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Rotary Arm

Product Specification
Service Instructions
Maintenance

Rotation wrapping machine can only be operated by an employee who has been assign to it and has been acquainted with these instructions and safety rules herein stated in a demonstrable way.

TABLE OF CONTENT

1. GENERAL

These instructions are the original instructions for use according to Directive EU no. 2006/42/ES and they are authorized by the manufacturer.

1.1. Utilization

Rotary Arm WRA is a fully automated machine to be included in transportation lines, eventually for a freestanding use. The machine is designed for plants with higher capacity of wrapping and high wrapping demands; it ensures a perfect fixation of wares on the pallet while using a minimum amount of film. It is also designed for wrapping of lighter wares where a dynamic momentum working upon the pallet as in the case of conventional method of rotating pallet would otherwise result in moving or spilling the wares.

High productivity of the machine is provided for by a wrapping technology whereby a pallet is not being rotated as in case of standard machines but is being wrapped by a spool-film rotating on an arm around the wares.

Stretching mechanism moves vertically on a rotary-arm track, which is fixated by a solid tenon to a stator part of the machine. Propulsion of the rotary arm is ensured by a spiral gear drive and chain gear.

Due to simple construction is this machine noted for its high proportion between utility value and price.

1.2. Description, Accessories

1 **Mainframe.** Rotary arm with stretching mechanism is hung on it.

2 **Arm** rotates around the wares and stretching mechanism moves vertically on it.

3 **Stretching mechanism.** It carries a film-spool and ensures both correct wrapping of wares including tightening to ensure better firmness of wrapped pallet, and film stretching in order to reduce its usage.

4 **Top platen mechanism** for unstable wares is not part of the standard package. It is suitable for light or unstable wares. It is a pneumatic mechanism, which is ejected from the main tenon, and its correct position is during the whole course of action secured by shear mechanism.

5 **Ending mechanism.** The machine is equipped with ending mechanism by default. As per order, one of following two mechanism can be delivered:

- smoothing ending mechanism
- sealing ending mechanism

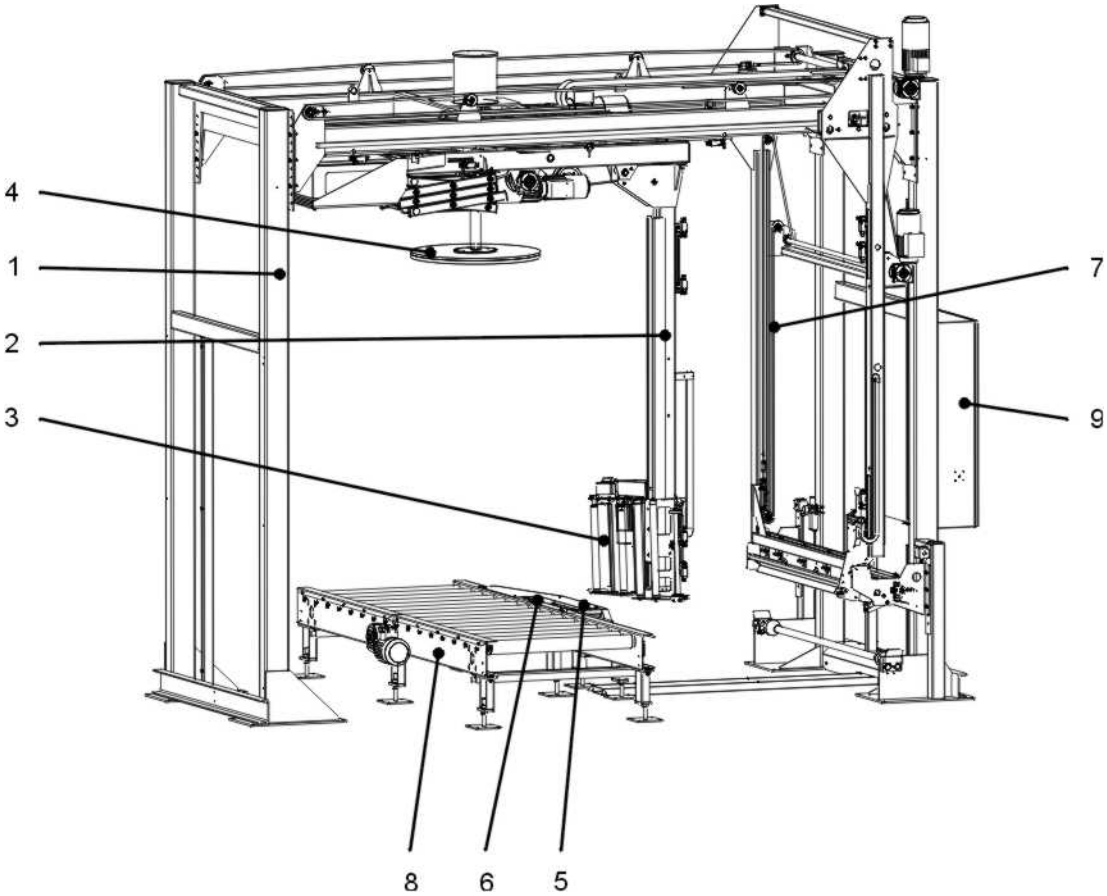
6 **Film gripper**. It is placed on a conveyor and works in co-operation with ending arm. During the ending it grips the end of the film from the stretching mechanism and at the beginning of the following wrapping it secures the film on the pallet.

7 **Overlap mechanism. Not part of standard package,** it can be fitted per order onto model PROFI only. It lays overlap film on top of the wrapping pallet.

8 **Conveyor**. It serves to carry pallets with wares into the workplace of the machine and to carry wrapped wares further on the line.

9 **Switch-board** with control panel.

10 **Protection fencing.** (not displayed). It is mounted as per project (see Chap. 3.1) and ensures safety of manipulation staff as well as other people in the vicinity of the machine.



Detail description of individual parts of the machine incl. its manipulation in Chapter 5.

1.3. Wrapping Material

1.3.1. Wrapping Foil

The machine is designed for wrapping the wares on pallets with linear low-density polyethylene stretch film (LLDPE) with thickness of 20 ÷ 40 μm. The film must have dilatability of 150%, be in spools of 500±10 mm in width and diameter of maximum of 250 mm. The tube onto which the film is wound must have inside diameter of 76±3 mm and length of 510±5 mm.

Both one-sidedly adhesive and non-adhesive film can be used. Adhesion of one side means that individual layers wrapped around the wares will very well stick together, yet they do not tend to damage the wares on the pallet in any way. The main purpose of utilizing this film is to better set the wares on pallet, better firmness of the wrapping and its bigger resistance against climatic effects and mechanic straining during transportation. After wrapping a pallet with the wares, it is recommended that the wound film be oriented with its adhesive side onto the wares so that the pallets will not stick together with each other during manipulation and transportation.

The film is normally resistant against UV radiation for 6 months, i.e. the wrapped wares can be stored during this time outdoors and be exposed to the solar radiation while keeping all original characteristics of the wrapping. If required to be stored outdoors for longer time, some films can be supplied with better resistance against UV radiation.

Stretch films meet above-mentioned requirements:

Model	Dilatability	Use	Possible variations
POWERFLEX HPQ	250%	Automatic machines with mechanical, single- or twin-engine stretching mechanism.	Various thickness Non-adhesive and one-sidedly adhesive High UV radiation resistance
POWERFLEX SPQ	300%	Use – similar as POWERFLEX HPQ.	Various thickness Non-adhesive and one-sidedly adhesive High UV radiation resistance

At wrapping machine setting in operation we recommend you to contact the supplier or the manufacturer, which will recommend you optimum stretch film for wrapping the wares from their experience.

We do not recommend using of packaging material other than stated here, e.g. perforated films, reticular films, laminated films, printed films etc., without prior consultation with and without permission of the manufacturer as a proper functioning of the wrapping machine cannot be guaranteed. If, during guarantee period, the machine wraps imperfectly, or if the machine or the wrapped wares get crippled then usage of uncertified films or packaging material by the manufacturer may be a reason for the claim rejection.

1.3.2. Overlapping film

The overlapping device (provided that it is fitted to the machine) should be operated with a smooth non-stretching film of polyethylene (PE), thickness 50 to 80 µm, supplied in rolls. Without a consent of the manufacturer, an atypical film may not be used (e.g. network-like, perforated, layered, with bubbles, made of other material than PE, etc.). Concerning the machine design, no requirements are defined for other properties of the overlapping film than those specified in this chapter. Specific width of the film is given by dimensions of the wrapped goods on the pallet and the wrapping method. The overlapping film on the roll of width max. 1700 mm can be inserted into the machine ROTARY ARM 1700.

Diameter of the overlapping film roll is max. 250 mm. The film must be would up on a tube the inner diameter of which should fall within 55 to 85 mm; the tube must go beyond the roll face at both ends or must match with it. Concerning the machine design, no requirements are defined for stretching ability or other properties of the overlapping film than those specified in this chapter.

1.3.3. Environmentalism

The film can be included into assorted waste (polyethylene PE, to be precise). The material is well recyclable. It can be easily burned and while keeping correct combustion conditions, no harmful fouling originates. It is not biologically decomposable and the decomposition in the dumping ground is very slow. No harmful by-products to elude to the air or to pollute water or soil are known.

1.4. Machine Design

On condition of installation and running the machine according to the project done under Chap. 3.1, the machine design conforms to relevant technical regulations and standards and meets requirements of relevant safety and fire regulations.

Standard and regulation requirements are included in the production documentation. Precautions on the part of the user are described in this accompanying technical documentation - service manual.

The expected machine lifetime is 10 year or 50,000 service hours, what happens first, providing the machine is used in conformity with this accompanying technical documentation and the specified maintenance and periodical checks of the machine are kept.

1.5. Machine Operating Conditions

The wrapping machine is designed for operation in the ambience, which has to meet following conditions:

Common ambience in terms of a Czech standard ČSN 33 2000-3 (IEC 364-3) under the terms as set out further in this chapter and on condition of installation and running in conformity with this accompanying technical documentation.

The machine must be fitted up and operated in sheltered operation premises protected from atmospheric factors.

The floor must be level and braced, the maximum variation from the flatness of the floor is ± 3 mm / 2m. Before fitting the machine in place, it is necessary to remove dirt, chips etc. from the surface.

The temperature range for operating the machine should be between +5ºC and +40ºC, the rate of change of the temperature be max. of 10°C / 30 min.

The relative humidity should be 30% ÷ 95%, without moisture condensation.

The machine can only be operated in the premises, which meet requirements of governmental working condition regulations - regulation No. 178/2001 of the Statute Book, "Government Regulation, which establishes conditions for health protection at work" and Ministerial Regulation No. 48/1982 of the Statute Book, "Regulation of the Czech Occupational Safety Authority, which establishes basic requirements for ensuring occupational and machine safety".

It is not allowed to fit up the machine so that the access paths to the electric installation would be reduced under the minimum values as set out in governmental regulations, i.e. ČSN 33 3210 Distribution Equipment - Common Provisions.

No obstacles, which could cause injuries of manipulators, may be placed in the vicinity of the machine (e.g. stairs, platforms, drop ceilings, others machines etc.).

The product must not be used in the explosive atmosphere or where the explosive atmosphere could arise even for a span.

The machine, and especially its electric installation, must be fitted up and operated according to instructions of the manufacturer as mentioned in this accompanying technical documentation.

1.6. Warranty

General warranty conditions are defined in the Warranty Sheet which is an integral part of documentation accompanying the machine. The warranty sheet must be duly and fully filled in and confirmed by the manufacturer.

Prerequisite for warranty is regular check and maintenance of the machine and exclusive usage of original spare parts.

- **Warranty does not apply to defects caused by:**
- mishandling
- non-respecting the operating instructions of the product
- intervention into the product by unauthorized person or organization, and
- overloading.

Warranty also does not apply to:

- Tear-and wear parts specified in Chapter 8.2.1.
- Damage to machine or goods caused by using wrong consumable material, other than approved by the manufacturer (see chapter 1.3).

1.7. Manipulation

The machine is designed for manipulation by one person. Working station at the control panel in combination with specified protecting device ensure that the manipulator will work beyond reach of the working space of the machine.

1.8. Electrical Installation of Machine

Electrical installation of the machine has been executed pursuant to EN 60204-1.

Electrical installation of the machine comprises of a switch-board and an electric distribution on the machine. There are bipolar supply terminal and machine on-off switch in the switch-board. Machine supply must be protected by fuses or circuit breaker. The mains, to which the machine will be connected, must comply with both international and national regulations and standards.

2. SAFETY INSTRUCTIONS

2.1. Revisions and Tests of Electric Installation

The machine is subject to regular revisions and tests of electrical installation. It is necessary to meet requirements as set out in EN 60204-1 during those operations.

The revision of electrical installation must be executed prior to initiation of the machine - see Chap. 3.3.

2.2. Safety Recommendation

Since every unprofessional interference with electrical installation could cause major damage to the machine or an injury to the personnel, any intervention can only be carried out by person competent in accordance with national regulations for electrical work..

Machine manipulators must be demonstrably familiarized with this service manual and the manual must be made available to them at all times.

The main machine switch on the switch-board is lockable and it enables to lock the switch in the off position. We recommend the machine user to sort out handling of the key on the floor where the machine has been fitted up and thus prevent the machine from running by unauthorized person.

2.3. Occupational Safety

2.3.1. Protective Devices for Occupational Safety

Dangerous places, which could endanger the manipulator during operation, are secured by protective fencing, which is connected with the control system of the machine; eventually, the project executed according to Chap. 3.1 must apply safety measures, which provide equal health protection of machine manipulators as well as other people in the vicinity of the workplace. If both, the specified operation for wrapping and instructions as stated in this documentation, are met the work with the wrapping machine is safe.

Dangerous places outside the working space of the machine result from principles of individual activities of the machine:

1) Roller or chain conveyors enable independent movement of pallets with wrapped wares.

To ensure safety of personnel, the following are used:

1) **EMERGENCY STOP** button for quick switch-off of the machine. The button is mechanically blocked in on position and is placed within reach of the manipulator on the control panel.

2) **CONTROL VOLTAGE** button. On power supply outage or upon touch of **EMERGENCY STOP** button, the supply of control system is switched off and the machine stops performing any activity, even if the supply is recovered or the **EMERGENCY STOP** button is prematurely unblocked as a result of accidental or inadequate action of the manipulator or service. Only the touch of **CONTROL VOLTAGE** button enables further activity of the machine.
3) Machine control is executed from the control panel, which is placed on the side of the machine, or independently as per the project. The control panel is out of reach of working space of the machine.
4) There is a protective fencing around the whole machine, eventually equivalent safety measures are used as per project as designed in Chap. 3.1
5) Ending mechanism. Control element (reverser) for opening and closing film fixture is placed in a way that during its operating the mechanism of film fixture is out of reach for the manipulator.

2.3.2. Duties of Manipulator and Machine User

For personal safety, the manipulator is obliged to follow these instructions:

6) The crew of the machine is made up of one person only. No other person than the manipulator is allowed to be in the vicinity of the machine during run.
7) Only a worker older than 18 years, who has been authorised for it and has been familiarized with this manual and safety rules demonstrably, is allowed to manipulate with the wrapping machine.
8) The manipulator must not be under influence of alcohol, addictive drugs or drugs, which may influence safety at work.
9) During the operation, the manipulator must be beyond reach of the working space, i.e. by the control panel.
10) The manipulator must operate and maintain the machine in accordance with this manual. Material damage and injuries can be avoided, if the machine is properly used.
11) The manipulator must check the whole machine a correct functioning of its individual parts, mainly integrity of electric cables before work initiation.
12) During operation of the machine or the conveyor is prohibited to manipulate with wrapped wares on roller or chain conveyor or with the conveyor itself differently than specified in this manual.
13) To remove, dismount or lift off covers is only allowed after the machine has been brought to a complete stop and the off position has been secured.
14) Safety marking, symbols and signs on the machine must be kept in legible condition. On their damaging or at their illegibility, the user must restore the state in accordance with the original design.

It is prohibited:

1) **To use the machine for other purposes or otherwise than specified in this service manual.**
2) **To start up and to use the machine, if protective equipment (cover, keyboard sheet) is dismounted or damaged.**
3) **To touch moving palette.**
4) **To operate the machine, if working space of the machine and workplace are not well illuminated.**
5) **To carry out maintenance, cleaning and repairs, if the machine is not switched off with the main switch and secured against accidental start-up.**
6) **To carry out checks or repairs of electrical installation by a person without necessary qualification.**
7) **To put out of operation safety, protective and security equipment or otherwise interfere with the installation and electrical elements of the machine.**

2.4. Health and Occupational Hygiene

Weight of the wrapping film is approx. 17 kg. To handle loads over 15 kg is prohibited to all women and juveniles.

Working ambient, in which the machine is operated, is influenced by the nature of manufactured and packed goods. The user is obliged to guarantee occupational safety and hygiene of workers in conformity with national regulations for occupational hygiene.

To reduce the physical effort, the manipulator must during manipulation with packed pallets use hoist means of mechanisation, which have been assigned to him by the employer.

If the nature of the packed product could lead in hand or any other injury of the manipulator during operation, or if packed goods does not meet hygiene limits (chemical and biological materials, dustiness, din etc.), the operating staff must use personal means of protection that the machine user has given them for that purpose.

2.5. Fire Protection

To ensure the fire protection during operating the wrapping machine, the user must equip the workplace of the wrapping machine with relevant fire-fighting means. Their purpose and placement must be consulted with and approved by experts in fire protection and inspection, mainly in relation to nature of processed material and to the fact that the wrapping machine is an electrical device.

The placement of fire extinguishers and their selection is done by fire-prevention officer of the user according to local conditions.

2.5.1. Instructions for Machine Staff

In case of fire accident, the manipulator must in the first instance turn off power supply by switching off the main switch.

To subsequently put out the emerged fire, the manipulator must only use the fire extinguishers designed for it.

Neither water nor foam fire extinguishers are allowed during fire extinguishing!

3. ACTIVATION AND HANDLING

A supplying company normally executes machine assembly and activation. There must be a three-phase supply and compressed air at disposal on side. For parameters of power supply and compressed air see Chap. 4. After the assembly and connecting to power supply it is necessary to carry out revision of electrical installation before activation - see Chap. 3.3.

3.1. Project

Before the machine assembly, a project tackling the following must be drawn up:

- meeting machine ambient requirements (see Chap. 1.5),
- occupational safety of the personnel and other persons in the vicinity of the workplace. Access to the working space of the machine must be barred during the wrapping process by e.g. using protective fencing, light barriers, electronic locks and other protective measures as needed,
- location and orientation of the machine within the wrapping line in term of functionality of both, the machine and the line, and according to needs of the packed goods,
- if the machine is fitted with the overlapping device it is necessary to minimize airflow in the machine vicinity (the cut-off overlapping film is carried by the airflow away from its optimum position and the overlap can be of poor quality),
- location of the switch-board and the personnel (in case the machine is delivered without the switch-board, or with detached one),
- access to places of manipulation and places essential to maintenance and repair works,
- mechanical, electric and software co-operation with other machines on the line,
- supply of electricity and compressed air and cable guide so that neither the supply and the cables could not be damaged, nor the manipulator or other persons in the vicinity of the workplace be injured,
- positioning of more Emergency stop buttons if need be so that they would be easily accessible for both, the manipulator and other persons in the vicinity of the workplace.
- These times of emergency stop of the machine apply to calculating safe distances according to ČSN EN 999 :

Machine version	1700	2300
Standard	1 s	1,2 s
Profi	1 s	1,2 s

The project may be drawn up by a company or a person knowing the rules of occupational and machine safety as established by applicable international and national law and standards. Safety of the whole workplace must be analyzed by the supplier who is responsible for the solution and, if need be, prepares

guidelines for occupational safety. By default, the manufacturer or the supplier of the machine drawn up the project.

3.2. Storage

If the machine is not put into service immediately after delivery it needs to be stored in original protective wrapping in sheltered place protecting from atmospherical factors (rain, snow). The range of storage temperature is between 0ºC and +55ºC, with humidity between 5% and 95% without moisture condensation. Corroding agents or materials releasing vapours that may damage cable insulation, or materials that may create combustible or explosive atmosphere must not be stored on the same place as the machine.

3.3. Connection To Supply System

Electrical package of the machine comprises of a switch-board and distribution through the machine. The main switch and five-pole supply terminal with U-, V-, W-, N- and Pe-connectors are placed in the switch-board. The machine supply must be secured with fuses and circuit breaker.

First check service voltage and machine frequence as shown on electrical installation label with voltage and frequence of the mains, to which the machine should be connected. Even voltage variation by maximum of 5% of face-value ensures proper functionality of the machine. The mains, to which the machine will be connected, must comply with all international and national standards and regulations.

Outer protective terminals on the machine and contactor switch-board must be connected to protection system of the user and be properly cured.

Before the machine is put into service, a proper functionality of the protection against dangerous contact voltage as per IEC 60364-4-41 must be checked and a revision of the machine supply cable as per IEC 60364-6 be carried out. The revision must be executed by revision worker who meets national regulation requirements.

The machine may be connected to the mains with the main switch after a thorough examination of the supply and specified revision.

3.4. Machine Disassembly

On machine disposal after finishing its lifetime put all mechanism in such position that no danger could arise from falling detached parts and that all dismounted parts could be safely taken away. Remove supply connection by pulling the plug out of the socket and compressed air by disconnecting from the supply. A person competent under Chap. 2.2 checks remnant voltage in the electric circuit, if any, before start of dismount; potential remnant voltage must be discharged.

Dismantle engines with gear boxes, drain the oil, which is to be stored in solid, break-resistant and impermeable vessel.

Dismantle all parts of the machine.

Sort all parts according to waste classes (steel, non-ferrous metal, plastics, cables, electrical elements etc.). Hand over the separated waste including oils to specialized companies for its competent disposal.

4. TECHNICAL PARAMETERS

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Max. pallet diagonal		**1700**
Weight		1330 kg
(per type, min.)		(see type label)
Proportions	Height	as ordered
	Width	3000
	rotary arm diameter	3000
Arm	Motor	2.2 kW / 50Hz 400 V
	Revolution	30 rpm + 20%
	Revolution direction	left
Film container motor		el. motor 550 W / 50Hz 400 V
Air pressure	Input	max. 1.5 MPa
	Operational	0.6 MPa
Wrapping film spool weight		approx. 17 kg
Overlapping film spool weight		approx. 50 – 100 kg
Conveyor	Width	900
	Height	as ordered
	Length	3000 mm
	Speed	0.2 m/s
	Propulsion	roller conveyor:: el. motor 550W/50Hz 400V
Circuitry	Working voltage	3 × 400 V / 50Hz
	Motor input	9.2 kVA (see type label)
	Supply protection	40 A (see type label)
	Control circuit voltage	24 V
	Electric installation protection rate	IP 54

4.1. Label

4.1.1. Type Label

Type label is placed on a bottom part of pillar and its identical copy is in the switch-board to be protected from any damage. It includes following:

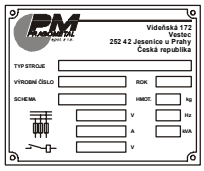
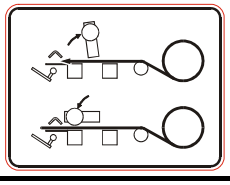
- Name and address of manufacturer (supplier)
- Product type designation
- Machine serial number
- Production year
- Electrical scheme number
- Machine weight (kg)
- Supply voltage (V)
- Supply voltage frequence (Hz)
- Voltage protection (A)
- Machine input (kVA)
- Control circuit voltage (V)

Data on type label take precedence over any data about technical parameters or other data in this documentation.

4.1.2. Other Labels and Tags

Labels and tags serving as source of information and warning of danger for manipulators are shown in the tab. In case of them being damaged or lost, restoration must happen.

The list shows all labels and tags that may appear on fully equipped machine. Potential use restriction is shown in Use column.

Label		Position
Manufacturer label		bottom part of pillar copy inside switch-board
lightning - warning of electric shock in case of removed cover		switch-board door
Scheme of loading film into machine		arm, near film spool

5. EQUIPMENT

5.1. Stretching Mechanism

The film, for which the stretching mechanism is designed, is specified in Chap. 1.3.

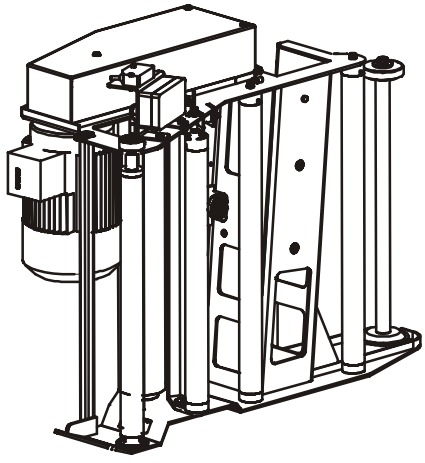
Primary stretching happens between stretching mechanism rollers as a result of their different rotation speed. The main outcome is film saving. Secondary stretching happens between the stretching mechanism and pallet directly by pulling the pallet against retarded rollers of the mechanism and it determines the tightness of the wrapping (tightening of the film around the goods).

The entire stretching mechanism is mounted on a trolley, which moves along the full length of rotation arm pillar.

The operation is controlled from a control panel of the wrapping machine.

