the film down.	**1**	**U**	**–**
	T2 – Simple wrapping without top sheet; beginning of wrapping down; ending of the film up.	**1**	**D**	**–**

Symbol	Method of wrapping	Description		
		Type	Begin	Over
	T3 – Double wrapping without top sheet; beginning of wrapping and ending of the film up.	**2**	**U**	**–**
	T4 – Double wrapping without top sheet; beginning of wrapping and ending of the film down.	**2**	**DT**	**–**
	T5 – Simple wrapping with dust-tight top sheet; beginning of wrapping up, ending of the film down.	**1**	**U**	**P**
	T6 – Simple wrapping with water-tight top sheet; beginning of wrapping down, ending of the film up.	**1**	**DT**	**WT**
	T7 – Double wrapping with dust-tight top sheet; beginning of wrapping and ending of the film up.	**2**	**U**	**P**
	T8 – Double wrapping with water-tight top sheet; beginning of wrapping and ending of the film up.	**2**	**U**	**WT**
	T9 – Double wrapping with water-tight top sheet; beginning of wrapping and ending of the film down.	**2**	**DT**	**WT**
	T10 – Fixation of the pallet with one stripe placed down.	**F**	**DT**	**–**
	T11 – Fixation of the pallet with one stripe placed up.	**F**	**U**	**–**
	T12 – Fixation of the pallet with two stripes placed down and then up; each stripe is ended separately.	**F**	**DU**	**–**
	T13 – Fixation of the pallet with two stripes placed up and then down; each stripe is ended separately.	**F**	**UD**	**–**

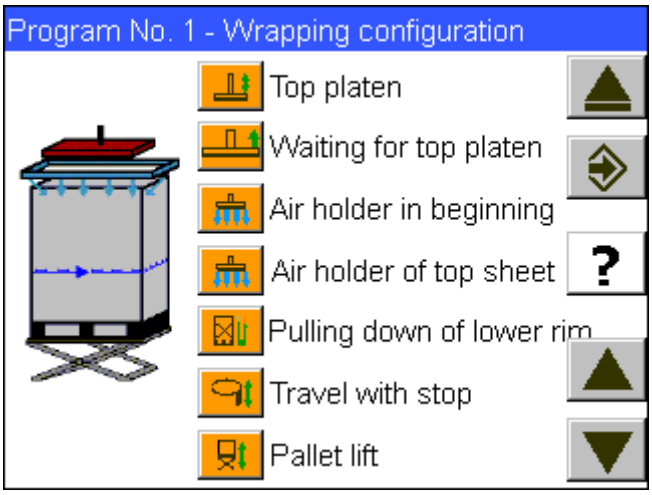
The column Description presents a shortened record as it is recommended for using in the table of parameters of the wrapping programs (this table is given as the annex at the end of the Instructions).

Type – type of wrapping; **0** – No; **1** – Simple, **2** – Double, **F** – Fixation.

Begin – beginning of wrapping; **U** – Up, **D** – Down, **DU** – first Down, then Up, **UD** – first Up, then Down.

Over – Top sheet; **–** – without top sheet, **DT** – dust-tight, **WT** – water-tight.

Wrapping configuration



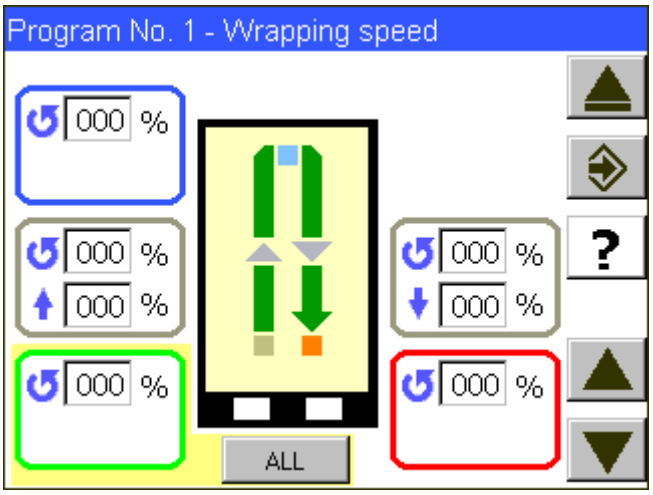
This display specifies the method of wrapping:

Parameter	Description	Unit	Range	Value
Top platen	Selection of using the top platen device to improve stability of the wrapped goods. Value **YES** selects using of the top platen on the goods		YES - NO	
Waiting for top platen	According to this selection, start of the ring rotation is waiting for sitting down of the top platen device. With value **YES**, the wrapping machine is waiting until the top platen sits down on the goods; then, the wrapping is started – this is used in the case that the top platen shall hold down unstable goods. With value **NO**, the machine does not wait for the top platen and starts wrapping immediately – this is used in the case when the top platen should only hold down the top sheet film.		YES - NO	
Air holder in beginning	Selection of air holder on the free end of the film in the beginning of wrapping for its better fixation under the wrapping film. With value **YES**, air holder on the wrapping film is used in the beginning of wrapping		YES - NO	
Air holder of top sheet	Selection of using air holder on the top sheet film. With value **YES**, air holder is used on the top sheet film		YES - NO	

Parameter	Description	Unit	Range	Value
Pulling down of lower rim	Selection of using the pulling down device to pull down the lower rim of the film for better fixation of the goods to the pallet in the case that the pallet must not be wrapped. With value **YES**, the film at the pallet will be partially constricted during wrapping.		YES - NO	
Travel with stop	Selection: during the frame travel upwards or downwards, it is stopped and the number of the film layers in defined parts of the pallet is thus increased. With value **YES**, the frame is stopped during wrapping and additional revolutions are wound up.		YES - NO	
Pallet lift	Selection of using the lifting device of pallets. With value **YES**, the lift of the goods is used, the goods will be wrapped including the pallet (under-wrapping; see Chapter 5.8)		YES - NO	

The display content corresponds to the configuration of your machine (for instance, in the case your machine is not equipped with the pallet lift the symbol of the pallet lift and the push-button for switching on / off the pallet lift are not shown).

Wrapping speed



The control system of machine **OBS ROTOMATIC** enables setting of speed of the ring and speed of the frame travel in individual phase of wrapping.

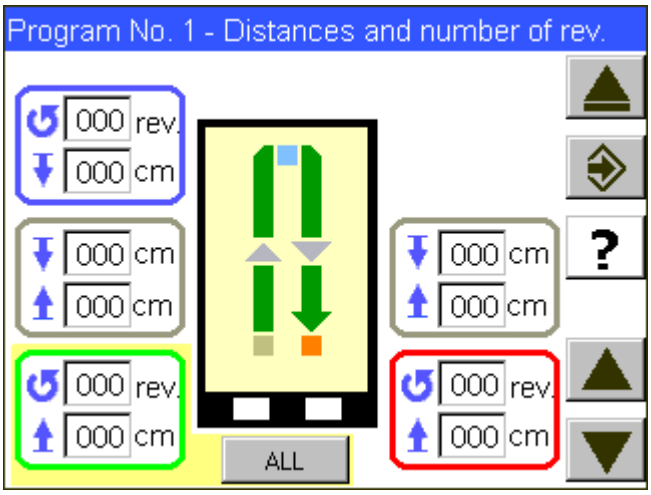
100 % speed of the ring corresponds to the maximum speed; 100 % speed of the lift ensures sufficient top sheet of the film layers at 100 % speed of the ring.

Push-button **All** will write the values from the marked area into the remaining fields where these values can be changed.

Parameter	Description	Unit	Range	Value
	Speed of the ring as percentage of the maximum speed. With this speed the prestretch device rotates around the wrapped goods.	%	20 to 100	100
	Speed of movement of the frame up as percentage of the maximum speed. With this speed the frame with the ring and the prestretch device travel during wrapping.	%	20 to 100	100
	Speed of movement of the frame down as percentage of the maximum speed. With this speed the frame with the ring and the prestretch device travel during wrapping.	%	20 to 100	100

The parameters are entered in the fields according to the selected method of wrapping and correspond to the picture in the centre of the screen. Green field at the beginning of wrapping. Blue field in the middle of wrapping (in case of double wrapping only). Red field in the end of wrapping. Grey field for movement of the frame up or down.

Distances and number of revolutions



Setting of the number of revolutions of the ring determines their number before starting vertical movement; the number of revolutions does not include possible revolutions necessary for ending the film.

The distances locate the film rim with respect to the upper edge of the goods (positive value means incomplete wrapping of the pallet top, negative value means its excessive wrapping) or the distance of the lower rim of the film from the bottom limit position (positive values only).

The change determines the vertical distance which the frame will travel before the parameters of wrapping (ring speed and film stretch) are changed between individual phases of wrapping.

The parameters are entered in the fields according to the selected method of wrapping and correspond to the picture in the centre of the screen. Green field at the beginning of wrapping. Blue field in the middle of wrapping (in case of double wrapping only). Red field at the end of wrapping. Grey field for movement of the frame up or down.

The value written in the yellow-highlighted field can be copied into remaining fields using push-button **ALL**.

Green, blue, or red field

Note	Description	Unit	Range	Value
	Number of revolutions in the given phase of the wrapping cycle	Rev.	0.0 to 8.0	2
	Distance of the film rim from the upper edge of the goods in the given phase of wrapping. Positive value means incomplete wrapping of the pallet, negative value means top sheet of the wrapping film over the over pallet (on the pallet top only)	cm	-20 to 200	0
	Distance of the film rim from the lower edge of the goods in the given phase of wrapping. Positive value means incomplete wrapping of the pallet.	cm	0 to 200	0

Grey field

Note	Description	Dimension	Range	Value
	Distance of the change in parameters (prestretch and speed of rotation) from the upper edge of the goods in transition between phases of wrapping.	cm	0 to 200	0
	Distance of the change in parameters (prestretch and speed of rotation) from the lower edge of the goods in transition between phases of wrapping.	cm	0 to 200	0

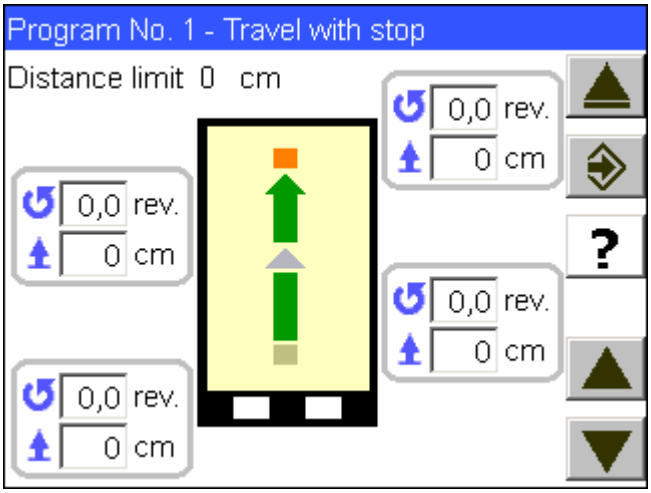
Travel with stop

This serves for strengthening of wrapping (addition of revolutions) at defined heights. It is used in the cases when the packing needs strengthening (for instance, at the interface of layers of goods on the pallet).

The direction determines in which parts of wrapping the film layers are added at defined heights – the selection applies to the double wrapping only.

The height of stopping determines the position of centre of additional film layers from the bottom edge of the pallet.

The number of revolutions of the ring determines their number before continuation of the vertical movement.



In the case the possibility is not chosen in the wrapping configuration the values are in a grey field and they cannot be edited.

The picture in the screen centre determines the direction in which the additional stripes are applied. In case of the double wrapping, this direction can be changed by clicking on the icon of direction.

The upper part shows the limits of distances. In the case the entered distance is smaller than this value the additional stripe will not be applied. Nor will it be applied in the case the distance of the stripe from the upper edge of the goods is smaller than this value.

After entering the distance 0, the given stripe will not be applied. The number of revolutions equal to 0 means that the frame at a given height stops and goes straight on in vertical movement (the layers condensed).

The revolutions are accomplished in the sequence according to the direction of wrapping. (For instance, if the direction upwards is selected, the value in the 1st field from the bottom is 120 cm and that in the 2nd field from the bottom is 80 cm, other heights are 0; after accomplishing the revolutions down, the frame moves to the height of 120 cm where it performs the selected number of revolutions; then it moves to the height of 80 cm where it performs the selected number of revolutions, and then it continues moving to the upper edge of the goods).

Note	Description	Unit	Range	Value
	Number of revolutions in the beginning in the given phase of the wrapping cycle.	Rev.	0.0 to 8.0	0
	Distance of centre of the additional stripe from the bottom edge of the goods.	cm	0 to 200	0

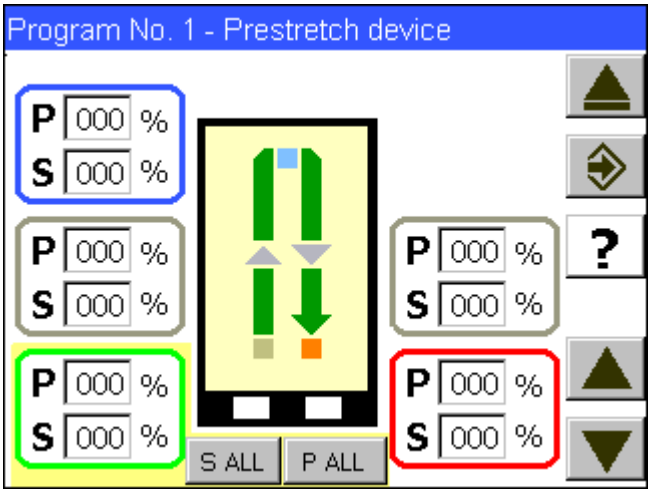
Prestretch device

It enables the stretch values to be set in individual phases of wrapping.

Push-button **All** will write the values from the marked area into the remaining fields where these values can be changed.

The secondary prestretch determines the value of the film stretch between the prestretch device and the pallet – value 100 % means that no additional prestretch of the film takes place; a lower value causes the film releasing, a higher value causes its additional prestretch.

The primary stretch can be set with the two-motors prestretch device and it determines the ratio of speed of the prestretch device rollers (in the single-motor devices it is determined by a fixed transmission); value 100 % means that the film in the prestretch device will be stretched to double length (200 % to triple, ...).



The parameters are entered in the fields according to the selected method of wrapping and correspond to the picture in the centre of the screen. Green field at the beginning of wrapping. Blue field in the middle of wrapping (in case of double wrapping only). Red field in the end of wrapping. Grey field for movement of the frame up or down.

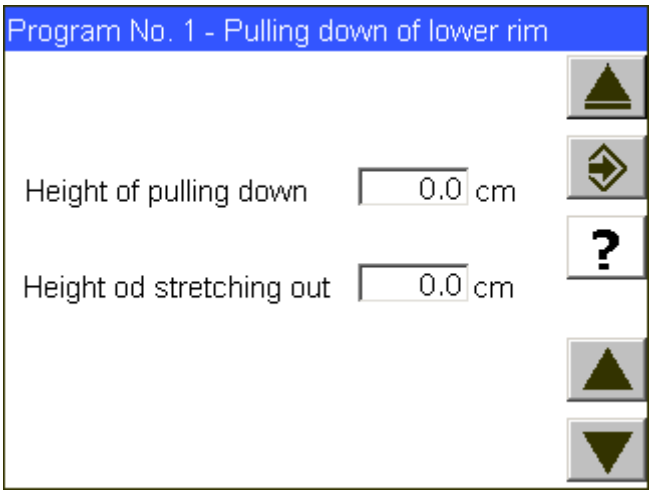
The value written in the yellow-highlighted field can be copied into the remaining fields using push-button **S ALL** (secondary) or **P ALL** (primary).

For variant Double, the values are common.

Push-buttons for setting film stretch:

Parameter	Description	Unit	Range	Value
P	Primary film prestretch – the value of the film prestretch between the prestretch device rollers – for the two-motors prestretch device only	%	80 to 400	160
S	Secondary film prestretch – the value of the film prestretch between the prestretch device rollers and the pallet	%	60 to 200	100

Pulling down of lower rim



The screen enables defining of the frame height from the pallet bottom when the film is pulled down and stretched out. The setting enables precise defining of the pulled down film rim.

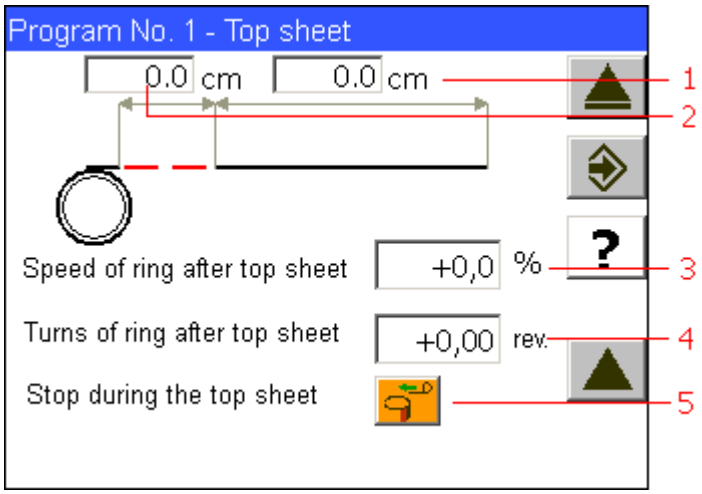
Height of pulling down – the distance from the frame lower position when pulling down of the film is started during the down movement of the frame.

Height of stretching out – the distance from the frame lower position when stretching out of the film is started during the upward movement of the frame.

For variant Double, the values are common.

In the case the possibility is not chosen in the wrapping configuration the values are in the grey field and they cannot be edited.

Top sheet



In the case the wrapping with top sheet is not selected the values are in the grey field and they cannot be edited.

Parameter	Description	Unit	Range	Value
1	Length of the film determines the dimension of the cut off top sheet film.	cm	0 to 250	120
2	Shift of the film determines the distance of its shifting after cutting off and it enables the film to be centred with respect to the pallet.	cm	0 to 100	10
3	Speed of the ring after the top sheet determines speed of the ring after the top sheet film has been laid.	%	20 to 100	50
4	Turns of the ring after the top sheet determines the number of revolutions accomplished at the speed after the top sheet.	-		1
5	Stop during the top sheet will stop the ring rotation during laying the top sheet film.	-		

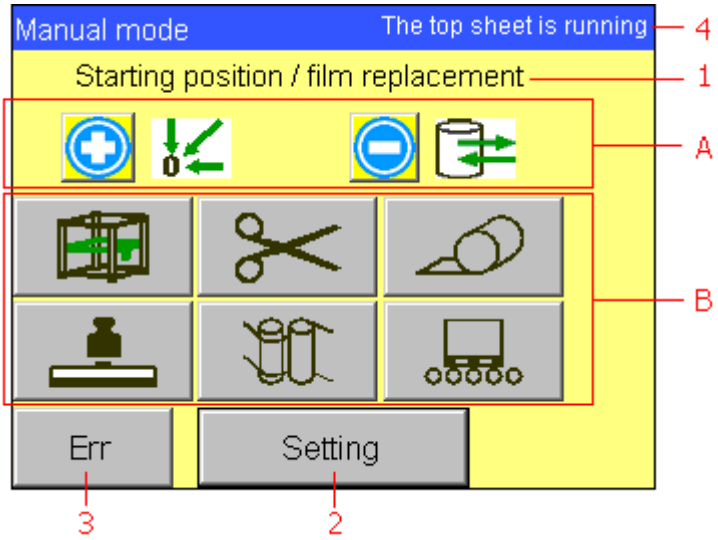
6.10. Manual mode of machine

The control system of the machine enables manual control of its individual mechanisms. This control is not intended to be used in conventional wrapping; it is utilized for manipulation with the machine during service works or in solving emergency situations.

The **manual mode** of the machine can be entered by means of the change-over switch on the control panel. The manual mode is terminated by switching over to the automatic mode by means of the change-over switch on the control panel.

6.10.1.Display content

After switching on the machine set to the manual mode or after switching over to the manual mode, the screen will show the basic display of the manual mode to which the machine is set:



1 Description of the manual function which is active (which can be controlled). After switching over to the manual mode, this is the function Starting position – film replacement.

2 The push-button for transition to editing the parameters and setting the machine.

3 If an error occurs push-button **ERR** will change its colour and the screen will show the window with information on the defect. See Chapter 7

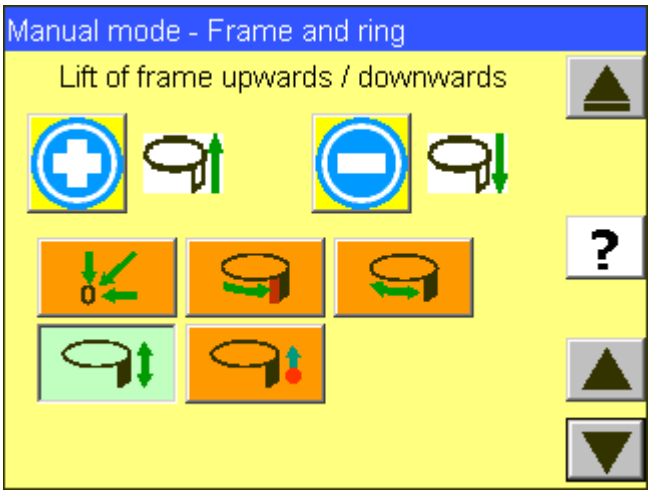
4 Information on the running operation (description in the automatic mode).

A The Help for movement to the position for the film replacement and to the starting position. This movement can be carried out directly from this basic display by means of mechanical push-buttons "**+**" and "**–**" on the control panel of the machine.

B Direct switching over of groups of manual functions.

Individual movements are combined into logical groups according to mechanisms. They are switched over by the group of change-over switches B.

Individual groups do not only include push-buttons for controlling mechanisms of the given group; the groups can also contain mechanisms belonging to a different group in the case the possibility of their control is purposeful.



Icons "**+**" and "**–**" serve, in addition to these symbols, as helps in direct control of the mechanisms. These icons are non-functional; if you try to use them for controlling the machine a message appears "This is a non-functional push-button". The mechanisms are directly controlled using mechanical push-buttons "+" and "-" on the switchboard panel.

Using push-button **TRANSITION BY ONE LEVEL UP** you can return from any group of manual functions back to the main display of the manual mode.

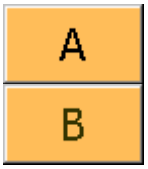
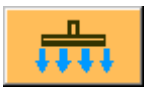
Use push-buttons **NEXT PAGE** and **PREVIOUS PAGE** to switch over between individual groups of manual functions in the sequence:

Display			
Main display of manual mode			
Frame and ring			
Ending			
Top sheet			
Top platen			
Prestretch device			
Line			
Conveyors (in the case they are controlled by your wrapping machine)			

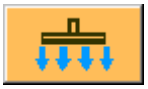
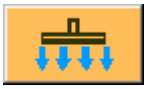
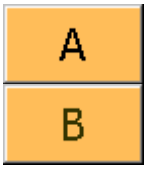
6.10.2.List of manual functions

The following table presents the list of manual functions, their description, and control. In the case some mechanism from the list of manual functions is not mounted on your machine the particular manual function is irrelevant.

Display content		Control
Main display of manual mode		
	**Starting position / film replacement**	**+** it starts putting the machine mechanisms into the starting position (see Chapter 6.10.3) **–** it starts moving the frame to the height for replacing the wrapping film (see Chapter 6.10.3) and turning the ring into an oriented position. After the position for replacing the film has been reached, it is possible to continue in movement down to the position for replacing the top sheet film by repeated depressing of the push-button.
Group of manual functions **Frame and ring**		
	**Starting position / film replacement**	**+** it starts putting the machine mechanisms into starting position (see Chapter 6.10.3) **–** it starts moving the frame to the height for replacing the wrapping film (see Chapter 6.10.3) and turning the ring into the oriented position. After the position for replacing the film has been reached, it is possible to continue in movement down to the position for replacing the top sheet film by repeated depressing of the push-button.
	**Oriented stop of ring**	**+** it starts the cycle of turning the ring to the oriented position (i.e. in the starting position)
	**Ring forwards / backwards**	**+** it puts the ring in the counter-clockwise movement (while the push-button is held depressed). **-** it puts the ring in the clockwise movement (while the push-button is held depressed).
	**Lift of frame with ring upwards / downwards**	**+** it puts the frame in movement in the direction upwards (while the push-button is held depressed); at the upper end-limit sensor the movement stops. **–** it puts the frame in movement in the direction downwards (while the push-button is held depressed); at the lower end-limit sensor the movement stops.
	**Lift of frame - releasing**	**+** it puts the frame in movement in the direction upwards at the minimum speed. This function serves for releasing the lift securing in case of its self-gripping – the function is only accessible for the user's level 5 and higher.

Display content		Control
Group of manual functions **Ending**		
		It switches over the function of ending for the ending device A/B – it applies to the variant with two prestretch devices only.
	**Ending complete**	+ it starts the complete cycle of ending, including necessary revolutions of the ring (for variant Double of both ending devices)
	**Bracket of ending**	In variant Double, movement on the ending device A or B is performed according to selection of the change-over switch. + it puts the bracket in movement in the direction to the pallet (while the push-button is held depressed). The movement is only possible in the case lever 1 is tilted to the lower position. – it puts the bracket in movement in the direction from the pallet (while the push-button is held depressed).
	**Lever 1** (lever with sensor of the bracket approaching to the goods)	In variant Double, movement on the ending device A or B is performed according to selection of the change-over switch. + it tilts the lever to the lower position; – it tilts the lever to the upper position
	**Lever 2** (with cutting wire)	In variant Double, movement on the ending device A or B is performed according to selection of the change-over switch. + it tilts the lever to the lower position; – it tilts the lever to the upper position
	**Lever 3** (with welding strip)	In variant Double, movement on the ending device A or B is performed according to selection of the change-over switch. + it tilts the lever to the lower position; – it tilts the lever to the upper position
	**Air holder**	In variant Double, movement on the ending device A or B is performed according to selection of the change-over switch. + it switches on the air holder on the wrapping film for the period of holding the push-button (while the push-button is held depressed)
	**Cutting**	In variant Double, movement on the ending device A or B is performed according to selection of the change-over switch. + power supply to the cutting wire (the film is cut)
	**Welding**	In variant Double, movement on the ending device A or B is performed according to selection of the change-over switch + power supply to the welding wire

Display content		Control
Group of manual functions **Top sheet**		
	**Top sheet completed**	**+** it starts the complete cycle of top sheet – the sensor for measuring height of the goods must be above the upper edge of the goods.
	**Bracket of top sheet**	The bracket bearing the movable tongs of the top sheet. **+** it puts the bracket in movement in the direction from the container of the top sheet film (while the push-button is held depressed). **–** it puts the bracket in movement in the direction to the container of the top sheet film (while the push-button is held depressed).
	**Cutting**	**+** it switches on power supply to the cutting wire for the period of holding the push-button.
	**Fixed tongs**	**+** it tilts the tongs to their upper position (open). **–** it tilts the tongs to their lower position (closed).
	**Movable tongs**	The tongs fitted to the top sheet bracket hold the film during its pulling out from the container. **+** it tilts the tongs to their upper position (open). **–** it tilts the tongs to their lower position (closed).
	**Lever of cutting**	Control of the lever with the cutting wire for detaching the top sheet film. **+** it tilts the lever to its upper position. **–** it tilts the lever to its lower position (position for cutting).
	**Starting position / film replacement**	**+** it starts putting the machine mechanisms into their starting position (see Chapter 6.10.3) **–** it starts moving the frame to the height for the wrapping film replacement (see Chapter 6.10.3) and turning the ring to the oriented position. After the position for the film replacement has been reached, it is possible to go on in the movement down to the position for the top sheet film replacement by repeated depressing of the push-button.

Display content		Control
	**Top platen upwards / downwards**	Control of movement of the top platen plate. **+** it puts the frame in movement in the direction upwards (while the push-button is held depressed); at the upper end-limit sensor the movement stops. **–** it puts the frame in movement in the direction downwards (while the push-button is held depressed); at the lower end-limit sensor the movement stops.
	**Lift of frame with ring upwards / downwards**	**+** it puts the frame in movement in the direction upwards (while the push-button is held depressed); at the upper end-limit sensor the movement stops. **–** it puts the frame to movement in the direction downwards (while the push-button is held depressed); at the lower end-limit sensor the movement stops.
Group of manual functions **Top platen**		
	**Top platen upwards / downwards**	Control of movement of the top platen plate. **+** it puts the plate in movement in the direction upwards (while the push-button is held depressed); at the upper end-limit sensor the movement stops. **–** it puts the plate to movement in the direction downwards (while the push-button is held depressed); at the lower end-limit sensor the movement stops.
	**Air holder front**	**+** it switches on the flow on the top sheet film (on the side at the film container) while the push-button is held depressed – when placed on the top platen the air holder is not functional.
	**Air holder rear**	**+** it switches on the flow on the top sheet film (on the side from the film container or on the top platen) while the push-button is held depressed
	**Top platen - releasing**	**+** it puts the frame in movement in the direction upwards at minimum speed. This function serves for releasing the lift securing in case of its self-gripping – the function is accessible only for the user's level 5 and higher.
Group of manual functions **Prestretch device**		
		It switches over functions of the prestretch device for the prestretch device A/B – it applies only to the variant with two prestretch devices.

Display content		Control
	**Pulling down of film**	Control of the pulling down device of the bottom rim of the film installed on the prestretch device. In variant Double, movement on the ending device A or B is performed according to selection of the change-over switch. **+** it pulls the film down. **–** it releases pulling of the film down.
Manual function of conveyors This group is only depicted when your wrapping machine controls also the conveyors and/or the wrapping line. The control is based on the flow chart of your line; negative number designates conveyors upstream of the wrapping machine; number 0 means a conveyor in the working area of the wrapping machine; positive number marks conveyors downstream of the wrapping machine. The flow chart is oriented so that it would correspond to the view of the wrapping line from the control panel. The following push-buttons on the displays are used to control the line:		
	**Conveyor *n* forwards**	**+** conveyor forwards. The arrow on the push-button for selecting the conveyor as well as in the help row on the display of manual functions corresponds to the direction forwards when viewing from the control panel of the wrapping machine. The conveyor can move forwards only. **–** no function
	**Conveyor n forwards / backwards**	**+** conveyor forwards. The arrow on the push-button for selecting the conveyor as well as in the help row on the display of manual functions corresponds to the direction forwards when viewing from the control panel of the wrapping machine. **–** conveyor backwards
	**Lift of pallets**	Control of the lifting device of the pallets for under-wrapping or better fixation of the goods to the pallet. **+** the pallet is lifted. **–** the pallet is lowered to provide for passage on the conveyor
	**Turn (turntable) forwards / backwards**	**+** Turn forwards (as a standard in the clockwise direction) **–** Turn backwards

6.10.3.Starting position of machine

In order to minimize emergency situations during operation, two basic standstill states are defined for this machine. In the beginning of wrapping, the machine checks whether it is in the starting position; otherwise, it moves to this position and only then the wrapping is started.

Starting position of machine	The machine starts and ends the cycle in this position. 1) The top platen is in the upper position 2) The frame with the ring is in the upper position. 3) The bracket of ending is in the starting position. 4) The levers of ending are in the starting position. 5) The front end of the film is inserted between the levers of ending 2 and 3. 6) The ring is in the oriented (initial) position. 7) The top sheet device is in the starting position.
Position of machine for film replacement	The most favourable position of the machine for the film replacement. 1) The frame with the ring is in the position for the film replacement.

6.11. Service parameters of machine

These parameters of the machine are used for adjustment of the machine functions during its assembly or repair. They can also be used for adapting the machine functions to particular operation, environment, and wrapped goods. They are important for correct function of the machine; their incorrect setting can result in the machine failure or in a health risk. Therefore these parameters are not ordinarily accessible for usual operators of the machine and are protected with a password against unauthorized interventions. The service parameters are divided into three groups:

1	Service parameters 1	Their change influences the machine behaviour, quality and efficiency of wrapping; their improper using can result in poor-quality or non-economical wrapping. The parameters are accessible to qualified staff of the user; the required password for entering the editing is of level P (Maintenance) - see Chapter 6.4.5
2	Service parameters of line	Their change affects operation of machines in the surroundings of the wrapping machine in the case they are controlled by the system of the wrapping machine (for instance, conveyors). The parameters are accessible to qualified staff of the user; the required password for entering the editing is of level P (Maintenance) - see Chapter 6.4.5

3	Service parameters 2	Setting of the parameters is critical for the machine function, as their improper setting could damage the machine or lead to injury of persons. They can only be accessed by the manufacturer or the service organization; the required password for entering the editing is of level S (Service) - see Chapter 6.4.5

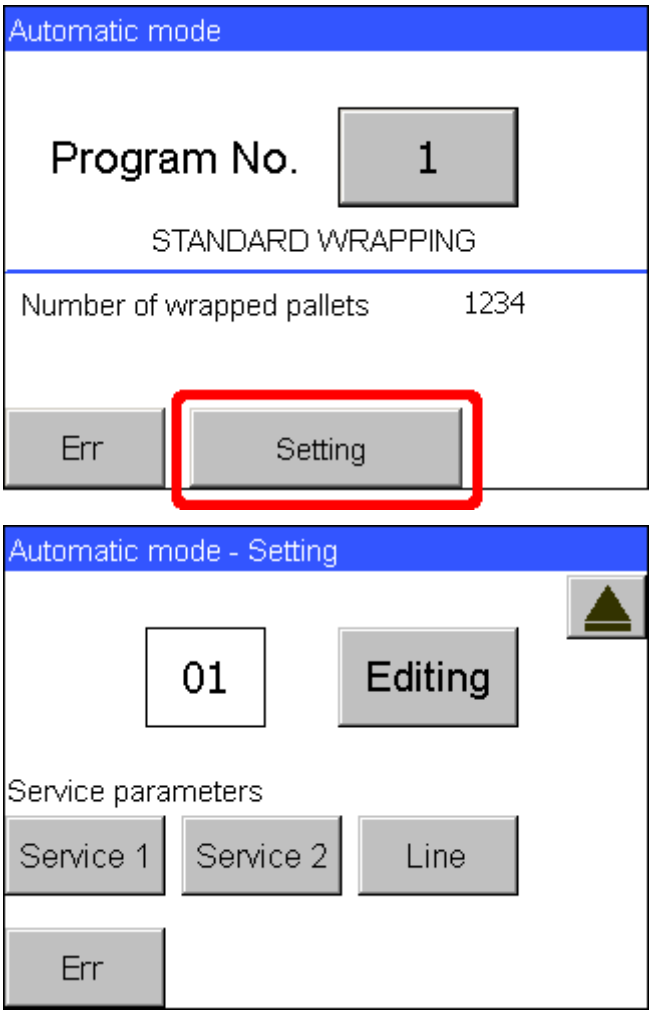
The values of all parameters are set by the manufacturer so that they would suit to substantial majority of conventional wrapping methods.

6.11.1.Editing of service parameters

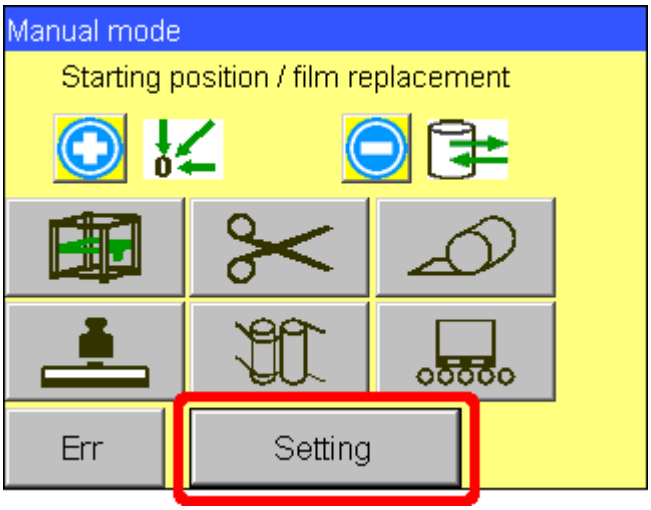
Entry to mode of editing service parameters

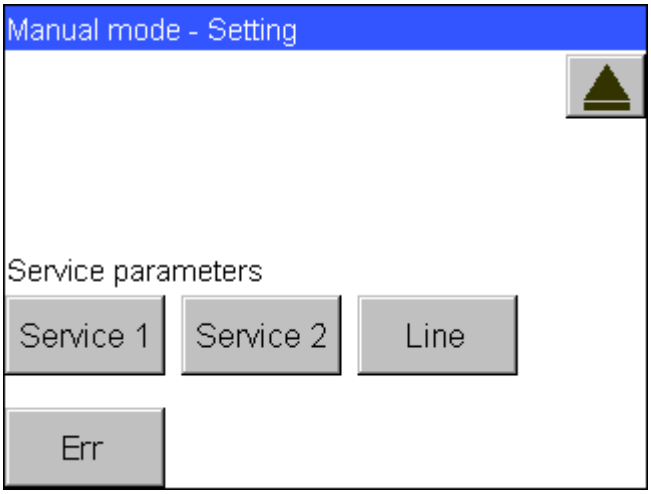
The service parameters can be called and edited both in the manual and in the automatic mode of the machine.

Touch push-button **Setting** to pass from the main display of the automatic mode to the dialog box of programming and setting the machine:

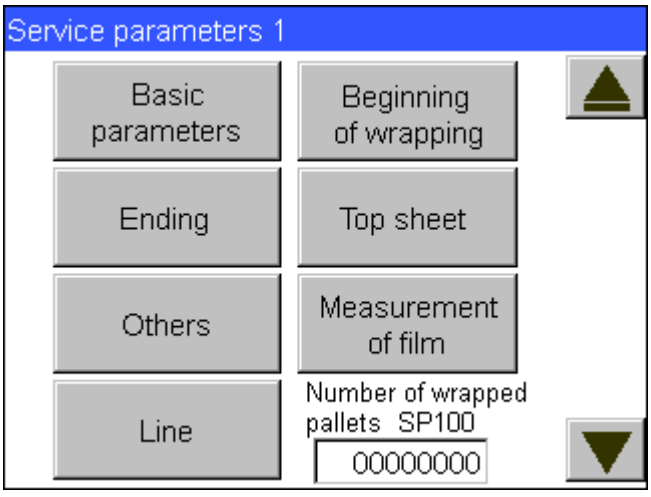


Similarly, you can pass to editing the service parameters from the main display of the manual mode using push-button **Setting**:

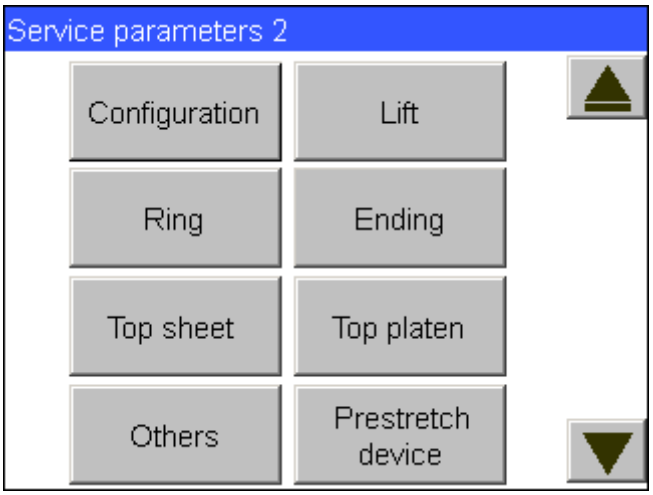




Touch push-button **Service 1** (in any mode) to depict the main display of service parameters 1. It serves as a "signpost" for a shortened access to individual groups of service parameters 1. For the change in service parameters 1, it must be entered (see Chapter 6.11, 6.4.6).



Similarly, by touching push-button **Service 2** (in any mode) you can depict the main display of service parameters 2. As a standard, most of the service parameters 2 can be shown; just some displays are not accessible and can be depicted after correct password has been entered. For changing service parameters 2, which can be standardly shown, it is necessary to enter corresponding password (Chapter 6.11, 6.4.5).



According to their function, service parameters 1 and Service parameters 2 are divided into logical groups.

Touch push-button **Line** to enter the dialog of editing the line parameters.

If the password is entered it remains valid until logging off using push-button **Logoff** as described in Chapter 6.4.6.

Touch push-buttons **Next page**, **Previous page** and **Transition by one level up** to switch over between individual groups of the service parameters.

Push-buttons for transition between the groups of **service parameters 1**:

Service parameters 1	▼	▲	⏏
Main display of service parameters 1			
Basic parameters			
Beginning of wrapping			
Ending 1			
Ending 2			
Ending 3			
Top sheet 1			
Top sheet 2			
Others			
Measurement of film 1			
Measurement of film 2			
Setting language (for details see Chapter 8.22)			

Push-button for transition between the groups of **service parameters 2**:

Service parameters 2			
Main display of service parameters 2 - 1			
Main display of service parameters 2 - 2			
Configuration of machine 1			
Configuration of machine 2			
Configuration of machine 3			
Lift 1			
Lift 2			
Lift 3			
Lift 4			
Lift 5			
Ring 1			
Ring 2			
Ring 3			
Ring 4			
Ring 5			
Ring 6			
Ending 1			
Ending 2			
Top sheet 1			
Top sheet 2			
Top platen 1			
Top platen 2			
Others 1			
Others 2			
Prestretch device 1			
Prestretch device 2			
Windows Info 1 to Info 3 and Statistics are available for the manufacturer and service only.			
Info 1			
Info 2			
Info 3			
Statistics			

Change in parameter values

After entering particular area of the service parameters, all parameters without limitation can be watched and browsed.

Procedure mentioned in Chapter 6.4 are valid for changing values of the parameters.

New value of a parameter is immediately stored without any confirmation.

Ending of mode of editing service parameters

The mode of editing the service parameters can be stopped in some of the following manners:

Select the function Transition by one level up in the main display of service parameters 1 or 2 to get to the main screen of the manual or automatic mode (depending on which mode the machine is found in).

By turning change-over switch **AUTOMATIC – MANUAL MODE**.

Both ways are equal and lead to ending the editing of the service parameters.

6.11.2.Service parameters 1

(Note: Numbers of parameters correspond to internal numbers in the program code; they are relevant in possible communication with the manufacturer or the service organization, for instance, during a phone consultation of problems).

Parameter	Range	Dimension
Description		
Service parameters 1 - basic parameters		
110 Height for film replacement	0 to 1500	mm
The frame with the ring and the prestretch device moves to this height in replacing the consumed stretch film. The height is measured from the bottom end-limit scanner of the frame travel.		
111 Height for top sheet film replacement	0 to 1500	mm
The frame with the ring and the prestretch device moves to this height in replacing the consumed top sheet film. The height is measured from the bottom end-limit scanner of the frame travel.		
112 Height of goods	0 to 3000	mm
The value determines maximum height of wrapping; above this value the pallet is not wrapped. Value 0 switches off the function and the pallet is wrapped according to the measured height. If a value higher than 0 is set the wrapping is carried out according to the rules: • the goods are higher than the set value: wrapping up to the height set by this parameter; • the goods are lower than the set value: the goods are wrapped up to the height scanned by the optical sensor. Leave this parameter on the value set by the manufacturer or service.		
120 Film - Limit	0 to 30	mm
Thickness of the wound-up film when the running-out film is signalled.		
121 Slowing down of the machine if the line is not filled up	20 to 100	%

Parameter	Range	Dimension
Description		
If the wrapping line is not filled up the wrapping is running at a maximum speed set by this parameter (percentage of the maximum speed). The machine mechanisms as well as energy are saved.		
Service parameters 1 – beginning of wrapping		
122 Secondary stretch of the film in the beginning	60 to 200	%
Value of secondary stretch of the film in the beginning of wrapping.		
123 Primary stretch of the film in the beginning	80 to 400	%
Value of primary stretch of the film in the beginning of wrapping.		
124 Angle of stretch in the beginning	5 to 360	°
The angle for which the stretch in the beginning is valid. During this period, the film is catched at the edges of the goods on the pallet. The film is thus not pulled out from the lever of ending.		
125 Number of attempts at releasing the film	1 to 5	-
The number attepts at releasing the film in the beginning of wrapping. During the set number of revolutions, the levers of ending open and close after each revolution. In the case the film remains catched between the levers it will be released during these openings of the levers.		
126 Time of air holder in releasing the film	0 to 20	s
The time for which the flow of air from the air holder udevice of ending holds the released end of the film in the beginning of wrapping until its is wrapped to the pallet.		
Service parameters 1 – parameters of ending 1		
131 Time of welding film A	0.1 to 5.00	s
For this period, the resistance strip is heated in the welding lever.		
132 Time of welding film B	0.1 to 5.00	s
For this period, the resistance strip is heated in the welding lever.		
133 Time of cooling down of film A	0.1 to 5.00	s
The period between welding the film and opening the lever of the ending mechanism. During this period, the film is cooled down so that the welded joint would have sufficient strength.		
134 Time of cooling down of film B	0.1 to 5.00	s
The period between welding the film and opening the lever of the ending mechanism. During this period, the film is cooled down so that the welded joint would have sufficient strength.		
Service parameters 1 – parameters of ending 2		
135 Number of cycles	0 to 20	-
Lower number of cycles (left column) serves for evaluating frequency of welding and for shortening the period of welding during heating up the welding laths.		
136 Time for change	0 to 999	s
The time for number of cycles according to parameter 135		
137 Change in time of welding	0.00 to 5.00	s
The value of shortening the time of welding while meeting the conditions according to parameter 135, 136		
138 Number of cycles	0 to 20	-

Parameter	Range	Dimension
Description		
Higher number of cycles (right column) serves for evaluating frequency of welding and for shortening the period of welding during heating up the welding laths.		
139 Time for change	0 to 999	s
The time for number of cycles according to parameter 138		
140 Change in time of welding	0.00 to 5.00	s
The value of shortening the time of welding while meeting the conditions according to parameter 138, 139		
Service parameters 1 – parameters of ending 3		
141 Secondary stretch of the film during ending	60 to 200	%
The value of the film stretch during ending		
142 Primary stretch of the film during ending	80 to 400	%
The value of the film stretch during ending (for 2M prestretch device only).		
143 Track of pushing out the levers	100 to 600	mm
The track for which the levers of ending are pushed out beyond the wrapped pallets. Only then, are the levers tilted down to their initial (horizontal) position.		
144 Pushing away the brackets of ending	0.10 to 5.00	s
The period for which the ending mechanism will move away from the wrapped goods before the ending; it influences the film tightness during ending. In the case the value is too high the final layer of the film is wound up freely. If it is too small there is a danger of of the goods being catched by the levers of ending during their tilting down.		
145 Pushing away the bracket of ending – beginning	0.10 to 5.00	s
The period for which the ending mechanism will move away from the wrapped goods after approaching in the beginning of wrapping. Pushing away ensures that the levers of ending do not come into contact with the goods during beginning of wrapping.		
Service parameters 1 – parameters of top sheet 1		
150 Top sheet height	50 to 400	mm
The distance between the top sheet film and the top of the wrapped pallet after the top sheet film has been pulled out (during cutting off).		
151 Period of the film cutting in the top sheet	0.10 to 5.00	s
For this period, the cutting lever in the top sheet mechanism is tilted down.		
154 Angle of stopping during the top sheet	0 to 359	°
For this period, the cutting lever in the top sheet mechanism is tilted down.		
Service parameters 1 – parameters of top sheet 2		
155 Delay of the front air holder	0.0 to 9.9	s
Delay of air holder on the top sheet film at the side of the film container– delay from the moment of cutting off the film.		
156 Delay of the rear air holder	0.0 to 9.9	s
Delay of air holder of the top sheet film at the side opposite to the film container – delay from the moment of releasing the film from the movable tongs.		
Service parameters 1 – others		
160 Speed of the frame during lifting the pallet	20 to 100	%

Parameter	Range	Dimension
Description		
Speed of the machine frame during movement of the lifting device of pallets		
161 Height of the frame for lifting the pallet	0 to 999	mm
Height of the frame with the ring from the lower position when lifting of the pallet lifting device is started.		
162 Height of ending at pulling down	0 to 300	mm
The distance of the frame from the bottom for ending (in the stretched out state) in the case the pulling down at the bottom is used.		
163 Film centre	100 to 400	mm
The distance of the upper rim from the film centre – for defining the height during interrupted travel		
164 Angle for recognizing complete rotation	0 to 359	°
In the case the ring of the machine turns in the last revolution by an angle reduced by this value the revolution is recognized as complete.		
Service parameters 1 – measurement of film 1		
170 Film A max	0.00 to 10.00	V
The value of voltage of the analog scanner corresponding to the maximum winding up of the film on the prestretch device A. To be set using push-button SET see….		
171 Film A min	0.00 to 10.00	V
The value of voltage of the analog scanner corresponding to the empty tube on the prestretch device A. To be set using push-button SET see….		
172 Film B max	0.00 to 10.00	V
The value of voltage of the analog scanner corresponding to the maximum winding up of the film on the prestretch device B. To be set using push-button SET see….		
173 Film B min	0.00 to 10.00	V
The value of voltage of the analog scanner corresponding to the empty tube on the prestretch device B. To be set using push-button SET see….		
Service parameters 1 – measurement of film 2		
174 Diameter of film max.	100 to 300	mm
Diameter of the fully wound up roll of the film (the film used in calibration of the sensor)		
175 Diameter of film min.	50 to 150	mm
Diameter the empty tube of the film (the film used in calibration of the sensor)		

6.11.3.Service parameters 2

Parameter	Range	Dimension
Description		
Service parameters 2 – configuration 1		
201 Top sheet	YES – NO	–
It determines the installed outfit of the machine. With the value YES, the top sheet is a part of the machine configuration.		
202 Top platen	YES – NO	–
It determines the installed outfit of the machine. With the value YES, the top platen is a part of the machine configuration.		
203 Air holder of top sheet	YES – NO	–
It determines the installed outfit of the machine. With the value YES, the air holder on the top sheet film is a part of the machine configuration.		
204 Double	YES – NO	–
It determines the installed outfit of the machine. With the value YES, the machine is equipped with two prestretch devices.		
205 Two-motors prestretch device	YES – NO	–
It determines the installed outfit of the machine. With the value YES, the machine is equipped with the two-motors prestretch device		
206 Pulling down	YES – NO	–
It determines the installed outfit of the machine. With the value YES the machine is fitted with the device for pulling down the lower rim of the film into a cord.		
Service parameters 2 – configuration 2		
207 Film measurement	–	–
It determines the installed outfit of the machine. With the value YES, the machine is equipped with measurement of the film reel diameter.		
208 Lift of pallet	YES – NO	–
It determines the installed outfit of the machine. With the value YES, the pallet lift is a part of the machine configuration.		
209 End of wrapping after ending	YES – NO	–
YES gives a signal of end of wrapping after pushing out the lever of ending from behind the wrapping film.		
210 Excluding of the film error	YES – NO	–
YES means that the error of the run-out wrapping or top sheet film is not announced.		
211 Testing of prestretch device	YES – NO	–
For YES, the information on rotation of the ring is continuously handed on to the control system (independently of the actual state) – it serves for testing the prestretch device that is fully functional in this state even with the stopped ring.		
212 Second reference	YES – NO	–

Parameter	Range	Dimension
Description		
With the value YES, the sensors for the second reference position of the machine frame are parts of configuration.		
Service parameters 2 – configuration 3		
213 Remote selection of programs	YES – NO	–
With value YES, the programs from the superior system of the line can be switched over.		
214 Selection of way of communication	Binary – Simatic - Ethernet	–
It determines in which way the system communicates with the superior system of the line.		
215 Number of optional programs	1 to 18	–
The number of programs that can be switched over by means of communication signals; for binary it is always 8.		
216 IP address of communication / TCP port	-	–
The address of the system with which the system of the wrapping machine communicats through the ethernet.		
217 External door of fencing	YES – NO	–
With the value YES, the fence door of Rotomatic is connected to the superior system of the line.		
Service parameters 2 – lift 1		
218 Minimum height of the pallet for wrapping	100 to 1000	mm
Minimum height of the correctly wrapped pallet.		
219 Minimum height of the pallet for top sheet	100 to 1500	mm
Minimum height of the pallet correctly wrapped with laying the top sheet film.		
220 Distance of lift scanners	1000 to 7777	mm
The distance of boundary positions of the frame – automatic measurement.		
221 Height of goods for the 2nd reference	0 to 300	cm
The maximum height of the goods at which the machine frame moves away to the 2nd reference position.		
222 Height of 2nd reference	1000 to 7777	mm
The position of activating the sensor of the 2nd reference during movement of the frame from the bottom – automatic measurement.		
Service parameters 2 – lift 2		
223 Travel over of scanner of the 2nd reference	0 to 99	mm
The value by which the frame stops, at the 2nd reference position of the frame, above the value of the parameter Height of 2nd reference		
224 Distance of scanner of goods height	0 to 400	s
The distance of the goods height scanner from the upper rim of the narrowed film.		
225 Height of film in lower position	300 to 600	mm
The distance of upper rim of the narrowed film from the conveyor - the frame in the limit lower position (operating).		