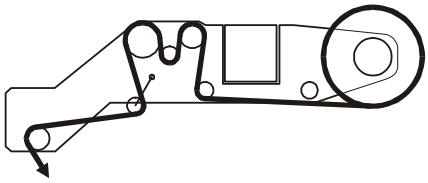
!	**!! WARNING !!** Any part of wrapping machine **must not** be in motion during any work near stretching mechanism rollers.

5.1.1. Single-engine Stretching Device



Working principle of the single-engine stretching device is primary film stretching between two main rollers, which are interlocked via gear transmission. Gear ratio is typically 160% and can be adjusted by changing gear wheels on rollers. Secondary film stretching happens between the pallet and the main roller, whose stopping power is determined by a difference between motor speed and arm rotation. Secondary stretching can be controlled from a control panel, its range is between 70% and 400%, with 100% meaning that the film leaves the stretching mechanism in such a speed that neither stretching, nor shortening happens after wrapping on goods. Single-engine stretching device is designed for plants with middle or higher capacity or packaging, demanding good quality of wrapping and film saving and with no or less frequent request for primary stretching value change.

The stretching mechanism is constructed from bearing structure, onto which main rollers, their propulsion and gearing are mounted. Here are also mounted secondary rollers ensuring proper and even application of the film on the goods.



Instructions for film initialization: Change empty spool for a new one. Unwind approx. 1 meter of the film from the spool, intertwine its end as much as needed for loading into the stretching mechanism and lead it between rollers according to the scheme as stuck on the device. The film will later straighten up again between the rollers during operation. Act similarly on re-initialization after breaking the film.

If not specified otherwise in the order, the primary film stretching is set to 160%, which suits commonly used films and wrapping procedures. If you need to change the primary stretching, you have a set of belt gear for different stretching size from 80% to 290% at your disposal. Pinion and primary gear remain identical for all values of primary stretching, only belt-gear wheel and secondary gear belt need to be changed. Remove top cover of the stretching mechanism, unscrew shaft axis bolts in belt wheels and pull down both wheels as well as the belt. Conversely, mount new belt and new belt wheel together with the original pinion (the pinion must always be on output shaft of the roller closet to electromotor).

Stretching	Wheel		Belt	
	No. of cogs	Order No.	Manufacturer No.	Order No.
80%	36	RTA-3.0-01-22	HTD-405-5M-15	1K-RE-0301
120%	44	RTA-3.0-01-23	HTD-425-5M-15	1K-RE-0302
160%	53	RTA-3.0-01-24	HTD-450-5M-15	1K-RE-0303
210%	62	RTA-3.0-01-25	HTD-475-5M-15	1K-RE-0304
250%	69	RTA-3.0-01-34	HTD-500-5M-15	1K-RE-0351
290%	79	RTA-3.0-01-27	HTD-525-5M-15	1K-RE-0305

Correct belt tension and procedure for setting are described in Chap. 8.2.9.

Maintenance of this device includes occasional check of belt tension and its condition - see Chap. 8.2.9.

5.1.2. Measuring Height of Goods on Pallet

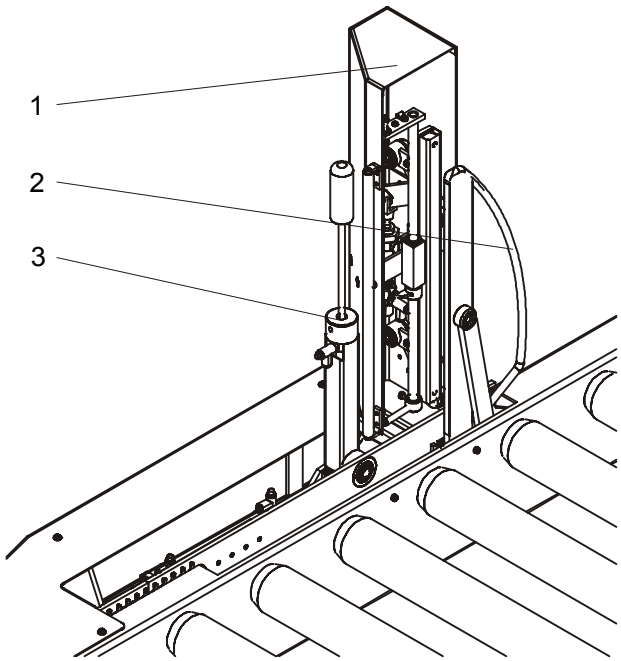
The wrapping machine is equipped with optical system for measuring the height of goods on the pallet. This device is designed for automatic halt of the stretching machine after wrapping top of the pallet. Optical sensor placed on the stretching mechanism scans current height of the pallet as it travels with the mechanism. From a moment when the sensor does not note any reflection (i.e. is above the level of goods on pallet), the mechanism carries on with travelling upwards until a moment as set up in the machine parameters and then stops.

5.2. Ending Mechanism

The mechanism is controlled with operating system of the machine. It is designed to stick the film to packed goods at the beginning and the end of wrapping; both activities are fully automatic with no crew intervention. It is placed on the conveyor or in its close distance in wrapping space of the machine.

5.2.1. Ending by Sealing

Ending mechanism consists of three bars; while inactive, they are tilted under the level of conveyor. For better illustration, the figure depicts all bars in upright position.



1 – ending arm – device for film sealing and its cutting is mounted here

2 – back plate fixing wrapping film during the complete ending of the film

3 – film fixture. Its function is to hold the film between two consecutive wrappings.

The entire ending process can be described as follows:

- Back plate is ejected before the end of ending.
- Back plate is wrapped with the wares to the pallet.
- Film fixture fixates the film between the stretching mechanism and the pallet at the end of wrapping. Ejected back plate ensures quality sealing.
- Ending arm and back plate tilt back and conveyor carries away the wrapped pallet.

Sealing arms and film fixture are powered by compressed air.

!	**!! WARNING !!** **Risk of scorch! Overburning wire and sealing device are red hot for a short time during cutting and sealing the film.**

5.3. Top platen Mechanism

The mechanism serves for fixing unstable, light goods during wrapping. It is not part of standard package and has to be ordered extra.
Shearlegs top platen device attached to rotary arm can be used. Adherence pressure of approx 300N (30kg) is developed by self weight of part of the mechanism.

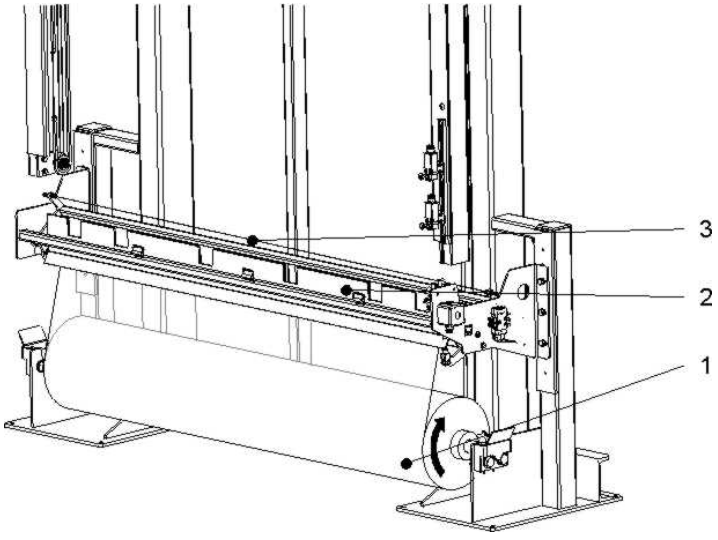
5.4. Overlap Mechanism

The mechanism is not part of standard package and has to be ordered extra. If the mechanism is not requested with the initial delivery of the wrapping machine, it cannot be supplied later - machine frame with the mechanism is not identical with the one without it.

The mechanism serves for protection of upper area of packed goods against atmospherical factors. Edges of protection film are fixated to pallet with stretching film.

Overlap film can be laid automatically - command to overlap the pallet is sent in the program of the wrapping machine so that the entire overlap process is done without any intervention of the manipulator. Adjustment of the process is possible only by setting optical sensors and changes in program and operation parameters.

5.4.1. Description of Overlap Mechanism



1 Container with overlap film

2 Static tongs hold end of overlap film from spool.

3 Chain blade. Resistance cutting wire is mounted on it. Overlap film is cut by red hot wire.

4 Mobile tongs pull loose end of the film so that it could be cut properly, and then lay cut film on top of the goods on pallet (mobile tongs are not drawn in the figure. For illustration, the figure shows a moment, when the tongs are off their starting position).

5.4.2. Operation Description

Operation of the overlap mechanism can be divided into following phases:

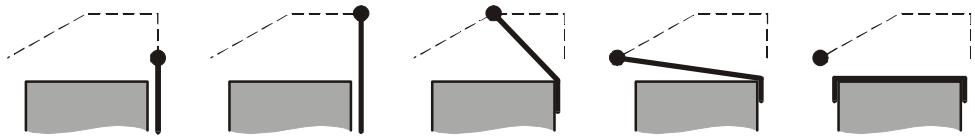
1 Starting position: The overlapping film is inserted into the machine and fastened in the fixed tongs. The moving tongs are in their starting position.

2 Film cutting. The moving tongs catch the film end, the fixed tongs open and release the film. The moving tongs stretch the film to required length in the vertical direction and then stop. The fixed tongs close again and catch the film. The cutting bar cuts the film.

3 Moving of overlap to the goods. The moving tongs with the cut-off film move in horizontal direction to the goods and find the upper edge of the goods in the vertical direction.

4a Standard overlap (laying of the film by horizontal movement): The moving tongs lay the film by horizontal movement to the top of the goods on the pallet.

4b Combined overlap (laying of the film by horizontal and vertical movement at the same time): The moving tongs move vertically to the preset height for the combined overlap and start laying the film by horizontal movement; after they have run the preset horizontal distance, they start moving down. This procedure reduces the risk of damaging the overlapping film by the sharp upper edge of the goods on the pallet.



5 Return. All mechanisms move back to their starting positions. The mechanism is prepared for laying the overlap on the next pallet.

5.5. Lifting Mechanism

Lifting mechanism is optional (delivered per order) and is located under the conveyor in wrapping machine axis. Before start of the wrapping, it lifts packed pallet by 10 to 15 cm and thus enables to wrap the wares including the pallet (so called under-wrapping), which fixates the goods to the pallet. It is mostly used with light or unstable goods. The lifting mechanism is controlled automatically by control system of the machine without any intervention by manipulator. Inclusion

of the operation of the lifting mechanism in the program is set in relevant parameter of the machine system (see Chap. 6.6.2).

5.6. Protection Fencing

Protection fencing guarantees manipulator's safety. It makes it impossible to activate the machine, if there is a man in front of the fencing, i.e. it does not allow anybody to stand in front of the fencing during operation. Electric lock and its manual manipulation are controlled by machine control system. Control elements of the fencing (electric lock buttons) are located outside the main panel of the switch-board, just beside doors to the fencing.

Protection fencing is perfected with light barriers, see Chap. 5.7.

5.7. Light barriers

Light barriers support the protection fencing by guarding roller conveyor at entrance and egress to the working space of the machine. In case of an attempt to enter the working space of the machine using conveyor, the machine is immediately switched off.

Category 3 safety elements as per ČSN EN 13849-1 are used. Operation of light barriers is fully automatic and does not depend on the personnel. Light barriers status is indicated as text on display and with bollard.

Light barriers protection function is moderated for essential period during passing the pallet into the working space of the machine (function muting). light barriers stop working during this period and unauthorized access is enabled. There, the access on the conveyor must be physically disabled by light barriers, by protection fencing reaching the light barriers and by mounting the light barriers just beside conveyors to disable the access between pallet and light barriers.

Activity of light barriers is indicated with bollard.

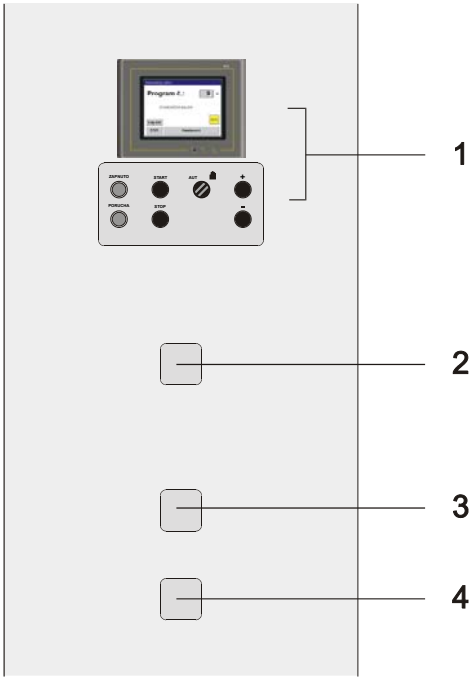
Line Status	Bollard Status
Standard status (machine is on and light barriers work as normally)	lit
Mute status (muting - pallet with goods is just passing the light barrier)	not lit
Emergency status (attempt to enter the space, accident or fallen goods in the light barrier)	blinking

Barrier protection function can be muted manually from serious reasons. More information – see Chap. 7.4.

5.8. Control Panel

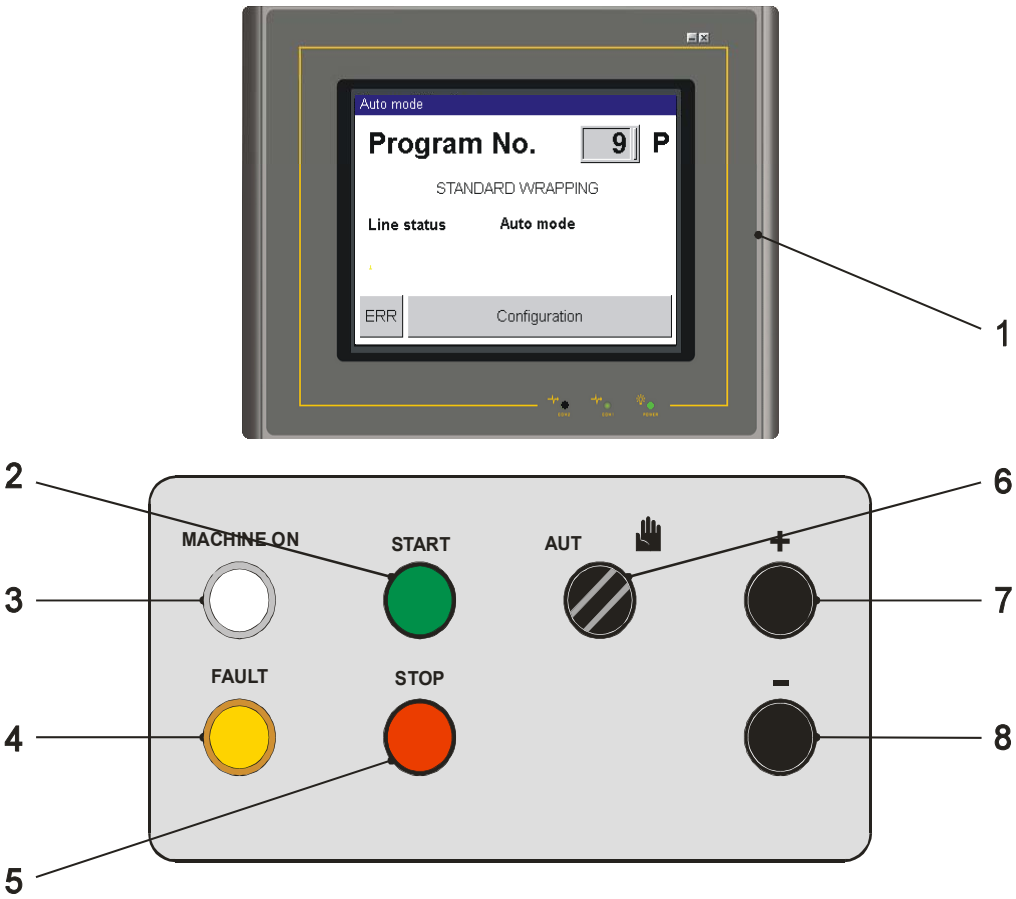
5.8.1. Switch-board Panel

Contains all controllers needed for machine manipulation, with exception of protection fencing door operating.



1) Operator panel
2) **TOTAL STOP** button (machine emergency switch-off)
3) **CONTROL VOLTAGE** button
4) **MAIN SWITCH**

5.8.2. Operator Panel



1) Operator panel MT 057 TST
2) Cycle **START** button
3) Indicator – voltage in machine **ON** (green)
4) **DEFECT** indicator (red)
5) Cycle **STOP** button
6) **AUTO – MANUAL MODE** switch
7) **+** button – manual function operation of machine – one direction
8) **–** button – manual function operation of machine – different direction

The machine is fitted with control system LGA. Touch operator panel MT 057 TST serves for connecting the operator with programmed robot. It enabled the operator to edit program and operation parameters, to choose manual function type and to display possible errors.

Graphic LED display is used on the panel. Displayed buttons serve for data input, changing displays and panel operating. Their location and purpose are adapted to usefulness and comfort of the personnel to the maximum extent.

Durable mechanic buttons "**+**" and "**–**" on the switch-board serve for direct manipulation of manual functions.

5.8.3. Special Buttons

The rest of the buttons and controllers are only used in some machines to help with particular needs. They are not necessarily placed on the control panel or in its vicinity, yet there, where it is more practical in terms of functionality and safety (e.g. near controlled element). If your machine does not feature these buttons or controllers, please ignore their description.

Two-phase controller **FILM FIXTURE**. Default position during operation is Closed (controller left). Film fixture is mounted on the conveyor; it grabs loose end of the film from stretching mechanism at the end of wrapping and holds it till the next wrapping.

Two-phase controller **OVERLAP STATIC TONGS**. Default position during operation is Closed (controller left).

5.9. Safety Equipment

The machine is fitted with several safety elements for manipulator's health protection or minimizing damage after accidents.

5.9.1. Emergency Stop Button

EMERGENCY STOP button is placed near control panel and serves for immediate machine halt in case of emergency (machine failure, fallen goods from pallet, crash, injury). By pressing it, the button is automatically locked in on position, to re-start the machine, the button must be unblocked. Pressed **EMERGENCY STOP** button is indicated by an indicator on panel. To re-start the machine, follow these steps:

- Remove cause of emergency stop
- Check condition of the machine:
  - Film must be correctly loaded in the stretching mechanism
- Unblock **EMERGENCY STOP** button by turning it right (indicated by arrow on button) until the button return into initial position
- Finally, control voltage of the system must be switch on before starting the machine (**CONTROL VOLTAGE** button) – see Chap. 5.9.2.

5.9.2. Control Voltage Button

This button and its function as a stopper in case of unexpected or unwilling behaviour of the machine after its start, breakdown, power outage or presence of **EMERGENCY STOP** button signal meet requirements of Czech and European safety standards. On power outage or after pressing **EMERGENCY STOP** button, power supply of the system will be disconnected and the machine will not carry out any activity, even if the supply would be restored or the **EMERGENCY STOP** button would be unblocked by mistake or any other unauthorized intervention. Only pressing the **CONTROL VOLTAGE** button enables further activity of the machine. This button must also be pressed on machine start-up. Power supply is indicated with button illumination, which is turned off after disconnection of the supply.

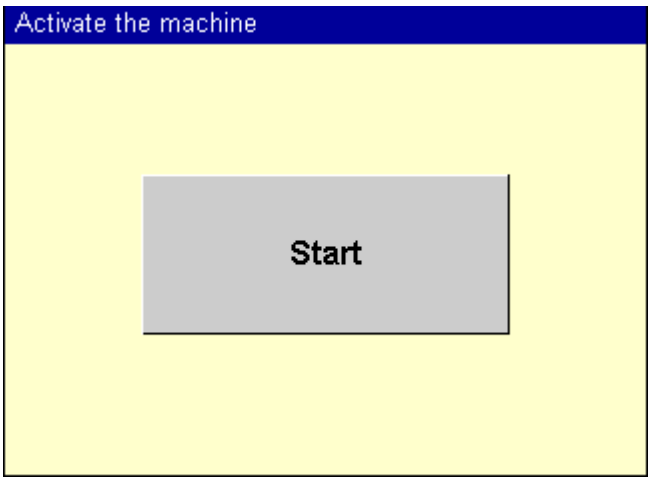
6. OPERATING STAFF

This service manual has been drawn up for maximum machine configuration. If your machine does not include some of the described parts, please ignore respective chapter.

6.1. Machine Start-up and Shutdown

To ensure proper machine operation, this procedure on how to active the machine must be followed:

- Press **MAIN SWITCH**
- Visually check situation on the line (pallets are correctly loaded with goods not colliding with the machine, the line or each other. There are no strange objects on the line or in the working space of the machine. There is nobody in the working space of the machine. Safety equipment is OK and in correct position) and switch on the control voltage by pressing **CONTROL VOLTAGE** button
- Displaying of machine initialization display (this display is displayed after each make of power circuits - after closing doors etc.)
- When the conveyor line is controlled by wrap machine system, the **START** button is displayed visually check situation on the line (pallets are correctly loaded with goods not colliding with the machine, the line or each other. There are no strange objects on the line or in the working space of the machine. There is nobody in the working space of the machine. Safety equipment is OK and in correct position) and if everything is OK, by pressing **START** button you initialize the machine and line. If not, all problems must be rectified - see Chap. 7.



Next procedure depends on mode of machine – automatic (see chap. 6.5) or manual (chap. 6.7).

Only the main switch needs to be turned off on machine shutdown.

6.2. Touch Display Control

6.2.1. Basic Terms

For comprehensibility, following terms are defined for purpose of this manual:

Panel (display panel) – technical device mounted on switch-board and designed for communication between manipulator and machine system.

Display – what is displayed on the display panel.

Button – control button visualized on the display. It is visualized protrudently, as if being real button.

Keyboard – mean of touch panel system for inputting number or character values.

6.2.2. Common Rules

Buttons of basic functions are placed on the right edge of the panel. Only those buttons, which are of some concern for given display are displayed. See the text below for detail description of functions of individual buttons.

One level up.

Saving parameters or programs into memory. A dialog box is displayed that enables saving and also protects the system from undesirable interventions.

Help.

ACK button – error message confirmation; it is only displayed in case of error or failure. See Chap. 7

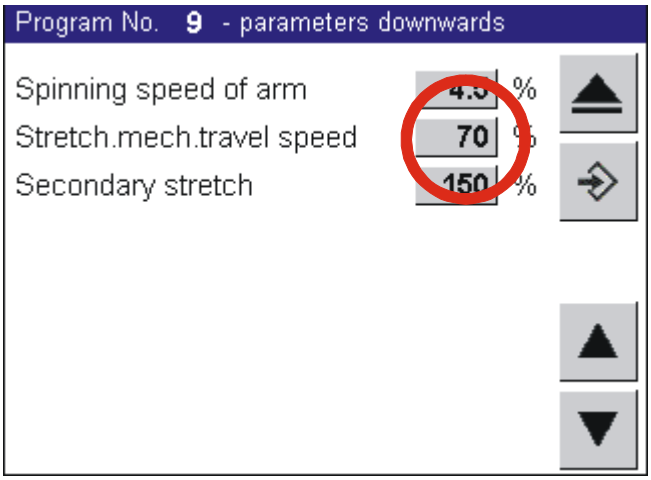
Move up (go to previous page)

Move down (go to next page)

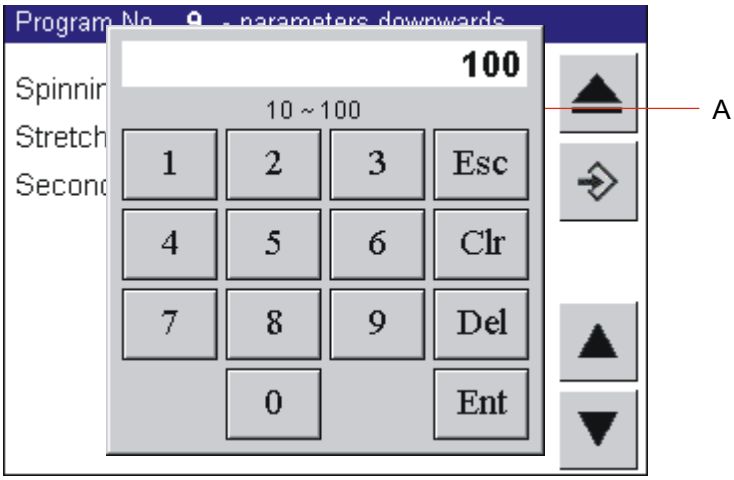
6.2.3. Number Values Input

Examples of editing program parameters are shown in following chapters. The same procedure applies for editing operating parameters. Parameter values in examples are illustrative and may vary from your machine.

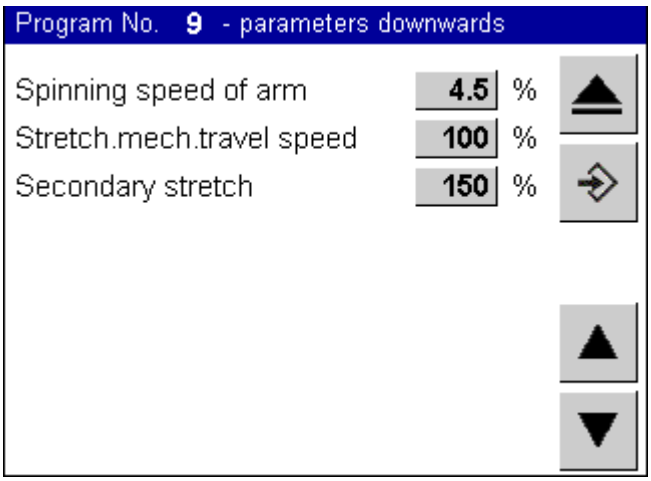
We are going to set speed of 100% for arm rotation in following example.