Parameter	Range	Dimension
Description		
226 Recalculation of speed	10 to 100	%
The ratio to which the 100 % value of speed in programs corresponds relatively to the speed in HSP.		
Service parameters 2 – lift 3		
227 Maximum lifting speed	10 to 800	mm/s
Speed of the frame for the HSP converter – The constant for calculations; its change has no effect on the change of lifting speed.		
228 Minimum lifting speed	5 to 100	%
Minimum speed of lifting the frame as percentage of the maximum speed. The frame cannot move slower.		
229 Braking distance of lift downwards	10 to 300	mm
The distance for which the frame with the ring is stoping from HSP		
230 Braking distance of lift upwards	10 to 300	mm
The distance for which the frame with the ring is stoping from HSP		
231 Allowance of the lift final braking	1 to 50	mm
The distance for the lift mooves at low speed during stopping.		
Service parameters 2 – lift 4		
232 Transmission of lift encoder	0.001 to 9.999	mm/imp
The constant for calculating precise measurement of the frame travel distance. The distance that the machine frame travels between individual impulses of the lift encoder.		
234 Deviation of lift reference	0 to 50	%
The value of deviation of movement to the reference position for announcement of an error.		
235 Speed of lift - manual	5 to 100	mm
The speed at which the lift frame moves in the manual mode.		
236 Correction of stopping upwards	-50 to 50	mm
The correction value of stopping.		
237 Correction of stopping downwards	-50 to 50	mm
The correction value of stopping.		
Service parameters 2 – lift 5		
238 LSP of lift converter	10.0 to 100.0	Hz.
Setting of the value of the LSP converter - The constant for calculations; its change has no effect on the change in setting in the converter.		
239 HSP of lift converter	10.0 to 100.0	Hz.
Setting of the value of the HSP converter - The constant for calculations; its change has no effect on the change of lifting speed.		
Service parameters 2 – ring 1		
240 Time of rotation at maximum speed	0.1 to 5.0	s
The time of one roration of the ring at maximum speed. The constant for calculations; its change has no effect on the change of the ring speed.		

Parameter	Range	Dimension
Description		
241 Transmission of ring encoder	100 to 7777	imp/rev
The number of pulses of the encoder per 1 revolution of the ring – automatic measurement.		
242 Minimum speed of ring	5 to 100	%
Minimum speed of the ring as percentage of maximum speed. The ring cannot move slower.		
Service parameters 2 – ring 2		
243 Angle of ring braking	20 to 720	°
The angle at which the rotating ring can stop from maximum speed.		
244 Angle of accelerating period 1 of ring	20 to 999	°
The angle at which the ring can reach maximum speed at low revolutions.		
245 Angle of accelerating period 2 of ring	20 to 999	°
The angle at which the ring can reach maximum speed at high revolutions.		
246 Speed for accelerating period 1	5 to 100	%
The speed of the ring when the change in steepness of the starting up ramp takes place.		
Service parameters 2 – ring 3		
247 Maximum speed of ring during film releasing	20 to 100	%
The speed of the ring during the film releasing at the beginning of wrapping – it ends after the set number of releasings and returns of the lever to the starting position has been performed.		
248 Maximum speed of ring during film ending	20 to 100	%
The speed of the ring during ending.		
249 Speed of ring before ending	20 to 100	%
The speed of the ring in the revolution before ending.		
250 Speed of the ring during positioning	20 to 50	%
The speed of the ring during positioning.		
251 Ring speed - manual	20 to 100	%
The ring speed in the manual mode.		
Service parameters 2 – ring 4		
252 Travel over of ring scanner before return	0 to 360	°
The value of the travel over of the ring during stopping.		
253 Travel over of ring return	0 to 90	°
The value of the ring return during stoping at the flag of oriented stopping.		
254 Angle of slowing down	0.1 to 360.0	°
The angle before the ring braking for which the ring rotates at the speed for positioning.		
255 Correction of positioning	-90 to 90	°
The correction value of the ring positioning.		
256 Delay in ring return	0.01 to 5.00	s
The time of the ring return delay – the dwell before the ring returns during ending.		

Parameter	Range	Dimension
Description		
Service parameters 2 – ring 5		
257 Deviation of ring reference	0 to 50	-
The value of deviation of movement to the reference position for announcement of an error.		
258 Correction the ring braking	0 to 99	°
The correction value for calculations.		
Service parameters 2 – ring 6		
259 Speed reduction – imbalance 1	20 to 100	%
In the case the imbalance 1 is higher – the ring speed must not exceed this value – or be reduced (in the same ratio the lift speed is reduced).		
260 Speed reduction – imbalance 2	20 to 100	%
In the case the imbalance 2 is higher – the ring speed must not exceed this value – or be reduced (in the same ratio the lift speed is reduced).		
261 Ratio of film reels– Imbalance 1	0 to 100	%
The ratio of weight of the film reels for reducing the speed according to imbalance 1.		
262 Ratio of film reels– Imbalance 2	0 to 100	%
The ratio of weight of the film reels for reducing the speed according to imbalance 2.		
Service parameters 2 – ending 1		
267 Position for moving lever 2 - releasing	0 to 180	°
The beginning of movement of the lever 2 of ending after travel over of the oriented stopping during releasing the film.		
268 Time for film releasing	0.01 to 5.00	s
The period of opening the levers of ending during releasing the film.		
269 Position for moving lever 1	0 to 180	°
The beginning of movement of lever 1 of ending after travel over of the oriented stopping.		
270 Position for moving lever 2	0 to 540	°
The beginning of movement of lever 2 of ending after travel over of the oriented stopping.		
271 Position for moving lever 3	0 to 900	°
The beginning of movement of lever 3 of ending after travel over of the oriented stopping.		
Service parameters 2 – ending 2		
272 Time of shifting bracket of ending A to the goods	0.0 to 5.0	s
The time of shifting the bracket to the goods at the beginning of wrapping.		
273 Time of shifting bracket of ending B to the goods	0.0 to 5.0	s
The time of shifting the bracket to the goods at the beginning of wrapping.		
274 Delay in heating of welding	0.0 to 5.0	s
The delay of the beginning of welding after sitting down of the lever to its lower position.		

Parameter	Range	Dimension
Description		
275 Timeout of bracket of ending	1 to 20	s
Maximum time of movement of the bracket of ending.		
276 Distance of ending from the top	300 to 700	mm
The distance of the machine frame from the upper position when the ending cycle can still be accomplished.		
Service parameters 2 – top sheet 1		
280 Speed of top sheet	100 to 999	mm/s
The speed of movement of the top sheet bracket – the value for calculations, it does not influence actual speed.		
281 Dwell of top sheet tongs	0.1 to 9.9	s
Dwells in movements of the film top sheet mechanisms – they eliminate times of movement of the pneumatic mechanisms		
282 Dwell of releasing top sheet film	0.1 to 9.9	s
The dwell for releasing the film from the movable tongs.		
283 Top sheet distance	100 to 800	mm
The distance of the top sheet film and the upper rim of the wrapping film.		
284 Timeout of top sheet bracket	1 to 20	s
The maximum time of movement of the top sheet bracket.		
Service parameters 2 – top sheet 2		
285 Timeout of film - top sheet	0.1 to 9.9	s
Maximum time for which rolling off of the top sheet film is not recorded (no signal from the sensor).		
Service parameters 2 – top platen 1		
290 Transmission of top platen encoder	0.001 to 9.999	mm/imp
The distance which the top platen travels between individual impulses of the top platen encoder.		
291 Correction of top platen position		
It corrects values in calculations – difference between the end-limit position and the position of the scanner opening.		
292 Distance of top platen	0 to 7777	mm
The distance of the top platen plate from the sensor of the goods height in the upper position – automatic measurement.		
293 Dwell in pressing down the film	0.0 to 9. 9	s
The distance which the top platen travels between individual impulses of the top platen encoder.		
294 Delay in accelerating period of top platen	0. 1 to 5.0	s
The delay in the accelerating period of the top platen after loosing the signal from the sensor of position of the top platen frame.		
Service parameters 2 – top platen 2		
295 Distance of top platen braking	0 to 300	mm
The distance (with allowance) necessary for stopping the top platen device from the maximum speed		

Parameter	Range	Dimension
Description		
296 Deviation of top platen reference	0 to 50	mm
The value of deviation of moving to the reference position for announcement of an error.		
297 Timeout of top platen encoder	1 to 10	s
Maximum period for which the encoder movement need not be recorded.		
298 Timeout of top platen	1 to 99	s
Maximum duration of the top platen movement.		
299 Delay in top platen accelerating period upwards	0 to 5.00	s
Delay in accelerating period of the top platen in the direction upwards.		
Service parameters 2 – others 1		
310 Height of pallet lift	0 to 300	mm
The height by which the lifting device lifts the pallet above the conveyor.		
311 Timeout of movement of pneumatic mechanisms	0.1 to 9.9	s
Maximum time of movement of the pneumatic mechanisms.		
312 Timeout of wrapping	20 to 300	s
Maximum time of duration of the wrapping cycle.		
313 Timeout of pallet lift	1 to 20	s
Maximum time of movement of the pallet lift.		
Service parameters 2 – others 2		
314 Timeout of lift encoder	1 to 10	s
Maximum period for which the loss of pulses for the lift run is toletated.		
315 Timeout of ring encoder	1 to 10	s
Maximum period for which the loss of pulses for the ring run is toletated.		
Service parameters 2 – others 3		
316 Timeout for establishing communication	0 to 120	s
Maximum period of establishing connection between the main system and the system of the prestretch device.		
317 Timeout of communication	0.1 to 5.0	s
Maximum period of the fallout of communication between the systems.		
318 Timeout of external communication	0.1 to 5.0	s
Maximum period of the fallout of communication with the external system.		
Service parameters 2 – prestretch device 1		
400 Transmission of encoder of pulses of prestretch device	1 to 600	-
The number of pulses of the measuring roller encoder per 1 m of the wound off film.		
401 Constant of film transmission - motor	1 to 600	-
The length (mm) of the let-out film per 50 ms during HSP		
402 Constant of film transmission – brake	1 to 600	-
The length (mm) of the let-out film per 50 ms during HSP		

Parameter	Range	Dimension
Description		
405 Minimum speed - motor	2 to 20	Hz
Fequency of movement at minimum speed (in releasing the film)		
406 Minimum speed - brake	2 to 20	Hz
Fequency of movement at minimum speed (in releasing the film)		
Service parameters 2 – prestretch device 2		
407 Timeout of film - wrapping	0.1 to 9.9	s
Maximum time for which rolling off of the wrapping film is not recorded – for annpuncement of the film error.		
408 Timeout of pulling down	1 to 10	s
Maximum time of movement of the pulling down device.		
409 Coefficient of calculation		
The value for correcting the calculation.		
410 Running time of UPS	0 to 999	s
The time for which the control system of the prestretch device is supplied form a backup source.		
Service parameters 2 – Info 1 (accessible to the service only)		
450 Number of wrapped pallets	**-**	**-**
The displayed number of wrapped pallets. Information on pallet counters - see Chapter 6.4.7		
453 Number of complete revolutions	**-**	**-**
The number of accomplished revolutions of the last wrapping cycle.		
528 Time of wrapping cycle – taking away of pallet	**-**	**s**
The time of the last wrapping cycle – pallet replacement permitted.		
454 Time of wrapping cycle – end of movements	**-**	**s**
The time of the last wrapping cycle – mechanisms in their starting position – the start possible.		
530 Time of pallet replacement	**-**	**s**
The time from the program ending (pallet replacement permitted).		
Service parameters 2 – Info 2 (accessible to the service only)		
451 Program version - main		
The version of the program of the machine control system.		
452 Program version - prestretch device		
The version of the program of the machine control system.		
Service parameters 2 – Info 3 (accessible to the service only)		
Time of welding A / B		**s**
Current time of welding.		
Time x cycles		**s**
Duration of the displayed number of recent cycles.		
Speed of rotation		**%**
Current speed of the ring		

Parameter	Range	Dimension
Description		
Speed of lift		**%**
Current speed of the lift		
Prestretch P/S		**%**
Current value of the primary (2M only) and secondary prestretch		
Film A/B		**mm**
Current diameter of the film in the prestretch device		
Imbalance		**-**
Current evaluation of imbalance of the film reels in the prestretch devices.		
Service parameters 2 – statistics (accessible to the service only)		
Statistical data providing time and number of revolutions from the cycle start.		
500 Beginning of top sheet – Starting of the top sheet sequences.		
502 End of top sheet – Ending of the top sheet, the frame at the height for revolutions after the top sheet.		
504 Movement to goods – The frame has moved to the height of the wrapping beginning.		
506 In the beginning – Revolutions in the beginning completed.		
508 In the middle – The frame has moved to the height of the revolutions in the middle.		
510 In the middle – Revolutions in the middle completed.		
512 In the end - The frame has moved to the height of the revolutions in the end.		
514 Slowing down of ending - 1		
516 Slowing down of ending -2		
518 Movement – 2nd stripe – The frame has moved to the height of making the 2nd stripe.		
520 Beginning of ending – 1 – The beginning of ending the 1st stripe (in the case wrapping with two stripes).		
522 Beginning of ending – 2 – The beginning of ending (in the case wrapping with two stripes - the 2nd stripe).		
524 End of ending – 1 – The end of ending the 1st stripe (in the case wrapping with two stripes)		
526 End of ending – 2 – The end of ending (in case of wrapping with two stripes – 2nd stripe).		
528 End of wrapping –pallet replacement permitted.		
530 Time of the pallet replacement – The time from the last ending of the program (pallet replacement permitted).		

6.11.4.Service parameters of line

These parameters serve for co-operation of the wrapping machine with other machines in the wrapping line, provided they are controlled by the system of the wrapping machine (for instance, conveyors). Their change influences, for instance, correct position of pallets on the conveyor track, their effective relocation, and other operations of machines in the surroundings of the wrapping machine. They are individual for each machine or line; therefore, they are not described below.

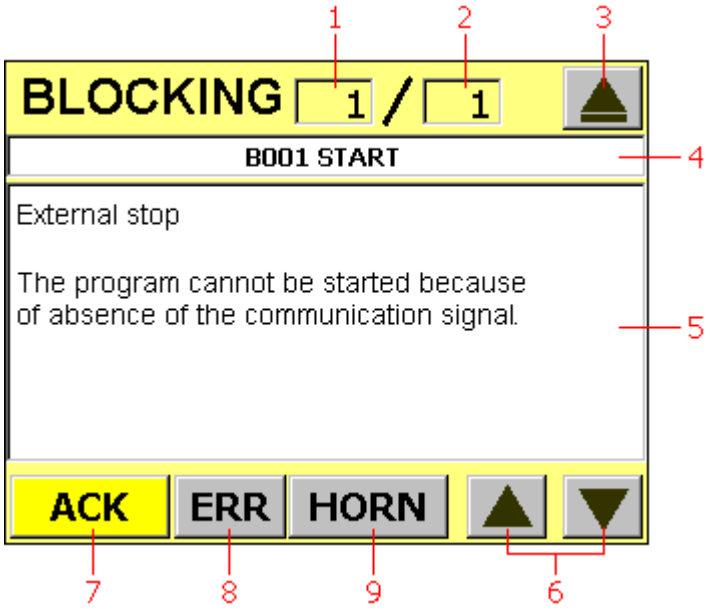
In the case they are used in your wrapping line, their description and function are presented in the separate annex at the end of these Instructions. As a standard, the editing of the service parameters of the line is accessible after entering the required password of level P – Maintenance, unless otherwise stated in the annex.

7. FAILURES AND THEIR REPAIR

7.1. Blocking

The control system watches the machine state. In the case the manual handling or the operation of the machine after signal **START** would result in a collision or in an error state the system will block the given function and the message on the display will show why the required manipulation cannot be carried out. This message is shown for the period of the forced idle state of the machine after starting the program or after depressing key **+** or **–.**

The blocking is announced by the window showing description of the blocking, its cause, and repair.



1 Order number of active blocking.

2 Total number of active blockings.

3 Push-button of hiding the window. The display is shown in which the failure occurred. You can get back to the failure message by touching push-button ERR on the main screen of the manual or automatic mode (the push-button is highlighted in yellow).

4 Designation of blocking.

5 Description of blocking.

6 Push-buttons for browsing through active blockings.

7 Push-button of confirmation.

8 Push-button of the list of failures and blockings.

9 Push-button for switching off the horn (in case it is installed).

Touch the confirmation push-button **ACK** to close the informative window; at the same time, the blocking message is confirmed.

7.1.1. List of blocking messages

Designation of blocking	Description
B001 START	External stop. The program cannot be started because of absence of the communication signal Entry I0.1
B002 START	Pallet under ring. The pallet intrudes into the wrapping area (in front of, under or behind the wrapping machine). Sensors obscured by rests of the film or another obstacle. Incorrect setting of sensors or their failure. Entries I2.6, I2.7
B003 START	Pallet perpendicularity The pallet inclination exceeds the permitted deviation. Sensors obscured by rests of the film or another obstacle. Incorrect setting of sensors or their failure.
B004 START	Obscured scanner of the goods height The pallet obscures the sensor of the goods height (too high goods). Sensors are obscured by rests of the film or another obstacle. Incorrect setting of sensors or their failure. Entry I4.4
B010 STARTING POSITION	Position of top sheet and top platen not defined. Mutual positions of the bracket of top sheet and top platen do not provide for safe automatic moving to the starting position. Set the mechanisms to proper positions by means of manual functions. Manual movement of the top platen upwards recommended – Beware of possible collision with the top sheet bracket.
B011 STARTING POSITION	Pallet under ring. The pallet intrudes into the wrapping area (in front of, under or behind the wrapping machine). Sensors are obscured by rests of the film or another obstacle. Incorrect setting of sensors or their failure. Entries I2.6, I2.7

Designation of blocking	Description
B012 FRAME MOVEMENT	Lever of securing against fall off the upper position. The lever cannot reach the upper position because of gripping with the shaft. (After releasing, manual function - Frame releasing can be used). Insufficient air pressure. Incorrect sensor setting or its failure. Entry I3.5
B013 FRAME MOVEMENT UPWARDS	The frame is in its upper position. The frame has reached its upper end-limit position. Incorrect sensor setting or its failure. Entry DI1(1A3/1)
B014 FRAME MOVEMENT DOWNWARDS	Ending bracket off its starting position. The bracket of ending is not in its end-limit position in the direction from the pallet. Incorrect sensor setting or its failure. Entries I5.1, I8.0
B015 FRAME MOVEMENT DOWNWARDS	Top sheet beyond limit position. The top sheet bracket must be in one of the limit positions. Incorrect sensor setting or its failure. Entries I6.0, I6.1
B016 FRAME MOVEMENT DOWNWARDS	Pallet under ring. The pallet intrudes into the wrapping area (in front of, under or behind the wrapping machine). Sensors are obscured by rests of the film or another obstacle. Incorrect sensors setting or their failure.
B017 FRAME MOVEMENT DOWNWARDS	Frame in the lower position. The frame has reached its lower end-limit position. Incorrect sensor setting or its failure.
B018 FILM REPLACEMENT	Top sheet position not defined. The top sheet bracket must be in one of the limit positions. Incorrect sensor setting or its failure.
B019 FILM REPLACEMENT	Ending position not defined. The bracket of ending is not in the end-limit position in the direction from the pallet. Incorrect sensor setting or its failure.

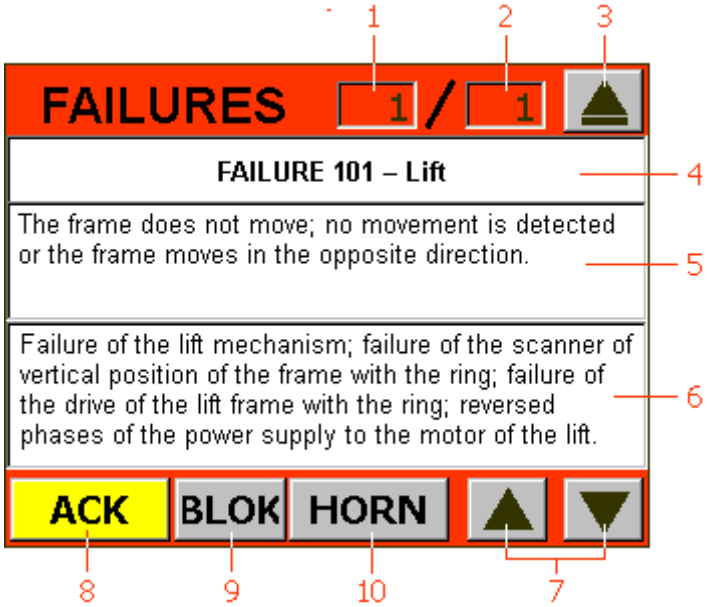
Designation of blocking	Description
B030 –RING	Pallet under ring. The pallet intrudes into the wrapping area (in front of, under or behind the wrapping machine). Sensors are obscured by rests of the film or another obstacle. Incorrect sensors setting or their failure. Entries I2.6, I2.7
B040 – ENDING BRACKETS A	The ending lever 1 is not in the lower position. The ending lever 1 (with goods sensor) is not in its lower position. Incorrect sensor setting or its failure.
B041 ENDING LEVERS A	The ending bracket is not in the starting position. The ending bracket must be in its end-limit position in the direction from the pallet. Incorrect sensor setting or its failure.
B042 ENDING LEVERS 1 A	Lever in touch with the goods The sensor detecting the touch of the lever and the goods is activated. Incorrect sensor setting or its failure.
B043 WELDING A	Levers 1, 2, 3 are not in the lower position. The levers must be in their lower position. Incorrect sensors setting or their failure.
B044 ENDING BRACKETS A	Ending bracket in the limit position. The bracket of ending is in the end-limit position and further movement in the required direction is impossible. Incorrect sensors setting or their failure.
B045 ENDING BRACKETS A	Lever in touch with the goods. Lever 1 is leant on the goods and further movement in the forward direction is impossible. Incorrect sensor setting or its failure.
B050 ENDING BRACKETS B	Ending lever 1 is not in lower position. The ending lever 1 (with goods sensor) is not in the lower position. Incorrect sensor setting or its failure.
B051 ENDING LEVERS B	The ending bracket is not in the starting position. The ending bracket must be in its end-limit position in the direction from the pallet. Incorrect sensor setting or its failure.
B052 ENDING LEVERS 1 B	Lever in touch with the goods The sensor detecting the touch of the lever and the goods is activated. Incorrect sensor setting or its failure.

Designation of blocking	Description
B053 WELDING B	Levers 1, 2, 3 are not in the lower position. The levers must be in their lower position. Incorrect sensors setting or their failure.
B054 ENDING BRACKETS B	Ending bracket in the limit position. The bracket of ending is in the end-limit position and further movement in the required direction is impossible. Incorrect sensors setting or their failure.
B055 ENDING BRACKETS B	Lever in touch with the goods. Lever 1 is leant on the goods and further movement in the forward direction is impossible. Incorrect sensor setting or its failure.
B060 TOP SHEET	Scanner of the goods obscured. The frame is too low and the sensor of the goods height is obscured. Incorrect sensor setting or its failure.
B061 TOP SHEET	The top platen is not in the safe position. The top platen device is not in the upper limit position or there is no signal from the sensor of mutual position of the top platen and the frame. Incorrect sensors setting or their failure.
B062 TOP SHEET	The cutting bracket is not in the upper position. The lever of the top sheet cutting is not in its upper position. Incorrect setting of the sensor, or its failure.
B063 CUTTING BRACKETS	The top sheet bracket is in the starting position. In the case the top sheet bracket is in its end-limit position at the container, the lever of cutting cannot be tilted to its lower position. Incorrect sensor setting or its failure.
B064 TOP SHEET BRACKET	The top sheet bracket is in the limit position. The top sheet bracket is in its end-limit position and further movement in the required direction is not possible. Incorrect sensors setting or their failure.
B070 TOP PLATEN DOWNWARDS	Top sheet off the initial or end-limit position. For the top platen movement, the top sheet bracket must be in one of the limit positions. Incorrect sensors setting or their failure.
B071 TOP PLATEN	The top platen is in the lower limit position. The top platen device has reached the limit position and further movement in the required direction is not possible. Defect of the top platen mechanism preventing its movement. Incorrect sensor setting or its failure.

Designation of blocking	Description
B072 TOP PLATEN	The top platen in the upper limit position. The top sheet bracket is in its end-limit position and further movement in the required direction is not possible. Incorrect sensor setting or its failure.
B073 TOP PLATEN	Lever of securing against falling off the safe position. The lever cannot reach the position enabling the top platen movement. (To release use the manual function - Top platen upwards – releasing). Insufficient air pressure. Incorrect sensor setting or its failure.
B074 TOP PLATEN	The ending bracket is not in the starting position. For moving the top platen, the ending bracket must be in its starting position. Incorrect sensors setting or their failure.

7.2. Failures

If, for any reason, a defect occurs the machine will stop and pilot light **FAILURE** will be lit on in the control panel; the window in the upper part of the display will show the text with the error message and push-button **ACK**. In the automatic mode, the machine is stopped; in the manual mode, the movement being performed is stopped.



1 Order number of active failure.

2 Total number of active failures.

3 Push-button of hiding the window. The display is shown in which the failure occurred. You can get back to the failure message by touching push-button ERR on the main screen of the manual or automatic mode (the push-button is highlighted in red).

4 Designation of failure.

5 Cause and description of failure.

6 Proposal of repairing the failure.

7 Push-buttons for browsing through active blockings.

8 Push-button of confirmation of failure.

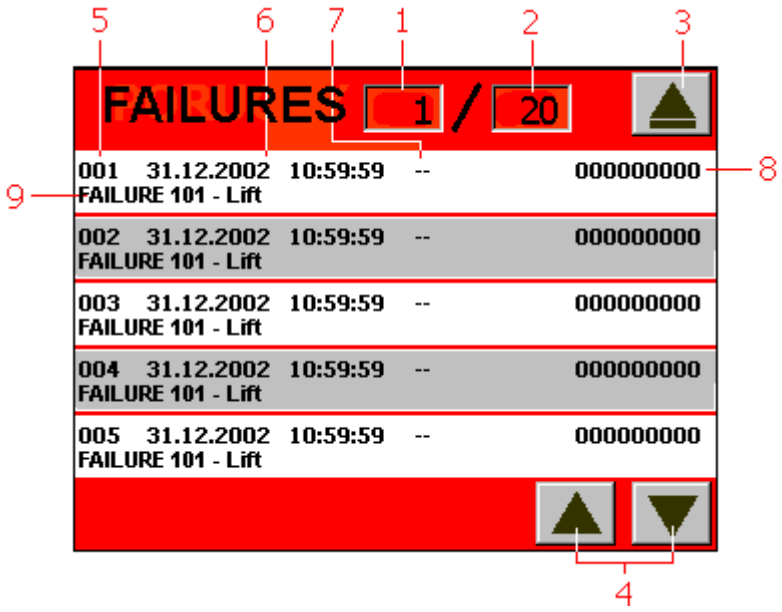
9 Push-button for depicting blockings.

10 Push-button for switching off the horn (in the case it is installed).

In the case the cause of the failure message is known remove the causes of failures and, then, by depressing **ACK** failure message it is confirmed. After push-button **ACK** is depressed, the pilot light is lit off (provided the given failure no more exists).

Push-button **ACK** is at disposal on the failure screen.

The list of defects that have occurred on the machine can be depicted by the service organization on display **Failure report** in the area of Service parameters 2. The list of defects need not be recorded for service technicians.



1 Order number of record page.

2 Total number of pages.

3 Push-button of closed window.

4 Push-buttons for browsing through the list of failures.

The window of the list of errors shows:

5 Order number of failures.

6 Date and time of failure (according to the control system).

7 In the case an error occurred during the automatic wrapping cycle letter B is shown.

8 State of the counter of wrapped pallets (SP450).

9 Designation of failure

7.2.1. List of failure messages

Failure designation	Description	Cause / Repair
FAILURE 101 – Lift	The frame does not move; no movement is detected or the frame moves in the opposite direction.	Failure of the lift mechanism; failure of the scanner of vertical position of the frame with the ring; failure of the drive of the lift frame with the ring; reversed phases of the power supply to the motor of the lift drive (frame moves in opposite direction); reversed inputs of the encoder sensors.
FAILURE 102 – Lift converter	Failure of the lift converter. Power supply to the lift converter.	Check the converter condition. Check the converter power supply.
FAILURE 103 – Ring	The ring does not move; no movement is detected or the ring moves in the opposite direction.	No movement of the ring is indicated; failure of the ring scanner; failure of the ring drive; reversed phases of power supply to the ring drive motor (frame moves in opposite direction); reversed inputs of the encoder sensors.
FAILURE 104 – Ring converter	Failure of the ring converter. Power supply to the ring converter.	Check the converter condition. Check the converter power supply.
FAILURE 105 – Top platen	The top platen does not move; no movement is detected or the top platen moves in the opposite direction.	Failure of the drive; reversed phases of the power supply to the ring drive motor; reversed inputs of the encoder sensors.

Failure designation	Description	Cause / Repair
FAILURE 106 – top platen converter	Failure of the top platen converter. Power supply of top platen converter	Check the converter condition. Check the converter power supply.
FAILURE 108 – Prestretch device not ready	No communication between the main control system and the control system of the prestretch device. Power supply to the control system of the prestretch device.	Check the circuit breakers and fuses. Check the communication cables and their terminals in the auxiliary switchboard on the ring. Check the communication cables and their terminals in the main switchboard and auxiliary switchboard on the upper frame of the cage.
FAILURE 109 – Ring brake	The ring brake manually released by the change-over switch in the switchboard.	Turn the change-over switch to its correct position.
FAILURE 110 – Circuit breaker of input circuits	Power supply to the input circuits interrupted.	Check the circuit breakers and fuses.
FAILURE 111 – Circuit breaker of output circuits	Power supply to the output circuits interrupted.	Check the circuit breakers and fuses.
FAILURE 112 – Overvoltage protection	The unit of overvoltage protection open.	Check the unit of the overvoltage protection.
FAILURE 115 – The machine is not in the starting position	The machine is not able to move to its starting position. Mutual position of the machine mechanisms does not provide for automatic moving to the starting position.	Set the machine mechanisms in the manual mode.
FAILURE 116 – Timeout of wrapping	Maximum time of wrapping exceeded.	Too long wrapping program or a program error.
FAILURE 117 – Timeout of external communication	Exceeded maximum time of the fallout of communication with the superior system	
FAILURE 118 – External STOP	Movements of the machine from the superior line are not permitted.	
FAILURE 120 – Lever of securing against falling of the top platen off its safe position.	The lever is not in its upper safe position. Low pressure of compressed air. The lever gripped by the lift shaft.	Check the mechanism. Check air pressure. Releasing of the mechanism by the manual function Frame releasing.

Failure designation	Description	Cause / Repair
FAILURE 121 – Lower emergency end-limit switch of the frame	The lower emergency switch has closed during the frame movement.	Failure of the scanner of the vertical position of the frame with the ring. Incorrect machine parameters entered; shifting of the end-limit sensors or their failure.
FAILURE 122 – Scanner of chain tightening	One of the chain sensors is open. The frame has sat down on the goods. The lift chains slacked.	Check the state of chains. Check the sensors of the chain tightening.
FAILURE 123 – Pallet under ring	The pallet intrudes into the wrapping area (in front of, under or behind the wrapping machine). Sensors obscured by rests of the film or another obstacle.	Check placement of the pallets. Check obscured sensors by foreign objects. Check the sensors
FAILURE 124 – Sensor of goods height	Non-permitted obscuring of the sensor of the goods height during starting the program. Too high goods. Incorrect sensor setting or its failure.	Check the sensor of the goods height
FAILURE 125 – Error of lift reference	The actual value of the frame position does not correspond to the expected value.	Check the lift encoder.
FAILURE 126 – Error of movement to the 2nd reference position	The actual value of the frame position does not correspond to the expected value.	Check the lift encoder.
FAILURE 127 – Error of reference ring	The actual value of the frame position does not correspond to the expected value.	Check the sensors of the ring encoder.
FAILURE 128 – Tightening of the belt of the ring drive	Low tightening of the belt of the ring drive or it is damaged.	Check condition of the ring drive belt. Check the sensor detecting reduced tightening of the belt. Replace or tighten the belt.
FAILURE 130 – Bracket of ending A	The bracket of ending did not reach required position within a time limit.	Check the mechanism of the ending travel. Check the circuit breaker of the ending travel. Check the sensors of the ending travel.

Failure designation	Description	Cause / Repair
FAILURE 131 – Bracket of ending B	The bracket of ending did not reach required position within a time limit.	Check the mechanism of the ending travel. Check the circuit breaker of the ending travel. Check the sensors of the ending travel.
FAILURE 132 – Closed scanner of goods A	Closed scanner of the goods in the case the lever 1 is not in its lower position	Check the sensor in lever 1
FAILURE 133 – Closed scanner of goods B	Closed scanner of the goods in the case the lever 1 is not in its lower position	Check the sensor in lever 1
FAILURE 134 – Cutting and welding of film	Power supply to the cutting or welding. Power supply to the top sheet film cutting	Check the circuit breakers
FAILURE 140 – Error of top sheet film	The top sheet film has run out or it has been released or ruptured.	Replace the top sheet film. Insert the top sheet film once again.
FAILURE 141 – Incorrect position of the movable tongs of top sheet	The movable tongs are in an incorrect position.	Check the mechanism of the movable tongs of the top sheet. Check the air pressure.
FAILURE 142 – Top sheet bracket	The top sheet bracket has not reached the required position.	Check the mechanism of the top sheet travel. Check the circuit breaker of the top sheet travel. Check the sensors of the top sheet travel.
FAILURE 143 – Top sheet is off its starting position	Incorrect position of the top sheet bracket	Check the mechanism of the top sheet travel. Check the circuit breaker of the top sheet travel. Check the sensors of the top sheet travel.
FAILURE 150 – The lever of securing against falling of the top platen off the safe position	The lever is not in the upper safe position. Low pressure of compressed air. The lever gripped by the top platen arms.	Check the mechanism. Check air pressure. Release the mechanism of manual functions Top platen upwards – releasing.
FAILURE 151 – Error of top platen reference	Actual value of the top platen position does not correspond to the expected value.	Check the sensors of the top platen encoder.

Failure designation	Description	Cause / Repair
FAILURE 152 – Timeout of top platen	The top platen has not reached the required position; maximum time of movement exceeded.	Check the mechanism of the top platen. Check the lifting strap. Check the direction of the strap winding up.
FAILURE 160 – Pallet lift	The pallet lift has not reached the required position. Too heavy goods.	Check the mechanism of the pallet lift. Check air pressure.
FAILURE 170– Pneumatic system	Some of the pneumatic mechanisms are not in the required position (it has not reached the position within a set time).	Check air pressure. Check the valves and pneumatic mechanisms.
FAILURE 180– Emergency stop	The machine has been stopped by push-button EMERGENCY STOP on the wrapping machine.	Remove the cause of the emergency stopping. Unblock the push-button of emergency stop. Switch on the control voltage.
FAILURE 181 – External emergency stop	The machine has been stopped by push-button EMERGENCY STOP on a neighbouring line.	Remove the cause of the emergency stopping. Unblock the push-button of emergency stop. Switch on the control voltage.
FAILURE 182 – Protective covers	Open door of the protective fence.	Close and lock the fence door.
FAILURE 183 – Optical barriers	Attempt at non-permitted access to the working area of the machine on the transport track. Fall of the goods from the pallet to the space of the barrier.	Remove the cause of blocking. Unblock the barriers in the manual mode. Reset the barrier protective module.
FAILURE 200 – Converter of motor of prestretch device A	Failure of the prestretch device converter. Power supply to the prestretch device converter.	Check the converter condition. Check power supply to the converter.
FAILURE 201 – Converter of motor of prestretch device B	Failure of the prestretch device converter. Power supply to the prestretch device converter.	Check the converter condition. Check power supply to the converter.
FAILURE 202 – Converter of prestretch device brake	Failure of the converter of the prestretch device brake. Power supply to the converter of the prestretch device brake.	Check the converter condition. Check power supply to the converter.

Failure designation	Description	Cause / Repair
FAILURE 204 – Inserting device of film A	The inserting device of the film open. The inserting device of the film non-secured.	Close and secure the film inserting device. Check the sensors of the film inserting device.
FAILURE 205 – Inserting device of film B	The inserting device of the film open. The inserting device of the film non-secured.	Close and secure the film inserting device. Check the sensors of the film inserting device.
FAILURE 206 – holder of film A	The film holder tilted out. The film holder non-secured.	Close and secure the film holder Check the sensors film holder.
FAILURE 207 – holder of film B	The film holder tilted out. The film holder non-secured.	Close and secure the film holder Check the sensors film holder.
FAILURE 208 – Error of film A	The wrapping film has run out. Ruptured wrapping film.	Replace the wrapping film. Insert the wrapping film once again.
FAILURE 209 – Error of film B	The wrapping film has run out. Ruptured wrapping film.	Replace the wrapping film. Insert the wrapping film once again.
FAILURE 210 – Timeout of pulling down	The pulling down device has not reached the required position.	Check the mechanism of the pulling down device. Check power supply to the pulling down mechanism.

8. MACHINE MAINTENANCE

This chapter describes the maintenance and service interventions that can be performed by the user's staff. The activities not mentioned here can only be carried out by the manufacturer, dealer, or an authorized service organization.

8.1. Obligations of maintenance staff

In the machine maintenance, the below given rules of labour safety and health protection as well as protection of the machine against damages shall be observed.

The maintenance can only be carried out by the purpose-dedicated and qualified staff. The maintenance of electric devices can only be performed by workers with sufficient qualification according to Chapter 3.1.

Before the maintenance or repair, move the frame with the ring and the prestretch device to the lower limit position (until it sits down on the stops or with a gap of max. 25 mm). In the case your machine is equipped with the top platen device move it also to its lower limit position in the manual mode.

Before any maintenance or repair during which the machine need not necessarily be switched on and functional, it is necessary to switch off the machine, to close the compressed air supply, to lockout the main switch and secure it against switching on by an unauthorized person, and to place a warning label on the switchboard.

In the case the maintenance is to be carried out at height, always use a suitable ladder or a working platform intended for lifting persons, and use appropriate boots and a protective helmet.

For lifting weights, always use appropriate manipulation technique of sufficient load-bearing capacity and with a valid certificate for operation. The manipulation technique can only be operated by staff with valid authorization.

Do not remove switches and scanners, or do not change their position and orientation beyond the information in this chapter without good knowledge of their function and without consultation with the manufacturer or dealer.

8.2. Guarantee

The guarantee, as it is defined in the Letter of guarantee and in Chapter 2.6, does not relate to parts undergoing usual wear. This concerns the following parts:

Part	Placement
Carbons of phase	Collector
Carbons of earth	Collector
Burning wire	Ending
Burning wire	Top sheet

Part	Placement
Resistance stripe	Ending
Teflon coat	Ending
Foam gum	Ending
Winding round of roller	Prestretch device

8.3. Periodic maintenance

The wrapping wind-round machine requires regular maintenance. Meeting of this requirement will result in a substantially prolonged service life of the complete machine.

The table applies to maximally equipped machine.

Operation	Chap-ter	**Daily**	**Monthly** (500 h)	**Small** (1000 h)	**Medium** (5000 h)	**Large** (10 000h)
Machine cleaning	8.4	●	●	●	●	●
Daily check	8.5	●	●	●	●	●
Visual check of lifting strap of shear top platen	8.14	●	●	●	●	●
Check of cutting wire of top sheet	8.13.3	●	●	●	●	●
Check of cutting wire of ending	8.12.3	●	●	●	●	●
Visual check of gearboxes	8.6.3		●	●	●	●
Check and maintenance of collector	8.10		● [1])	●	●	●
Top sheet check	8.13			●	●	●
Check of lubrication according to lubricating plan	8.6		●	●	●	●
Check of pneumatic system	8.7			●	●	●
Check of ring drive	8.9	●	●	●	●	●
Check of prestretch device	8.11			●	●	●
Check of braking insertion of film holder	8.11		● [1])	●	●	●
Check of ending device	8.12			●	●	●
Check of end-limit switches and sensors	8.17			●	●	●
Check of functionality of light barriers	8.19.1			●	●	●
Check and maintenance of electric installation	8.18				●	●
Check of function of safety devices	8.20				●	●
Tightening of screws	8.24				●	●
Replacement of oil in lift gearbox	8.6					●
Replacement of chains of lift frame	8.8					●

[1]) – possible check after 500 hours - see information in Chapter 8.10 and 8.11.

Monthly maintenance – each 500 operating hours, not later than 1x per month.

Small maintenance – each 1000 operating hours, not later than 1x per 3 months.

Medium maintenance – each 5000 operating hours, not later than 1x per year.

Large maintenance – each 10,000 operating hours, not later than 1x per 3 years.

The table of operations contains the check and maintenance of all parts of a fully equipped machine. In the case your machine is not fitted with some outfit component ignore particular chapter.

The terms of checks and repairs given in this document can be specified based on experience in operation and tests of the machine at the manufacturer and the user.

8.4. Cleaning

In short intervals adapted to character of the workplace, it is necessary to remove dust and dirt.

The surface of the machine can be washed with water and conventional detergents. During cleaning, the machine must be switched off from power supply.

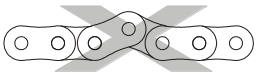
Windows and mirrors of the optical sensors should also be regularly cleaned. During their cleaning, do not use any sharp tools or aids that could scratch the optical elements or windows, or cause their non-transparency.

8.5. Daily check

Before each switching on of the machine or always once a day, make the daily check of the machine. This check consists in visual inspection; it does not require any tools, and is short; its aim is to find out small defects and, thus, prevent expensive repairs and idle times of the machine. This check should always be performed after collisions and accidents, after service interventions, maintenance or repair.

Due to the fact that, during a daily check, actual condition of the machine is compared with usual condition during normal operation without a failure, the daily check should be carried out by the staff familiar with the machine and its function.

The check is carried out on:



- Condition of all chains (lift, ending, top sheet); no link must be deflected (this state means that the chain pin is seized and the chain damages chain wheels). The chain damaged in this way should be replaced.
- Anchoring of the machine and conveyors to the floor.
- Position and orientation of the optical sensors.
- Overall exterior of the machine – no signs of a collision with the manipulation technique or possible fall of the goods from the pallet (deformation, damaged varnish, ruptured welds, released joints, machine parts off their usual position) may be apparent on the machine, protective fence, safety barriers, or conveyors. If so, mechanical state of the workplace should be examined; the line can only be started after the inspection has proved that the machine is not damaged.
- State of safety and information labels. In the case they have been damaged or lost the designation should be put into the original state.
- During the first wrapping, check smoothness of all movements in their whole range and correct function of the machine and the scanners (i.e. that the

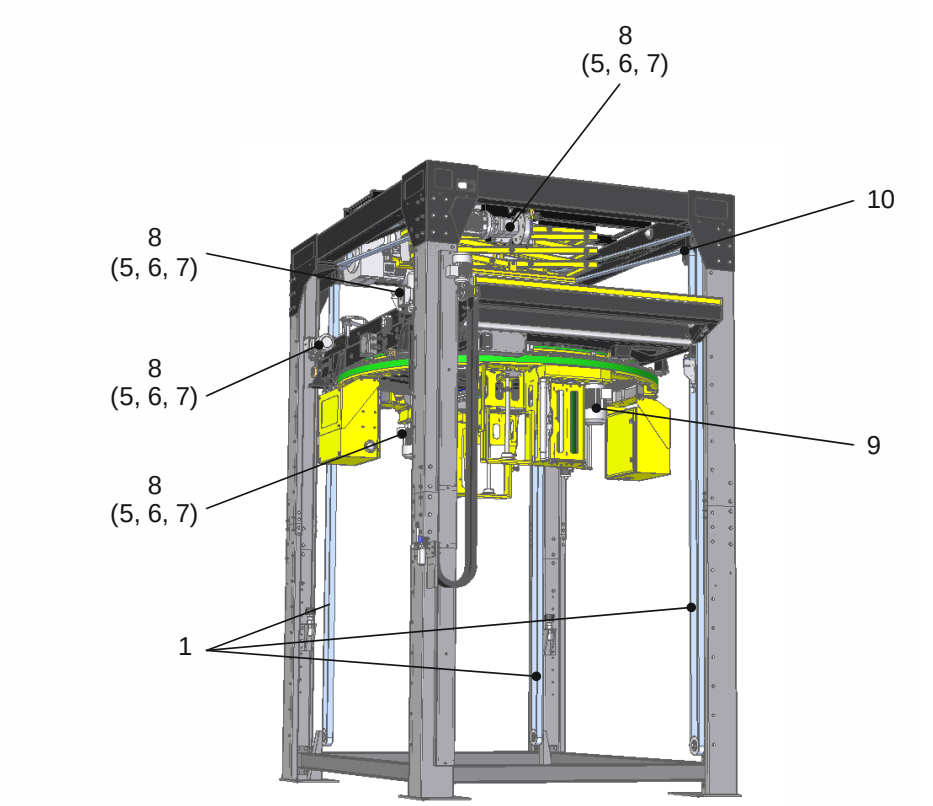
pallets are reliably detected and that the mechanisms of the machine and the wrapping process are running properly).

8.6. Lubrication

The numbers in the diagram of checking places correspond to the numbers of lubricating points in the table of lubricating points in Chapter 8.6.1.

The gearboxes Bonfiglioli are mounted on the machine as a standard. In the case the gearboxes and drives SEW are used on your machine the values put in brackets are valid.

The lubricating diagrams are valid for the machine of the highest configuration. In the case some component is not mounted on your wrapping machine ignore particular paragraph.


8
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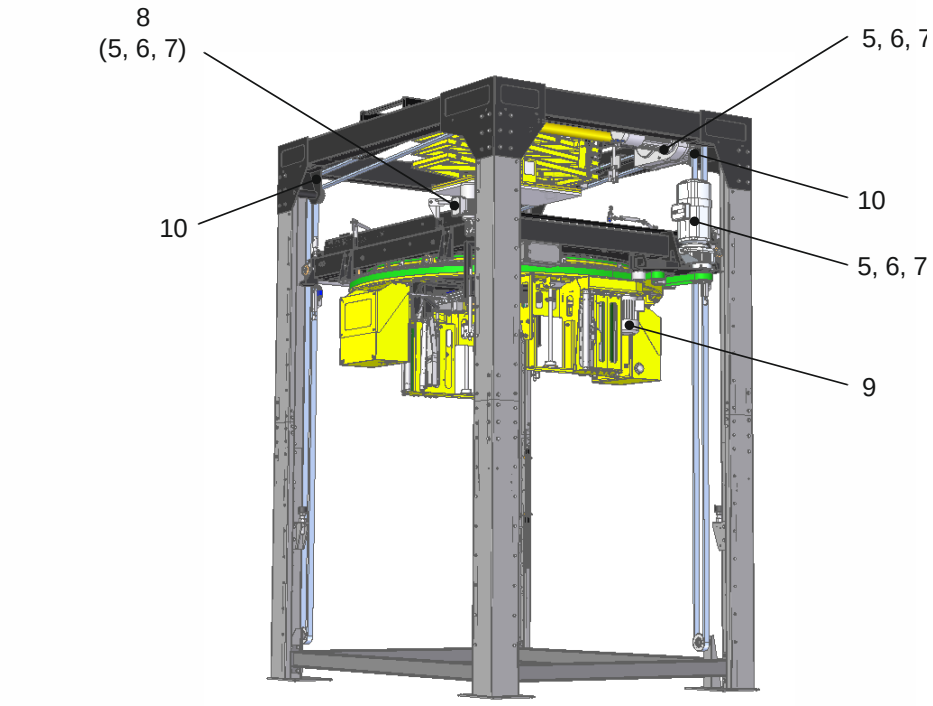
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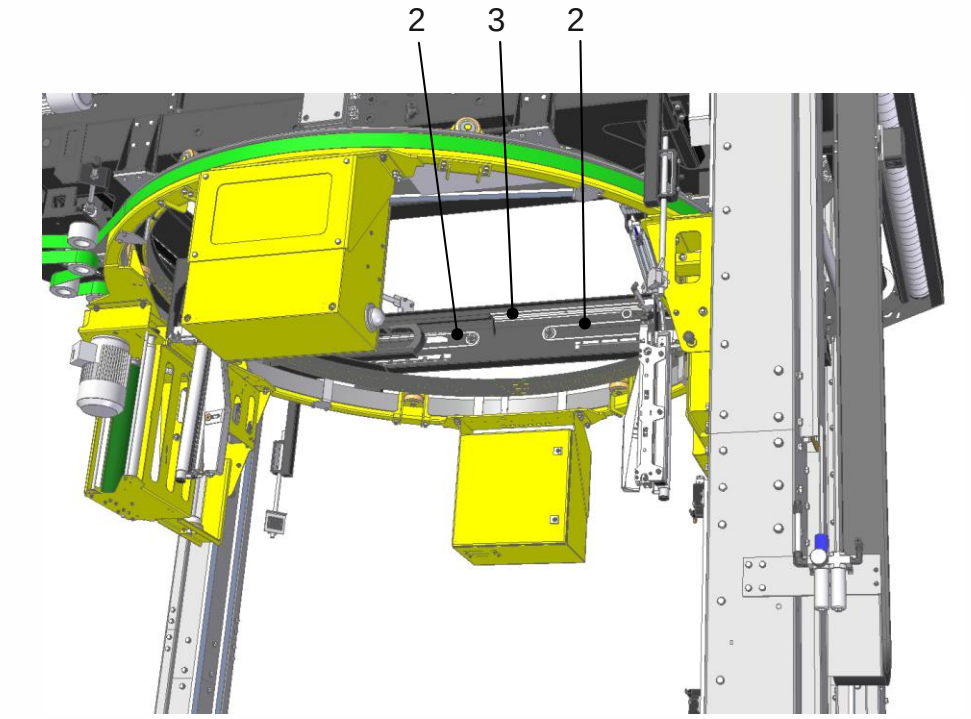
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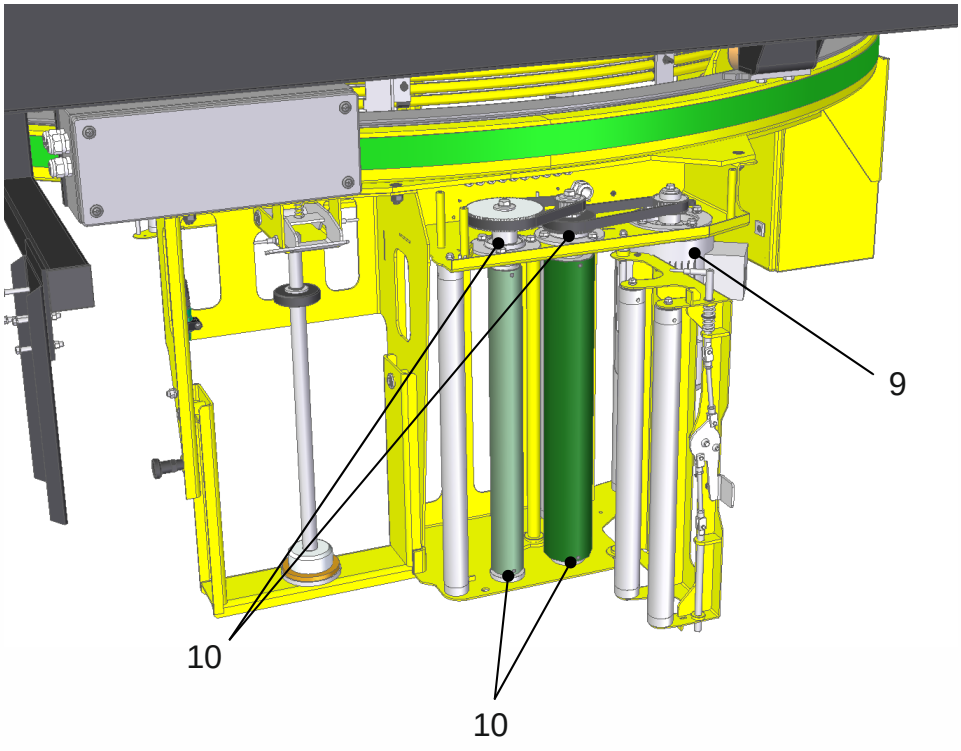

9
10
10

8.6.1. Lubricating points

The number in the column "Lubricant" corresponds to the table Overview of lubricants in Chapter 8.6.2.