After pressing button with number value of Arm Rotation Speed parameter number keyboard is displayed.



Help row (marked as A) shows range of possible values. Type in requested value of "100" on the keyboard. Press **Ent** to confirm. The keyboard disappears and a new parameter value is displayed on the main display.



Del button deletes last digit.

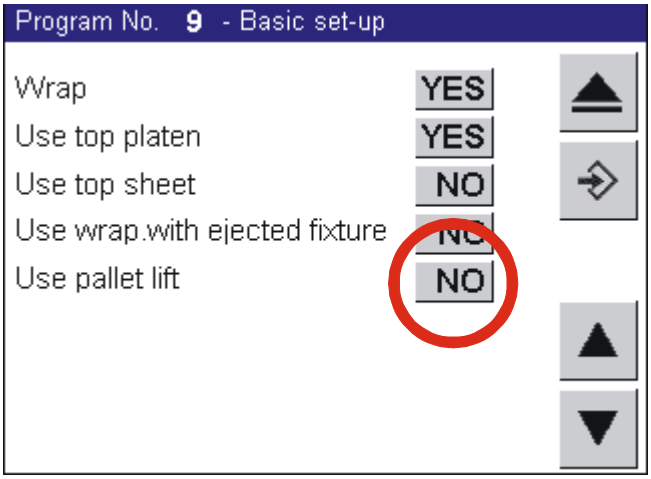
Clr button deletes contents of the whole line.

By pressing **Esc** button, you cancel the option and return on the main display of the automatic mode without any change of program set-up. In this case, the Arm Rotation Speed parameter stays with original values of 70%.

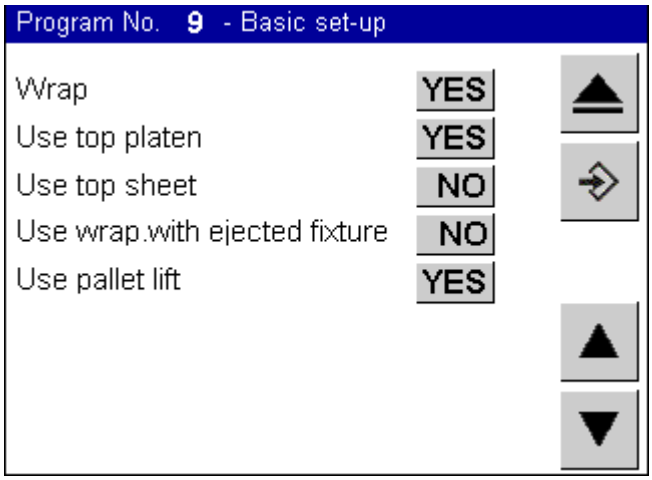
When granted by a parameter, the keyboard displays a button with decimal point. Similarly, when negative values are enabled, the keyboard displays a button with minus sign ("-").

6.2.4. Value Change YES-NO

Some parameters can only bear YES or NO value. In following example, we want to use pallet lift.

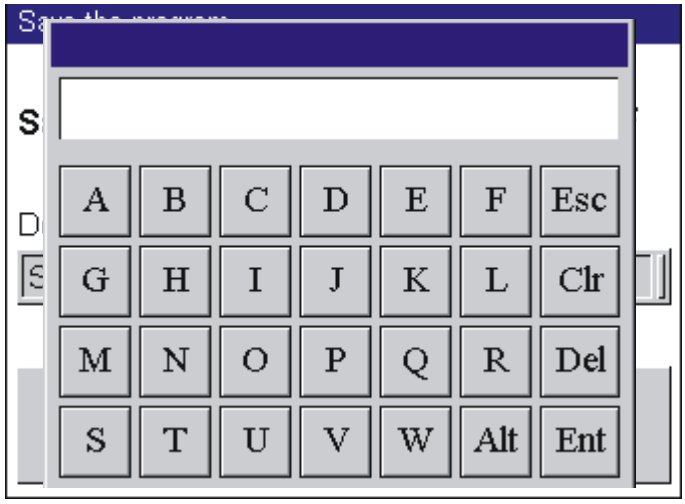


Values are switched when you press relevant button. After pressing Use Pallet Lift button, the parameter value changes (in this example to YES).



6.2.5. Text Value Input

Display with alphanumeric keyboard is displayed on insertion of text values.



Alt button switches between data input of characters A-W and X,Y,Z, numbers, and space and symbols.

By touching **Ent** button you save the inserted text into memory and return on initial display.

Del button deletes last inserted characters one by one.

Clr button deletes entire string.

Esc button cancels data insertion and closes the panel. Edited text remains unchanged, as before editing.

6.2.6. Password Protection

All programs and parameters can be viewed without restriction, password protection works when an attempt is made to change and save parameters or program. Exception is made for password editing (Chap. 8.1.1) and language change (Chap. 8.1.2). The machine and parameters are protected on various levels according to their purpose and importance:

User		
8	Administrator	*Only for manufacturers and service companies.* It is required for service parameters 2, which are not desirable to be changed without good knowledge of the machine and the system. It allows a change of all machine parameters and programs, which are available for administrator, technician, user and manipulator.

User		
5	Technician	*For company maintenance and machine administration* System requires this password level for service parameters 1, which are not dedicated for users 1. It enables change of parameters and programs available for technician, user and manipulator.
2	User	*For machine operation*. This level is used for setup of program parameters (machine programming). It is possible to change parameters and programs available for user and manipulator.
	Manipulator	*General access*. Given parameter is not password protected, it can be changed at will and system does not require its insertion. This level is set up at machine start-up. It only concerns a selection of a number of run program.

System itself manages password insertion, it requests it only when you try to select a password protected function (i.e. attempt to save changed program parameters or values of machine parameters).

User 8 password (administrator) is only known to the manufacturer and service companies.

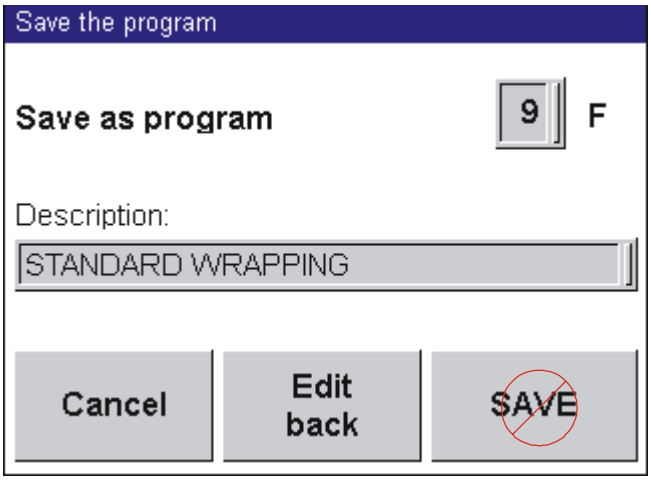
User 5 (technician) and 2 (user) passwords are listed on the last page of this Service manual. We recommend that you remove this page before handing the manual to manipulators and only reveal the passwords to authorized workers.

Passwords can be changed. Person, which is logged into the system under a certain password can change passwords of his/her own level and lower levels. Procedure for password setup is shown in Chap. 8.1.1.

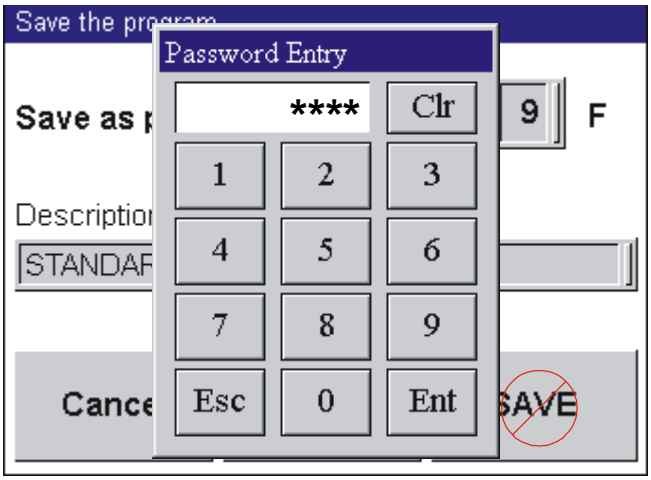
6.2.7. Password Entry

Following text describes password entry on saving program parameters. The procedure for password entry is identical with saving service parameters in manual and auto mode, for display language change and others.

You have altered a program, want to save the changes and a valid password has not been entered. Crossed ring is displayed on a display for parameter saving on **SAVE** button.



After pressing Save button, a dialog box for password entry is displayed. Entry the password - it comprises of maximum of 8 digits. Keyboard display shows * instead of digits and so it is not possible for unauthorized person to read the password during entry.

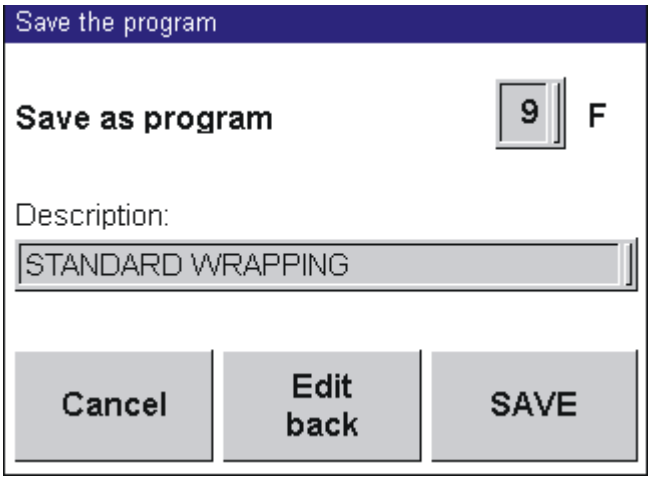


Four-digit password is entered on figure above as an example. Confirm entered password by pressing **Ent** key.

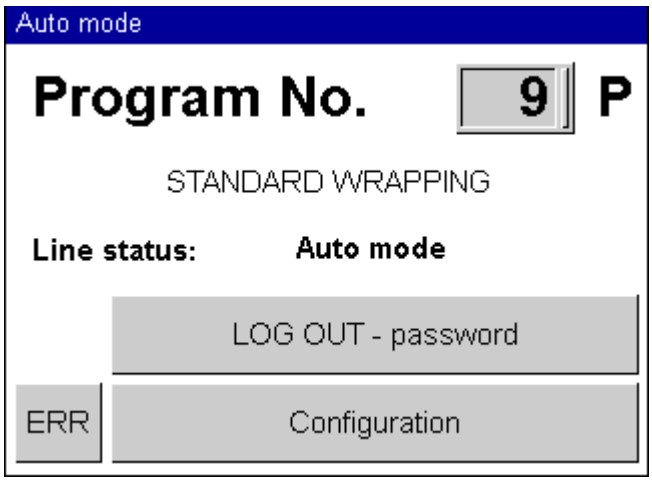
If the password has been entered correctly the crossed-ring icon is not displayed on any of Save buttons, for which the password authorizes saving.

With incorrect password entry will the password keyboard be displayed again. After pressing **Esc**, the password entry will be cancelled and the keyboard will disappear. Preceding display will be shown and there is always a possibility to leave this mode without password entry, i.e. without saving changes - to do so, press button **Cancel** on the display.

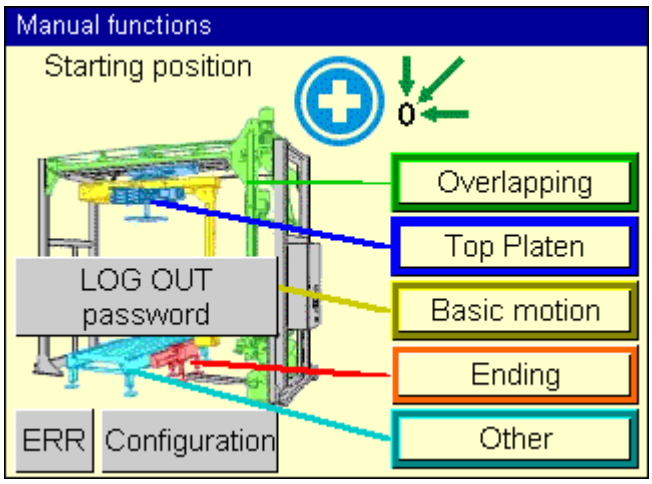
Only buttons without crossed-ring icon are functionally. Required operation (here, the command **SAVE**) will be executed after button re-pressing.



Entered password remains valid, **LOG OUT Password** button is displayed on main panel of auto mode during this time:



The same button is displayed on the display during manual mode, if you switch on it or if you edit service parameters.



After entering the password, the set password is valid for 5 min from the last pressing of any key; for this time, all parameters permitted by the password can be set in the system.

Entered password is cancelled and the system is again protected from saving changed parameters and programs after pressing **LOG OUT Password** button. **LOG OUT Password** button is no longer displayed.

The password is entered and valid and the system enables changes of parameters and programs, their saving and immediate testing of changed parameters and programs during the time when **LOG OUT Password** buttons are displayed.

6.2.8. Statistics

Counters of wrapped pallets are displayed on main displays of service parameters 1 and 2. Both counters only count fully wrapped pallets; pallets, whose wrapping has been interrupted either by user or following a failure, are not included in the count. Both counters can be set up after touching a number of wrapped pallets as shown in Chap. 6.2.3.

Service parameters 1 - set up of a number of wrapped pallets is password protected - level 5 technician. It is designed for monitoring a number of wrapped pallets according to the needs of the user (e.g. number of pallets per shift, week, month, for a delivery order etc.)

Service parameters 2 - set up of a number of wrapped pallets is password protected - level 8 administrator. It is designed for monitoring a number of wrapped pallets according to the needs of the service (e.g. total number during machine lifetime, number of pallets from general revision, configuration change etc.).

6.2.9. Screensaver

If the display is not active for longer time (operating staff is not controlling the machine via the touch display for longer time) a screensaver with dark and non-contrast image is activated. Automatically set time is 7 minutes. Display shows following information: "Press to restore standard display" - touch the display anywhere on its surface and the standard display as left before screensaver activation appears. This switch does not bring any other operation, neither it actives a parameter, command or function, which are displayed.

6.2.10. Display Structure

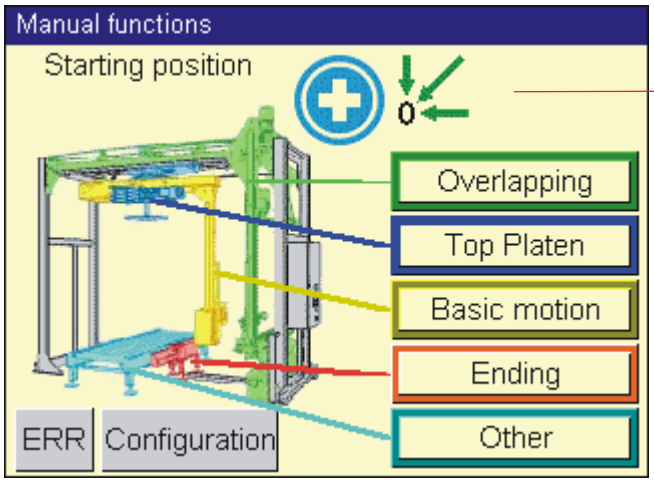
Basic displays - for manual and auto mode - can be switched by mechanical switch **MANUAL AND AUTO MODE SWITCH.**

Display structure, i.e. description of mutual dependency and logical sequence of the displays is always displayed in respective chapter (auto mode, manual mode, program free edit mode).

6.3. Loading Wrapping Film Into Machine

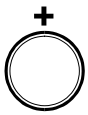
When the film is used up the machine automatically moves to position for film loading. If, in exceptional circumstances, i.e. mechanisms are not in position suitable for film change, e.g. following a tearing, you need to manually change the film, follow these instructions:

1 Switch the machine to manual mode



Menu of manual mode for approach to position for film change and to initial position appears on the display. This menu always appears as the primary one after switching to manual mode.

3 Use button **+** on the switch-board (see help in top part of the display marked with A) to move to initial position for wrapping as necessary.



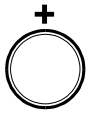
4 Change the film or load it again into the machine - the procedure is described below.

5 Switch the machine back to auto mode as necessary.

Films, which are not designed for stretching mechanisms, are specified in Chap. 1.3.

Loading of the film itself differs in details for various stretching mechanism types, which are mounted on the machine:

1 Put the machine in initial position, if needed, using **+** button in manual mode (on the main display of manual mode).



2 Place film spool on spike and load it into the stretching mechanism using procedure suitable for your stretching device type as per Chap. 5.1.

3 Open film fixture using controller on back side of the switch-board.

4 Load film end into the open film fixture. Close the film fixture using auxiliary controller.

The film is loaded and the machine is ready for further operation.

Reload torn film using similar way of loading.

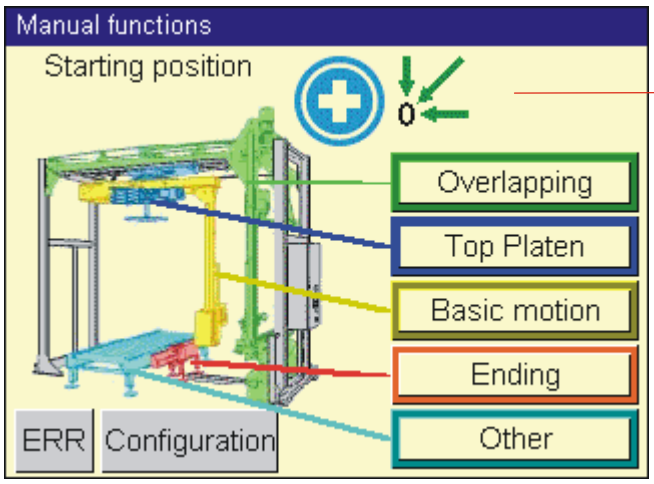
6.4. Loading Overlap Film Into Machine

We advise that spool with overlap film weights approx 60 to 80 kg.

Wait until all machine mechanisms have come to halt.

Overlap mechanism is in initial position by default, i.e. mobile tongs are in upper position. If it is not so from any reasons follow these instructions:

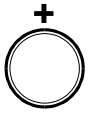
1 Switch the machine to manual mode



A

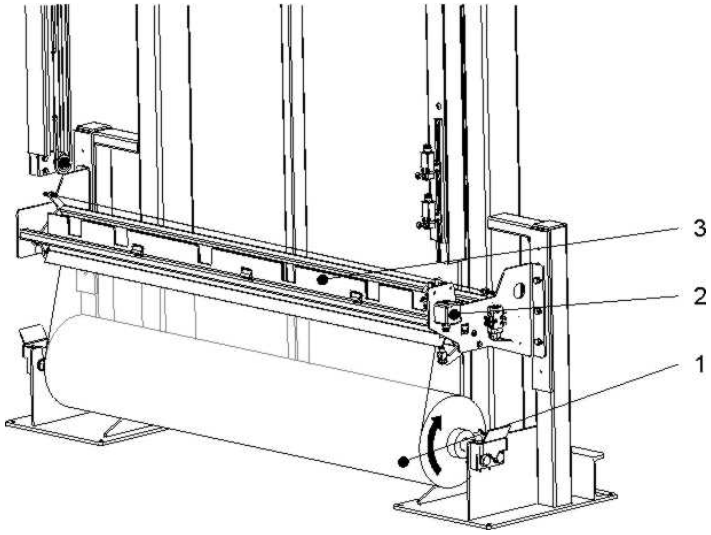
Main display of manual mode appears on the display.

3 Use button **+** on the switch-board (see help in top part of the display marked with A) to move to initial position for wrapping as necessary.



4 Change the film or load it again into the machine - the procedure is described below.

5 Switch the machine back to auto mode.



Open doors to protection fencing of the machine.

!	**The doors must stay open during the whole period, during which person(s) are in working space of the machine!**

Spool with film (1) is loosely laid in unwind mechanism under overlap mechanism itself. Remove it upwards. In the spool core, there is an auxiliary axis - loosen up one of the wobblers, remove cone and take out the auxiliary axis. Use reverse procedure to put the auxiliary axis into a new spool with film and place the whole into the unwind mechanism from the top.

Place the spool with film so that it unwinds during overlap in the direction as shown by an arrow on the figure above. In opposite direction could the unwinding be more difficult and the film could slip from mobile tongs.

To open the tongs, switch **OVERLAP STATIS TONGS** (2) button to position right.

Unwind required amount of overlap film from the spool and load it in between jaws of static overlap tongs (3). To ease manipulation, unwind approx. 10 to 15 cm more of the film and fold it over static part of the tongs.

To close the tongs, switch controller (2) to left (initial) position. The film is loaded. Leave working space of the machine and close doors to protection fencing.

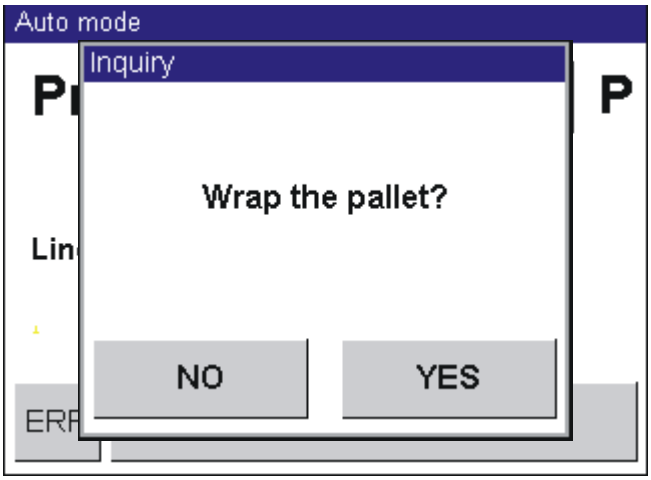
The machine is ready for further operation.

6.5. Auto Mode

To enter **auto mode** of the machine, select **AUT** on the main panel. As the machine is designed for work mainly in automatic lines **START** command for the machine is given by the control system of the line depending on movement of packed goods on the line. Automatic cycle of the machine can also be switched on from control panel by pressing **START**. The machine will execute one wrapping cycle as according to the entered program after **START** command.

Auto mode of the machine can be suspended by pressing **STOP** at anytime. After pressing **START** button, the machine moves to initial position, if not on it already, and a new wrapping cycle begins. The film can be finalized before re-start by using manual function **Full Ending** (see manual functions, Chap. 6.7)

Next step be valid only when conveyor line is controlled by wrapping machine system: If there is a pallet on the conveyor under rotary arm after machine start-up or switch to auto mode, system message will appear on the display:



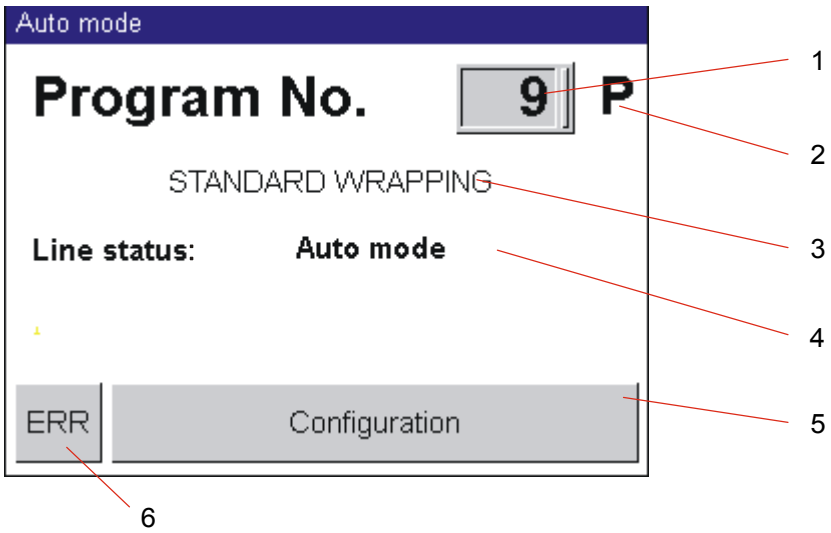
Press **YES** to execute wrapping. If **NO** is selected, the pallet is considered wrapped and is carried away from the machine.

!	**WARNING !** **Only manipulating person can be in the vicinity of the machine.**

The machines support up to 20 wrapping programs with numbers 0 to 19.

6.5.1. Display

If the machine is switched on in auto mode or switched in it, initial auto-mode display screen is displayed for the mode, in which the machine runs.



1 Program number.

2 Program type (shown as P - parametric program or F - freely editable program. More information about these programs, the difference between them and their features is shown in Chapters 6.6.1 and 6.6.3.

3 Short info text describing wrapping program.

4 If the machine is delivered inclusive of wrapping line control line status is displayed here and also other information needed for entire wrapping line control. If the machine is delivered solo and does not command the wrapping line row is not displayed.

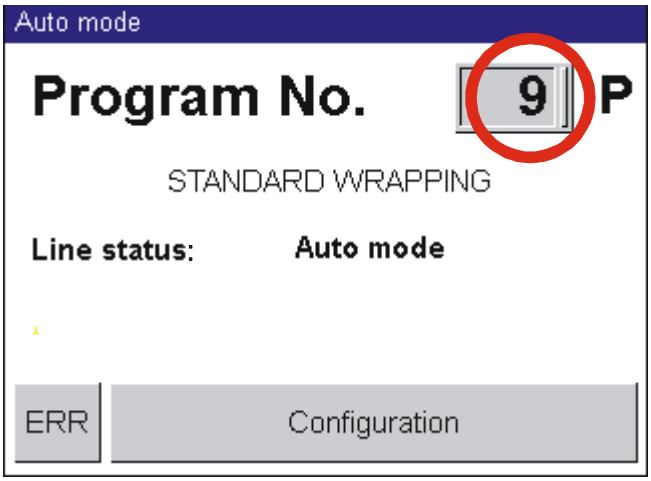
5 Button for edit parameters option and machine set-up.