Lubricating point		Lubricant	Interval		Note
			Check	Lubrication	
1	Chains of lift frame	1 (2)	small maintenance	small maintenance	
2	Chains of ending shift	1	small maintenance	small maintenance	
3	Chains of top sheet shift	1	small maintenance	small maintenance	
4	Gearboxes TOS Znojmo	3	small maintenance	as required	A
5	Gearboxes - manufacturer SEW	4	small maintenance	large maintenance	B,C
6	Bearings of gearbox SEW	5	large maintenance	large maintenance	B,C
7	Bearings of electric motor SEW	6	large maintenance	as required	A
8	Gearboxes Bonfiglioli	7	large maintenance	as required	A
9	Bearings of electric motor Siemens	6	large maintenance	as required	A
10	Other bearings	–	small maintenance	–	D
	Pneumatic system	8	small maintenance	as required	E

Notes:

A In the case leakage only – the lubricant charge is for the whole service life;

B See the SEW documentation - according to what happens earlier;

C Instructions for maintenance of gearboxes and drives SEW - see original SEW documentation (on CD ROM);

D Check possible grease leakage – in positive case, replace the bearing with a new one of identical type and version (grease leakage means damaged O-rings);

E As a standard, the pneumatic distribution is not lubricated – see Chapter 8.7

8.6.2. Overview of lubricants

The following lubricants are used on the machine (the number in the first column corresponds to the column Lubricant in the table of the lubricating rules in Chapter 8.6.1):

Lubricant	Recommended type
1	Oils: WS40 or usual oils intended for lubricating chains under conventional conditions (temperature, speed, environment).

Lubricant	Recommended type
2	Greases: Mogul G3, Mogul LV 2-3 or usual oils intended for lubricating chains under conventional conditions (temperature, speed, environment).
3	Shell Tivela Compound A
4	Shell Omala 220 Aral Degol PG 220 Mobil Mobilgear 630 BP Energol GR-XP 220
5	Mobil Mobilux EP2
6	Esso Unionrex N3 Shell Alvania R3
7	The gearbox charge was filled by the manufacturer for the whole service life. In case of oil leakage contact the manufacturer of the wrapping machine or your closest technical agency of the firm Bonfiglioli.
8	FESTO OFSW-32 Aral Vitam GF 32 Esso Nuto H 32 Mobil DTE 24 BP Energol HLP-HM 32 Shell Hydrol DO 32 (hydraulic oil according to DIN 51524 part 2 of viscosity 32 mm^2/s at 40°C (HLP 32)

8.6.3. Visual check of gearboxes

Visually check all gearboxes – no lubricant may escape around the shafts, flanges, discharge and filling openings, plugs, oil-level gauge, etc. In opposite case:

- Check and tighten the leaking joints and clean the gearbox for the next check.
- If necessary, replenish the lubricant – see the text above in this chapter.
- Check the gearbox more frequently than stated in Chapter 8.3. In the case the defect keeps appearing during next regular check replace the gearbox.

8.7. Pneumatic system

Make visual inspection of the condition of the pneumatic cylinders – the piston rods must not be sagged or otherwise deformed, and they must not be mechanically damaged or corroded. The pivots on forks and swivels of the pneumatic cylinders must be properly secured.

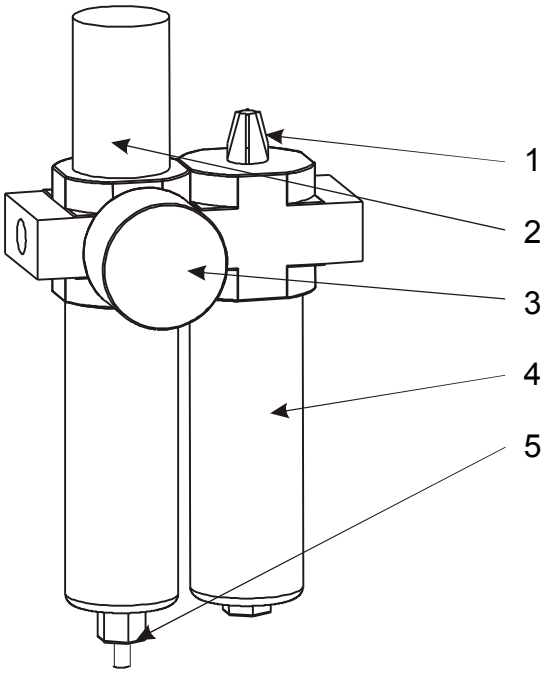
Check functionality of the pneumatic mechanisms in the manual mode and/or watch them carefully during the wrapping process. The mechanisms should move smoothly and uniformly within the whole range of movements.

Check the condition of the pneumatic distribution, in particular hoses, whether they are not broken or otherwise damaged, and whether they are properly attached in the screwed joints and other pneumatic components.

In the systems of air holder, check all jets whether they are not clogged and whether the air can freely flow. If necessary, the jets can be cleaned by unclogging or the jet can be taken out and blown through with compressed air. Diameter of the jets is 0.6 mm; they can be unclogged using, for instance, a nylon fishing line or a copper wire of diameter 0.5 mm. It is not recommended to use a steel wire or various substitutes (wooden chips, needles, fibulas, clips, etc.) – there is a risk of damaging the jets or breaking these tool substitutes and subsequent improper or non-economical operation of the air holder mechanism.

Inlet air pressure range between 0.6 and 1.5 MPa – its check and regulation depends on the pneumatic distribution of the machine user.

The air pressure in the machine must be set to a value stated on the label at the unit of air treatment (as a standard, 0.5 MPa). It is set by a regulating valve, item 2; air pressure is checked using the manometer, item 3.



If the level of condensate is less than 10 mm under the upper edge of the filter of the separator on the air treatment unit, discharge the condensate. Put a suitable vessel under the separator for catching the condensate, release the discharge valve (item 5). The condensate with settled dirt is expelled by air pressure from the separator vessel. After discharging the condensate, shut the discharging valve again.

As a standard, the pneumatic system is not lubricated (the cylinders are filled with lubricant charge for the whole service life). If defects caused by insufficient lubrication (seizing, irregular or slow run, damage of the piston rod) occur it is recommended to lubricate the pneumatic system using the following procedure:

- Oil should be replenished not later than in the case that the oil level in the vessel (item 4) is under the lower edge of the inspection window.
- Close both the air supply upstream of the machine and the regulating valve, item 2.

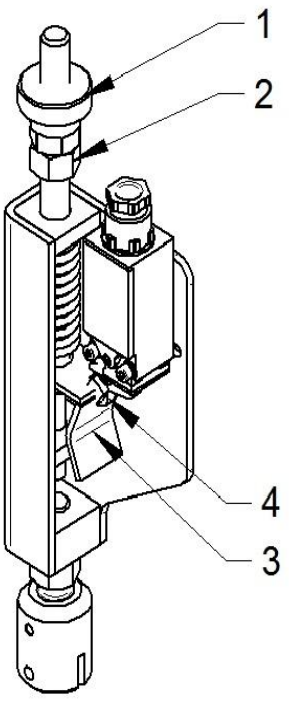
- Release the discharge valve (item 5); thus, both the condensate is discharged and the system is vented (compressed air is discharged).
- Wait until the pneumatic system is completely vented (as long as the escaping air can be heard).
- After the pneumatic system has been completely vented, unscrew the vessel with oil (item 4) and fill it with a specified lubricant (see Chapter 8.6).
- Screw the filled vessel back paying attention to correct position of the tightening O-ring.
- Shut the discharging valve, open the compressed air supply upstream of the machine and subsequently on the air treatment unit (item 2) – this procedure will provide for slow increase of air pressure in the pneumatic system of the machine.
- Check setting of the inlet air pressure. Using the regulating valve, set correct working pressure – see the plate at the air treatment unit.

The adjusting screw of the amount of oil added to the air, item 1, has already been set and needs no adjustment for the whole service life of the machine.

8.8. Lift frame

The ring with the prestretch device and possibly also the top sheet device are mounted on the horizontal frame. The frame travels vertically in the wrapping machine structure by means of the electric motor with the gearbox and four lifting chains.

The lift frame is secured against falling down in case of a failure of the lift drive brake. The securing is realized with a latch on the lift shaft and activated in case of opening of the fence door. If the frame drops down the latch mechanism can be blocked. This is indicated by signalization **FAILURE 120 - Lever of securing against falling of top platen off safe position** after the fence door has been closed. After checking air pressure and the whole mechanism, the mechanism can be released by means of manual function **Lift of frame with ring – releasing**. However, the cause of this state should always be ascertained.



8.8.1. Starting position of lift frame

In its starting position, the lift frame is on the top and sensor **S4** is closed.

The lever securing the frame against falling down is in the starting position (pneumatic valve without power supply) in the lower position and prevents rotation of the lifting shaft rosette. With the switched on power supply of the machine and the locked fence door, the lever lifts to its upper position.

8.8.2. Scanners of chain tightening

The condition of each chain is separately watched by the scanner of the chain state; in case of a

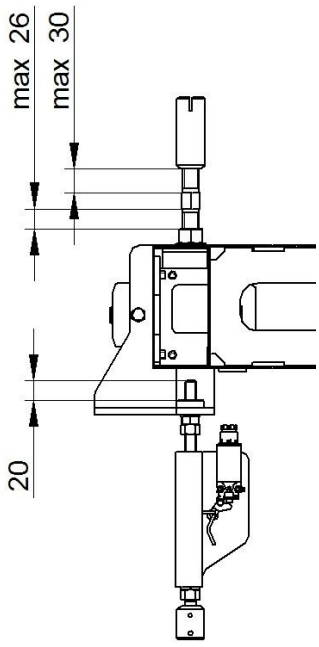
defect the machine is stopped and the system reports **FAILURE 122 – Scanner of chain tightening** (see Chapter 7.2) indicating some of the following states:

- The frame has sat down on the pallet with the goods. Switch over the machine into the manual mode; lift the frame and take the pallet away. Inspect the machine for possible damage during this collision; check also the state of the scanners of the chain condition (the switch pulleys must be in axis with the cams; possible adjustment – see the following paragraph).
- The chain is drawn; adjust the chain condition scanner using the following procedure:
  - Release nut 2 securing the scanner of the chain condition to the frame.
  - Rotate the nut, item 1, to set the position of the pulley, item 4, to axis of the cam, item 2.
  - Retighten the nut, item 1. By sidewise pulling of the chain under the scanner (in the chain creeper plane) check the scanner functionality.
  - In the case the scanner of the chain condition cannot be adjusted in this way (some of the nut is off the thread edge), the chain is excessively pulled out and should be replaced. Always replace all chains of the lift frame.
- If some of the chains is ruptured always replace all chains.

8.8.3. Replacement of lift chains

The chains of the lift frame are preventatively replaced in the interval given in Chapter 8.3; best at the same time with replacement of oil in the lift gearbox. The chains are replaced including the joints.

For the chain replacement, the machine frame should be in its lower position, laid on the solid stops. For moving down to this position, select manual function **Lift of frame with ring upwards/downwards**; depress the push-button to move the frame to its lowest possible position (the **FAILURE 121 – Lower emergency end-limit switch of frame** will be announced). The sitting down on the stops must be carried out by means of the lift brake contactor. It should be born in mind that, after releasing the brake, the frame moves down by the free fall and, therefore, it is necessary to move down at a minimum distance and, possibly, release the brake in short impulses.



After the frame has sat down on the stops, the chain replacement can begin. Open the fence door and switch off the main switch of the machine.

If the chains have not been released release them – above the frame by means of right-left tightening screws, under the frame by means of the scanners of the chain tightening. Detach the chains from the frame swivels and remove them from the machine.

Check the chain wheels, the transferring pulleys, and their bearings. Replace them as necessary.

For the reassembly of new chains, prepare setting of the upper tightening screws. Reduce the maximum distance according to the picture by 10 mm. Adjust the tightening scanners mounted on

the bottom side of the frame so that it would be possible to release them by about 20 mm (to shift them down).

Put the chains on the pulleys of the upper frame of the cage. Place the chains in the chain creepers of the lifting shaft off the teeth so that they could be shifted. Fasten the chains to the upper swivels of the frame by means of the joints. Put the chain on the chain creepers of the lifting shaft. The load-bearing branches of the chain to the upper swivels must be as tight as possible. Tighten the return branches in the lower part by loading them (by hanging a weight at the chain link).

Close the fence, switch on the machine, and, using manual function **Lift of frame with ring upwards/downwards**, move the frame by about 50 mm above the solid stops (**FAILURE 122** can be unblocked by means of a corresponding relay in the switchboard).

Open the fence door and switch off the main switch of the machine. Check levelling off of the machine frame. Maximum deviation from the horizontal position is 2 mm in places of the chain gripping. In the case the deviation is higher than the chain pitch, move the frame down onto the solid stops and reposition the chains on the chain creepers of the lift shaft. If the differences are smaller adjust flatness by means of the right-left screws of the upper swivels. **Maximum values according to the picture must not be exceeded.**

Place the return branches over the lower pulleys of the cage to the tightening scanners. Shorten the chains to necessary length and fasten them to the tightening scanners by means of the joints. Adjust them according to 8.8.1.

Check functionality of the chain scanners by pulling the chain (before the test, the relay must be returned to the correct position). Proper function must call **FAILURE 122 – Scanner of chain tightening**.

8.8.4. Lever of securing against fall

Adjust speed of the lever movement by means of the throttling valves on the pneumatic cylinders. The movement upwards is not braked. Speed of the movement downwards should be adjusted so that the lever would move for about 2 seconds.

8.8.5. Setting of lift sensors

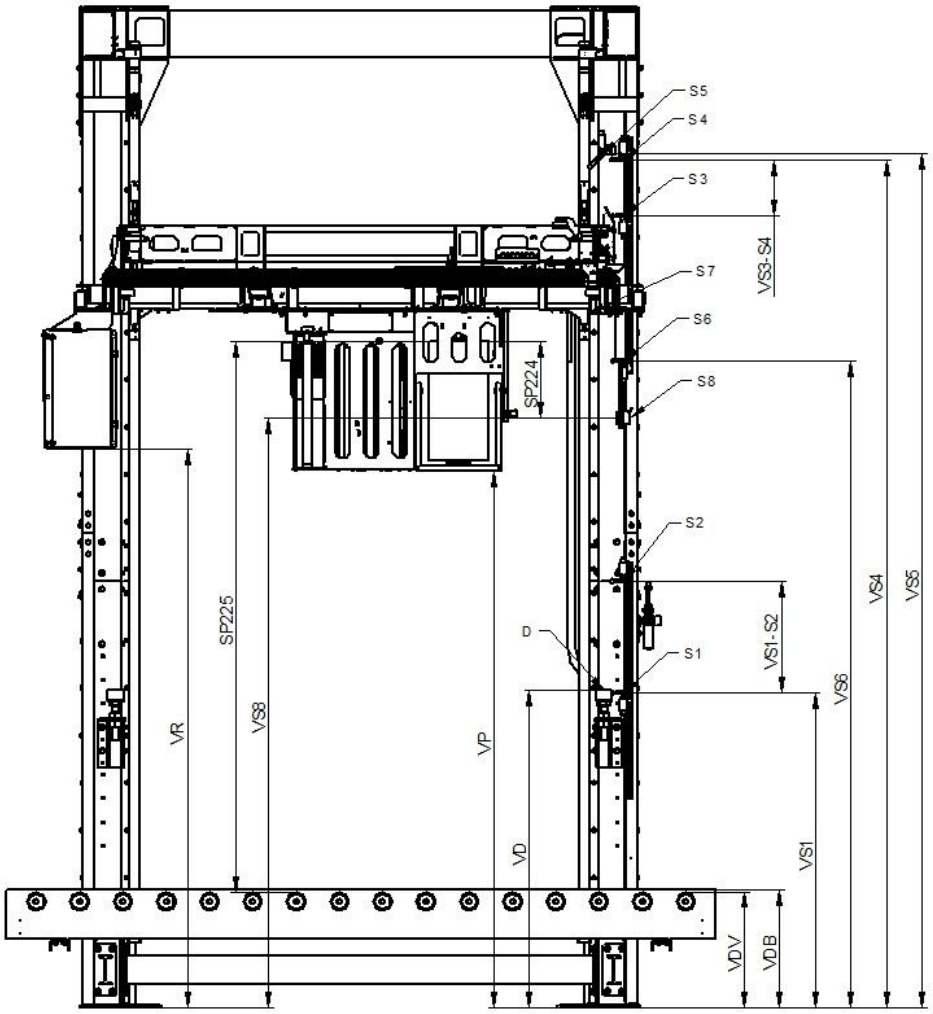
It is recommended to leave setting of the sensors on the service organization – their incorrect setting or error link to the service parameters of the machine can cause its breakdown.

The lift sensors control vertical movement of the frame in the limit positions (upper and lower limit position). They are activated by means of the mechanical end-limit scanners. Five (six in case of using the second reference position of the frame) sensors S1 ÷ S5 (S6) are fastened to the cage leg. Sensor **S1** (Safety switch – lift down), **S2** (Operating switch – lift down), **S3** (Operating switch – lift up), **S4** (Operating end-limit switch– lift up) are slide-wise attached to an aluminium lath, and **S5** (Safety switch – lift up) is fix-screwed to the cage.

In the case the second reference position of the frame is used sensor **S6** is added that detects the second reference position of the frame. In such case, the

machine should be equipped with a sensor detecting height of the pallet before it enters the wrapping machine.

Further safety elements of vertical movement of the frame are solid mechanical stops **D** and sensors **S7** (4x) indicating tightening force in the bottom branches of the lifting chains. Sensors **S7** indicate both releasing of the chain tightening and their overloading in case of possible sitting down of the horizontal frame on an obstacle. The cage is also fitted with the encoder of the motor of the horizontal frame lift.



Sensor **S8** serves for measuring height of the goods during wrapping.

Position of the lever securing the frame against falling down is checked by sensor **S9**. This sensor is installed on the pneumatic cylinder close to the lift shaft rosette; it checks safe position of the lever (the position when the shaft can rotate).

Setting of stops and sensors

Set the height of mechanical stops **D** so that the height of the lowest point of the prestretch device **VP** would, with the horizontal frame fully sitting down on the stops (with the lift brake released), be by 30 mm higher than the highest point of

the conveyor under the machine (of all devices located within the collar between circles **D1** and **D2** – see Setting of sensors "Pallet under ring" Chapter 8.15.1) **VDB** (**VP = VDB + 30**).

Install sensor **S1** (**VS1**) so that, during movement of the horizontal frame downwards, the switch would close in a position where the horizontal frame is 10 mm before sitting down on solid mechanical stops **D**.

Place sensor **S2** by distance **VS1 - S2** above sensor **S1 –** This value must be by 30 mm higher than the value set by parameter **SP229** (Braking distance of the lift downwards) **VS1 - S2 = SP229 + 30**.

According to particular outfit of the machine, place sensor **S5** so that, during movement of the frame upwards, the parts moving together with the horizontal frame and the parts of the solid cage and the top platen cannot come into mechanical contact. The minimum free distance between the parts of the horizontal frame and the parts of the firm cage in the vertical direction must be **at least 30 mm**. When the shear top platen (possibly also with air holder) is used the movable tongs of the top sheet must be allowed to pass under the top platen plate with allowance of **at least 80 mm**.

Set sensor **S4** according to the maximum height of the goods and the required wrapping method. In the case the wrapping is required to end „down“ and, at the same time, the condition of the ending device being placed by the track is met, sensor **S4** must be installed so that, after the horizontal frame has moved to its upper position (sensor **S4** closed), value **VR ≥ VDV + maximum height of goods + 50 mm** for the machine variant DOUBLE or **VS8 ≥ VDV + maximum height of goods + 50 mm** for the machine variant with the single prestretch device. In the case the wrapping is required to end „up “ sensor **S4** must be placed so that, after the horizontal frame has moved to its ending upper position (sensor **S4** closed), the ending levers would be pulled out from below the final film layer with allowance of **at least 50 mm**. During movement of the frame upwards, sensor **S4** must be closed by **at least 20 mm** lower than sensor **S5** is closed.

Place sensor **S3** by distance **VS3 - S4** under sensor **S4 –** This value must be by **20 mm** higher than the value set in parameter **SP230** (Braking distance of lift upwards) **VS3 - S4 = SP230 + 20**.

In case the second reference position of the frame is used the machine is fitted with sensor **S6**. Set sensor **S6** according to the maximum height of the goods according to parameter **SP221** (height of the goods for the 2nd reference) and the required wrapping method. In the case the wrapping is required to end „down“ and, at the same time, the condition of the ending device being placed by the track is met, sensor **S6** must be placed so that, after the horizontal frame has moved to the sensor in the downward direction (sensor **S6** closed) value **VR ≥ VDV + SP221 + 50 mm** for the machine variant DOUBLE or **VS8 ≥ VDV + SP221 + 50 mm** for the machine variant with the single prestretch device. In the case the wrapping is required to end „up “ sensor **S6** must be placed so that, after the horizontal frame has moved to its upper position (sensor **S6** closed), the ending levers would be pulled out from below the final film layer with allowance of **at least 50 mm**.

If the second reference is used a sensor distinguishing low and high pallets (height according to **SP221**) must be placed at the entry of the pallets to the machine. This sensor shall ensure that a high pallet is not allowed to enter the

wrapping area in case the frame is in the lower reference position. The sensor height is set to the value above the conveyor according to **SP221**.

Set sensor **S7** in the scanners of the chain tightening so that, during movement of the finger upwards or downwards, the end-limit scanner would not be closed. In fact, the finger remains standing with respect to the horizontal frame; the sensor moves upwards during releasing the bottom chain branch or down when the frame sits down on an obstacle or when the bottom branch is too tightened.

The sensor of measuring height of the goods **S8** is set with respect to the film reel inserted to the prestretch device. It is set to the value of factory setting **SP224** (distance of the beam under the upper rim of the film).

The value of parameter **SP225** (Height of the film in the lower position) is measured with the frame in the lower position and written down into the parameter.

Lift calibration

Using push-button **'+'** (hold the push-button) in the manual function „Lift upwards and downwards", move the horizontal frame to its upper position (sensor **S4** closes and the frame stops).

In **SP220** (distance of lift scanners), set value 7777.

Using push-button **'-'** (hold the push-button), move the horizontal frame to its lower position (sensor **S1** closes and the frame stops).

Using push-button **'+'** (hold the push-button) move the horizontal frame to its upper position (sensor **S4** closes and the frame stops).

Wait for about 10 s; during this period, the value of parameter **SP220** - 7777 on the display changes to an actual value of the distance of the lift scanner.

Reduce this value by **10 mm**.

Test of setting lift sensors

In **SP110** (height for the film replacement) and **SP111** (height for the top sheet film replacement), set value 0.

In the manual functions, select „Film replacement"; on depressing push-button **'-'**, the frame moves to its lower position (if value 0 is set in SP110 the frame stops at the height of about 20 mm above the top of rubber stops **D**).