6 In case of errors, a rolling text with error messages is displayed in the upper part of the display. By pressing ERR you enter a display with the list of error messages where you can find more information about particular error and its possible solution. See Chap. 7

Also, if the machine is in error state after start-up a yellow button ACK as well as error message are displayed - see Chap. 7.2.

6.5.2. Program Selection In Auto Mode

To select a program, follow similar rules as shown in Chap. 6.2.3. If you want to change a wrapping program, a dialog box for new program selection is displayed after touching program number on standard display of auto mode.



6.5.3. Automatic Program Switch After Incorporation Into Line

Remotely, i.e. using control system of the line without manipulator's intervention, programs can be switched over by means of 3 communication signals. Parametric programs 0 to 3 and freely editable programs 10 to 13 are used for remote switching. To activate this function, one of following programs must be manually set up. The function is inactive following different program number selection, i.e. program 4 to 9 or 14 to 19) and the wrapping is executed according to program selected on operator panel.

Tab. Assignment of combination of communication signals and programs

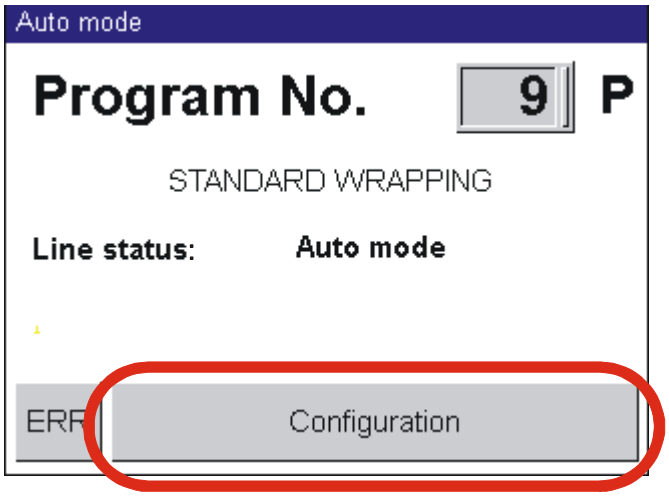
Communication signal	Category 1	Category 2	Category 3
Program 0	0	0	0
Program 1	1	0	0
Program 2	0	1	0
Program 3	1	1	0
Program 10	0	0	1
Program 11	1	0	1
Program 12	0	1	1
Program 13	1	1	1

6.6. Programming of Operation of Machine

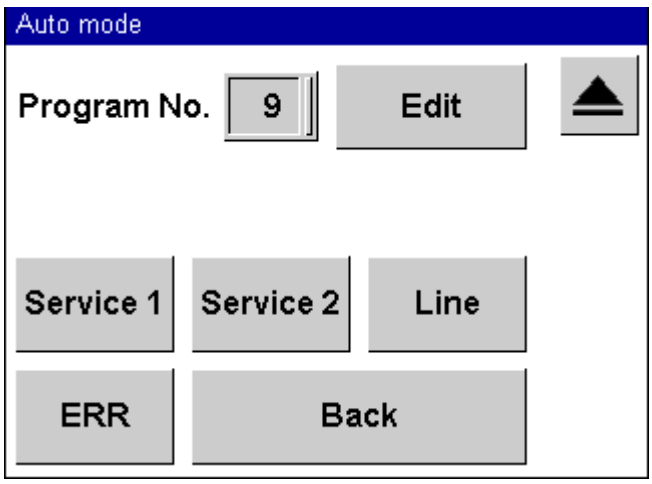
Program number or program parameter can be changed at any time, even during program execution. If wrapping cycle is being executed during program or parameter change, parameters valid at the time of start of wrapping are used. Changes in program or program parameter as changed during program execution will take effect during following program start after the changed parameters have been saved.

Entering program mode

Enter the program mode in auto mode by touching **Configuration** button. It is not important whether the program you want to edit is set up or not; you will do it in the next step.



If you wish to edit program, which is offered on following display (No. 3, in this case), press **Edit** to enter edit mode of the parameters of the selected programs. If you wish to edit different program, select its number as shown in Chap. 6.2.3 and confirm by pressing **Edit** button.



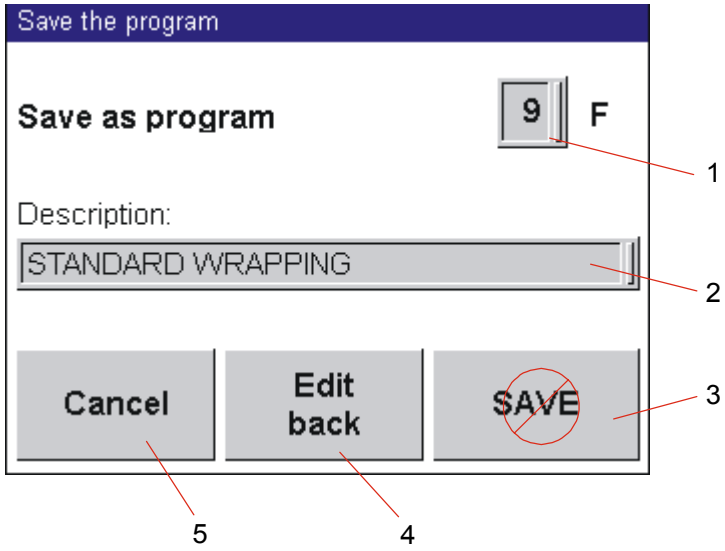
Should you have entered this display in error, you can return on the main display by pressing **Back** or **One Level Up** button - both buttons are

equivalent.

Note: other displayed button do not relate to programming (buttons **Service 1**, **Service 2** and **Line** relate to service parameters of the machine in Chap. 6.8, **ERR** button serves for displaying and processing error messages - see Chap. 7).

Program Mode Termination

You can leave service parameters editing display upon pressing **Save** button, or **Save, back**) to get to dialog box display for saving changed parameters.



1. Input field displays number of a program being currently edited. If you wish to save the program under different number, a keyboard will pop up after pressing program number (see Chap. 6.2.3) and you can enter a number, under which you want to save the program.

2. Short description line. It serves for better orientation of the personnel, maximum of 20 characters can be inserted here to describe the program. Upon touching this line, a dialog box for entering text string pops up - see Chap. 6.2.5

3. **SAVE** button. If a crossed ring is displayed on this button (as shown on the picture), parameters saving is password protected; upon pressing this button a dialog box for password entry is displayed (see Chap. 6.2.7) and after re-pressing of **SAVE** button is the program saved. If no crossed ring is displayed, valid password has been entered and program can be saved directly and main display of auto mode will pop up.

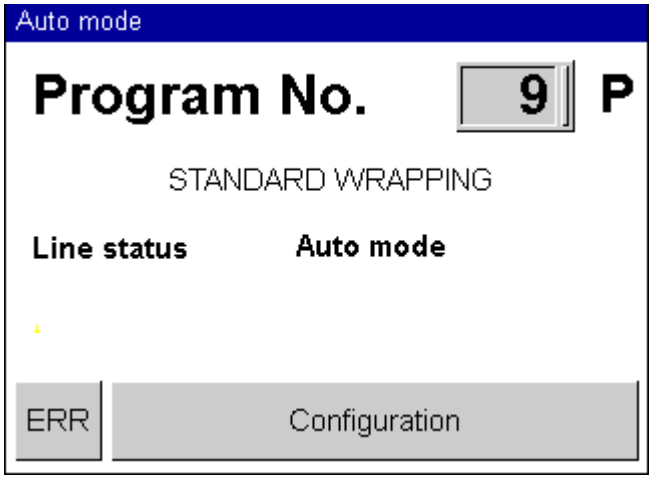
4. **Edit Back** button. If you forget to change any parameter, you can use this button to return to parameter editing.

5. **Cancel** button. Changed program is not saved and main display of auto mode is displayed. This button can also be used if saving is password protected and you don't know it.

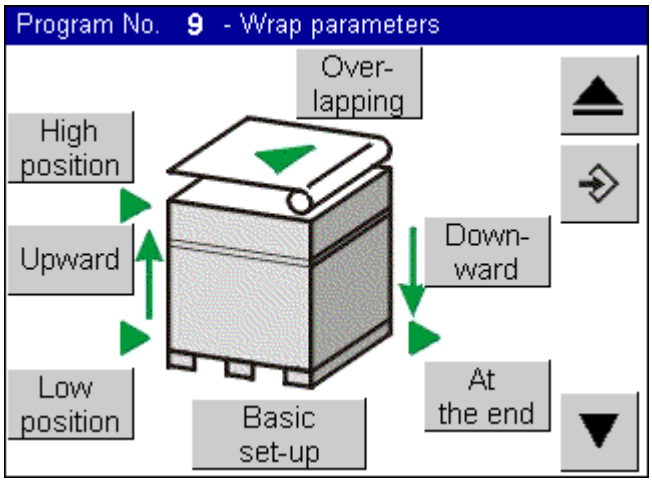
6.6.1. Parametric programs

Parametric programs can be relatively easily set up and enable reliable and cost-effective wrapping under normal conditions. Use freely editable programs if you have bigger call for wrapping and the way of wrapping (Chap. 6.6.3).

Parametric programs have program number 0 to 9 and are indicated with a letter **P** beside program number on the display.



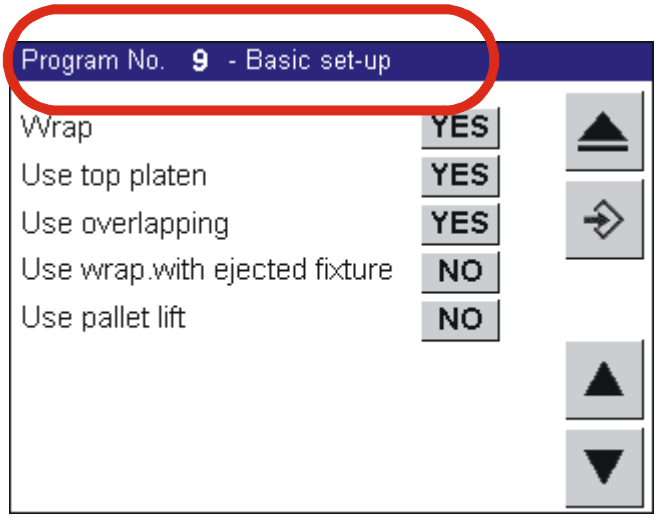
Using process as per Chap. 6.6 (button order **Configuration** - **Edit**) you have switch to the main display for parametric programs.



You can access the display with parameters for respective wrapping part from the main display of parametric programs. Switching between pages using buttons Next Page, Previous Page and One Level Up is transparently shown in tab.

	Parameters - Program		
	Main display of parametric programs		
	Basic set-up		
	Low position		
	Upward		
	High position		
	Downward		
	At the end		
	Overlap		

Number of edited program and displayed part of program are shown in the display heading.



Use button Save to call dialog box to save program - see Chap. 6.6

6.6.2. Automated Wrapping Cycle Parameters

Text Displayed	Parameter Name	Values	Unit
Basic set-up. Activities to be performed by the machine are defined here (what mechanisms are to be used during wrapping)			
Wrap	Wrap Yes: Full wrapping sequence will be executed after start-up. Wrap No: Pallet will only pass through the machine	**YES/NO**	
Use top platen	If **YES**, top platen is used during wrapping	**YES/NO**	
Use overlapping	If **YES**, Overlap is used during wrapping	**YES/NO**	
Use wrap.with ejected fixture	Use wrapping with ejected fixture If **YES**, wrapping starts with erected film fixture, if **NO**, the fixture is down. Erected spike is important if ground plan of packed goods is smaller than that of pallet. If it's the case, initial tapered part of film is laid on pallet.	**YES/NO**	
Use pallet lift	If **YES**, pallet lift is used during wrapping (i.e. the wares is wrapped with the pallet - under-wrapping)	**YES/NO**	
Low position - wrapping parameters in low position as used at start of wrapping when the stretching mechanism is down. Main purpose of this phase of wrapping is to firmly and reliably fixate start of the film to the goods and part of the goods to pallet.			
No. of Arm Turns	Number of turns at start of wrapping in low position. Only after completing these turns the stretching mechanism starts to go up. The turns fixate the film to pallet.	1-9	turns
Spinning speed of arm	Spinning speed of arm during turns in low position	0-100	%
Secondary stretch	Secondary film stretch during turns in low position	60-150	%
Upward. Used when stretching mechanism moves up along the pallet. Ordinary wrapping phase.			
Spinning speed of arm	Spinning speed of arm during stretching mechanism travel upwards.	0-100	%
Stretch.mech.travel speed	Stretching mechanism travel speed Speed of the stretching mechanism on the arm during travel upwards		%
Secondary stretch	Secondary film stretch during stretching mechanism travel upwards	60-150	%
High position - wrapping parameters in upper position. During the period when the stretching mechanism is in upper position above goods and eventual activity of Overlap mechanism is happening. The main task is to fix upper part of goods to pallet.			

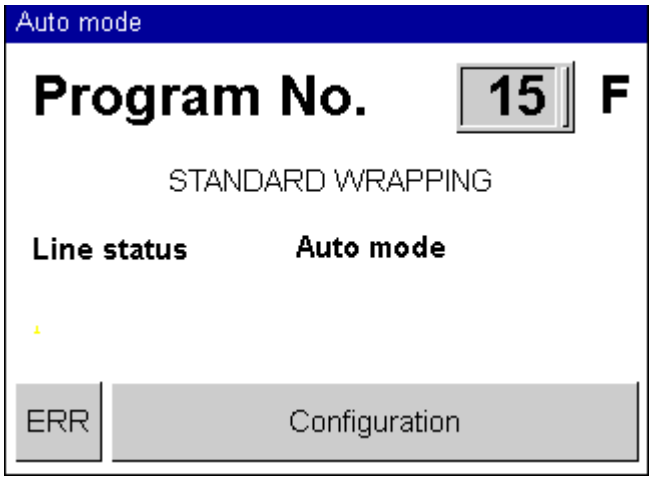
Text Displayed	Parameter Name	Values	Unit
No of Arm Turns	Number of turns in upper position after start. These turns fixate upper part of packed goods to pallet and if overlap film is used they fixate it as well. Film end is also fixated during simple wrapping.	0-9	turns
F.overlap ab.edge of goods	Film overlap above edge of goods Distance, which is used for overlapping of upper part of film above edge of goods on pallet. Edge of goods is over-wrapped. Film protects edges of packed goods and eventually fixates overlap film, if used.		cm
Spinning speed of arm	Spinning speed of arm during turns in upper position.	0-100	%
Secondary stretch	Secondary film stretch during turns in upper position.	60-150	%
Downward – wrapping parameters downwards. Used when machine moves downwards along the goods on pallet.			
Spinning speed of arm	Spinning speed of arm during stretching mechanism travel downwards	0-100	%
Stretch.mech.travel speed	Stretching mechanism travel speed Speed of the stretching mechanism on the arm during travel downwards	0-200	%
Secondary stretch	Secondary film stretch during stretching mechanism travel downwards. Only used for double (cross) wrapping.	60-150	%
At the end – wrapping parameters at the end of wrapping. Used for end of wrapping. These parameters need to be set up so that wrapping is optimally finished and stretching mechanism film is properly fixed in film fixture.			
No of Arm Turns	Number of turns in low position before wrapping end in case of double (cross) wrapping. These turns fixate film end. These turns do not include turns needed to finalize the film.	1-9	turns
Spinning speed of arm	Spinning speed of arm during final turns	0-100	%
Secondary stretch	Secondary film stretch during final turns	60-150	%
Overlap – overlap wrapping parameters. Set up these parameters so that overlap film has optimum length, is evenly laid on top of goods on pallet and is properly fixed by stretching film.			
Overlap film length	Overlap film length. Overlap film is cut to this length from spool.	80-200	cm
Overlap film shift	Distance from rotary arm centre, by which cut overlap film shifts in horizontal move over the goods on pallet. The parameter is used to centre the film on goods and to align it.	0-80	cm

Text Displayed	Parameter Name	Values	Unit
No of turns after overlap	Number of turns after overlap	0-100	turns
Sec.stretch after overlap	Secondary film stretch after overlap	60-150	%
Height of pallet for overlap	Height to which the moving tongs of overlap drive before measurement of the pallet height. For the value 0 the moving tongs drive to height after cutting off the film	0-300	cm
Combined overlap	When **Yes** is chosen for this parameter, the overlap will be laid by the procedure for the combined overlap – laying of the film by horizontal and vertical movement at the same time (see chap. 5.4.2, 6.8.2)	**YES-NO**	–

6.6.3. Freely editable programs

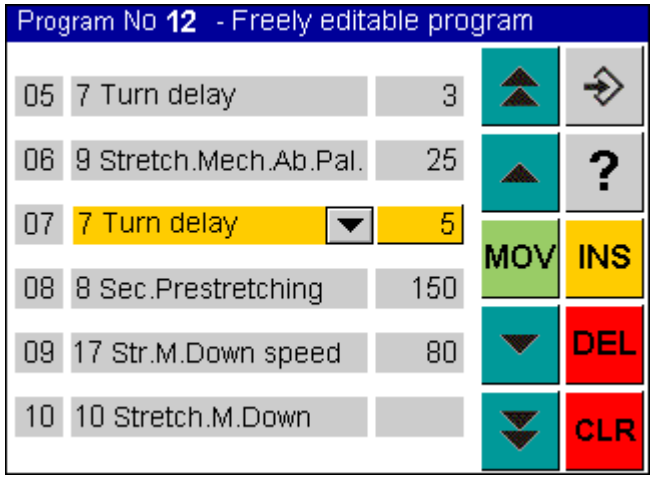
Open programs are more difficult to set up, yet they enable to set up the program more precisely.

Open program bear program numbers from 10 to 19 and are indicated on the display by a letter **F** placed beside program number. The treely editable programs cannot be saved as parametric program (i.e. program number 0 to 9).

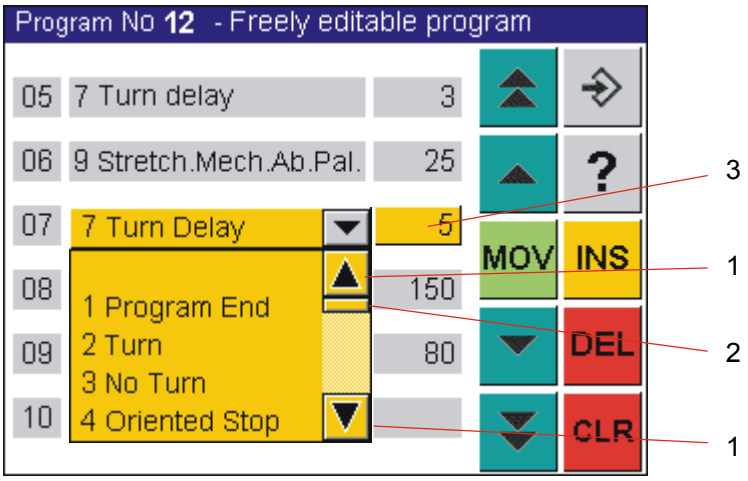


Open program editing enables the most precise parameter set up and, unlike parametric programs, to alter most of the values during wrapping, or to program special wrapping procedures. To facilitate the programming, we recommend you to copy similar suitable program, either editable or parametric. The easiest way is to prepare the most similar parametric program, save it with program number 10 and higher, and to edit it in free edit mode.

Having followed procedure as in Chap. 6.6 (button order **Configuration** - **Edit**) you have switched to the main display of parametric programs.



Left part contains list of six lines of the program. Line marked in yellow is the **active line** and serves for direct editing (line number 7 on the picture). Press command on the active line to display list of commands.



Use Up/Down arrow (1) to move in the parameter list. Press-and-drag scroll bar (2) enables quick shift in command list. If you press selected command combo list will be closed and the command is displayed in the active line. Existing command will be overwritten.

Touch the parameter and activate parameter value editing - see Chap.6.2.3. Some commands have no parameters so touching them will cause no action.

Tab below shows functions of individual program buttons. For simplicity, the examples are generic and simply illustrate displayed commands.

Active line is in **bold**.

PAGE UP button. List will display commands on previous page.

```
Command 8
Command 9
Command 10
Command 11
Command 12
Command 13
```

Press **PAGE UP**

Commands will move one page up; current first line will show on the last line of the new display (line with command No. 8 in following example).

```
Command 3
Command 4
Command 5
Command 6
Command 7
Command 8
```

Button **UP**. Browsing in the list one line up.

```
Command 3
Command 4
Command 5
Command 6
Command 7
Command 8
```

Press **UP**

Commands will be moved by one line up.

```
Command 2
Command 3
Command 4
Command 5
Command 6
Command 7
```

Button **MOV**, move command to another place in the program. Command in the active line will not be changed if **MOV** is pressed and other lines will be moved upon pressing **UP** or **DOWN**. Press **MOV** again and unblock the active line.

Please note that buttons **PAGE UP** and **PAGE DOWN** cannot be used!

Example of functionality of button **MOV**:

Press **MOV**. **Command 5** on the active line will get blocked.

```
Command 3
Command 4
Command 5
Command 6
Command 7
Command 8
```

Press 2x **UP**

```
Command 1
Command 2
Command 5
Command 3
Command 4
```

```
Command 6
```

Press 1x **DOWN**

```
Command 2
Command 3
Command 5
Command 4
Command 6
Command 7
```

Press **MOV**, thus unblocking the active line, which is now placed on a new place in the program. Press 1x **DOWN**

```
Command 3
Command 5
Command 4
Command 6
Command 7
Command 8
```

Button **DOWN**. Browsing in the list one line down.

```
Command 4
Command 5
Command 6
Command 7
Command 8
Command 9
```

Press 2x **DOWN**

Commands will be moved by two lines up

```
Command 5
Command 6
Command 7
Command 8
Command 9
Command 10
```

Button **PAGE DOWN**. The list displays commands on next page.

```
Command 4
Command 5
Command 6
Command 7
Command 8
Command 9
```

Press **PAGE DOWN**

Commands will be moved by one page down; current last line will then be shown on the first line of new display (line with command 9 in following example).

```
Command 9
Command 10
Command 11
Command 12
Command 13
Command 14
```

INS

Button **INS**, insert command. Command on the active line before pressing **INS** and next commands will be moved by one line further.

```
Command 1
Command 2
Command 3
Command 4
Command 5
Command 6
```

Press **INS**:

```
Command 1
Command 2

Command 3
Command 4
Command 5
```

and choose command as needed:

```
Command 1
Command 2
New command
Command 3
Command 4
Command 5
```

DEL

Button **DEL**, deleting command on the active line. Commands on next lines will be moved by one line up. After pressing this button, a confirmation box will be displayed to prevent from unwanted deletion.

```
Command 1
Command 2
Command 3
Command 4
Command 5
Command 6
```

Press **DEL** and acknowledge:

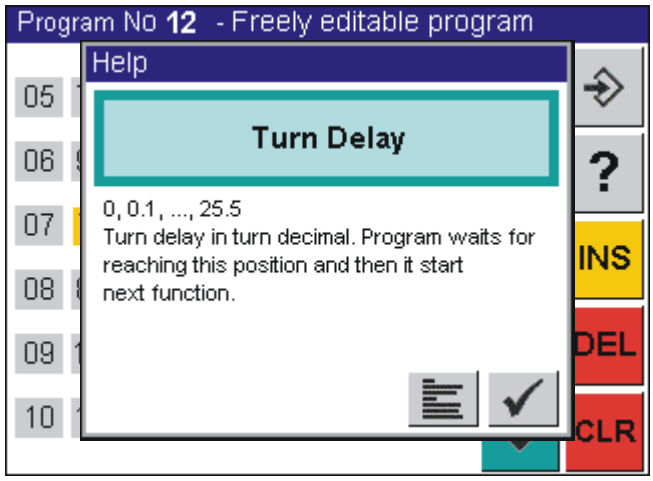
```
Command 1
Command 2
Command 4
Command 5
Command 6
Command 7
```

CLR

Deletion of all program commands. After pressing this button, a confirmation box will be displayed to prevent from unwanted deletion.

Program save. Program save display is shown – see chapter 6.6.1. If a program is created as open, it cannot be saved as parametric (system will only enable to save the program under numbers 10 to 19).

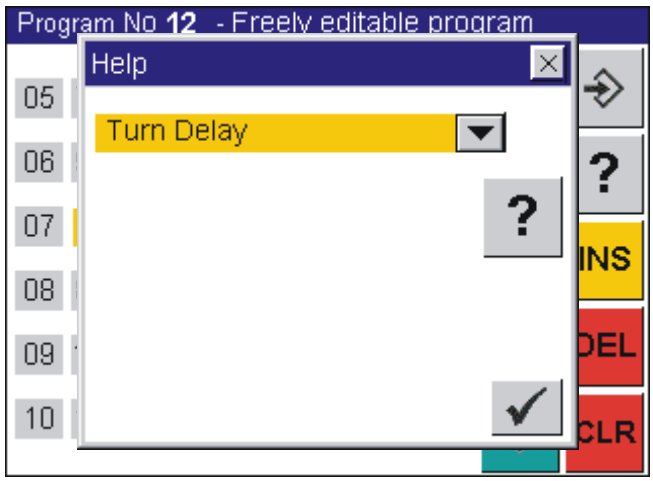
Help. Help to the active line is displayed after pressing this button.



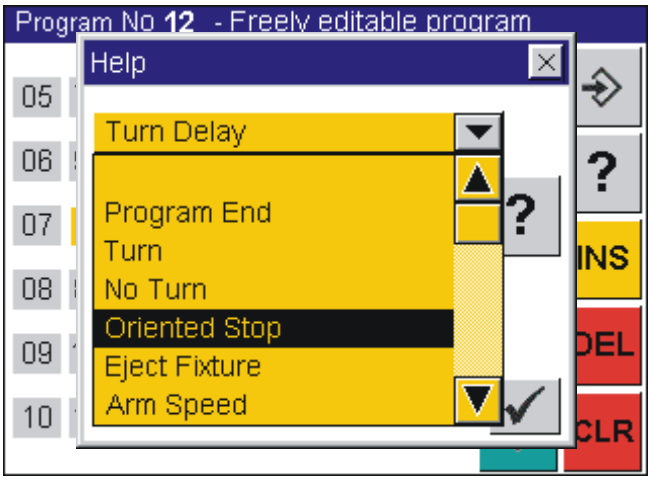
First line displays range and min.unit of parameters (in example above, range is 0 to 25.5, min.unit is 0.1 turn. Min. value is set as the difference between the 2 lowest values).

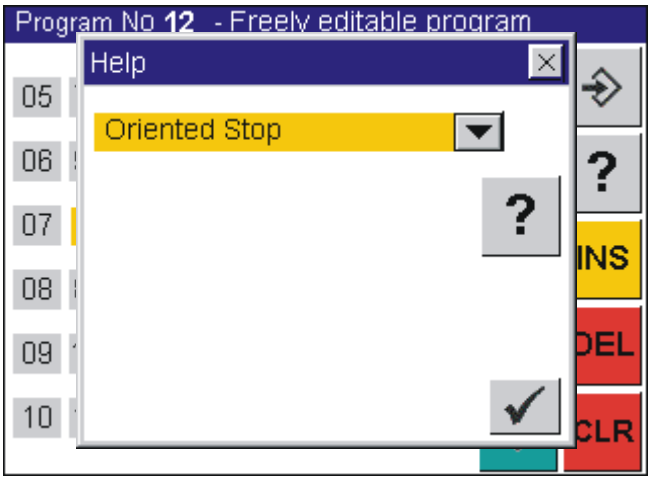
After pressing **Confirm** is the help window closed and the display again shows the standard window of freely editable program.

After pressing **List**, a display with drop down menu of all commands is shown.

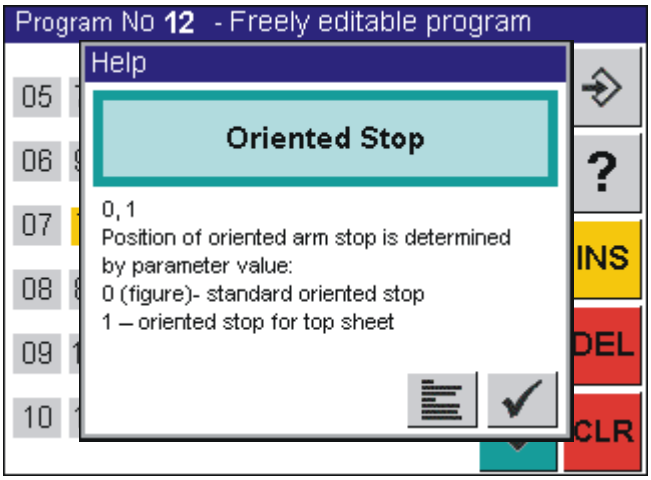


Using a procedure similar to command selection of standard display, you choose a command, whose help you want to read.





Help to selected command is displayed after pressing Help button.



Help displayed in this way, i.e. through command list has to be closed by confirm button in order to display window with command list. Window with command list is only opened once and you can get to it by moving window with help (drag-and-drop style of working with windows). Display then becomes messy and we do not recommend doing this.

6.6.4. List of Commands of Freely Editable Program

Command	Description	Range	Unit
	(empty line)		
1 Program End	End program command.	–	
2 Turn	Arm speed turn as set up in parameter **Arm Speed**. Function **Arm Speed** must be set up before this parameter.	–	
3 No Turn	Immediate stop of the arm.	–	
4 Oriented Stop	Position of oriented arm stop is determined by parameter value: 0 (figure)- standard oriented stop 1 – oriented stop for overlap	0, 1	
5 Eject Fixture	Fixture ejection at wrapping start. Fixture mechanism movements are controlled by values as set up in service parameters.	–	
6 Arm Speed	Arm turn speed set up as a % of maximum speed.	20, 30, ... 100	%
7 Turn Delay	Turn delay in turn decimal. Program waits for reaching this position and then it start next function.	0, 0.1, ..., 25.5	turn
8 Sec.Pre-stretching	Secondary pre-stretching set-up.	60, 62, ..., 400	%
9 Stretch.Mech. Ab.Pal.	Stretching Mechanism Above Pallet. Passing the stretching mechanism over pallet by distance and with speed as set by parameter **Arm Speed**. Function **Arm Speed** must be set up before this parameter.	0, 1, ..., 100	cm
10 Stretch.Mech. Down	Command for descending stretching mechanism to low position with speed as set in parameter **Stretch.M.Down Speed** (Stretching Mechanism Down Speed). Speed parameter must be set up prior to this one.	–	–
11 Stretch.Mech.To Pos.	Position of the stretching mechanism - counted from bottom with speed as set up in parameter **Stretch.M.Down Speed** (Stretching Mechanism Down Speed) or **Stretch.M.Up Speed** (Stretching Mechanism Up Speed). Speed parameters must be set up prior to this one.	0, 1, ..., 255	cm
12 Stretch.M. Down By	Command for descending the mechanism by given distance with speed as set up in parameter **Stretch.M.Down Speed** (Stretching Mechanism Down Speed). The speed parameter must be set up prior to this one.	0, 1, ..., 255	cm

Command	Description	Range	Unit
13 Stretch.M. Position	Reaching position of stretching mechanism above upper outside position. Next commands will be executed only after reaching this position or after a halt of stretching mechanism travel.	0, 1, ..., 255	cm
14 Pos.of Str.M.Ab.Pal.	Reaching position of stretching mechanism above pallet. Next commands will be executed only after reaching this position or after a halt of stretching mechanism travel.	0, 1, ..., 99	cm
15 Pos.of Str.M.Dwn By	Monitoring a moment when stretching mechanism slides down by set-up distance, next command is executed only after reaching this position or after a halt of stretching mechanism travel.	0, 1, ..., 255	cm
16 Stretch.M.Up Speed	Setting of travel speed of stretching mechanism upwards. Speed of 100% corresponds with rising of approx. 300 mm per 1 arm turn with arm speed 100%.	10, 11, ..., 200	%
17 Str.M.Down Speed	Setting of travel speed of stretching mechanism downwards. Speed of 100% corresponds with rising of approx. 300 mm per 1 arm turn with arm speed 100%.	10, 11, ..., 200	%
18 Time Delay	Time delay after which will next commands be executed.	0, 0.1, ..., 60.0	s
19 Top Platen Up	Top platen mechanism moves to upper outside position.	–	–
20 Top Platen Down	Top platen mechanism moves down to touch the wares, eventually to lower outside position.	–	–
21 Wait Ready	Waiting for a moment when moves reach end position, next commands will be executed only when moves have finished. It concerns top platen mechanism moves, stretching mechanism travel, oriented arm stop or arm stop on position for overlap.	–	–
22 Return Up	If stretching mechanism is above pallet and travel downwards is then executed, this command returns the mechanism above pallet at the same place. Important for overlap.	–	–
23 Ending	Entire ending sequence, including arm turns.	–	–
24 Overlap Extension	Overlap film is pulled out as defined by parameter. If the parameter is not set up, implicit value of 120 cm is used.	80, 81, ..., 200	cm

Command	Description	Range	Unit
25 Overlap	Entire overlap is executed, including prospect necessary moves of other mechanisms. Parameter determines overlap of overlap behind centre of arm rotation. If **Overlap Extension** parameter is not set up its implicit value of 120 cm is used.	0, 1, ..., 80	cm
26 Height of pallet	Height to which the moving tongs of overlap drive before measurement of the pallet height. For the value 0, the moving tongs drive to height after cutting off the film. The command is only functional before the command **25 Overlap**.		cm
27 Pallet Lift Up	It lifts the pallet up if the machine is equipped with pallet lift mechanism.	–	–
28 Pallet Lift Down	It lowers down the pallet on conveyor if the machine is equipped with pallet lift mechanism.	–	–
29 Combined overlap	When this parameter is added, the overlap will be laid by the procedure for the combined overlap by horizontal and vertical movement (see chap. 5.4.2, 6.8.2). The command is only functional before the command **25 Overlap**	–	–

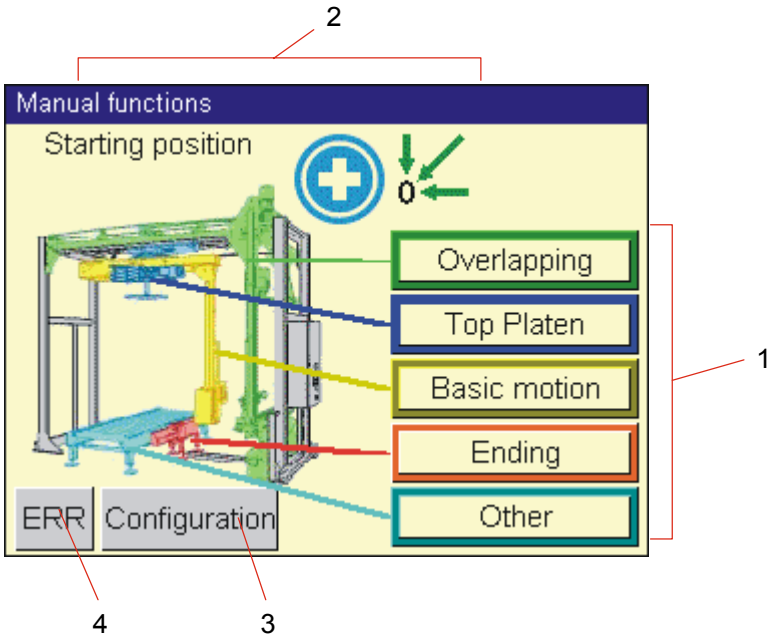
6.7. Manual Functions of Machine

Machine control system enables manual controlling of its individual mechanism. This controlling is not designed for normal wrapping, it is used for machine manipulation during service work or emergency situations.

Enter the **manual mode** through switch on the control panel.

6.7.1. Display

If the machine is switch on or to manual mode display of manual mode, which is currently selected for the machine, is shown:



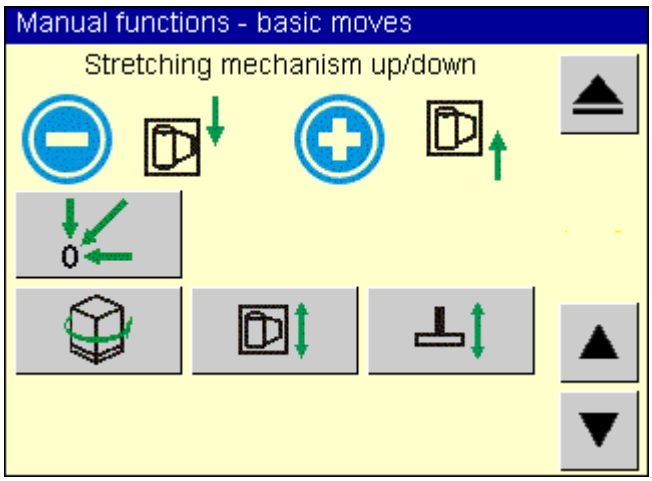
1 Mechanism switches

2 Help for travel to initial position. This move can be directed directly from this main display by pressing mechanic button "+" on the control panel of the machine.

3 Parameter edit and machine configuration button

4 If errors are detected, rolling text with error messages is displayed in upper part of the display. By pressing **ERR**, you enter display with error messages list where you will find more information about an error and ways how to fix it. See Chap. 7

Individual moves are logically grouped according to mechanisms. To switch them, use mechanism switches (1).



Icons "+" and "-", next to those symbols, serve as a help for direct controlling of mechanisms. This happens through mechanism buttons on machine switch-board near display.

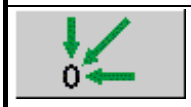
To return from any manual function group to the main display of manual mode, use button **ONE LEVEL UP**.

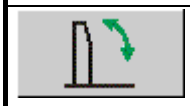
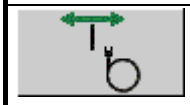
Use buttons **NEXT PAGE** and **PREVIOUS PAGE** to switch individual manual function groups in following order:

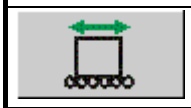
	**Manual function group**	
	Basic (basic moves)	
	Ending	
	Top platen	
	Overlap	
	Other (other moves)	

6.7.2. List of Manual Functions

Following tab shows a list of manual functions, their description and controlling. If a particular mechanism as described on the list is not mounted on your machine, please ignore it.

Display		Controlling
Main display of manual mode		
	**Starting position**	**+** Wrapping machine shifts to starting position
Manual function group **Basic moves**		
	**Starting position**	**+** Wrapping machine shifts to starting position
	**Arm forward**	**+** Swivel arm forward
	**Stretching mechanism up/down**	**+** Stretching mechanism moves up the pillar **–** Stretching mechanism moves down the pillar
	**Top platen mechanism up/down**	**+** Lift top platen mechanism **–** Lower top platen mechanism (on goods)
Manual function group **Ending**		
	**Complete ending**	**+** full ending sequence happens, including moving the stretching mechanism to low position

Display		Controlling
	**Slide in/eject fixture**	+ Eject film fixture (erection from low position) – Slide in film fixture (move down to low position)
	**Open/close fixture**	+ Open fixture (release film) – Close fixture (grab film)
	**Seal back plate**	+ Eject seal back plate – Slide in seal back plate
	**Eject/slide in ending arm**	+ Eject ending arm - Slide in ending arm
	**Cutting arm eject**	+ Arm with cutting wire is ejected and the wire heated until the button is released.
	**Eject/slide in smoothing arm**	+ Eject smoothing arm - Slide in smoothing arm
	**Sealing**	+ Sealing impulse (voltage in sealing stripe).
	**Blowing**	+ Directed air flow blows on film end
Manual function group **Top platen**		
	**Top platen mechanism up/down**	+ Lift top platen mechanism – Lower top platen mechanism (on goods)
Manual function group **Overlapping**		
	**Arm to overlap**	+ Arm turns 180° to be in position for overlap
	**Full overlapping**	+ Full overlap sequence
	**Overlap up/down**	+ Overlap static tongs bracket up – Overlap static tongs bracket down
	**Overlap forward/backward**	+ Overlap bracket forward (towards goods on pallet). After reaching centre sensor it stops. To continue, press + – Overlap bracket backward (towards spool with overlap film)
	**Up/down overlap cutting bracket**	+ Cutting is initiated, cutting bracket drops and comes back
	**Overlap cutting**	+ Overlap film cutting. Overlap film is being while the button is pressed.

Display		Controlling
	**Open/close static tongs**	**+** Open static overlap tongs **–** Close static overlap tongs
	**Open/close mobile tongs**	**+** Open tongs on overlap bracket – Close tongs on overlap bracket
Manual function group **Other –** mechanisms co-operating with wrapping machine. These functions may be implemented in control system of your machine or be skipped otherwise. Installation of your particular machine and line determines utilization of manual functions for conveyor control.		
	**Pallet lift**	**+** Lifting jack with pallet up – Lifting jack with pallet down
	**Conveyor**	**+** Conveyor forward – Conveyor backward
	**Turn**	**+** Turn forward – Turn backward

6.8. Machine Service Parameters

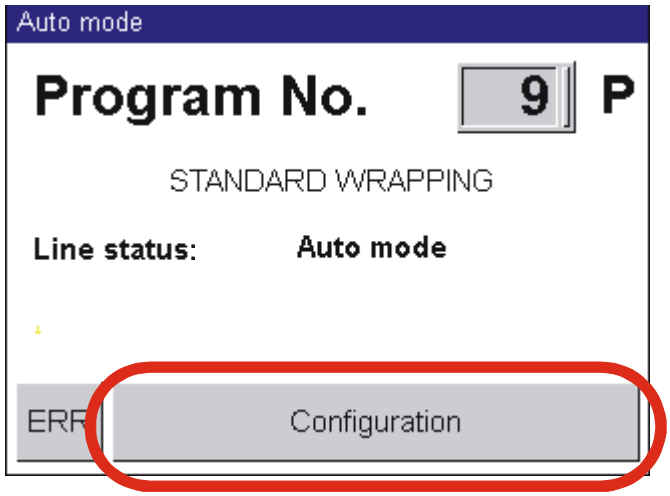
These parameters serve for adjusting machine functions during its mounting or repairing. They adjust machine functions to particular plant, ambient and packed goods. They are important for correct functioning of the machine and their incorrect set up may lead to machine breakdown or health hazard and that's why they are not commonly available for machine manipulators and are password protected from unauthorized access. Password system enables some parameters to be only changed by manufacturer or service workers, some parameters may be changed by user - see more details about password system in Chap. 6.2.6. Values of all parameters are pre-set from manufacturer to accommodate vast majority of common wrapping methods.

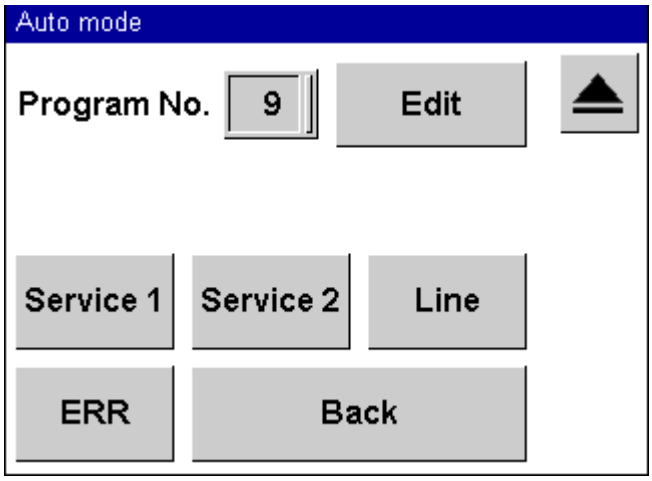
6.8.1. Editing of Service Parameters

Entering mode for editing of service parameters

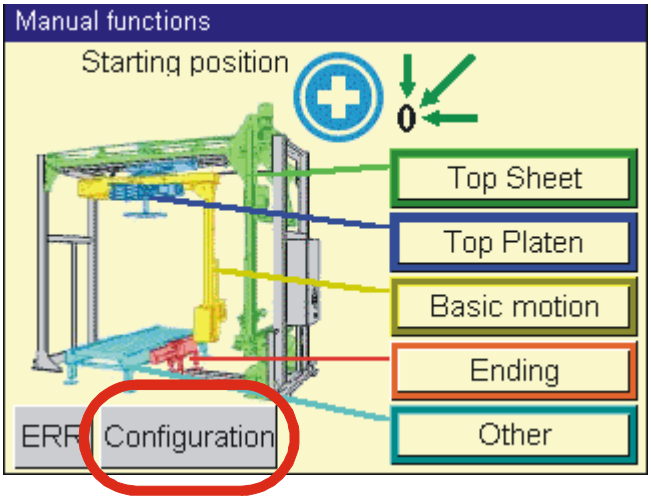
Service parameters can be operated and edited both, in manual and auto mode of the machine.

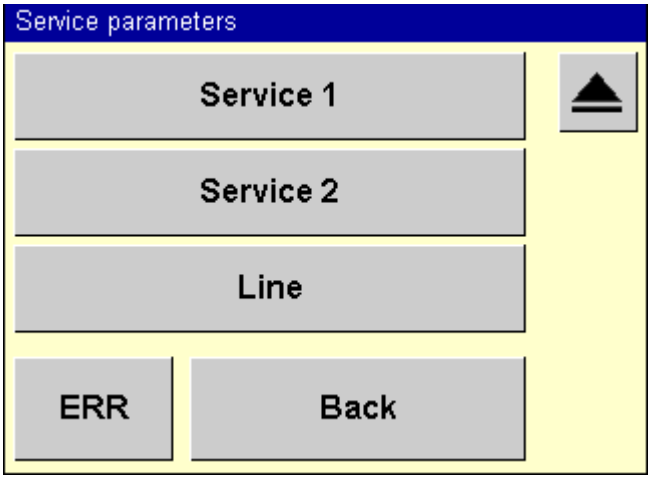
Press **Configuration** button to switch from main display of auto mode to menu for programming and configuration of the machine:



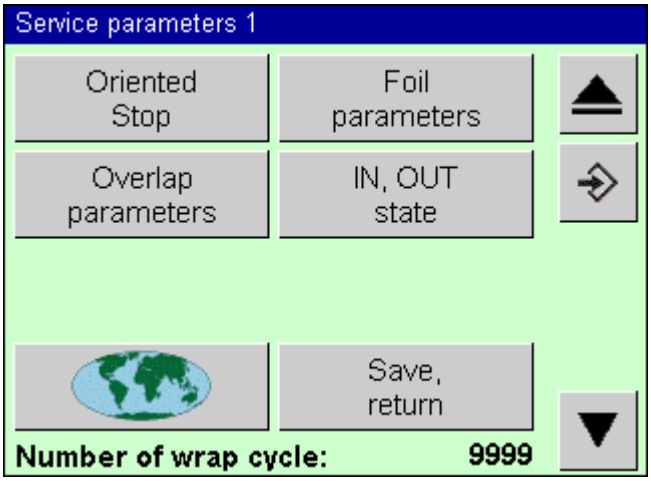


Similarly, you can get to from main display of manual mode to editing of service parameters by pressing **Configuration**:

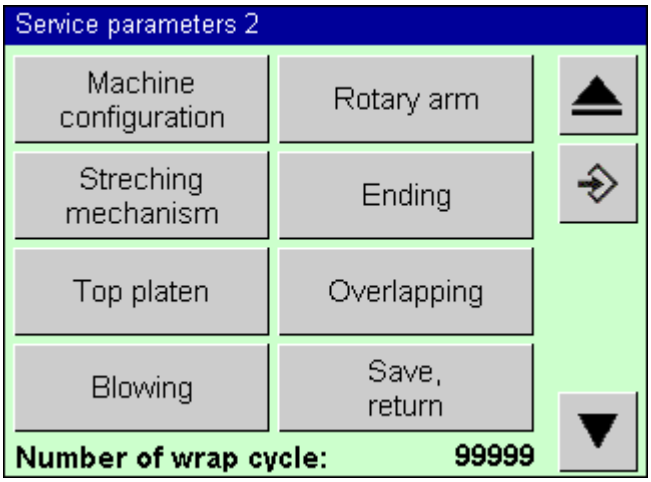




Open the main display of service parameters 1 by pressing **Service 1** (in any mode). It is a guide-post for an access to individual groups of service parameters 1.



Similarly, by pressing **Service 2** in any mode you will open the main display of service parameters 2:



Service parameters 1 and 2 are divided into logical groups according to their function.

Open editing of line parameters by pressing **Line** button. These parameters serve for co-operation of the wrapping machine with other machine in wrapping line and their mutual communication. They are individual for each machine, or line, therefore not described further.

Switch between particular groups of service parameters by pressing button **Next Page, Previous Page** and **One Level Up**.

Buttons for switching between groups of service parameters 1:

	**Service parameters 1**		
	Main display of service parameters 1		
	Parameters for oriented stop		
	Film parameters		
	Overlap parameters – part 1		
	Overlap parameters – part 2		
	Language Setup – see chapter 8.1.2		
	Input – Output state – see chapter 7.3		

Buttons for switching between groups of service parameters 2:

	**Service parameters 2**		
	Main display of service parameters 2		
	Machine configuration		
	Rotary arm parameters		
	Stretching mechanism parameters		
	Ending parameters		
	Top platen parameters		
	Overlap parameters – part 1		
	Overlap parameters – part 2		
	Parameters for blowing		

End of editing of service parameters

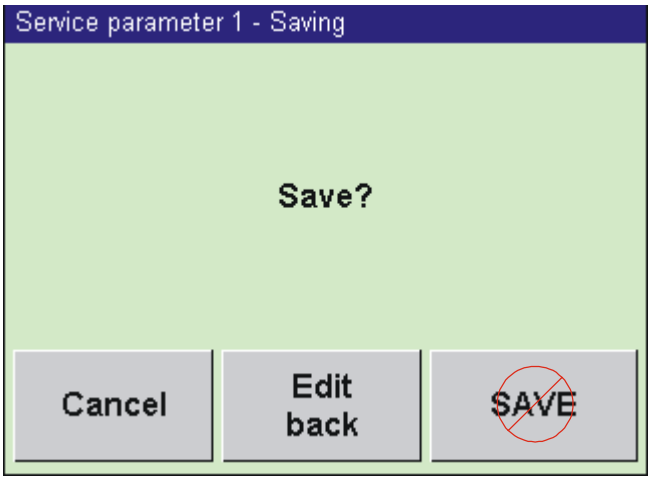
You can end mode for editing of service parameters, be it with or without saving the changes, by one of the following ways:

Choose function One Level Up on the main display of service parameters 1 or 2.