Depress push-button **'+'** to move the frame to its upper position.

In **SP110** (height for the film replacement) and **SP111** (height for the top sheet film replacement), set the value for a convenient replacement of the film.

Calibration of sensor of the 2nd reference frame position

Using push-button **'+'** (hold the push-button) in the manual function „Lift upwards and downwards", move the horizontal frame to its upper position (sensor **S4** closes and the frame stops).

In **SP222** (distance of lift scanners), set value 7777.

Using push-button **'-'** (hold the push-button), move the horizontal frame to the position under sensor **S6** (the sensor must not remain closed).

Using push-button **'+'** (hold the push-button), move the horizontal frame to its upper position.

Wait for about 10 s; during this period, the value of parameter **SP222** - 7777 on the display changes to an actual value of the position of the second reference.

Test of setting sensor of measuring goods height

In the program parameters: „Distance of the film rim from the upper edge", set value 0.

Carry out a testing wrapping – if the setting is correct the upper rim of the film will match the upper edge of the goods (a deviation can also be caused by an excessive prestretch of the film when it gets narrowed) and/or modify setting of parameter **SP224** (distance of the scanner of the goods height).

In the program parameters: „Distance of the film rim from the upper edge", set a required value.

8.9. Ring drive

The ring is driven by the electric motor with the gearbox by means of a flat belt. During the check, inspect the condition and wear of the belt. In the case the belt is excessively worn out, its damage is visible, and/or it is frayed, replace the belt.

8.9.1. Starting position of ring

In its starting position, the ring is turned in the position for the film replacement. Sensor **S21** is above the flag attached to the ring.

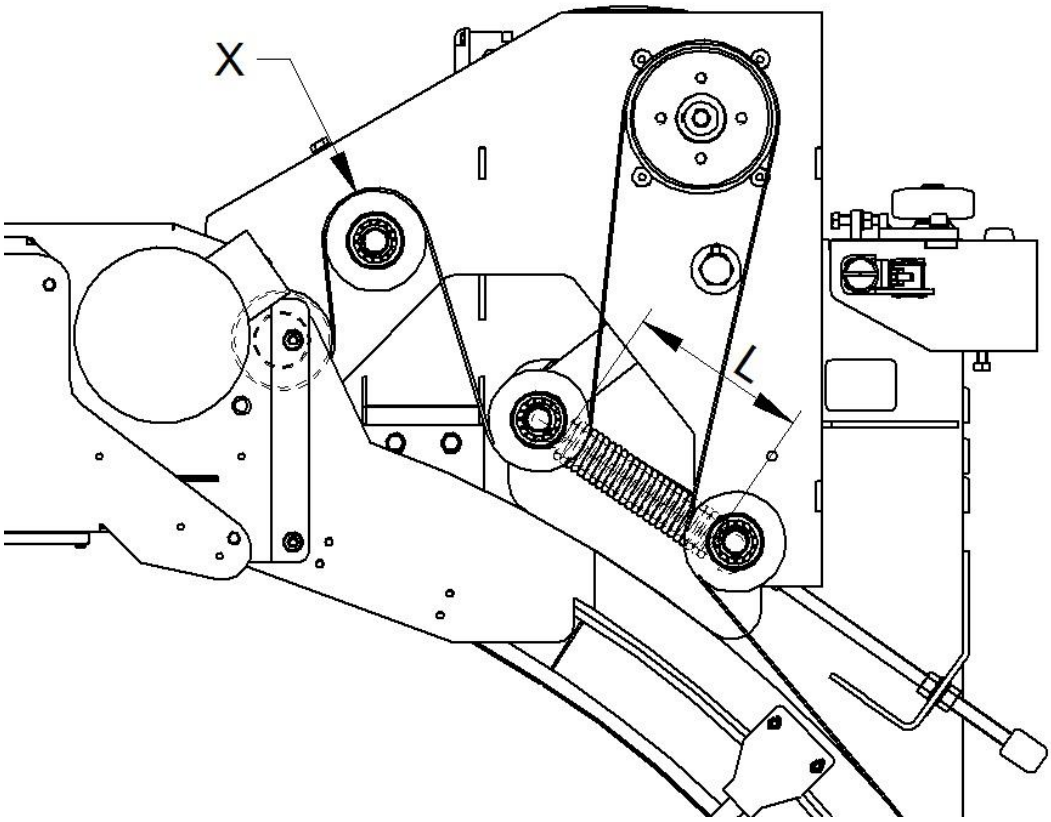
8.9.2. Belt replacement

For dismantling the belt, release the spring of the tightening arm by means of a tightening screw. After releasing, remove the belt from the pulleys of the drive and the ring.

For reassembly, the brake of the ring drive should be released by means of a change-over switch placed in the main switchboard of the machine. At the same time, the power supply of the machine must be switched on. In this case, after the fence door has been opened, the power supply of the ring drive brake remains switched on and the ring can rotate.

Put the belt onto the ring. In case of the one-side belts (different colour of the belt sides) the belt should be put on the ring with the red colour facing it (after putting on, the coloured side is visible). Reeve the belt through the system of driving and tightening pulleys according to the figure and lightly tighten the tightening spring (so that the belt cannot fall down from the pulleys).

The position of the pulley of the tightening lever can be changed by changing the position of the shifting pulley **X**. This pulley can be shifted in the groove after releasing the upper nut by means of the tightening screw. The pulley can only be moved with the released spring of the tightening lever; before tightening the belt, always tighten the upper nut.



Centre the belt on the pulleys and set corresponding position on the ring according to the pulleys along the whole circumference.

Spring	RTG-3.B-00-06			
Wire diameter [mm]	7			
Number of threads	25			
Length of threaded part – free [mm]	180			
Length **L** of threaded part – tightened [mm]	300			

Tighten the spring to ¼ of maximum tightening and manually (not electrically) make two revolutions of the ring. During rotation, check behaviour of the belt on the drive pulleys. The position towards the axis of the pulleys can change; this is not a defect. However, the belt must not fall down from the pulleys.

Tighten the spring to ½ of maximum tightening and make manually two revolutions of the ring while monitoring behaviour of the belt.

Tighten the spring to ¾ of maximum tightening and make manually two revolutions of the ring while monitoring behaviour of the belt.

Tighten the spring to its maximum tightening and make manually two revolutions of the ring while monitoring behaviour of the belt.

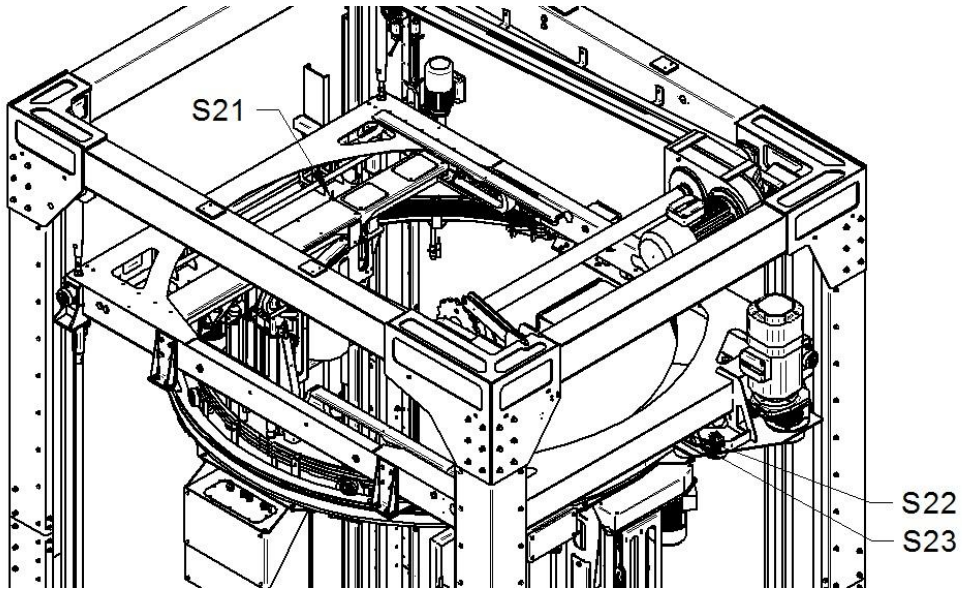
Turn the change-over switch of the drive brake in the main switchboard to the working position and test the ring drive in the manual mode of the machine. During the test, watch behaviour of the belt on the ring and the driving pulleys. Position of the belt on the pulleys can change, however, the belt must not tend to fall down from the pulleys.

8.9.3. Setting of ring sensors

It is recommended to leave setting of the sensors on the service organization – their incorrect setting or error link to the service parameters of the machine can cause its breakdown.

The starting position of the ring circle is indicated by sensor **S21** installed on the movable frame of the machine. This sensor is of the induction type and scans the flag attached to the prestretch device circle.

The position of the ring is indicated by a pair of sensors of the ring encoder **S22**, **S23**. Sensors **S22** and **S23** are of the induction type.



Setting of sensors

Positions of all sensors and flags are determined by the machine design. The induction sensors are set to the centre of the sensitivity range.

Calibration of ring encoder

Switch over to the manual function „Ring forwards / backwards“ .

In SP241 “Transmission of ring encoder”, set value 7777 and confirm by Enter.

Using push-button '+' (hold the push-button), start rotating the ring. The ring will rotate at low speed, make 4 revolutions, and then accelerate to the speed according to the manual mode.

The parameter value will depict the measured number of impulses per revolution of the ring.

8.10. Trolley collector

The trolley collector serves for transferring power supply and signals from fixed parts of the machine to the rotating prestretch device.

ATTENTION !

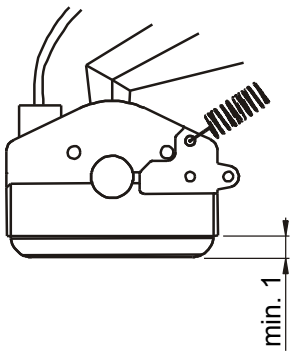
Any check or maintenance must always be done with the device switched off by the main switch; pay attention to the machine switchboard being secured against switching on (locked with fitted warning label).

For usual conditions, it is recommended to make a check of the carbons once in 1000 operating hours or once per 3 months – what happens earlier. In case the machine is operated in a dusty environment it is recommended to shorten the interval first to 500 hours or once a month – what happens earlier; then, the terms of checks should be specified according to the experience gained.

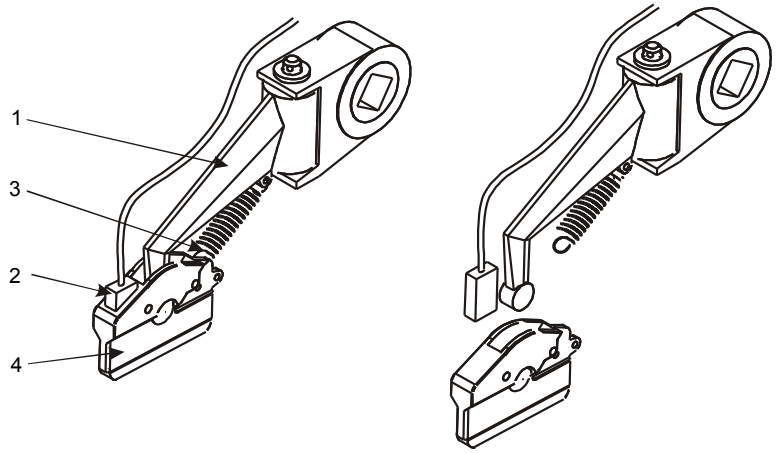
The contact surfaces of the trolleys and collectors, collector arms, and trolley collars should be cleaned from dust. Check the collectors (Chapter 8.10.1) and trolleys (Chapter 8.10.2).

8.10.1.Check and replacement of collector carbons

The collector arms can be tilted out from the trolley against the spring force. Check the surface of the carbons and its condition: in case the surface is damaged, with broken off pieces, or if the carbon is excessively worn out, i.e. less than 1 mm of the carbon height has left (see the figure), replace the carbon:



- Detach the cable, item 2, by pulling it down from the contact (item 2).
- Release the spring, item 3, wrest it out from the eye on the carbon.
- Pull down the carbon, item 4, from the arm.



Use an reverse procedure to mount a new carbon. All carbons should be replaced.

Check the cables leading from the carbons – they must not be broken, have damaged insulation (mechanically or thermally).

8.10.2.Check of trolleys

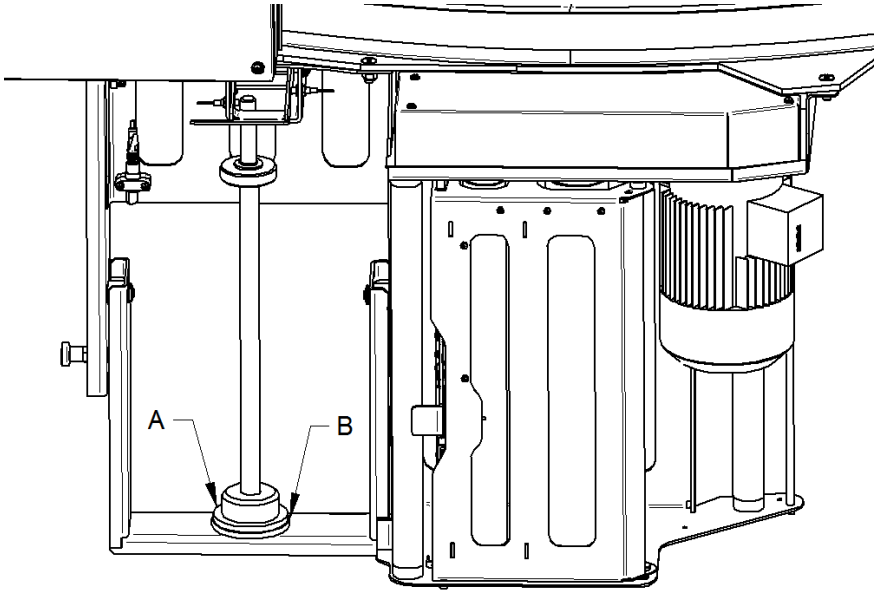
Check the functional surfaces of the collars of the trolley collector and clean them as necessary. Remove possible welded on rests of dirt and signs of corrosion, or oxidized surface. In the case the functional surface is worn through or it has bent edges or broken off parts at the contact of segments, replace the collector collar – the carbons are getting excessively worn out. Always replace the complete collar (all segments). In case all collars show approximately the same wear, it is recommended to preventatively replace all collars.

Check condition of the cables connected to the collectors – they must not be broken, have damaged insulation (mechanically or thermally).

8.11. Prestretch device

During each inspection, remove the cover of the belts on the upper side of the prestretch device and clean the space. Check the following:

- Integrity of the belt (belts). In the case the belt is broken, with broken off teeth, or with frayed edges, it should be replaced.
- Condition of brake pad **A** and washer **B** of the film roll holder – see the picture. If the pad or the washer is excessively worn out (this is manifested as a visible thinning, its deformation, non-uniform wear), replace the parts. In a dusty environment, check the parts within the monthly maintenance and later adjust the actual interval of the checks according to the practical experience.



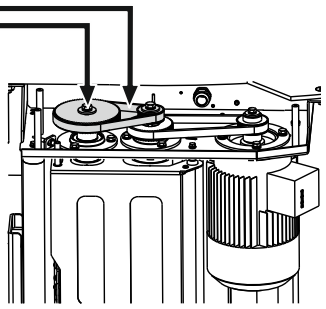
- Smoothness of run of all the rollers on the prestretch device. The rollers must rotate freely and smoothly and must not be deformed. If necessary or in case of an improper run of their bearings, replace the rollers.
- During the operation, watch function of the compensating roller (it is mounted on a sprung swinging lever). In the end of the wrapping cycle, the roller has to reduce stress in the film between the prestretch device and the pallet.

8.11.1.Change of primary prestretch

This chapter relates only to the single-motor prestretch device; in the two-motors device, the primary prestretch can be set in the parameters.

The primary prestretch can be set by replacing the toothed belt and the wheel according to the table in Chapter 5.3.1. This table is valid for your machine; it is placed on the plate of the prestretch device.

80%	HTD 405-5M-15	405	HTD P36-5M-15-6F	36
120%	HTD 425-5M-15	425	HTD P44-5M-15-6W	44
160%	HTD 450-5M-15	450	HTD P53-5M-15-B	53
210%	HTD 475-5M-15	475	HTD P62-5M-15-B	62
250%	HTD 500-5M-15	500	HTD P69-5M-15-B	69
290%	HTD 525-5M-15	525	HTD P79-5M-15-B	79



Remove the cover of the gearings of the prestretch device. Release screw M10 on the bigger gear (the most remote from the motor). Pull down the gear including the belt. According to the required prestretch, assemble a correct combination of the toothed belt and the gear using a reverse procedure according to the table.

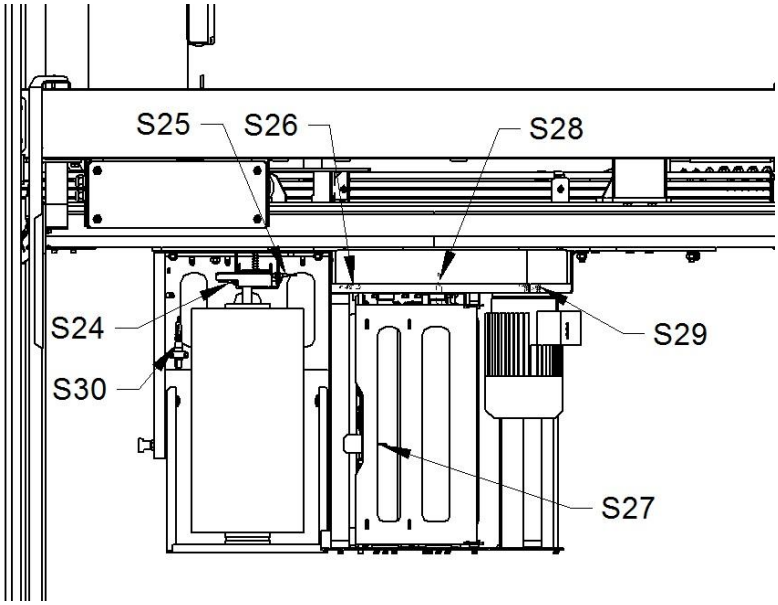
8.11.2.Setting of prestretch device sensors

The prestretch device is fitted with sensors **S24**, **S25**, **S26**, **S27**, **S28,** and the encoder of measuring roller **S29**. In case of measuring the diameter of the film reel, also with sensor **S30**.

Sensor **S24** indicates correct position of the film holder; sensor **S25** indicates securing of the film holder; sensor **S26** indicates closed state of the film inserting device, and sensor **S27** indicates securing of the inserting device. These sensors are of the induction type and their location is given by the machine design.

Sensor **S28** scans position of the compensating lever and serves for releasing the film in the end of the wrapping cycle; encoder **S29** serves for controlling the prestretch device. Sensor **S28** is of the induction type and its location is given by the machine design.

Sensor **S30** serves for measuring the diameter of the film reel inserted in the holder. This is an ultrasound sensor.



8.11.3.Setting of sensors

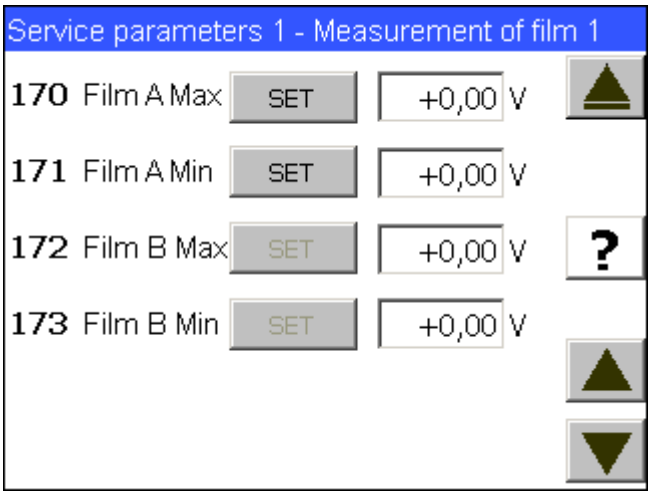
It is recommended to leave setting of the sensors on the service organization – their incorrect setting or erroneous link to the service parameters of the machine can cause its breakdown.

Position of all sensors is determined by the machine design. The induction sensors are set to the centre of the sensitivity range. The position of sensor **S30** is given by the machine design; turn it at the centre of the film container rod.

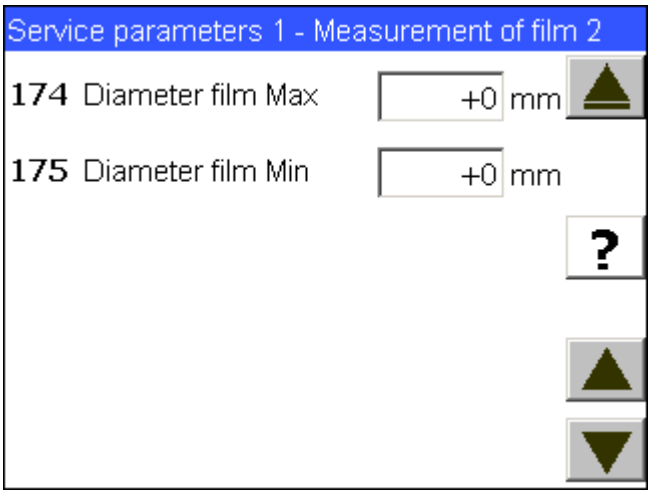
8.11.4.Calibration of measuring film quantity

In the case the machine is equipped with ultrasound sensors for measuring the diameter of the film reel on the prestretch device and the evaluating is erroneous (reduced rate of wrapping because of imbalance even if the film reels are identical; erroneous announcement of a running out film), it is necessary to carry out new calibration of the sensors.

For the calibration, the film with the maximum wind up and the empty tube should be prepared. The calibration is accomplished in Service parameters 1 – Film measurement. Insert the empty tube into the prestretch device and, after closing the fence door and starting up the control system, depress push-button SET for Film A (B) Min. On depressing, the window for confirmation is displayed where you can confirm the operation. Take out the empty tube and insert the fully wound-up film. Use push-button SET for setting for Film A (B) Max.



Go on to the following display. Measure the diameter of the reel with the maximum wind up and write the value into parameter Film diameter Max; measure the empty tube and write the value into parameter Diameter film Min.



8.12. Mechanism of ending

General functional check of the ending mechanism is carried out during the check of the pneumatic system (see Chapter 8.7).

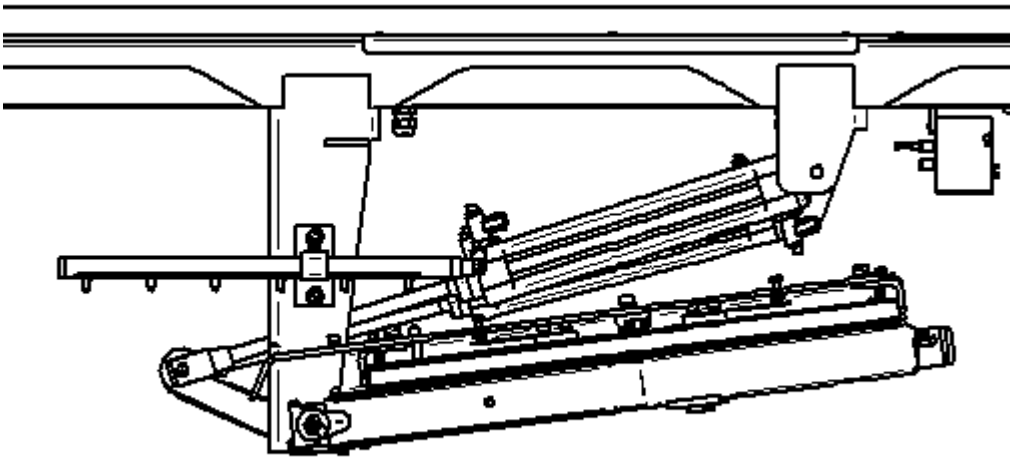
The check should also include:

- The chain of shifting the ending mechanism to the goods (see Chapter 8.12.2).
- Cutting wire (see Chapter 8.12.3).

- Condition of the Teflon coat on the ending lever. The Teflon fabric must not be damaged (torn, frayed in a distance larger than 1 cm from the rim); replace the fabric as necessary.
-

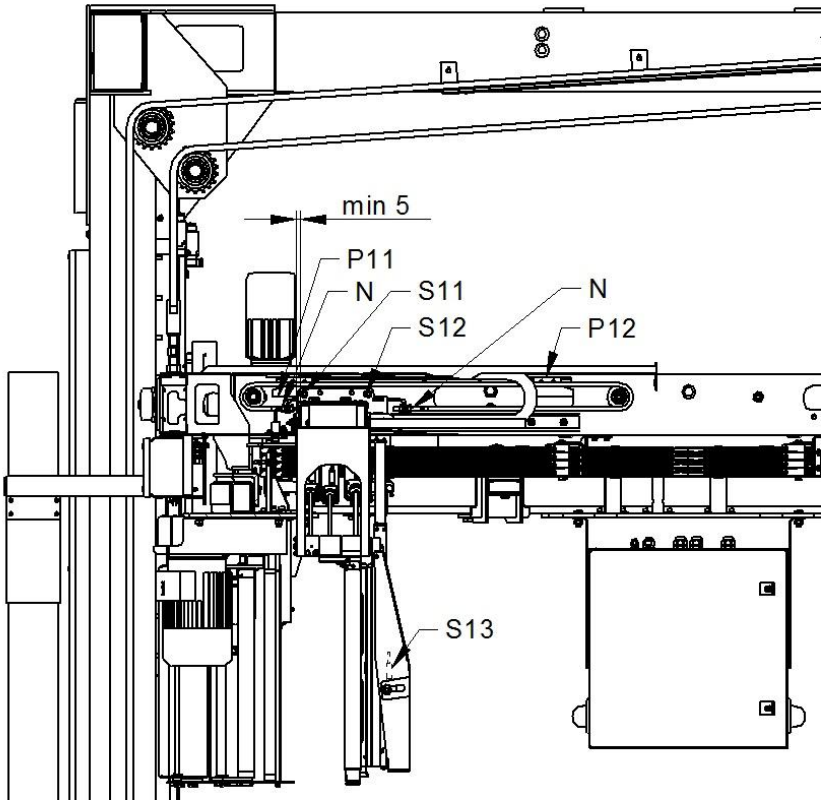
8.12.1.Starting position of ending mechanism

- In the starting position of the ending mechanism (no signal is brought to the pneumatic valves), the levers of ending are in the upper position and the bracket of ending in the end-limit position more distant from the pallet.