Press Save and **Back** button on the main display of service parameters 1 or 2 to finish editing of service parameters.

From any display of service parameters 1 or 2 by pressing Save button.

All three ways are equivalent and with the same function. Finish display will be shown.



Save service parameters by pressing **Save** button. Saving of changed service parameters is password protected - see Chap. 6.2.6 For description of password protection, see Chap. 6.2.7 for how to enter password.

Press **Cancel** to cancel all changes. Mode for editing service parameters is finished without saving changed values and the main display of manual or auto mode is displayed - depends on a position of Manual/Auto Mode switch. This button is also used in cases when you don't know the right password.

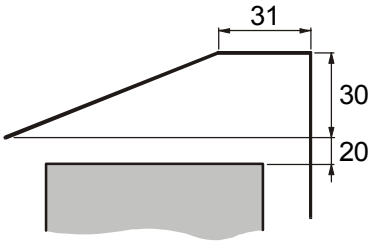
Press **Back Edit** button to return to the main display of service parameters 1 or 2 - depends on where you enter the display from. If you forgot to change a parameter you can add it this way.

6.8.2. List of Service Parameters

Service parameters 1 – designed for users

Display		Parameter name	Range	Unit
Service parameters 1 – Oriented stop				
01	**Finish distance**	Distance when arm starts to slow down to the minimum speed before finishing.	5-350	°
02	**Film pre-stretching delay**	Moment when setup pre-stretching is activated	0-5	turn
03	**Slow motion at start**	Slow arm motion at start of wrapping. During this time the arm rotates with arm speed at start so that the film does not get ripped out from the fixture.	0-360	°
04	**Arm speed at start**	Arm speed at start of wrapping	20-100	%
Service parameters 1 – Film parameters				
10	**Film stretch at ending**	Value of secondary stretch during ending	60-150	%
11	**Film cutting time**	Resistive wire in cutting mechanism of wrapping film is being heated during this time.	0-10	sec
12	**Film sealing time**	Resistive band in sealing mechanism is being heated during this time.	0-10	sec

Display		Parameter name	Range	Unit
13	**Film cooling down time**	Time between film sealing and departure of ending bracket. The film becomes cold during this time so that the sealed joint is rigid enough.	0-10	sec
14	**Minimum stretch of film**	The minimum value of secondary stretch which can be set up for the stretching mechanism during wrapping in manual mode and at wrapping start.	60-150	%
15	**Film stretch at start**	Secondary pre-stretch during turns before activating set-up pre-stretch.	60-150	%
Service parameters 1 - Overlap parameters 1				
20	**Overlap height**	Height of mobile tongs above the goods	0-200	cm
21	**Drop for overlapping**	Distance, by which pre-stretching mechanism slides down before laying overlap film	0-60	cm
22	**Overlap cutting time**	Time for tilt of overlap cutting lever	0-7	sec
23	**Length for release**	Movement of mobile tongs in horizontal direction after releasing overlap film	0-50	cm
24	**Slow turns after overlap**	Number of turns in low speed after overlap	0-3	turn
25	**Speed after overlap**	Arm rotation speed after overlap	0-100	%
26	**Overlap dragging speed**	Speed of overlap travel during laying film on pallet	0-100	%
Service parameters 1 - Overlap parameters 2				
27	**Stretch.m.speed after t.s.**	Stretch mechanism speed after overlap. Speed of film trolley movement upwards after overlap	0-200	%
28	**Rotation after overlap**	If YES, arm rotates during trolley movement upwards, if NOT, arm starts rotation at the moment when film trolley is in goods-high according to overlap film	**YES/NO**	-
29	**Lowering of overlap arrival**	Difference between the set height of the goods and the height to which the moving tongs drive before measurement of the pallet height	0-200	cm
	Combined overlap	Before laying of the overlapping film is started, the overlap moves to higher position and, during laying, it moves down. The risk of the film being caught by sharp edges of the goods on the pallet is thus reduced – see chap. 5.4.2.		
30	**Moving for combined overlap**	Before the combined overlap, the overlapping mechanism moves up above the goods to the height given by the sum of the parameters 20 and 30	0-300	cm

Display		Parameter name	Range	Unit
31	**Delay in overlap moving down**	After the overlap runs this distance in the horizontal travel, the overlapping mechanism starts moving down. The figure shows the track of the moving tongs at combined overlap (thick line) and numbers of parameters influencing this track. (beginning of the horizontal movement from the intermediate position of the overlap when the upper edge of the goods is detected). 	0-300	cm
Service parameters 1 - Language				
Button group for switching languages. Access to buttons is password protected on level User 5 - Technician. See procedure of setting language in Chap. 6.2				

Service parameters 2 – designed for manufacturer or service

Display		Parameter name	Range	Unit
Service parameters 2 – Machine configuration				
01	**Top platen**	Top platen mechanism mounted on machine	**YES/NO**	
02	**Overlap**	Overlap mechanism mounted on machine	**YES/NO**	
03	**Pallet lift**	Pallet lift included (for goods wrapping including pallet itself)	**YES/NO**	
04	**Conveyor**	Conveyor included in the line	**YES/NO**	
05	**Disable film error**	Disables function for checking spent wrapping or overlap film (spent film will or will not cause error message)	**YES/NO**	
06	**Current pallet change**	If YES is set up, then, in case that a wrapped pallet departs from the wrapping machine, another pallet will again be driven into the machine for wrapping. If NO is set up, then, the wrapped pallet will first be driven away from the wrapping machine, and, only then, another pallet will be driven into the machine for wrapping.	**YES/NO**	

Display		Parameter name	Range	Unit
07	**Delay in pallet change**	If parameter **06 Current pallet change** is set on YES, then, the pallet for wrapping will be driven into the machine with this retarding, after the moment, when the wrapped pallet will have got started, in order to leave the machine wrapping area. If parameter **06 Current pallet change** is set on NO, this parameter will become irrelevant	0-9	s
	Password set-up	Dialog box for password display and set-up. More information in Chap. 8.1.1.		
	Program version	Displays version of control system program		
Service parameters 2 – Rotary arm – rotary arm parameters				
10	**Max.number of arm turns**	Maximum possible rotation speed of arm. Parameter is used for calculations only, its change has no impact on change of maximum speed!	1-40	turn
11	**Minimum arm speed**	Minimum arm speed, which is set for its finish	5-100	%
12	**Arm acceleration**	Time, during which swivel accelerates from zero to maximum speed and back	0.1-5	sec
13	**Arm deceleration**	Time, during which swivel accelerates from zero to maximum speed and back	0.1-5	sec
14	**Max.frequency of freq.conv.**	Maximum frequency of a frequency converter that controls arm turns. Value should be equal to parameter HSP as set up on converter.	10 - 500	Hz
Service parameters 2 – Stretching mechanism – stretching mechanism parameters				
20	**Max. speed of stretch.m.**	Maximum possible speed of stretching mechanism. Parameter serves for calculations, to change it has no impact on change of maximum speed!	100-5000	cm/min
21	**Convert of pulse encoder**	Conversion of gauge drum encoder - constant for calculation of precise gauging. Only for manufacturer.	100-1000	1
22	**Film conversion constant**	Value for calculation - film amount (mm) released from pre-stretching mechanism at HSP within 50ms	0 – 500	1
23	**Stretch.m.timeout**	Timeout of stretching mechanism travel on pillar	5-60	sec
24	**Distance between goods sensor and film edge**	Distance between goods sensor and upper edge of film. Used for calculation of film crossing over upped edge of goods on pallet.	0-50	cm
	Maximum frequency converter frequency			

Display		Parameter name	Range	Unit
25	**Stretch.m.regulation**	Maximum frequency of frequency converter controlling stretching mechanism. Value should be equal to parameter HSP as set up on frequency converter.	10 - 500	Hz
26	**Stretch.m.travel on arm**	Maximum frequency of frequency converter controlling travel of stretching mechanism on arm. Value should be equal to parameter HSP as set up on frequency converter.	10 - 500	Hz
Service parameters 2 – Ending – ending parameters				
30	**Ending arm slow-down**	Time delay needed for further activity of ending	0-10	sec
31	**Ejection fixture angle**	Angle for tilt of film fixture lever at wrapping start	0-720	°
32	**Fixture delay – open**	Number of turns after wrapping start to open film fixture	0.5-5	turn
33	**Fixture delay – close**	Time needed to close fixture	0-5	sec
34	**Fixture delay – ejection**	Number of turns after wrapping start to open film fixture	0-5	sec
35	**Ending arm timeout**	Timeout needed to eject/slide in ending arm.	3-10	sec
Service parameters 2 - top platen – top platen mechanism parameters				
40	**Top plat.dev.travel timeout**	Top platen device travel timeout	5-60	sec
41	**Max.freq.conv. frequency**	Maximum frequency of frequency converter controlling arm turns. Value should be equal to parameter HSP as set up on frequency converter.	10 - 500	Hz
Service parameters 2 – Overlap – due to big number of parameters is the parameter list divided into 2 pages - **overlap 1**				
50	**Overlap tongs delay**	Delay between closing overlap mobile tongs and opening overlap static tongs after film pulling - delay between opening mobile tongs and their travel	0-5	sec
51	**Delay for overl.tongs return**	Delay for overlap tongs return. Delay before return of mobile tongs to starting position	0-5	sec
52	**Overlap cutting heat-up**	Time, during which overlap cutting wire is being heat-up on temperature needed for cutting overlap film.	1-10	sec
53	**Overl.timeout forw./backw.**	Overlap timeout forward/backward. Timeout of horizontal overlap travel	5-60	sec
54	**Overlap timeout up/down**	Timeout of vertical overlap travel	5-60	sec

Display		Parameter name	Range	Unit
55	**Max. speed of extending**	Max. speed of movement of mobile tongs in horizontal direction. Parameter serves for calculations, to change it has no impact on change of maximum speed!	0-100	cm/ sec
56	**Min. speed of extending**	Minimum speed of movement of mobile tongs in horizontal direction.	0-100	%
57	**Max. travel speed**	Max. speed of movement of mobile tongs in horizontal direction. Parameter serves for calculations, to change it has no impact on change of maximum speed!	0-100	cm/s ec
Service Parameters 2 – Overlap 2				
58	**Min. travel speed**	Min. speed of movement of mobile tongs in horizontal direction.	0-100	%
59	**Film unroll speed**	Mobile tongs speed in vertical direction during unrolling film from spool	0-100	%
60	**Overlap sensor distance**	Distance between goods sensor and the lowest point of mobile tongs	0-50	cm
61	**Middle travel distance**	Distance between mobile tongs and rotation axis during stop at middle travel sensor of overlap forward-wise	0-200	cm
	Maximum frequency converter frequency			
62	**Travel (horizontal)**	Maximum frequency of frequency converter controlling unrolling overlap film above goods .Value should be equal to parameter HSP as set up on frequency converter.	10-500	Hz
63	**Lift (vertical)**	Maximum frequency of frequency converter controlling unrolling overlap film upwards from spool .Value should be equal to parameter HSP as set up on frequency converter.	10-500	Hz
Service Parameters 2 – Overlap 3				
64	**Cut.start before overlapping**	Angle of overlap foil cutting before position for overlap.	0-720	°
65	**Lift acceleration**	Time, during which overlap foil accelerates from zero to maximum speed and back.	0 - 1.5	s
66	**Height of conveyor - overlap**	Vertical distance of the lowest point of the moving tongs in lower position and upper edge of the conveyor	0-200	cm
67	**Top sheet pneumatic timeout**	Timeout of top sheet pneumatic mechanisms (mobile and fixed tongs, cutting arm)	0-5	s
Service parameters 2 – Blowing – blowing parameters				
70	**Blowing start**	Moment from wrapping start when blowing is initiated	0.5-3	turn

Display		Parameter name	Range	Unit
71	**Blowing time**	Period during which is blowing active	0-20	sec

Line Service Parameters

These service parameters are individual for each wrapping line and depend on its configuration and control method; they needn´t be used at all. If used in your wrapping line, they are included in a separate appendix at the end of this manual.

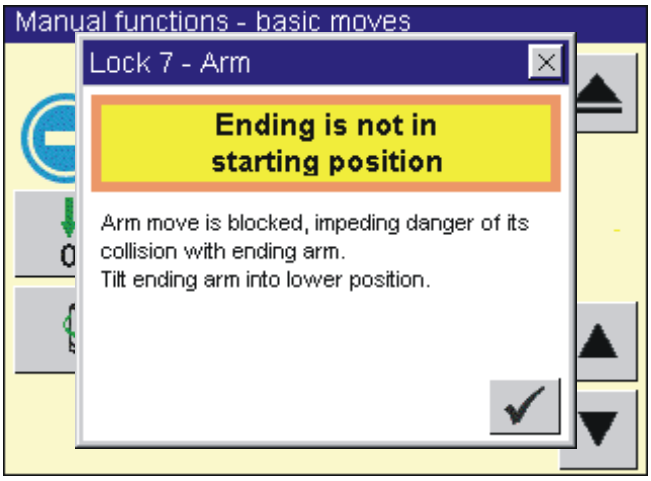
7. FAULTS AND THEIR REMOVALS

LGA control system program contains system for reporting machine locks and errors. This system enables the user to easily find a cause of machine stoppage.

7.1. Locks

Control systems watches machine state. In case that manual manipulation or any machine activity after **START** led into collision or error state, system would block relevant function and shows an error message on display as to why the function cannot be executed. This message is shown during forced inactivity of machine after program start or when button **+** or **-** are pressed.

Lock is announced via running line in upper part of display and a help window with lock description, its causes and remedies pops up at the same time.



Press confirm button to confirm lock message and close the window.

If lock cause persists, the lock message is also displayed on error message list (see Chap. 7.2)

7.1.1. List of Lock Messages

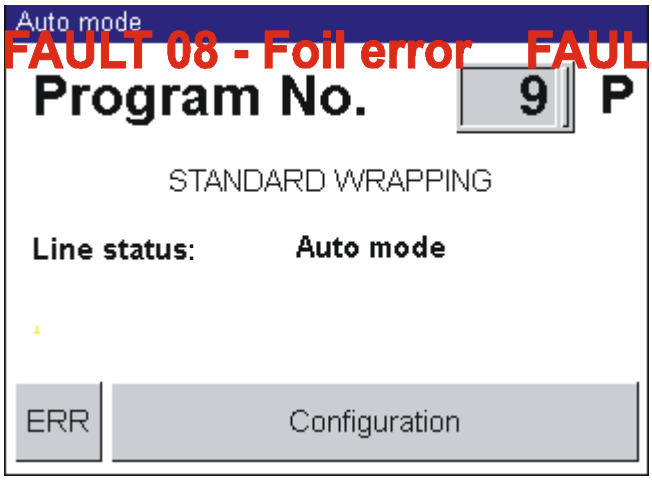
The table below shows inputs to the control system of the machine that detect necessity of blocking – the machine and its electric wiring can be checked according to the wiring diagram. For more details, see chapter 7.3.

Display	Description
Lock 2 ending **Rotary arm is not in initial position**	Ending arm move is blocked, impeding danger of its collision with rotary arm. Move arm to starting position. Input DI1/007
Lock 3 ending **Ending arm lock from smoothing desk**	Ending arm move is blocked, impeding danger of its collision with smoothing desk. Move smoothing desk to initial position. Inputs DI0.3/003 DI0.0/003 DI0.1/003
Lock 4 ending **Ending arm lock from cutting**	Ending arm move is blocked, impeding danger of its collision with film cutting lever. Move cutting lever to initial position. Inputs DI0.2/003 DI0.0/003 DI0.1/003
Lock 5 ending **Smoothing desk lock from sealing arm**	You can move smoothing desk only if sealing arm is in upper position. Input DI0.1/003
Lock 6 ending **Cutting lever lock from sealing arm**	You can move cutting lever only if sealing arm is in upper position. Input DI0.1/003
Lock 7 arm **Ending is not in starting position**	Arm move is blocked, impeding danger of its collision with ending arm. Tilt ending arm into lower position. Input DI0.0/003
Lock 8 arm **Overlap travel is not in starting position**	Ending arm move is blocked, impeding danger of its collision with overlap construction. Move overlap travel to starting position. Input DI0/011
Lock 9 arm **Top platen device is not in defined position**	Arm move is blocked, top platen mechanism is not in upper position, or not on the goods. Inputs DI0/008 DI1/008 DI2/008
Lock 10 top platen **Overlap device is not in defined position**	Top platen mechanism move is blocked, impeding danger of its collision with overlap mechanism. Move overlap mechanism to starting position. Inputs DI0/011 DI2/011 DI0.4/009
Lock 11 overlap down **Mobile tongs lock from cutting lever**	You can move overlap frame down only if cutting lever is lifted off. Input DI1/010

Display	Description
Lock 12 overlap **Mobile tongs lock from travel position**	You can move mobile overlap tongs only if vertical overlap travel is at one of the end controllers (on initial or middle position). Use manual function **Overlap Up/Down** to move it to one of the extreme positions. Inputs DI0/011 DI2/011
Lock 13 overlap **Rotary arm is not in proper position**	Overlap move is blocked, impeding danger of its collision with rotary arm. Move arm to the position for overlap. Input DI3/007
Lock 14 overlap **Ending arm is not in starting position**	Overlap move is blocked, impeding danger of its collision with ending arm. Tilt ending arm to low position. Inputs DI0/003 DI0.3/009
Lock 15 overlap **Top platen mechanism is not in upper position**	Overlap move is blocked, impeding danger of its collision with top platen mechanism. Move top platen mechanism to upper position. Input DI2/008
Lock 16 overlap **Frame not exceeding goods height**	Overlap move is blocked, impeding danger of its collision with goods. Input DI6/009
Lock 17 overlap **Cutting levers**	Cutting levers move is blocked, impeding danger of their collision with mobile tongs. Move mobile tongs higher. Input 0.2/009
Lock 18 conveyor **Machine is not in starting position**	Conveyor move (bringing goods in/away) is possible only if machine is in starting position. Inputs DI2/008 DI0/011 DI1/007
Lock 20 wrapping **Line blocks wrapping**	External signal "Wrapping Granted" is not active, superior line system has not granted wrapping machine operation. Input 0.0/002

7.2. Faults

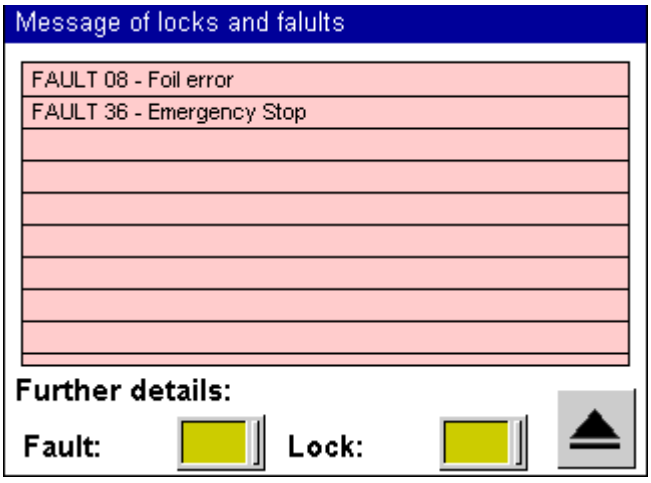
If a fault happens from any reasons, the machine stops and an indicator **ERROR** is displayed on the display as well as a running text with list of error messages and **ACK** button. The machine is stopped in auto mode whereas in manual mode, the error is only announced.



If the cause of error message is known, remove it and then press **ACK** to confirm error message. After pressing **ACK**, the indicator will be switched off in case that fault has been resolved. If not, it keeps blinking. To remove the fault source, use manual functions of the machine. If the fault has been removed, the indicator stops blinking and by pressing **ACK** you will remove all error messages.

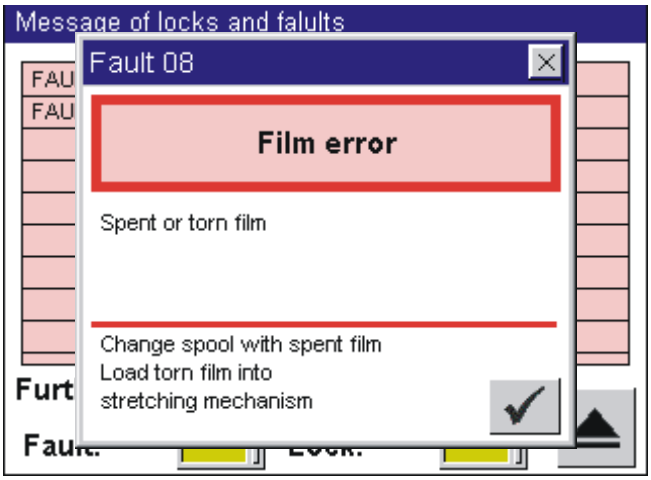
ACK button is available on the main display of both auto and manual mode, and also on all displays of machine manual function control.

Should you need more information on occurred faults, press **ERR** button and open list of error messages.



Fields for entering fault or lock number, on which you need more information, are at the bottom. You can have listed information on any fault, no matter if it is displayed in valid error messages list or not. If non-existing fault or lock number is entered system shows warning message.

Example: you need more info on fault 08 - Film error. Enter fault No. 08 as shown in Chap. 6.2.3 and confirm:



Close window with fault, or lock description by pressing confirm button.

Close list of error messages and return to display for displaying manual or auto mode (depends on **AUTO MODE - MANUAL MODE** switch) by pressing One Level Up button.

In case that control voltage has been switched off because of the fault (indicator is off), it needs to be switched on after removing fault source.

7.2.1. List of Reported Faults

The table below shows inputs to the control system of the machine that detect errors – the machine and its electric wiring can be checked according to the wiring diagram. For more details, see chapter 7.3.

Display	Description	Cause, remedy
FAULT 01 **Saving of the data is not possible**	Error or intern conflict between saving of the program or parameters.	• Repeat the saving • If saving of the data repeatly not happen, please call the Service - system error
FAULT 02 **Data of the system cannot be read**	Error in reading data (parameters) from the back-up memory during the system start.	• Switch the machine off and on. • If the error appears again call the service – the system failure
FAULT 04 **Fequency converter or arm motor**	Fault of frequency converter or arm motor.	• Check arm propulsion • Check sensors of oriented stop Inputs DI0/006 DI1/006 DI2/006

Display	Description	Cause, remedy
FAULT 05 **Motor of stretching mechanism travel**	Within given time, the required position was not attained or the position was incorrectly indicated.	• Check stretching mechanism travel • Check propulsion • Check sensors • Check setting of the parameters Inputs DI0/006 DI1/006 DI2/006
FAULT 06 **Cutting timeout**	Timeout time for cutting bracket exceeded	• Check sensors of cutting bracket position • Check air inlet (condition, pressure) Input DI0.2/003
FAULT 08 **Film error**	Spent or torn film	• Change spool with spent film • Load torn film into stretching mechanism
FAULT 09 **Ending arm timeout**	Ending arm timeout exceeded - arm has not reached required position within time limit	• Check condition of sensor of ending arm position • Check air inlet (condition, pressure) Inputs DI0.0/003 DI0.1/003
FAULT 10 **Static tongs timeout**	Static tongs timeout exceeded - arm has not reached required position within time limit	• Check condition of sensor of static tongs position • Check air inlet (condition, pressure)
FAULT 11 **Mobile tongs timeout**	Mobile tongs timeout exceeded - arm has not reached required position within time limit	• Check condition of sensor of mobile tongs position • Check air inlet (condition, pressure)
FAULT 12 **Overlap cutting timeout**	Overlap cutting console timeout exceeded - console has not reached required position within time limit	• Check condition of sensor of overlap cutting console position • Check air inlet (condition, pressure)
FAULT 13 **Top platen timeout**	Top platen mechanism has not reached required position within time limit	• Check top platen propulsion • Check top platen sensors Inputs DI0/008 DI1/008 DI2/008

Display	Description	Cause, remedy
FAULT 14 **Pallet lift timeout**	Pallet lift has not reached required position within time limit	• Check condition of sensors • Check air inlet (hoses, gaiters, pressure) • Goods weight (too heavy) Inputs DI0/005 DI1/005
FAULT 15 **Sensor of height of goods**	Fault of sensor of goods height, or goods loaded too high on pallet (sensor indicates goods even in upper extreme position)	• Lower height of goods • Check sensor, connection • Check sensor directing Input DI0/007
FAULT 16 **Sensor power supply**	Sensor supply fault	Check fuses and breakers in switch-board Input DI04/001
FAULT 17 **Pallet in trajectory of rotary arm**	Goods (in front of, or behind) reaches in working space of rotating arm with stretching mechanism - possible collision of rotating arm with goods on pallet	• Wrongly placed goods on pallet • Check sensor Inputs DI0.4/003 DI0.5/003
FAULT 18 **Overlapping film**	Spent or torn overlapping film or sensor fault	• Replace spent film • Load torn film again • Check sensor indicating unrolling film Input DI2/010
FAULT 19 **Overlap forward/backward timeout**	Mobile overlap tongs have not reached required position within time limit	• Check propulsion • Obstacle in trajectory of move of mobile overlap tongs Inputs DI0-011 DI2/011 DI3/011
FAULT 20 **Overlap up/down timeout**	Overlap mechanism chase has not reached in direction up/down required position within time limit	• Check propulsion • Obstacle in trajectory of move of overlap device Inputs DI0.0-009 DI0.2/009
FAULT 21 **Wrong position of pallet on conveyor 0**	Pallet under wrapping machine is outside expected position	• Check loaded goods on pallet • Check propulsion • Check pallet sensor
FAULT 22 **Conveyor 0 – pallet in/out**	Pallet has not reached required position within time limit	• Check propulsion • Obstacle in trajectory of move • Check pallet sensor

Display	Description	Cause, remedy
FAULT *xx* **Conveyor *xx* – pallet in/out**	Pallet has not reached required position within time limit. Number of conveyor: see the plan of your line.	• Check propulsion • Obstacle in trajectory of move • Check pallet sensor
FAULT 29 **Sealing timeout**	Time of sliding sealing blade of ending mechanism to starting position has been exceeded	• Check sensor • Check air inlet (condition, pressure) Input DI0.3/003
failure 31 **Communication CAN cannot be established**	Communication of the CAN bus cannot be established	• Check connection of the device to the CAN bus • If the error appears again call the service
FAULT 33 **CAN address 12 - LGC counter - conveyors**	Mechanism at CAN address 12 cannot be initiated (counter LGC - conveyors)	• Check power supply of given mechanism
FAULT 34 **Light barriers**	Machine stop - error signal from light barriers or attempted entry on roller conveyor)	Input DI0.2/001
FAULT 35 **Door**	Machine stop - door to protection fencing is open	Input DI0.1/001
FAULT 36 **Emergency stop**	Machine stop - button of emergency stop pressed (NOT-STOP)	Input DI0.0/001
FAULT 37 **CAN address 9 - LGC counter - overlap**	Mechanism at CAN address 9 cannot be initiated (counter LGC – overlap)	• Check power supply of given mechanism
FAULT 38 **CAN address 4 - LGC counter - encoders**	Mechanism at CAN address 4 cannot be initiated (counter LGC – encoders)	• Check power supply of given mechanism
FAULT 39 **CAN address 3 - LGC counter - ending**	Mechanism at CAN address 3 cannot be initiated (counter LGC – ending)	• Check power supply of given mechanism
FAULT 40 **CAN address 2 - LGC counter - communication**	Mechanism at CAN address 2 cannot be initiated (counter LGC – communication)	• Check power supply of given mechanism
FAULT 41 **CAN address 10 - overlap frequency converter - lift**	Mechanism at CAN address 10 cannot be initiated (overlap frequency converter - lift)	• Check power supply of given mechanism
FAULT 42 **CAN address 11 - overlap frequency converter - travel**	Mechanism at CAN address 2 cannot be initiated (overlap travel frequency converter)	• Check power supply of given mechanism

Display	Description	Cause, remedy
FAULT 43 **CAN address 8 - top platen frequency converter**	Mechanism at CAN address 8 cannot be initiated (frequency converter for top platen control)	• Check power supply of given mechanism
FAULT 44 **CAN address 7 - stretch mechanism frequency converter**	Mechanism at CAN address 7 cannot be initiated (frequency converter for stretch mechanism control)	• Check power supply of given mechanism
FAULT 45 **CAN address 6 - stretch mechanism lift frequency converter**	Mechanism at CAN address 6 cannot be initiated (frequency converter for stretch mechansm lift control)	• Check power supply of given mechanism
FAULT 46 **CAN address 5 - rotary arm frequency converter**	Mechanism at CAN address 5 cannot be initiated (frequency converter for rotary arm control)	• Check power supply of given mechanism

7.3. Monitoring state of sensors

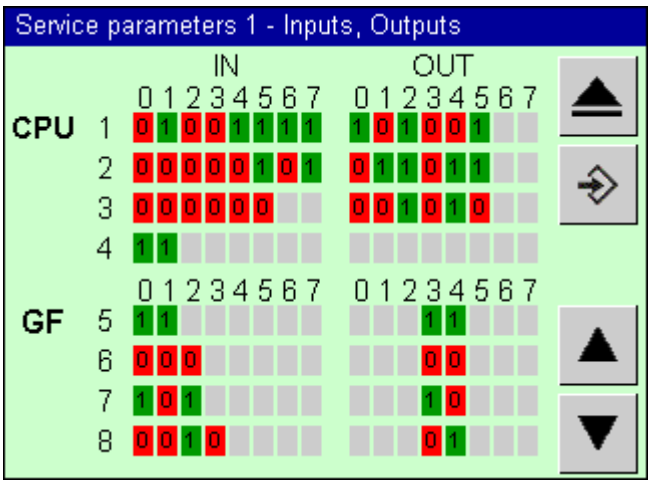
The tables of blockings and errors show sensors and inputs to the control system; their state is evaluated and, in case of an incorrect state, particular blocking or error is activated.

The system of the wrapping machine enables the state of these sensors to be monitored. Set the display to Service parameters 1 (chapter 6.8.1), push-button Display of inputs/outputs. For a number of inputs and outputs two displays are at disposal; changing-over between them is made using push-buttons Transition upwards and Transition downwards.

Inputs **DI0.x/yyy** are inputs to the system (group CPU on the display, yyy is CAN address of the system).

Inputs **DIx/yyy** are inputs to frequency converters (group GF on the display, yyy is the CAN address of the freqyency converter).

On the Display of inputs/outputs, x is number of input (column) and yyy is row of the display.



Service parameters 1 – state of inputs and outputs

Example: **DI0.5/002** is input to the system (CPU) with Can address 2 - row no. 2, input 5 (column of inputs IN no. 5). In the figure, this input has value 1.

The display provides also for monitoring outputs (**DO0.x/yyy**, **DOx/yyy**).

7.4. Light barriers

Light barriers may be placed on access of conveyor to machine, i.e. to working space of machine and egress from it. Connected light barriers enable fluent supply of pallets with goods into working space of machine and stop the machine in case of collision, fallen goods from pallet or attempted entry of people on conveyor. Their usage depends on project.

Following procedures show how to unblock machine, which has been stopped by protection circuit of light barriers in emergency. This unblocking enables to remove the object, which has cause the emergency stop.

The machine can also be unblocked this way in case that some of the light barriers is blocked out at machine start.

At least two people must work with the machine, if light barriers need to be unblocked, one unblocking the barriers and another working with machine. If control voltage is switched off as a result of an error, **CONTROL VOLTAGE** button must be pressed to switch it on (button shines).

!	Unblocking function switches safety equipment temporarily off. Only persons authorised to rectify the fault may be for necessary time in vicinity of the machine during this time. They are asked to pay maximum attention during their work at all times.
	Only the person who knows machine functions and who must monitor carefully risk area and immediately block machine activity by releasing button(s) in case of emergency, may use unblock function according to following description.

This chapter is relevant only if your machine is equipped with light barriers **LEUZE** and safety module **LEUZE**.

Button **SAFETY BLOCKINGS-RESET** on display is shining during normal activity of the machine. If the machine has been blocked, indicator is off, and light barriers block the machine.

① If light barriers is activated following unauthorized entry of a person on conveyor, or if obstacle was immediately removed, light barriers rays were not blocked out on operator intervention any more, no objects are in the machine, and **SAFETY BLOCKINGS -RESET** button is off:

- press **SAFETY BLOCKINGS -RESET** button to reset light barriers. The button starts shining. Wrapping machine is again operational

② If light barriers is activated by erected or shattered pallet, there are objects in the wrapping machine, manipulation with machine or line is necessary to remove the fault and **SAFETY BLOCKINGS -RESET** button is off:

- Press and release **SAFETY BLOCKINGS -RESET** button. If any of light barriers rays is blocked out, **SAFETY BLOCKINGS -RESET** button is blinking and it is possible to unblock light barriers according to following paragraph. If there is a pallet with goods inside machine and no light barrier ray is blocked out wrapping machine starts moving pallet on conveyor towards light barriers. Wait until **SAFETY BLOCKINGS -RESET** button starts blinking and then unblock light barriers according to following paragraph.

Unblocking light barriers: Press **SAFETY BLOCKINGS -RESET** button twice within 4sec. Light barriers will be unblocked after second press while the button is being pressed, no more than 10 minutes, though. Unblocking will be stopped immediately after releasing the button, or after unblocking time has lapsed. The machine is operational in both manual and auto mode during unblocking light barriers. After the button has been released, the system evaluates status of light barriers and will either reset them (**SAFETY BLOCKINGS -RESET** button shines and machine is ready for wrapping) or re-activate them (light barriers will block the machine again and **SAFETY BLOCKINGS -RESET** button is off).

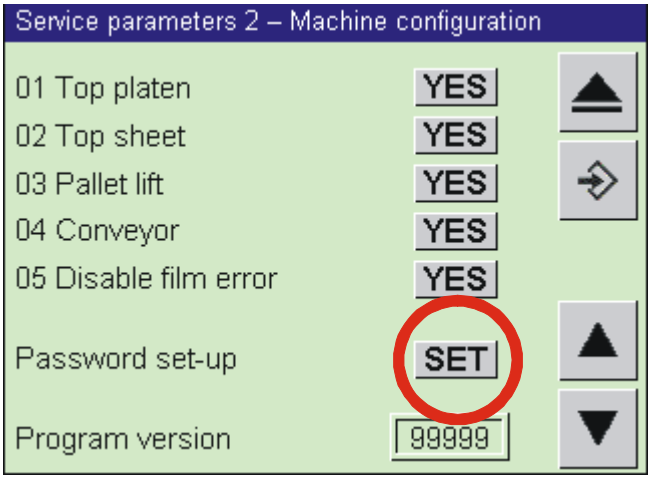
8. MACHINE MAINTENANCE AND CLEANING

The wrapping winding machine requires regular maintenance. If you respect this request, your machine will show longer life-time. For correct check, a pallet must not be on swivel and film must not be loaded into stretching mechanism.

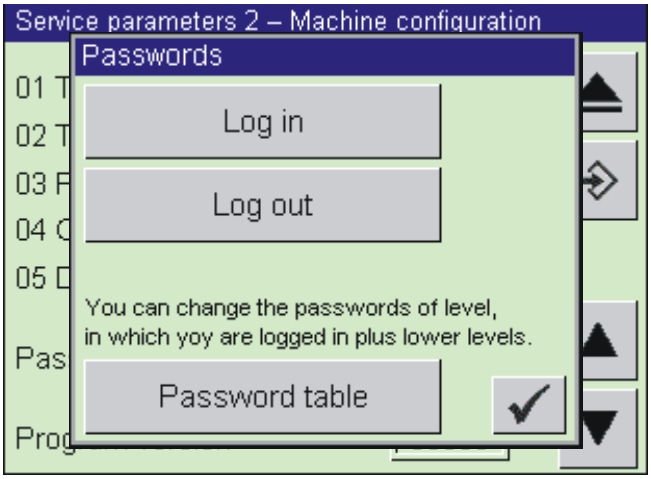
8.1. Machine Setting

8.1.1. Password Change

Password system has been described in Chap. 6.2.6. If needed, the password can be changed as shown in Chap. 6.8.1 set up service parameters 2, Machine Configuration.



Press Password Set-up button to open main display of password administration.



After usual log in as shown in Chap. 6.2.7 (**Log In**) you can display valid passwords and also change them by pressing **Password Tab** button (having

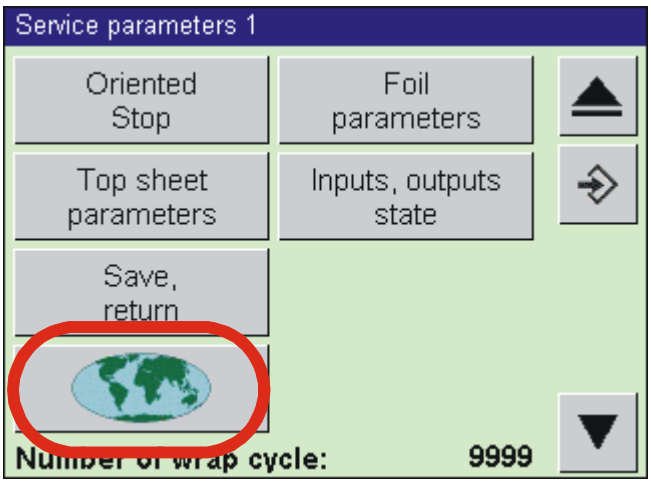
touched password value). Passwords of level, in which you are logged in plus lower levels, are always displayed; you can change these passwords.

You can log out after finishing password edit (**Log out** button). Also, you can do so on the main display of manual or auto mode.

8.1.2. Language Setup

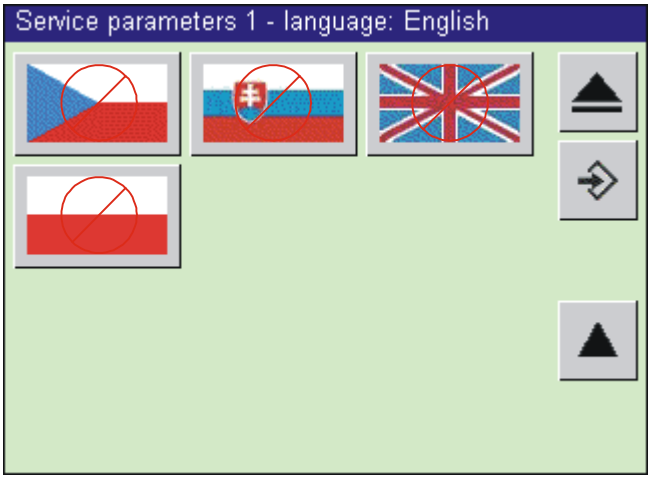
Dialog boxes in more languages can be implemented in the machine. If this option is supported you can set up language as follows:

Go to service parameters 1 setup as shown in Chap. 6.8



Press button with globe symbol and display list of available languages (only an example shown on figure!)

:



Touch a symbol of a flag for a country whose language you want to set up, enter password. After re-pressing of flag button is the language setted. Save service parameters as shown in Chap. 6.8.1. Level 5 password - technician - is required, i.e. the same one as for service parameters.

8.2. Machine maintenance

The machine maintenance is described for the machine with maximum outfit. In case your machine does not include some outfit item, ignore its description.

Maintenance operation	kap.	Daily	Monthly	Small	Medium	Large
Daily inspection	8.2.4	■	■	■	■	■
Visual inspection of belt of stretching device travel	8.2.6	■	■	■	■	■
Visual inspection of belt of down-pressure travel	8.2.12		■	■	■	■
Inspection of friction insert of spool holder	8.2.9		■	■	■	■
Cleaning and inspection of looped collector	8.2.8		■	■	■	■
Check of function of safety devices	8.2.15			■	■	■
Check of tightening and lubrication of arm drive chain	8.2.7			■	■	■
Inspection of electric installation, sensors	8.2.13 8.2.14				■	■
Inspection of pneumatic system	8.2.5				■	■
Inspection of stretching device	8.2.9				■	■
Inspection of ending device	8.2.10				■	■
Inspection and adjustment of overlapping mechanism	8.2.8					■

Monthly maintenance – every 500 operating hours, at least once per month.

Small maintenance – every 1000 operating hours, at least once per 3 months.

Medium maintenance – every 5000 operating hours, at least 1x annually.

Large maintenance – every 10 000 operating hours, at least once per 3 years.

Recommended cycles of operations – according to what comes sooner.

8.2.1. Warranty

Warranty as defined in the Warranty Sheet an in chap. 1.6 does not apply to tear-and-wear parts which are as follows:

part	location
Carbon	collector
Ring	collector
Burning wire	ending
Burning wire	top sheet
Resistor stripe	ending

8.2.2. Cleaning

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

The machine surface can be washed with water and common detergents. During cleaning, the machine must be disconnected from electric power supply.

Clean regularly also windows and mirrors of optical sensors. In doing this, do not use sharp tools, aids or chemicals that could scratch optical elements or windows, and/or cause their non-transparency.

8.2.3. Lubrication

The numbers in the diagram of inspection points correspond to the numbers of lubricating points in the table.

The lubricating diagrams apply to the machine with the highest configuration. In case some component is not fitted to your machine, ignore particular point.

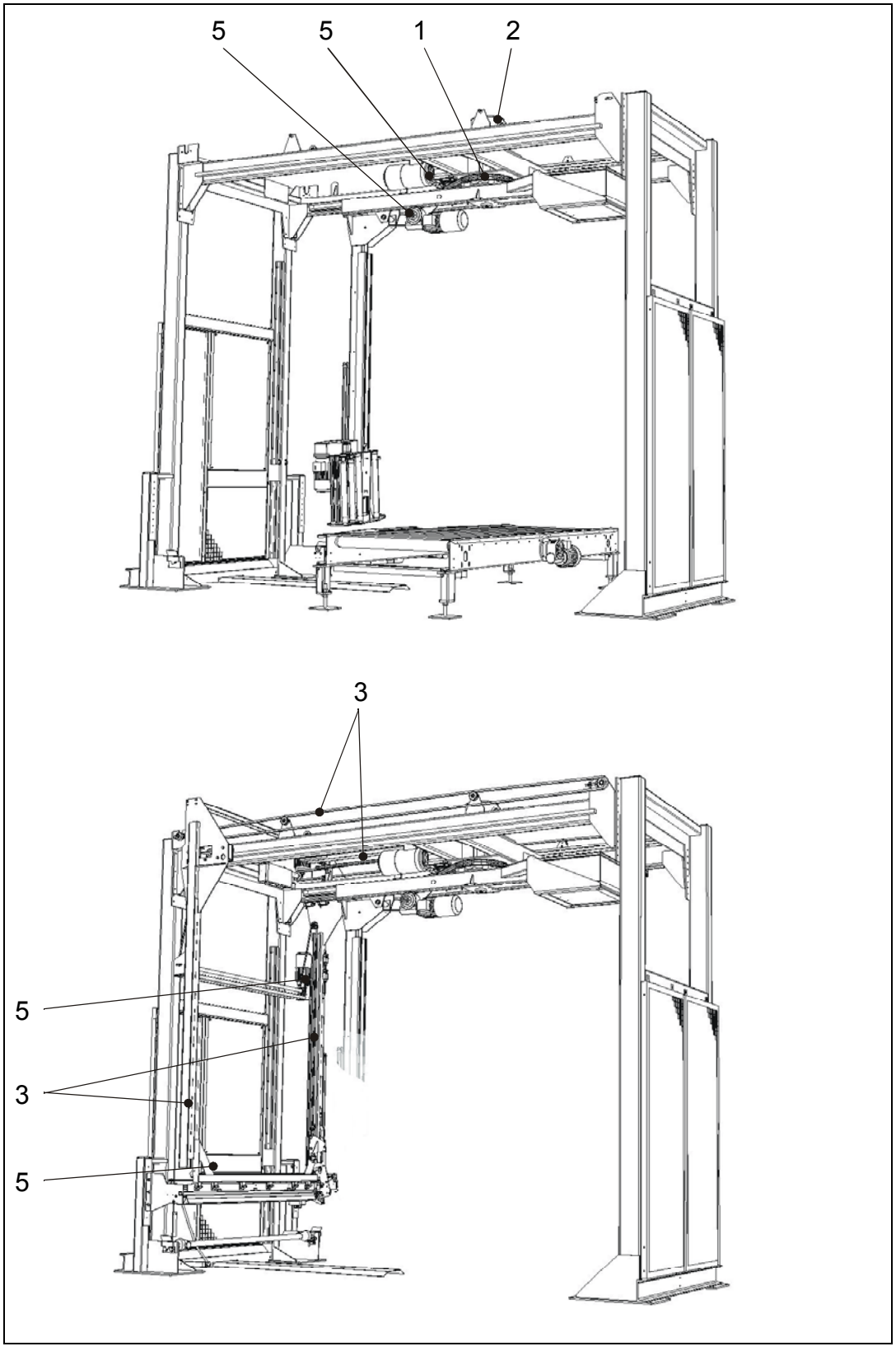

5
5
1
2
3
5
3
5

Table 1 – List of lubricating points

Point		Lubricant	period		Note
			Inspection	Maintenance	
1	Chain of arm rotation	1	small maintenance	small maintenance	
2	Radial bearings of arm rotation	–	small maintenance		B
2	Axial bearing of arm rotation	1	small maintenance	small maintenance	
3	Overlap chains	1 (2)	small maintenance	medium maintenance	
4	Other bearings	–	small maintenance		B
5	Drives of arm rotation, stretching device travel, and overlap	3	large maintenance		A
6	Bearings of electric motor of stretching device	–	medium maintenance		B
7	Pneumatic system	4	small maintenance	small maintenance	C

Notes:

A Just in case of escape - lubricant filling is for whole service life

B Check for possible grease escape – if so replace the bearing for new one of identical type and version (grease escape causes damage to sealing rings)

V See Chap. 8.2.5

Tab. 2 – List of lubricants

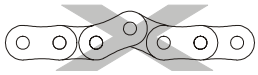
Lubricant	Recommended type
1	Mogul LV 2-3 or usual lithium soaps intended for general use under normal conditions (temperature, speed, environment)
2	Oils: WS40 or usual oils intended for lubricating chains under normal conditions (temperature, speed, environment)
3	From the producer, the filling of gearboxes is for the whole service life. In case of oil escape, contact the manufacturer of the wrapping machine or your nearest technical agency of the firm Bonfiglioli.
4	Festo OFSW-32 Aral Vitam GF 32 Mobil DTE 24 BP Energol HLP-HM 32

8.2.4. Daily inspection

Before each starting of the machine or always once a day, carry out daily check of the machine. This check is accomplished by inspection, requires no tools, and is short; its objective is to discover small defect and thus prevent costly repairs and outages of the machine. Such inspection should always be done in case of suspicion of a damage to the machine (e.g. after a bump with manipulation technique, fall of goods, etc.), after service interventions, maintenance or repair.

Because, in the daily inspection, actual state of the machine is compared with the usual state during normal faultless run, the daily inspection must be carried out by a technician acquainted with the machine and its function.

The inspection concerns:



- Condition of all chains; no link may be yawed (such state means that the chain pin is seized up and the chain damages the chain wheels). Replace the chain damaged in this way.
- Anchorage of the machine and the conveyors to the floor.
- Position and orientation of optical sensors.

Condition of the over-firing wire of the ending device and overlap; if necessary, clean the wire (see Chap. 8.2.10 and 8.2.11)

- Overall appearance of the machine – no signs of collision with manipulation technique or of possible fall of goods from the pallet (deformation, damaged varnish, loosened or damaged joints, parts of the machine off their usual position) may be visible on the machine, protection fencing, safety barriers or conveyors. If so, it is necessary to check mechanical condition of the workplace, i.e. to check integrity of mechanical units and electric installation, integrity and tightening of screw joints, anchors, etc.). The line can only be started in case that the inspection discovers no damage to the machine.
- Condition of safety and information plates. In case of a damage or loss, they should be restored in the original state.

8.2.5. Pneumatic system

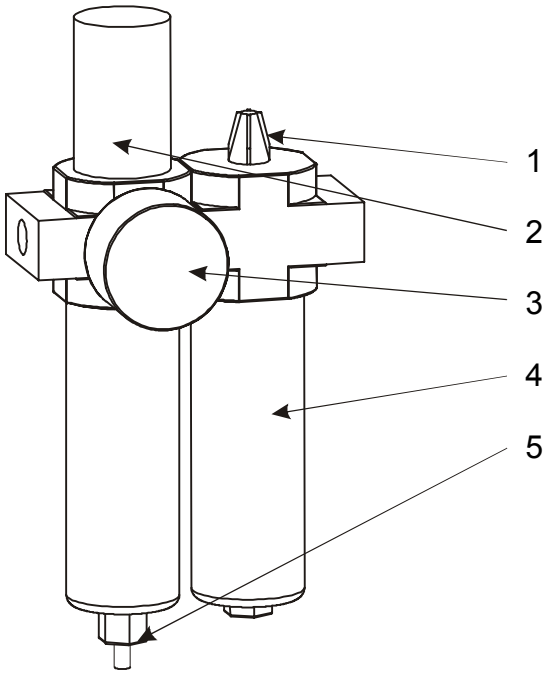
Make a visual inspection of the state of pneumatic cylinders – piston rods must not be bent or otherwise deformed, mechanically damaged or corroded. The pins in clevises and hinges of pneumatic cylinders must be properly secured with cotters.

Check function of pneumatic mechanisms in the manual mode and watch them carefully during the wrapping process. The mechanisms should move smoothly and uniformly in the whole movement range.

Check conditions of the pneumatic distribution, in particular the state of hoses for possible breaking or other damage; also check whether they are correctly fixed in screw joints and other pneumatic elements.

Inlet air pressure should be within the range 0.6 to 1.5 MPa – its checking and regulation depends on the pneumatic distribution of the machine user.

Air pressure in the machine must be set to a value stated on the plate next to the unit of air treatment (standard 0.5 MPa). It is set by a regulating valve - position 2; air pressure is monitored on the manometer - position 3.



In case the condensate level is less than 10 mm under the upper edge of the separator filter on the air treatment unit, open the discharge valve (position 5). The condensate with sedimented dirt is expelled from the separator vessel by air pressure. After the condensate is discharged, close the discharge valve again.

Under normal conditions, the pneumatic system does not require lubrication (slow and intermittent movements of the mechanisms). In an environment heavily polluted with air dust or with aggressive vapours in the atmosphere, it is recommended to lubricate the pneumatic system as follows:

- Oil should be refilled no later than in case when the oil level in the vessel (position 4) falls below the lower edge of the inspection window.
- Close the air inlet before the machine and the regulating valve - position 1.
- Open the discharge valve (position 5); the condensate is thus discharged and the system vented (discharge the compressed air).
- Wait until the pneumatic system is fully vented (as long as you hear the escaping air).
- After the pneumatic system has been fully vented, unscrew the vessel with oil (position 4) and fill it with a specified lubricant (see Chap.8.2.2).
- Screw the vessel back; make sure that the sealing O-ring is in correct position.
- Close the discharge valve, open the compressed air inlet before the machine and on the air treatment unit (position 2) – this procedure ensures slow increase of air pressure.
- Check setting of inlet and operating air pressure.