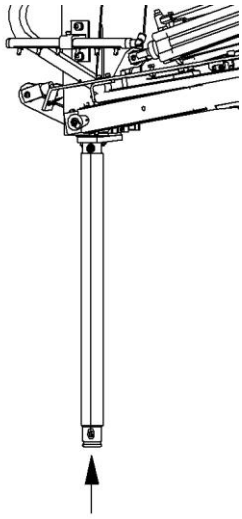
8.12.2.Chain of shifting the mechanism of ending to the goods

The mechanism of ending is shifted to the goods by means of the electric motor and two chain transmissions – there is one on each longitudinal arm of the frame. Check condition of both chains: the ending mechanism is in the starting position (most distant from the goods) and the machine is the standstill. The sag of the lower (longer) chain branch may be max. 5 mm. The chain sag is only caused by its own weight, without action of any external force on the chain or on the ending mechanism.



In case of a higher sag, adjust the chain. This is carried out using tightening screws **N** that attach the chain to the bracket of ending.

8.12.3.Cutting wire



Make a daily visual inspection of the wire integrity. If rests of the wrapping film are burned on it, remove them with a rag or a suitable tool made of plastic or wood, not metallic; herewith, pay attention to causing no damage to the Teflon coat of the wire.

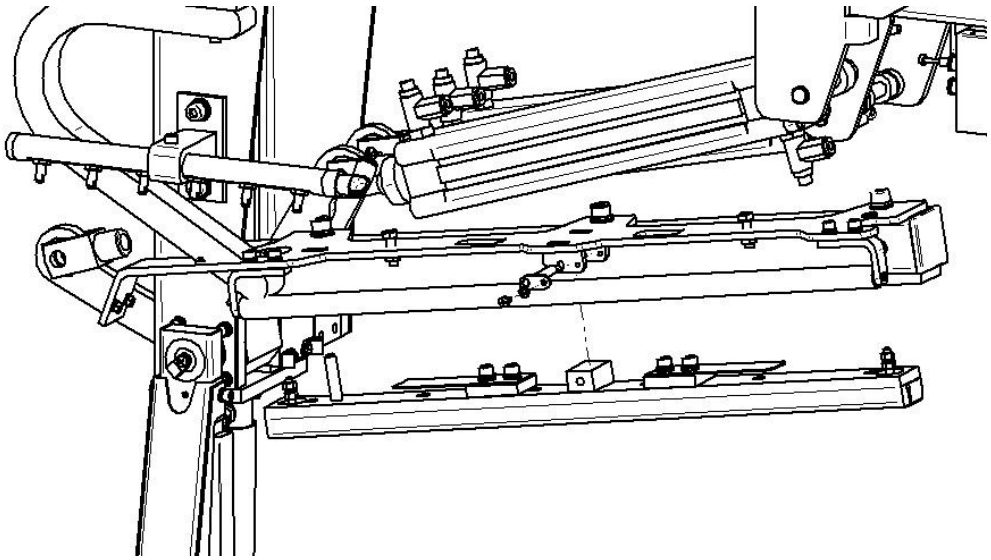
Wire replacement: Using the manual change-over switch on the valve of the lever control, tilt the lever to the lower position. Gripping of the cutting wire is identical on both ends. Release the screws in the cylindrical grip of the wire and take out the wire from this grip. In case of a new wire, remove the Teflon coat from both ends of the wire and fit the wire using a reverse procedure; during the assembly, the plug with the wire grip should be pressed down to the stop (see the arrow in the figure) so that the spring inside the lever would keep tightening the wire. Pay attention to proper contact of the inlet conductors with the burning wire; the Teflon coat must be removed so that reliable contact with the inlet conductors would be ensured; at the same time, however, the functional (cutting) part of the wire must be reliably protected with the Teflon coat.

After the replacement has been completed, return the lever to its upper position by means of the manual change-over switch.

8.12.4.Welding strip

Disconnect the feeding cables from the welding lath. Release the pivot of the welding lath and pull it out. Remove the welding lath from the ending lever.

Dismantle the welding lath from the load-bearing lath.

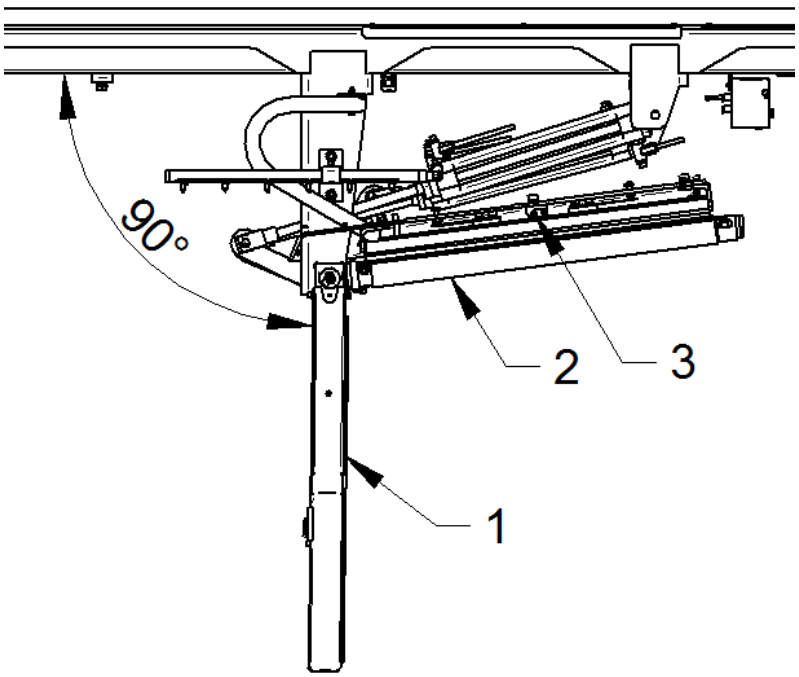


Unstick the Teflon coat and release the welding strip gripped between the washers.

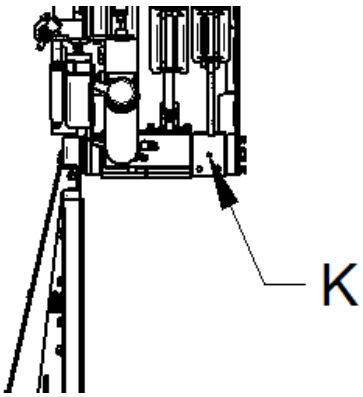
Fasten a new strip between the washers. The strip must not top sheet the surface of the welding lath; otherwise, there is a risk of the short circuit.

Stick a new Teflon coat and assemble the lath. Mount it back to the machine. Pay attention to correct orientation of the strip (it is placed non-symmetrically on the lath). Reconnect the welding cabling.

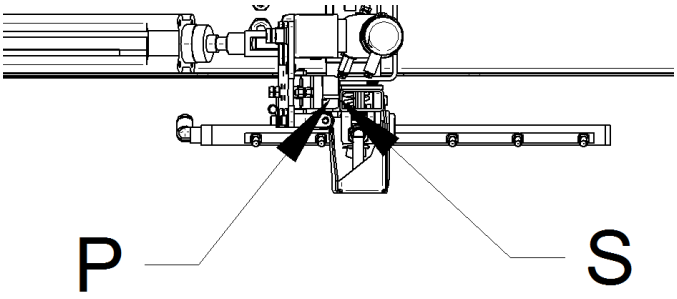
8.12.5.Adjustment of ending levers



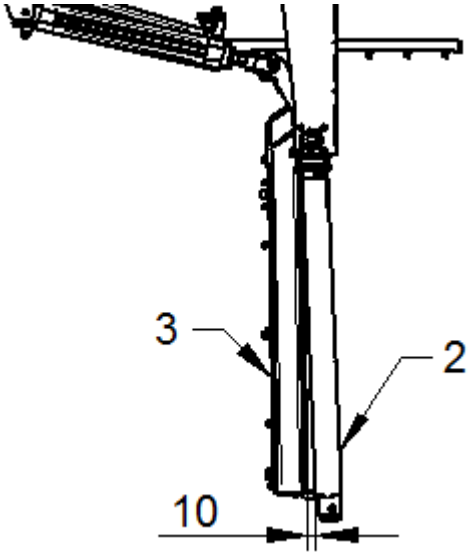
Using the fork of the pneumatic cylinder of lever 1, adjust the lever into the vertical position. The position of the lever and the pivot has been secured in the manufacturing plant with pin **K**. In case of replacing the levers, the fork(?) should be drilled and secured (for adjustment during drilling, screw the fork on a piston of 11 mm diameter(?)).



Lever 1 is adjusted to the vertical position. Adjust the fork of the pneumatic cylinder of lever 3 so that the lath of welding attached to lever 3 would be pressed down to lever 1 along whole its length. At the same time, the axis of heating strip **P** (on lever 3) must be coaxial with silicon strip **S** serving as a supporting surface (on lever 1).



Adjust the fork of the pneumatic cylinder of lever 2 so that, with the fully pushed-in roller, lever 2 would be in the position according to the picture and that the distance of 10 mm would be left at the end of the levers (The levers do not fit to each other at the bottom end).



Adjust damping of the lever movement by means of the throttling valves of the pneumatic cylinders and the damping of the end-limit position of the cylinders. The levers should move as quickly as possible, without any impacts both in the end-limit positions and in mutual touch of the levers.

8.12.6.Setting of ending sensors

It is recommended to leave setting of the sensors on the service organization – their incorrect setting or erroneous link to the service parameters of the machine can cause its breakdown.

The ending device is fitted with sensors **S11, S12, S13** that control movement of the ending bracket. Additional sensors are installed on the pneumatic cylinders. Sensor **S11** determines the position for taking away the bracket of ending from the goods. Sensor **S12** limits movement to the centre of the machine in case there is no pallet in the wrapping area. The sensors cannot be adjusted; perform their setting by shifting flags **P11**, **P12**. Sensor **S13** is installed inside the lever of ending and indices the touch of the lever with the goods.

Setting of sensors

Set the flag of sensor **P11** so that the bracket of ending, when taken away, would be at a sufficient distance from the goods (at least 200 mm). At the same time, minimum gap of 5 mm should be left between the ending bracket and the stops in the guiding. Set the flag of sensor **P12** so that the bracket would not hit the guiding stop. Placement of sensor **S13** is given by the device design. Placement of the sensors on the pneumatic cylinders is specified in the design documentation; these sensors indicate positions of the levers in their limit positions. All induction sensors are set to the centre of the sensitivity range.

8.13. Top sheet

8.13.1.Starting position of top sheet mechanisms

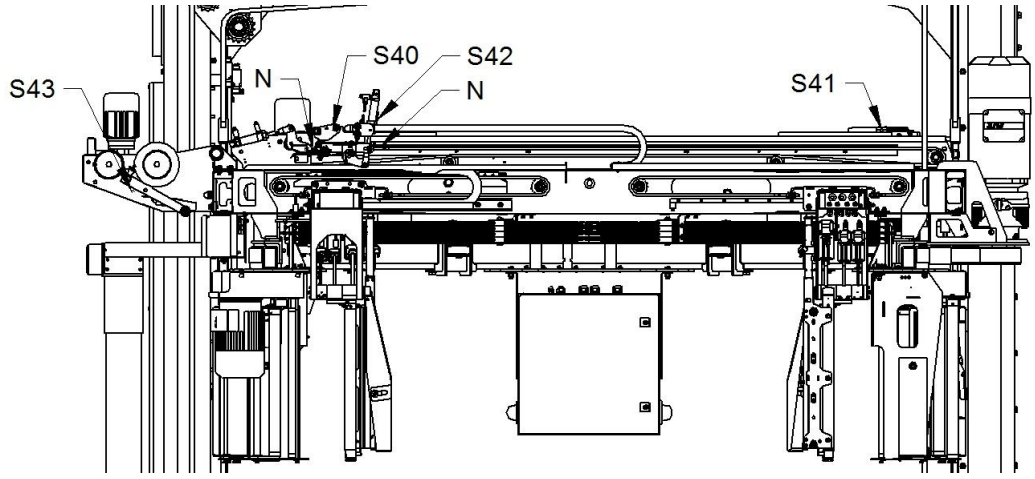
Under air pressure and with no signal being brought to the valves, the levers are in the following positions:

- Fixed tongs closed (roller inserted).
- Film cutting device in upper position (roller inserted).
- Movable tongs open (roller inserted).
- Movable tongs in limit positions for fixed tongs.

8.13.2.Chain of drive of top sheet bracket

There are two chains on the machine; they are placed on the inner side of both longitudinal arms of the feeder frame. Both chains should be checked and adjusted.

The chain should be tightened so that the sag of the upper chain branch would be 10 ± 5 mm. The sag is caused by the chain's own weight, without action of any external force. The machine must be in the standstill and the mechanism of the film feeder must be in its starting position. If necessary, the chain tightening can be adjusted. This is done using tightening screws **N** attaching the chain to the bracket of the movable tongs.



Take care that, after adjustment of both chains, the movable part of the top sheet would be parallel with the frame and the axis of the reel with the film along the whole travel track. In opposite case, one of the chains is excessively worn out – both chains should be replaced.

8.13.3.Cutting wire

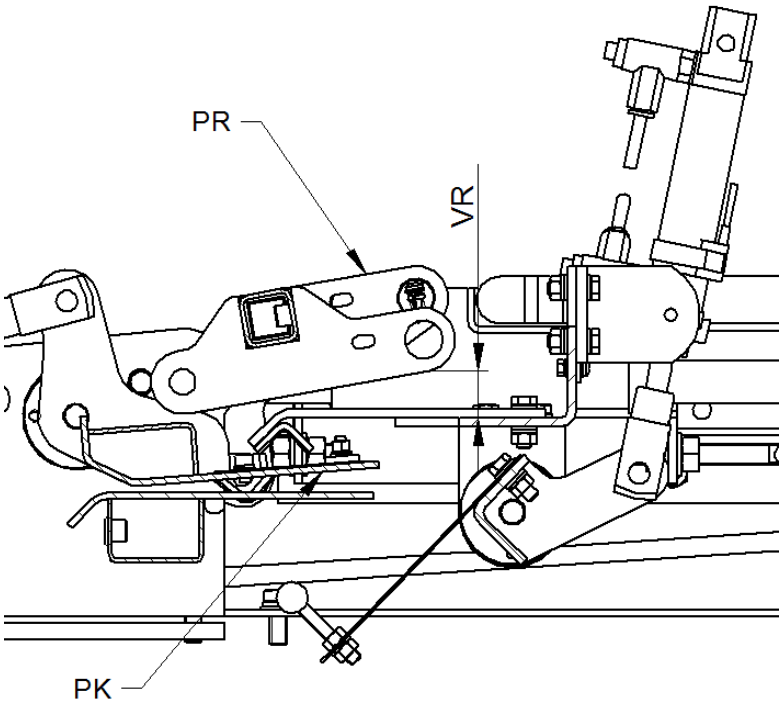
Make a daily visual check of the condition and integrity of the wire. If there are some burned-on rests of the top sheet film on the wire remove them with a rag or a suitable tool made of plastic or wood, not metal; take care of the Teflon coat of the wire not being damaged.

In case of the ruptured wire, its slipping out from its attachments, or damage of the Teflon coat, replace the wire; both ends of the wire are attached in the same way. Release the screws fixing the wire to the holder and replace the old wire. The Teflon coat of the eyes of the wire led under the washers on the holder must be removed by scratching. Install the new wire so that the stretcher springs would, after the assembly, be pressed down to the stop or almost to the stop; further possible pressing down of the spring should not be greater that 3 mm. During the assembly, pay attention to good contact of the electric lines – good condition of the conductors and the assembling eyes, tightened screws and nuts, and integrity of the cable insulation.

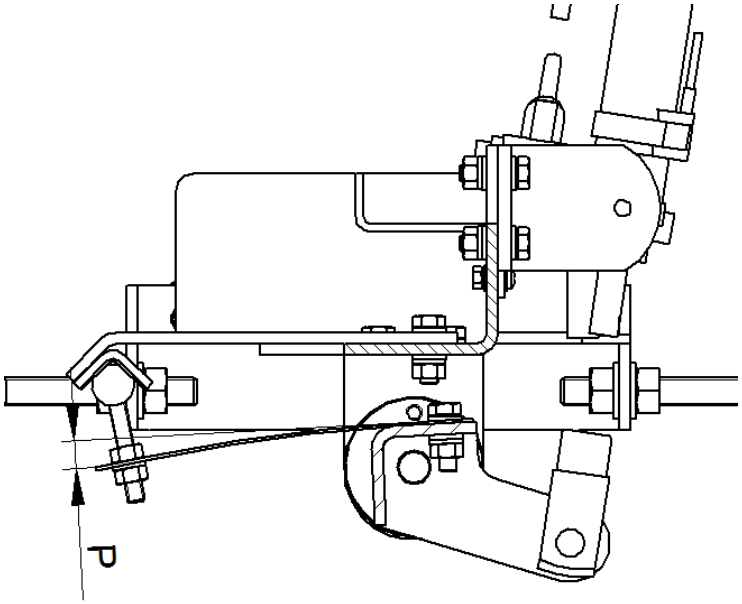
8.13.4.Adjustment of top sheet levers

Set the fork of the pneumatic cylinder of the fixed tongs lever **PK** so that the movable paws could safely catch the top sheet film.

Set the fork of the pneumatic cylinder of the film cutting lever **PR** so that the distance between the lever of the film cutting and the stop on the bracket of movable tongs **VR** would be at least 15 mm.



Adjust the paws of the movable tongs by means of the fork of the pneumatic cylinder and the nuts on screws of the pressing down rollers. Sitting of individual rollers is set by means of the nuts on the roller screws so that all rollers would sit in the counterpart in two straight lines. Overall prestretch of all rollers is done by means of the fork on the pneumatic cylinder so that springing of steel strips **P** would be about 5 mm.



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8.13.5.Setting of top sheet sensors

It is recommended to leave setting of the sensors on the service organization – their incorrect setting or erroneous link to the service parameters of the machine can cause its breakdown.

The top sheet device is fitted with sensors **S40, S41** controlling movement of the movable tongs. Additional sensors **S42** are installed on the pneumatic cylinders and the lever of starting the drive of film container **S43**. Sensor **S42** controls position of the movable tongs during picking up the film; Sensor **S42** determines position of the movable tongs during moving of the horizontal frame to the upper position.

8.13.6.Setting of sensors

Set sensor **S40** as close as possible to the film container so that, after moving to the sensor and stopping, a gap of 10 mm would be left between the paws of the movable tongs and the beam of the fixed tongs. At the same time, the wheels of carriages of the movable tongs must not hit the stops in the guiding rails. Sensor **S41** should be set as far as possible from the film container. In the case the movable tongs are in this position, sufficient distance must be left to the wrapped goods for vertical movement of the horizontal frame. At the same time, allowance of min. 30 mm should remain to the touch with the fixed parts and for going out of the guiding rails.

The position of the sensor of lever **S43** of starting the drive of the container is given by the design; placement of sensor **S42** on the pneumatic cylinder is specified in the design documentation; it indicates the limit position of the roller (movable tongs closed). All induction sensors are set to the centre of the sensitivity range.

8.14. Shear top platen

The top platen device is secured against falling down in case the brake of the top platen drive would fail. Securing is realized by a latch of the top platen arms and activated in case of opening the fence door. In case of dropping down of the top platen device the latch mechanism can get blocked. This is indicated by signalization of **FAILURE 150 – Lever of securing against falling down of top platen device off its safe position** after the fence door has been closed. After checking air pressure and whole mechanism, the mechanism can be released by means of manual function **Top platen - releasing.** However, the cause of this state should always be ascertained.

In the manual mode, move the top platen to the lower limit position. The lifting strap is well visible along all its working length.

The lifting strap must not be defective (fractured) or frayed on its rims. In the opposite case, it should be replaced.

Make also a visual inspection of the top platen plate; permitted state of its wear depends on the wrapped goods and on the danger of its damage by the top platen.

8.14.1.Starting position of top platen

The top platen in its starting position is in the upper position. Sensor **S50** is obscured.

The lever securing the top platen device against falling down is in the starting position (pneumatic valve without power supply) tilted to the arms and prevents them from moving down. With the switched on power supply of the machine and the locked fence door, the lever is tilted from the arms.

8.14.2.Strap replacement

Both ends of the strap are attached in an identical way.

Take down the securing ring from the pivot and remove the pivots from the footings of the top platen plate or from faces of the winding-up drum. Using a reverse procedure, fit the new belt and secure the pivot again with the securing ring. Dimensions of the new belt should be identical with the original; it is provided as a spare part, including stitched loops on both ends. If you decide to make the belt yourself ask the manufacturer for the documentation; proper strap must be used; the eyes should have correct dimensions and strength of the seams should be ensured.

8.14.3.Top platen moves in opposite sense

In the case the top platen moves in the opposite sense (i.e. with the requirement for the top platen to move down the top platen plate moves up or vice versa) or the top platen does not move down onto the wrapped goods although using of the top platen is selected, the strap is, due to the prior error, wound up on the drum in an opposite sense. This state can be ascertained visually (in the correct way, the strap should wind up on the pulley from the top towards the top platen arms).

Remedy: If there is a pallet with goods on the conveyor take it away. Switch over the machine into the manual mode and, using the manual function Top platen upwards with push-button **+** (i.e. using a logical opposite function than it would be expected), move the top platen to the lower limit position. Keep holding the push-button, the strap will again be wound on the drum, this time, however, in the correct sense. After the top platen has moved to its upper limit position, it will stop automatically. Then, switch over the machine back to the automatic mode.

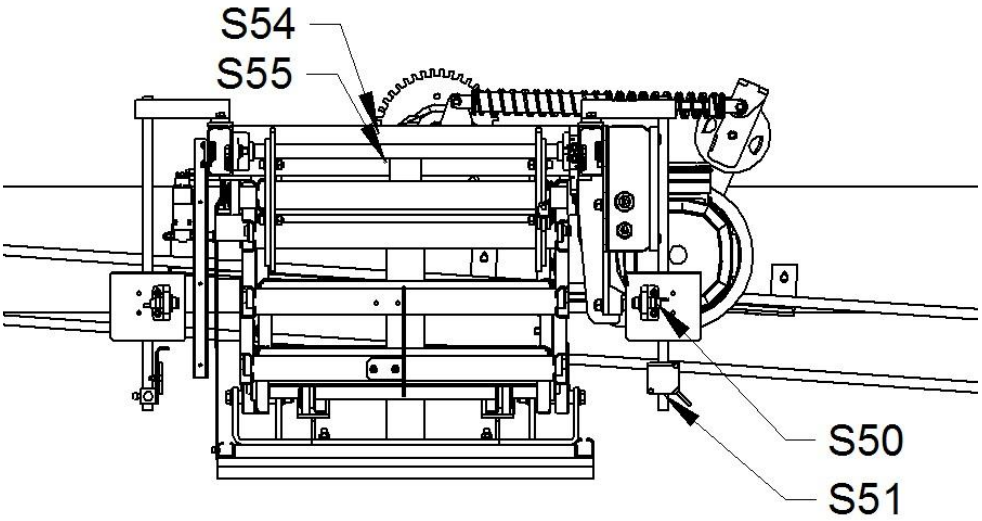
8.14.4.Lever of securing against falling down

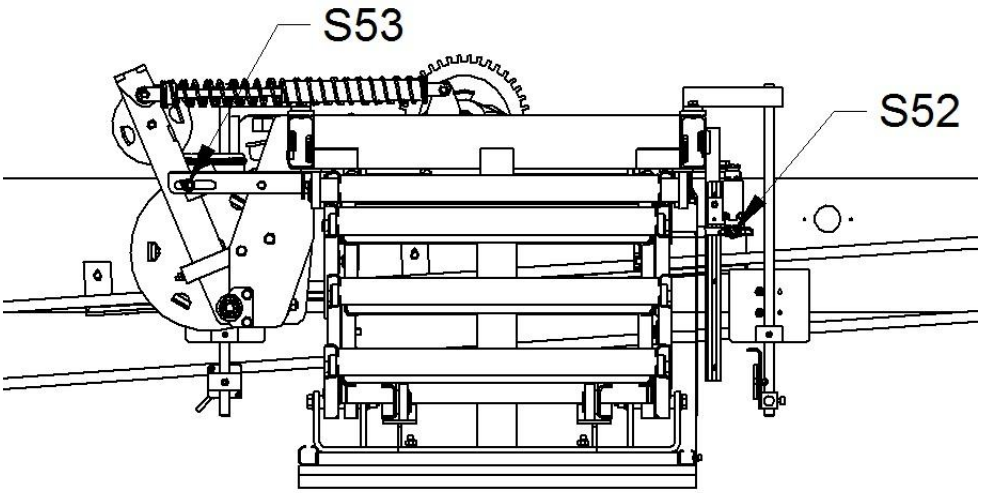
Adjust the speed of the lever movement by means of the throttling valves on the pneumatic cylinder. The movement from the arm is not braked. Adjust the speed of movement towards the arms so that the lever would move for about 1 s.