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

8.2.6. Inspection of belt of stretching device travel

Move the stretching device to its lower limit position. The belt must not have frayed edges along all its length nor may it be torn. Make inspection of eyes and their seams. In case the belt is damaged it should be replaced.

8.2.7. Inspection of arm chain tightening

Loosened or slacked chain causes vibration of the arm during stopping, which is also perceptible on the chain.

Unscrew the plate with the arm motor (4 screws) and tighten the chain with the tightening screw so that minimum clearance about 15 to 20 mm would be left in the chain middle.

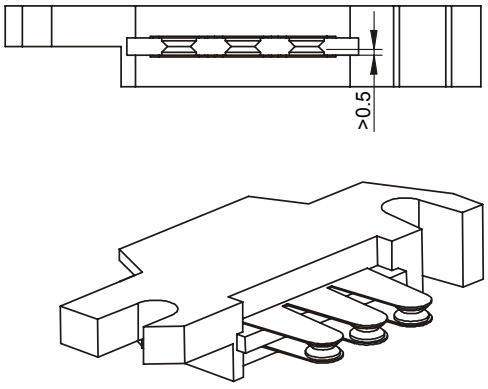
Check whether the chain is in correct engagement with the gears. If not, the chain should be replaced. If, after replacement, chain wheels do not have correct engagement with the chain the fault (wear) is in the chain wheels and they should be replaced.

After the chain has been replaced, check and, if necessary, adjust its tightening after the chain running-in (i.e. after about 1 to 2 weeks of operation).

8.2.8. Inspection of looped collector

Remove the collector cover (cylindrical cover above the main bearing of the rotating arm). Gradually, lift off all contacts of the looped collector (along its vertical axis), clean the contact surfaces of the collector and check their condition.

In case the contact surfaces of the collectors show an excess wear (i.e. height of any contact is smaller than 0.5 mm – see the figure), replace the contact. It is recommended to replace all contacts in the collector at the same time.



Inspect functional surfaces of the collector rings (loops) and clean them as necessary. Remove possible baked-on residual dirt and signs of corrosion or oxidized surface. If the functional surface is worn through, its edges are distorted or its parts broken off, replace the collector ring – the contact is being excessively

worn. In case all rings or most of them show approximately the same wear, it is recommended to replace all rings as prevention.

Inspect condition of cables connected to the collectors – they must be properly fixed, must not be broken or their insulation damaged (mechanically or thermally).

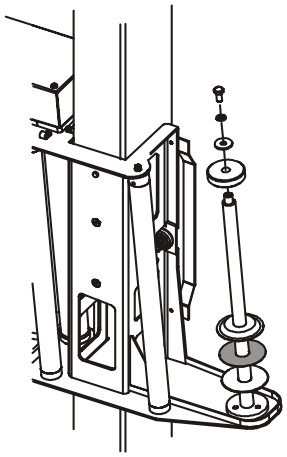
During the re-assembly, make sure that the cables are correctly laid (same as before the inspection; the risk of cables being caught in the collector mechanism and damaged is thus prevented.

8.2.9. Maintenance of single-motor stretching device

During the inspection and maintenance, no film should be inserted in the device.

The following should be checked on the stretching device:

- State and tightening of the belt: The belt condition should be checked; if its top layer is frayed, the belt is broken or pieces of rubber are torn off from it, it should be replaced for a new one of identical dimension and specification.
- Smooth and even run of all pulleys on the stretching device. The pulleys must not be deformed. If necessary, replace the pulleys or, in case of incorrect run, replace their bearings.
- During the operation, watch function of the balancing pulley (it is installed on a spring-mounted swinging lever). In case the spring is weak, i.e. the balancing lever cannot maintain tightness of the film that becomes slackened for a short time during wrapping, the spring should be replaced.



- The friction insert on the film roll holder; if the insert is excessively worn (this is manifested by an apparent thinning of the insert, its deformation, non-uniform wear, local waviness or visible approach to a worn-through insert), replace the insert. In a dusty environment, check the insert within the monthly maintenance, and later, according to practical experience, adjust the actual interval of the inspection.

8.2.10.Check and Maintenance of Ending Mechanism

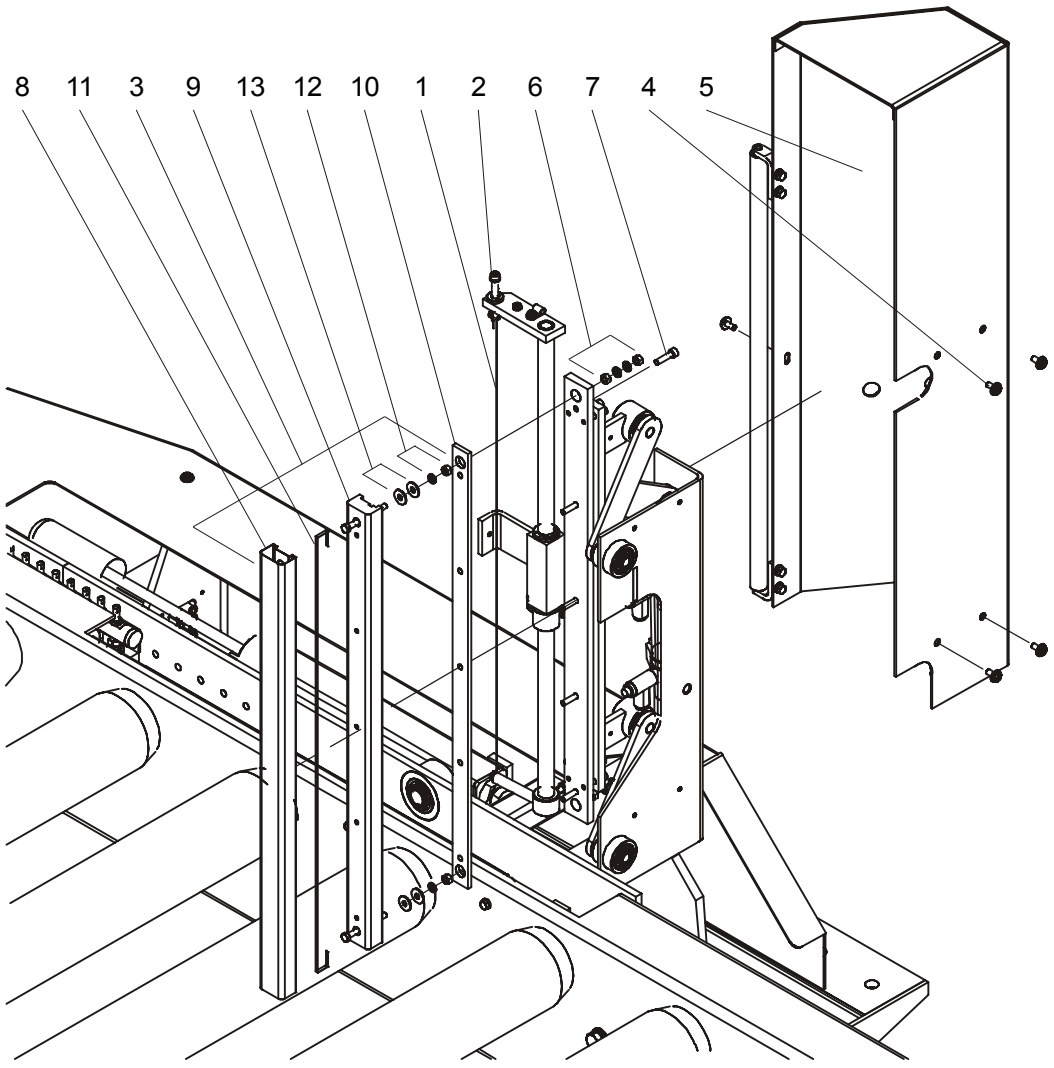
Check condition of the device during day-to-day maintenance of the machine:

- overburning wire (1): it must be reasonably tense (2 - wire suspension must not be sitting in any of the extreme positions, wire tension must be delimitated by spring). If film residues are on the wire, remove them;

- sealing body (3 - configuration): Teflon-fabric coating must not be frayed or torn. Sealing resistance strip (11, placed under Teflon fabric) must be unfailingly fixated on both sides to sealing body;

- film fixture (beside conveyor): make sure that no film residues have remained in the fixture. If yes, open the fixture with **FILM FIXTURE** controller, take out loaded film and remove film residues. Then, reload the film into the mechanism and close the fixture with **FILM FIXTURE** controller;

If you are dismantling sealing body while replacing damaged Teflon coating or sealing resistance strip, follow this procedure:



- take out bolts (4) and remove cover (5);

- disconnect cables (nuts and washers - 5) and unscrew bolts (7). Take down sealing body;

- If a new Teflon cloth is needed (8), replace it at this stage. Teflon cloth is clenched between sealing strip (9) and insert (10). During the dismounting, take heed to proper tension of Teflon cloth and check that slots in Teflon cloth match with slots for bolts in sealing strip. Assembling is a reverse procedure to dismounting. Self-adhesive cloth is used in some cases.

If sealing resistive strip (11) must be replaced, loose nuts and washers (12) after removing Teflon cloth. Replace the strip, slide ends between big washers (13) and nuts (12), re-tighten so that the strip is properly fixated. Put the Teflon cloth back, or replace for new, if needed. Assembling is a reverse procedure to dismounting.

8.2.11.Maintenance of overlap

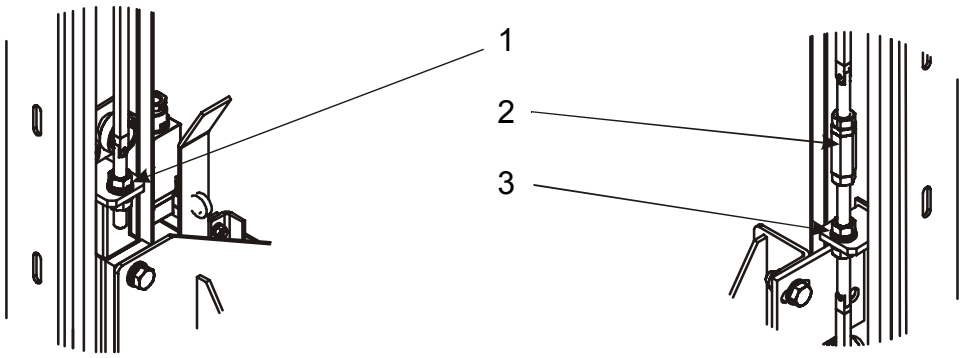
Make a daily visual inspection of the state and integrity of the wire. If residues of the overlapping film are baked on it remove them with a rag or an appropriate tool made of plastic or wood, never metallic; make sure that the Teflon coat of the wire is not damaged.

In case the wire is ruptured, slipped out from its attachments or the Teflon coat is damaged, replace the wire; both ends of the wire are attached in an identical way. Loosen the screws fixing the wire to the holder and remove the old wire. Mount the new wire so that, after assembly, the springs on the stretcher would be pressed to the limit or almost to the limit; it should be possible to further press the spring by max. 3 mm. The Teflon coat of the wire eyes laid under rests on the holder must be removed by scraping off. During the assembly, provide for good contact of electric supply leads – good condition of conductors and assembling eyes, tightening of bolts and nuts, and integrity of cable insulation.

Inspection and tightening of tongs travel chains (vertical chains)

Check tightening of the chain in the basic position of the machine (moving tongs in lower position). With the force 1 kp in the middle of the chain longer branch, the chain should get sagged by 60 to 85 mm. The moving tongs of overlap must be parallel with the fixed tongs with deviation max. 5 mm along the whole length of the tongs. The chains must be correctly engaged with the chain wheels; if the chain is slacked the run on wheels is irregular and noisy, and the chain wheels are damaged. The chain damaged in this way should be replaced; both chains in the given direction should always be replaced. Both chains should also be replaced in case it is impossible to tighten them correctly by the following procedure. After certain time when the chains were replaced (about one week of operation), check tightening of the chains and correct if necessary; the chain will run in and get slightly extended to its final length.

The chain tighteners are fitted on the cart of the overlap moving tongs.



The left chain (when viewed from the switchboard to the machine working space) has a simple tightener - position 1 - providing for correct tightening of the chain.

With the right chain, it is possible to set each chain branch separately. By setting each branch separately, the chain can be correctly tightened (tightener 2) and position of the moving tongs (adjusting nut 3) can be adjusted so that they are parallel with the fixed tongs (deviation max. 5 mm).

Inspection and tightening of arm travel chains (horizontal chains)

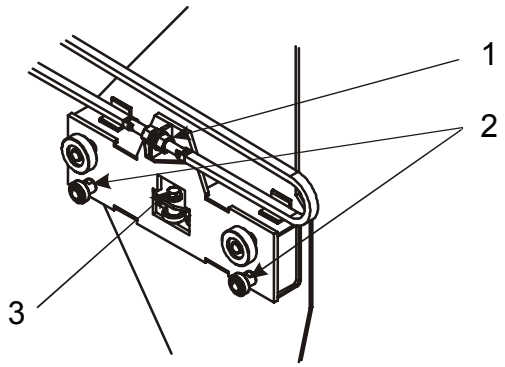
The chain tightening is checked on the upper branch, in the middle between the supporting pulleys. With a slight force exerted in the middle of the chain (about 1 kp) the chain should be sagged by 50 to 80 mm.

The data of the previous paragraph concerning the vertical chains apply fully to engagement of the chains with the chain wheels, replacement of the chains, and running-in of the replaced chains.

The chains are tightened using the tighteners on the return pulley (the most distant from the initial position of the overlap arm) - each chain extra. Loosen the nut in the pulley axis and tighten the chain by turning the tightening screw. Then, retighten the nut.

Adjustment of arm travel

All adjustments of the arm travel are carried out on the arm carts. The following is adjusted:



- Parallel orientation of the moving and fixed tongs. By the adjusting nut - position 1 - the adjustment is made so that the moving tongs in the lower position are parallel with the fixed tongs (deviation max. 5 mm).
- Longitudinal allowance (in the arm travel direction). If the allowance is large, the arm is considerably swinging during stopping and starting, and a bump of the travel rollers - position 2 – on guiding profiles is heard. Hold the roller pin on the bearing side with a flat spanner and, using a box spanner, loosen the nut on the other side of the cart weld. Move the roller to stop at the guiding profile and retighten the nut. After having adjusted all bearings, test the travel; in case the overlap arm runs heavily set the clearance between the bearing and the guiding profile to max. 0.5 mm following the same procedure.
- Transversal clearance is adjusted with the bearing 3. Adjust both bearings (on both carts): the carts in the overlap frame must be symmetrical; set clearance 0.5 to 1.5 mm between the guiding profile and the bearing.

8.2.12.Tongs down-pressure

In the manual mode, move the down-pressure to the lower limit position. The lifting belt is well visible along all its working length.

The lifting belt must not be defective (ruptured) or frayed at its edges. Otherwise, it should be replaced.

Make a visual inspection of the down-pressure plate as well; permitted degree of its wear depends on the goods to be wrapped and on the danger of its damage by the down-pressure plate.

Belt replacement

Both ends of the belt are fixed in identical manner.

Remove the securing ring from the pin and take the pin out from the lugs of the down-pressure plate or from faces of the spooling drum. Using a reverse procedure, mount the new belt and secure the pin with a securing cotter. Dimensions of the new belt must be identical with the original; it is provided as a spare part including stitched-on loops on both ends. In case the belt is made in your factory ask the manufacturer for documentation; a right belt must be used, the eyes must have correct dimension, and strength of seams must be observed.

Down-pressure moves in reverse sense

If the down-pressure moves in a reverse sense (i.e. the down-pressure plate moves upward when the downward movement of the down-pressure is required and vice versa), or the down-pressure does not move down onto the wrapped goods although application of the down-pressure has been chosen, the belt is spooled on the drum in a reverse sense as a result of the previous error. This state can be detected visually (in correct way, the belt must be spooled on the pulley from the top).

Remedy: If there is a pallet with goods on the machine conveyor remove it. Switch the machine over to the manual mode and move the down-pressure to its lower limit position using the manual function **Down-pressure up/down** for lifting the down-pressure (using push-button **+**, i.e. the push-button with logically reverse function than required). Hold the push-button, the belt will be spooled again on the drum, this time in correct sense. After the down-pressure reaches its upper limit position, it stops automatically. Switch the machine back to the automatic mode.

8.2.13. Electrical System Maintenance

Provision of Chap. 2.2 on qualification of worker doing maintenance must be complied with during maintenance of electrical system.

MAIN SWITCH must be off and locked, with removed key from lock, before manipulation with contactor switch-board and other electric installation may commence.

Disconnect **power supply** by unplugging supply cable from socket during bigger repairs!

Scheduled and regular maintenance is needed for electric installation. By respecting this request, you can substantially extend life-time of the installation. Use shorter intervals for removing dust and dirt from electric installation as well as from other mechanisms. Use longer intervals for tightening screws and contactors, especially after grave short-circuits. Also check functioning of thermal protectors, insulation resistance, or earthing. Main switch must be off before any work on engine may begin!

If the engine is not in operation for longer period, its condition must be checked as follows:

1) any visible damage to any of its parts
2) winding insulation resistance
3) condition of motor mounting (grease filling must be replaced after longer time)

8.2.14.End limit switches and sensors

Continuously check correct function of switches and sensors (the machine stops or performs required operation in correct places and at right time). During mechanical inspection of the switched-off machine, check mechanical state of the switches – non-damaged cables, the switch fix-fitted to the machine; non-damaged levers and pulleys of mechanical switches; correct closing ("clunking") of contacts during movement. For the optical and induction sensors, their state with the machine running is indicated by an LED. Clean the windows and mirrors of optical sensors in regular intervals.

Sensitivity of optical sensors, if not given by choice of the sensor type, is factory-set so that they can reliably scan the goods on the pallet and that the sensor would not react to remote objects or movement outside the machine. Adjustment of an insufficiently or excessively sensitive sensor, if possible, is carried out using the adjusting screw on the optical sensor.

Sensitivity of induction sensors is given by the type chosen by the designer for given purpose. Wrong function of the induction sensor is either caused by incorrect position of the sensor with respect to the indicated part (the gap should range between 2 and 5 mm and, after adjustment, it should be tested) or the sensor is defective. Adjustment (except gap adjustment) or repair of a defective sensor is impossible and it should be replaced for a sensor of identical type and specification. Potential replacements must be approved by the manufacturer.

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

8.2.15.Inspection of function of safety devices

This chapter relates to safety elements used as standard by the manufacturer of the wrapping machine. If the designer of your wrapping line used different safety devices he/she should revise this chapter and amend it, as necessary. These changes and amendments must become an integral part of this accompanying documentation.

The safety devices undergo regular inspection and check of their functionality.

The manufacturer and exact type specification of the safety devices referred to in this chapter can be found in the electric wiring diagram and/or you can obtain this information from your dealer or designer of the electric installation. This chapter relates to safety elements used as standard by the manufacturer of the wrapping machine. If the designer of your wrapping line used different safety devices he/she should revise this chapter and amend it, as necessary. These changes and amendments must become an integral part of this accompanying documentation.

Light barriers, module of light barriers

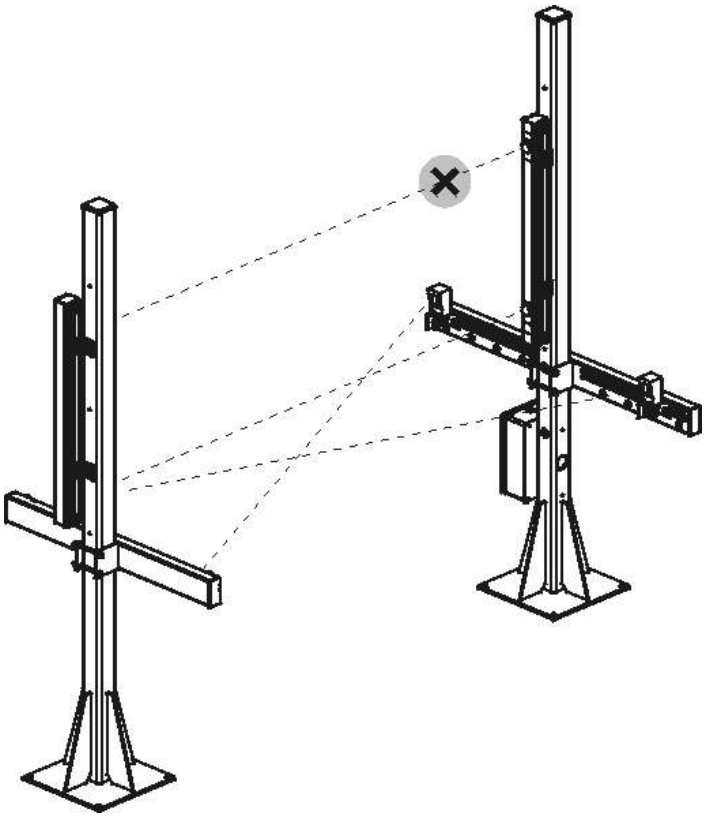
Once in three month, check functionality of the safety barriers by the following procedure:

- During the standard wrapping run, watch whether the pallets pass smoothly through the barriers. By watching the beacon, check whether the barriers are dampened for a necessary period only.
- Check whether skew beams of the damping sensors (on the horizontal arm of the safety barriers) are oriented to corresponding reflection plates on the opposite stand.
- Make sure that there is no person in the protected space.
- Start the wrapping process by pressing the push-button Start or wait for automatic start of the wrapping.

Simulate non-permitted passage on the entry track by interrupting one of the beams of the safety barriers. The beams of the light barriers are oriented

perpendicularly to the conveyor axis – see the figure with example. The wrapping machine should stop immediately; the run-out time of the machine should correspond to the maximum value valid for your machine given in table in Chap. 3.1.

- ave the beam of the light barriers shielded; using the procedure referred to in Chap. 7.4, unblock the machine and test the machine control in the manual mode. On releasing the unblocking push-button, the machine should stop immediately.
- emove the shield of the light barrier and, following the procedure referred to in Chap. 7.4 point 1, unblock the machine. After unblocking, the machine should be prepared to normal operation.



	**In case of any deviation in behaviour of the machine or in function of the safety barriers from this description, put the machine out of operation and provide for its service!**

	**For the light barriers and safety modules of the firm LEUZE, the manufacturer orders that an inspection of the device should be done once a year by a service technician authorized by the firm LEUZE. Contact your nearest trading or technical agency of the firm LEUZE or your supplier of the machine Rotary Arm**

Emergency stop

The module is installed in the switchboard. Stop the machine by pressing the push-button **EMERGENCY STOP**. Keep the push-button depressed and press the push-button **CONTROL VOLTAGE**; the push-button must not light up and the machine must not start working or moving in any way. Then, put the machine into operation according to Chap. 5.9.1. Successively test all push-buttons **EMERGENCY STOP** used on the machine and connected to its switchboard. Following this procedure, test function of the push-buttons **EMERGENCY STOP** and of the safety module controlling operation of the machine.

Electro-magnetic lock of protective fencing

The module is installed in the switchboard. Test its functionality; with no exception, it must perform all functions as referred to in Chap. 5.6. Test mechanical reliability of the lock (it must not permit the door to open by applying usual force). In this way, test the lock and the safety module in the switchboard that co-operates with the control system and with the machine power supply.

8.3. Notes

Check and maintenance intervals as implied in this manual may be adjusted on the basis of experience from operation and both manufacturer's and user's tests of the machine.

9. SERVICING

Reparations within and after warranty period are done by the manufacturer. The manufacturer also supplies individual spare parts as per orders of consumer.

Manufacturer's address:	PRAGOMETAL spol. s r.o. Vídeňská 172 252 42 Jesenice u Prahy
Telephone:	+420 - 234 144 746, 790
Fax :	+420 - 234 144 710, 777
email:	servis@pragometal.com

Document	*KLB_LGA_TS_4_GB.doc*
Date	*12/2010*

Program parameter setup

PROGRAM NUMBER:	0	1	2	3	4	5	6	7	8	9
Basic set-up										
Wrap										
Use top platen										
Use overlapping										
Use wrap.with ejected fixture										
Use pallet lift										
Low position										
No. of Arm Turns										
Spinning speed of arm										
Secondary stretch										
Upward										
Spinning speed of arm										
Stretch.mech.travel speed										
Secondary stretch										
High position										
No of Arm Turns										
F.overlap ab.edge of goods										
Spinning speed of arm										
Secondary stretch										
Downward										
Spinning speed of arm										
Stretch.mech.travel speed										
Secondary stretch										
At the end										
No of Arm Turns										

PROGRAM NUMBER:	0	1	2	3	4	5	6	7	8	9
Spinning speed of arm										
Secondary stretch										
Overlap										
Overlap film length										
Overlap film shift										
No of turns after overlap										
Sec.stretch after overlap										
Height of pallet for overlap										
Combined overlap										

FACTORY PASSWORD

for level "2 - user"

(for program access)

111

FACTORY PASSWORD

for level "5 – technician"

(for service parameter setup)

222

WARNING

Store these password in safe place so that unauthorized person would not get hold of them.