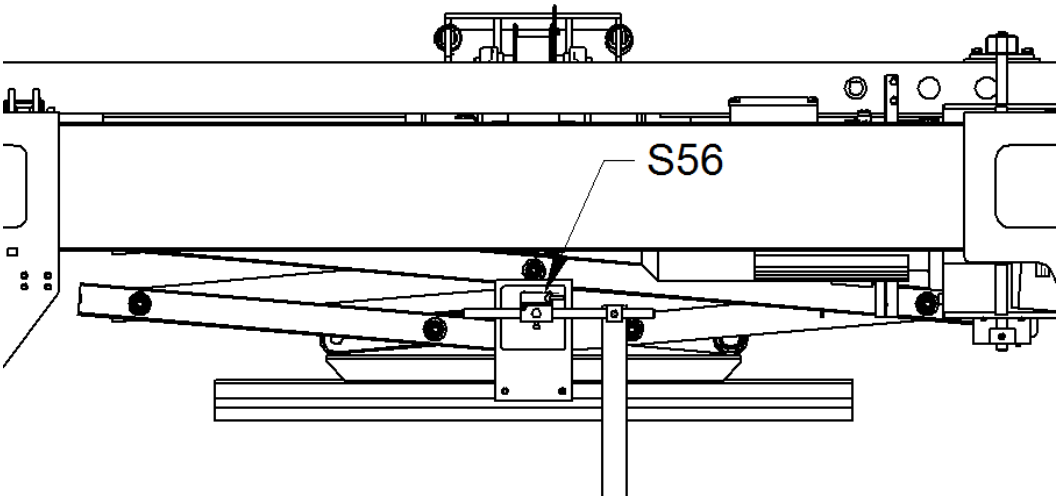
8.14.5.Setting sensors of top platen

It is recommended to leave setting of the sensors on the service organization – their incorrect setting or erroneous link to the service parameters of the machine can cause its breakdown.

The top sheet is fitted with sensors **S50, S51, S52, S53, S54, S55, S56**. Sensor **S50** indicates the upper position of the top sheet; sensor **S51 the** position at which the top platen is slowing down during its movement upwards. Sensor **S52** serves for a potential-free detection of the upper position of the frame and is intended for using in the superior control system. Sensor **S53** indicates sitting down of the top sheet onto the goods or onto the conveyor, or reaching of the lower position limited by the mechanical stops. In addition, sensor **S56** is mounted on the horizontal frame of the machine; it indicates mutual position of the top platen and the horizontal frame of the machine. The top platen movement is controlled by sensors **S54**, **S55** that substitute function of the encoder.







8.14.6.Adjustment of sensors

Set sensor **S50** so that, during movement of the top platen upwards, the top platen would stop before mechanical contact of individual arms of the top platen. Allowance of about 5 mm must be left between the arms. Sensor **S51** is set to the distance of about 150 mm. During movement of the top platen upwards, the top platen is slowing down at this sensor; its distance from sensor **S50** must be sufficient for slowing down of the top platen to a lower speed. Set sensor **S52** so that it would be closed when the top platen is in the upper position.

When the top platen plate has sat down onto the goods the drive pulley is tilted in the horizontal direction until sensor **S53** is obscured when the drive is stopped. Set the sensor so that it could not be obscured during further movement of the lever towards the stop (in the direction from the top platen).

Set sensor **S56** so that, in the upper position of the frame and the top platen, it would be directed towards the centre of the reflecting mirror.

Location of sensors **S54**, **S55** is given by the machine design.

All induction sensors are set to the centre of the sensitivity range.

Lift calibration

In the manual function „Lift upwards and downwards“, move the horizontal frame to the upper position by means of push-button **'+'** (hold the push-button).

In the manual function „Top platen upwards and downwards“, move the top platen to the upper position by means of push-button **'+'** (hold the push-button).

In **SP292** (distance of top platen) set value 7777.

Using push-button **'-'** (hold the push-button) move the top platen down, until the sensor of the goods height on the machine frame becomes obscured.

Wait for about 10 s; during this period, the value of parameter **SP292** - 7777 on the display will change to an actual value of distance of the top platen plate from the sensor of the goods height.

Using push-button **'+'** (hold the push-button) move the top platen to the upper position.

8.15. Setting of sensors in wrapping area

It is recommended to leave setting of the sensors on the service organization – their incorrect setting or erroneous link to the service parameters of the machine can cause its breakdown.

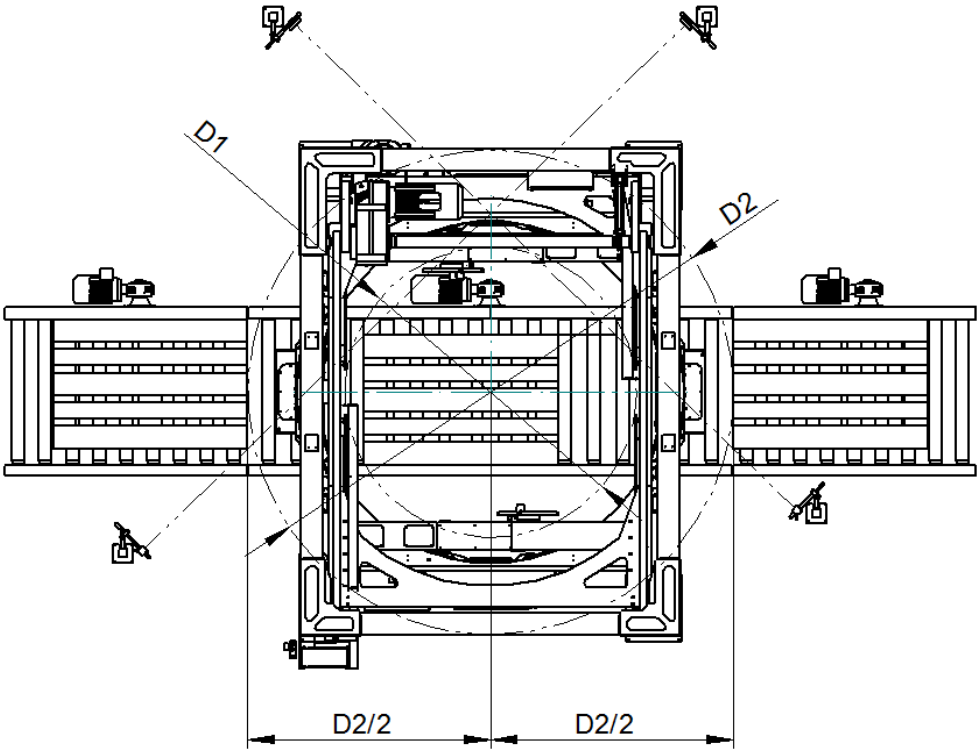
8.15.1.Sensor of pallet under ring

Sensor „Pallet under ring“ serve to protect movable parts of the machine ROTOMATIC against contact with the goods on the transport track. In the standard variant, this function is ensured by one pair of light beams. In special cases, more beams can be used with respect to character of the goods and the transport tracks.

Assembly of sensors

In the standard variant, the holders of optical sensors and the holders with mirrors are mounted on separate columns or on firm parts of surrounding structures. The sensor beams are horizontal and their height is chosen at the level of upper planks of the pallets. In no case, however, may the components placed within circle **D2** overtop the upper plane of the conveyor with any of their parts.

8.16. Setting of sensors



Place the pallet with goods (the largest possible dimension of the wrapped goods should be selected) or, possibly, its substitute of corresponding dimensions on the conveyor at the centre of the wrapping area of machine ROTOMATIC. No part of the goods may top sheet circle **D1** (no corner may be at a distance higher than **D1/2** from the centre of the ring rotation). Place the next pallet on the conveyor upstream of ROTOMATIC so that it would tangent-touch circle **D2** (front edge is at distance **D2/2** from the centre of the ring rotation). During placement of the pallet, the fact should be born in mind that the goods coming on the transport track need not be exactly in its centre but can be shifted with respect to the track axis. In the layout according to the picture and provided that the conveyor axis is identical with the axis of machine ROTOMATIC, the least favourable position is in the case the goods upstream (downstream) of the wrapping machine is pulled up to the conveyor side closer to the mirrors (up in the picture) and the goods in the wrapping area to the side closer to the sensors (down in the picture). In no case, may the goods shifted in the whole width of the conveyor top sheet circle **D1** even considering inaccuracy of stopping the goods on the conveyor.

In setting the sensors, use a string or a ruler placed over corners of the goods according to the picture. Set the sensor and the mirror so that the beam would be parallel to the ruler.

Place the pallet with goods behind ROTOMATIC and, using similar procedure, set the second sensor.

	Rotomatic 1700				
D1	Maximum 1800				
D2	minimum 3000				

8.16.1.Conveyor sensors

In installing the conveyor sensors, the condition should be met that none of their parts within circle D2 may exceed the upper plane of the conveyor.

8.17. End-limit switches and sensors

Make a continuous check of correct function of the switches and sensors (the machine stops or performs required operation at correct places and in right time). During mechanical inspection of the switched off machine, check mechanical state of the switches – non-damaged cables; the switch firmly fixed to the machine; non-damaged levers and pulleys of mechanical switches; correct closing of contacts during movement ("zoom" inspection). During the machine operation, the state of optical and induction sensors is indicated by checking with an LED light. In regular intervals, clean the windows and mirrors of the optical scanners.

Unless it is given by the choice of the scanner type, sensitivity of the optical scanners is set n the factory so that the scanners would reliably scan the goods on the pallet and, at the same time, the scanner would not react to remote objects or a movement outside the machine. Adjustment of an insufficiently or excessively sensitive scanner, if possible, is carried out using an adjusting screw on the optical scanner.

Sensitivity of the induction scanners is given by the type chosen by the designer for particular purpose. Improper function of the induction scanner is caused either by incorrect position of the sensor with respect to an indicated part (the gap should fall within the range according to the sensor size; after adjustment, it should be tested) or by the defective sensor. Adjustment (except for adjustment of the gap) or repair of a defective sensor is not possible; it should be replaced with a sensor of the identical manufacturer, type, and designation. Possible substitutes must be approved by the manufacturer.

Recommended distance of the induction sensors used by the manufacturer – setting to a half of maximum reach of the sensor.

Sensor	Maximum reach [mm]
XS1D08	1.5
XS1D12	2
XS1D18	5
XS1D30	10
XS2D12	4
XS2D18	8
XS2D30	15

In some cases, the scanner can be mechanically secured from the production in a correct position using a glue or a varnish. If necessary (change in orientation of the sensor), the glue or varnish can be removed with a nitro-thinner.

8.18. Check and maintenance of electric installation

Maintenance of the electric installation can only be carried out by the staff with qualification meeting requirements of Chapter ….

Before manipulation with the contactor switchboard as well as during other works with the electric outfit, the **MAIN SWITCH** must be turned off and locked; the key must be taken out from the lock.

In case of larger repairs, **switch off power supply** to the machine!

In shorter intervals, dust and dirt should be removed from the area of the electric devices and all instruments.

In the inspection of the electric installation, the following should be checked:

- Attachment of earthing and protective conductors to the machine structure, insulation resistance, zeroing, and/or earthing.
- Functionality of thermal protections.
- Tightening of all screw joints and contacts of contactors, particularly after heavy short circuits.
- Before each works on the motor, the main switch must be turned off!
- Visual inspection of condition of the cables in the cable chain.
- If the motor is out of action for a longer time its state must be checked, namely:
- visual damage of any of its parts;
- insulation resistance of the winding;
- condition of the motor bearings (after a longer period of the idle state, the grease filling should be replaced).

8.19. Light barriers

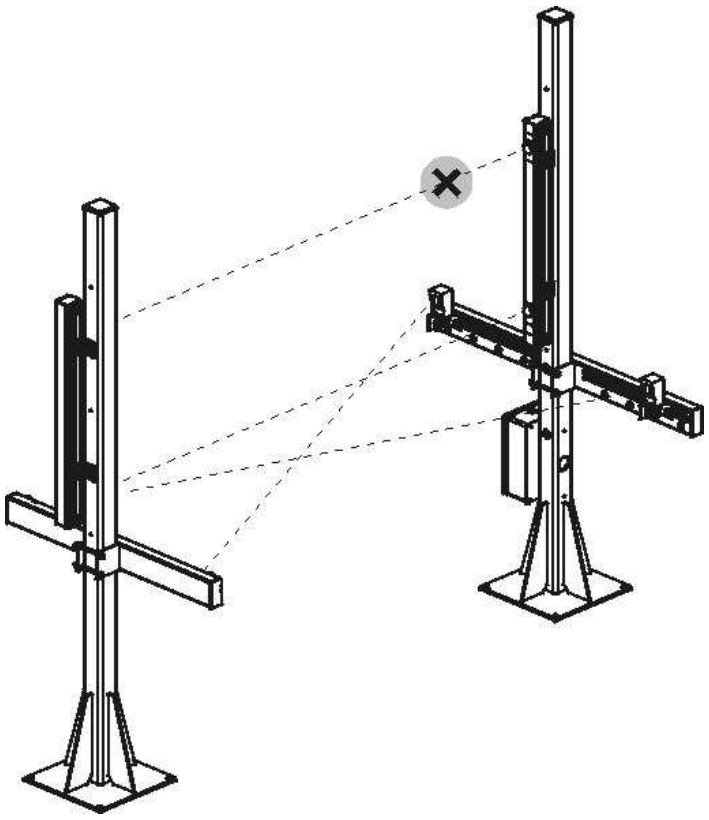
This chapter is written for safety elements used as a standard by the manufacturer of the wrapping machine. In the case the designer of your wrapping line has used different safety devices he/she shall revise this chapter and, if necessary, amend it. These amendments must become an integral part of this accompanying documentation.

8.19.1.Functional check

Once per three months, check function of the safety barriers by the following procedure:

- During the standard wrapping, watch whether the pallets are passing smoothly through the barriers. By monitoring the beacon, check whether the barriers are dampened just for a necessary period.

- Verify that the skew beams of the dampening scanners (on the horizontal arm of the safety barriers) are oriented to corresponding reflectors on the opposite stand.
- Make sure that there is no person in the protected area.
- Start the wrapping process by depressing push-button Start or wait for automatic start of the wrapping.
- Simulate non-permitted passage on the track at the entry by interrupting one beam of the safety barriers. The beams of the light barriers are oriented perpendicularly to the conveyor axis – see the picture with example. The wrapping machine should stop immediately; the period of the machine run out should correspond at most to the value valid for your machine as given in the table in Chapter 4.1.
- Leave the beam of the light barrier obscured; following the procedure in Chapter 8.19.2, unblock the machine and, in the manual mode, test the machine control. On releasing the blocking push-button, the machine must stop immediately.
- Remove the obscuring of the light barrier and, using the procedure in Chapter 8.19.3 point 1, unblock the machine. After unblocking, it should be prepared for normal operation.
-



In case of any deviation in behaviour of the machine or in functioning of the safety barriers from this description, the machine should be put out of operation and its service should be provided for!

	**For the light barriers and safety modules of the firm LEUZE, the manufacturer prescribes an annual check of the device by a service technician authorized by the firm LEUZE. Contact your nearest dealer or technical agency of the firm LEUZE or your dealer of the machine Rotomatic.**

8.19.2.Unblocking of machine

Using the following procedure, you can unblock the machine after its emergency stop by the protective circuit of the light barriers. This unblocking enables removing of an object that caused the emergency stop.

This procedure is also used for unblocking the machine in the case that, at the moment of its switching on, some of the light barriers is obscured.

Works on the machine requiring unblocking of the light barriers must always be carried out by at least two persons; one of them is unblocking the light barriers and the other works on the machine. If, due to the defect, control voltage is switched off it must be switched on by depressing push-button **CONTROL VOLTAGE** (the push-button is lit on).

Persons may only move within the working area of the machine when the machine is blocked or switched off.

	**The function of unblocking temporarily switches off the safety devices. During this period, only persons authorized for repairing the defect may stay in the vicinity of the machine for a necessary time. For the whole time of their work they must keep maximum caution.**
	**The function of unblocking according to the following description can only be used by a person familiar with function of the machine; he/she should carefully watch the risky space and, if necessary, block immediately operation of the machine once again by releasing the push-button.**

8.19.3.Light barriers LEUZE

This chapter applies only to the machine equipped with the light barriers LEUZE and the safety module LEUZE.

During normal operation of the machine, the beacon is lit on. On blocking the machine it is lit off, the machine is blocked by the light barriers.

① If the light barrier is activated by non-permitted passage of a person on the track or in the case the obstacle has immediately been removed, at the moment of intervention of the operator, the beams of the light barriers are no more obscured, there are no objects in the wrapping machine, and the beacon is lit off:

- Depress push-button **SAFETY BARRIERS – RESET** to reset the light barriers, the beacon is lit on. The wrapping machine is prepared for wrapping again.

② If the light barrier is activated by a standing or a broken-up pallet, there are objects in the wrapping machine, manipulation with the machine or track is necessary for repairing the defect, and the beacon is lit off:

- Depress and release push-button **SAFETY BARRIERS – RESET**.
- If some of the beams of the light barriers are obscured, the beacon is blinking, and it is possible to immediately unblock the light barriers according to the following point.
- If the pallet with goods is in the machine and no beam of the light barriers is obscured, the wrapping machine will start moving the pallet on the conveyor to the light barriers. Wait until the beacon starts blinking and, then, unblock the light barriers according to the following point.
- Unblocking of the light barriers: Depress push-button **SAFETY BARRIERS – RESET** twice within 4 s. After the second depressing, the light barriers are unblocked for the period of depressing the push-button, however, not longer than for 10 minutes. The unblocking is ended immediately after releasing the push-button or after the period of unblocking has elapsed. During unblocking of the light barriers the machine is functional in the manual as well as automatic mode. After releasing the push-button, the system evaluates the state of the light barriers; they are either reset (the beacon is lit on and the machine is prepared for wrapping) or they are activated again (the light barriers block the machine and the beacon goes off).

8.20. Check of function of safety devices

Information on the manufacturer and precise type designation of the safety devices mentioned below in this chapter can be ascertained from the electric wiring diagrams or you can get it from your dealer or designer of the electric installation. This chapter is written for safety elements used as a standard by the manufacturer of the wrapping machine. In the case the designer of your wrapping line has used different safety devices he/she shall revise this chapter and, if necessary, amend it. These amendments must become an integral part of this accompanying documentation.

8.20.1.Light barriers, module of light barriers

The check by the user is described in Chapter 8.19.1; it is carried out once per 3 months. For light barriers LEUZE, the manufacturer LEUZE prescribes annual check by an authorized service.

8.20.2. Emergency stop

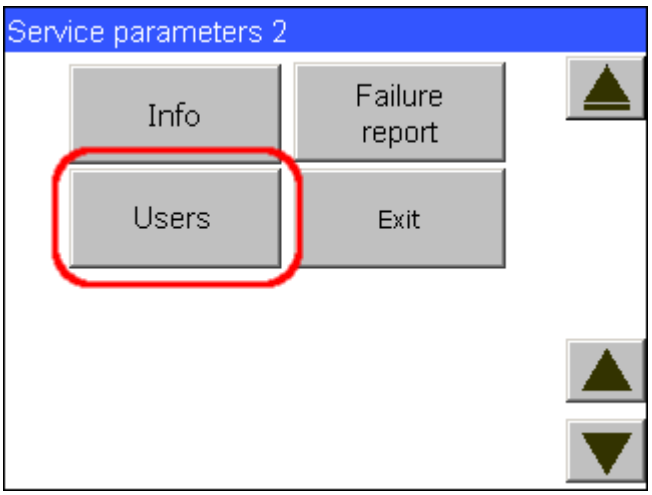
The module is installed in the switchboard. Stop the machine by depressing push-button **EMERGENCY STOP**. With the depressed push-button, depress push-button **CONTROL VOLTAGE**; the push-button must not get lit on and the machine must by no means be put into operation or move. Then, put the machine into operation according to Chapter 6.3. Gradually, test all push-buttons **EMERGENCY STOP** used on the machine and connected to its switchboard. In tis way, test function of push-buttons **EMERGENCY STOP** and the safety module controlling the machine behaviour.

8.20.3.Electromagnetic lock of protective fence

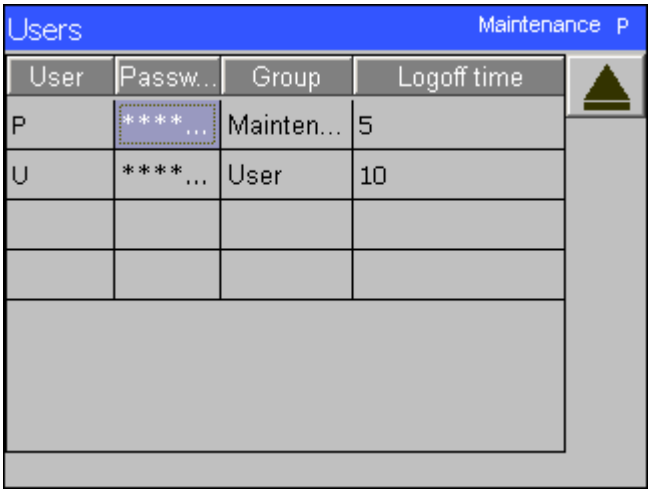
The module is installed in the switchboard. Test its function; without exceptions, it must be functional as stated in Chapter 6.2. Test also mechanical reliability of the lock (it must not allow the door to be opened when using normal force). In this way, test the lock and the safety module in the switchboard communicating with the with control system and with the machine power feeding.

8.21. Change of password

The system of passwords is described v Chapter 6.4.5. If necessary, the passwords can be changed: using the procedure in Chapter 6.11.1, set service parameters 2. The second screen displays push-button Users.



Depress it to display the dialog box of changing the password. You can only change passwords of the level you are logged on or a lower level; these passwords are shown in the table.

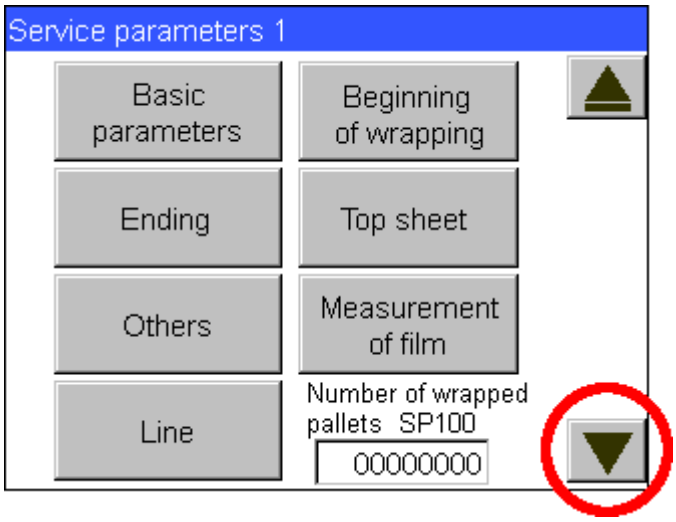


After finishing the editing of the passwords, log off in usual way in the main display of the manual or automatic mode.

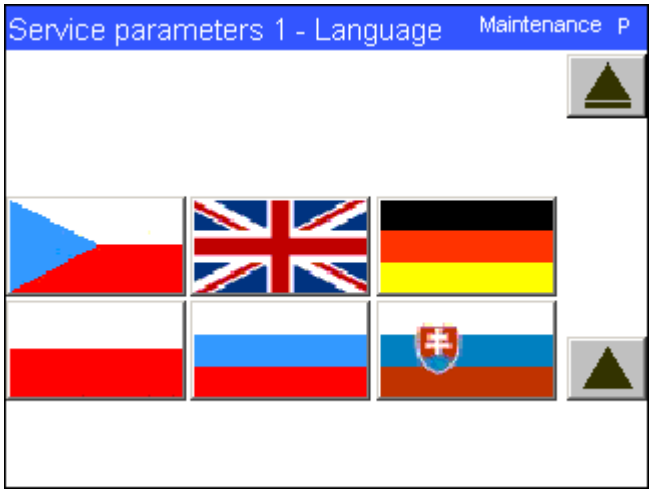
8.22. Setting of language

Several languages can be implemented in the machine dialog boxes. Provided this possibility is supported set the language as follows:

According to Chapter 6.11 go to setting of service parameters 1.



Depress the push-button with the symbol of the globe to depict the list of available languages (the picture shows an example only).



Touch the flag of particular country to immediately set its language in the whole environment of the touch panel. Editing of the service parameters is terminated using a standard procedure according to Chapter 6.11.1. The change of language requires a password of the level identical with that for service parameters 1, i.e. the password of level P – Maintenance.

8.23. Pneumatic flow charts of machine

The pneumatic system of the machine is composed of pneumatic cylinders, electromagnetic control valves, and distribution in the machine. Components from

the firm FECTO are used on the machine as a standard. The pneumatic flow chart is valid for a fully equipped machine. In the case your machine does not include some of the equipment particular branch of the pneumatic flow chart is not installed.

The pneumatic flow chart is a part the catalogue of spare parts.

8.24. Check of screw tightening

The check concerns, above all, exerted screw joints; they should be tightened with torque given in the table. The following places are relevant:

- Attachment of the prestretch device and the counterweight to the ring;
- Attachment of the drives, motors, and reaction captures.
- Screw joints of the machine structure.

Tightening torques	
Thread	**Torque [Nm]**
M6	5
M8	11
M10	22
M12	36
M20	157

FACTORY PASSWORD

For access to programs

Level	U - User
Password	222

FACTORY PASSWORD

For setting service parameters

Level	P - Maintenance
Password	124

WARNING

Keep these passwords so that they cannot get into hands of unauthorized persons.